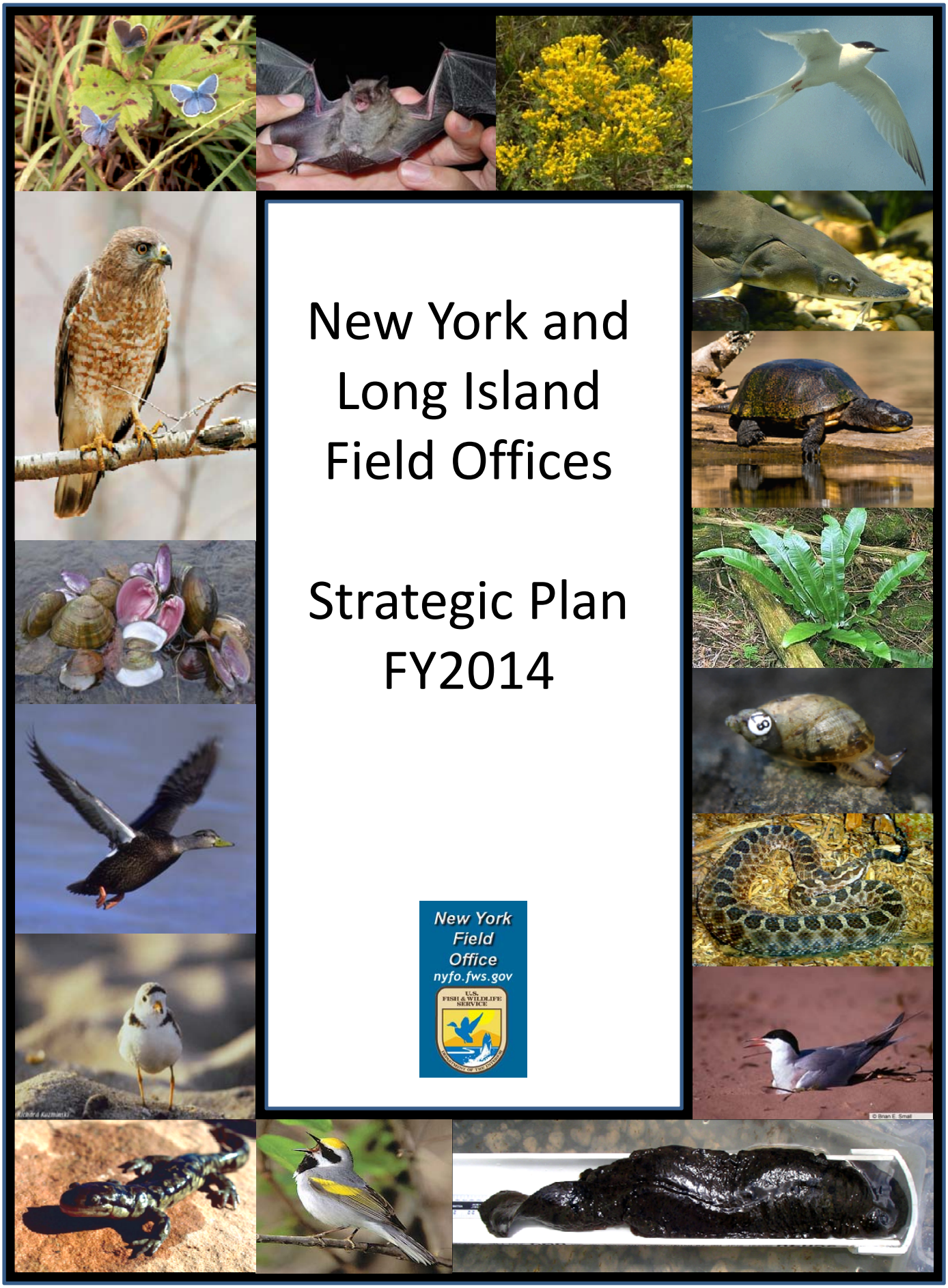

New York and Long Island Field Offices

Strategic Plan FY2014

New York Field Office
nyfo.fws.gov
U.S. FISH & WILDLIFE SERVICE

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U.S. Fish and Wildlife Service

New York and Long Island Field Offices

Strategic Plan Introduction

The U.S. Fish and Wildlife Service is evolving its landscape level approach to conservation. Like many of our conservation partners, there is a realization that, with the increasing numbers of species being designated as species of greatest conservation need, or have been Federally- or State-listed as threatened or endangered, that we must approach their recovery in a more holistic manner at the same scale they occur, a landscape scale. Working at a landscape scale requires working across political jurisdictions and with our many conservation partners; it requires an integration of efforts with each organization contributing within the scope of its mission.

The New York and Long Island Field Offices have developed a strategic plan for our future work. This plan provides the direction of our field offices' work and allows us to clearly articulate to others what our goals are and why. Our plan was developed using the Strategic Habitat Conservation approach (SHC). The SHC approach is an adaptive management methodology with 4 identifiable phases – biological planning, conservation design, conservation implementation, and monitoring. You will see that our strategic plan reflects this process in its construction.

During the biological planning phase, our office identified 8 geographic focal areas within New York that support concentrations of species of greatest conservation need or were important for the future of the species within their current or potential future range as modified by climate change. Forty-one priority representative species were selected. We identified and ranked threats, and identified population goals for these species. In the conservation design phase, we identified strategies to attain our population goals by determining ways to mitigate the threats having the greatest impact on the species. Monitoring will be done to determine if our strategies are successful or need to be modified.

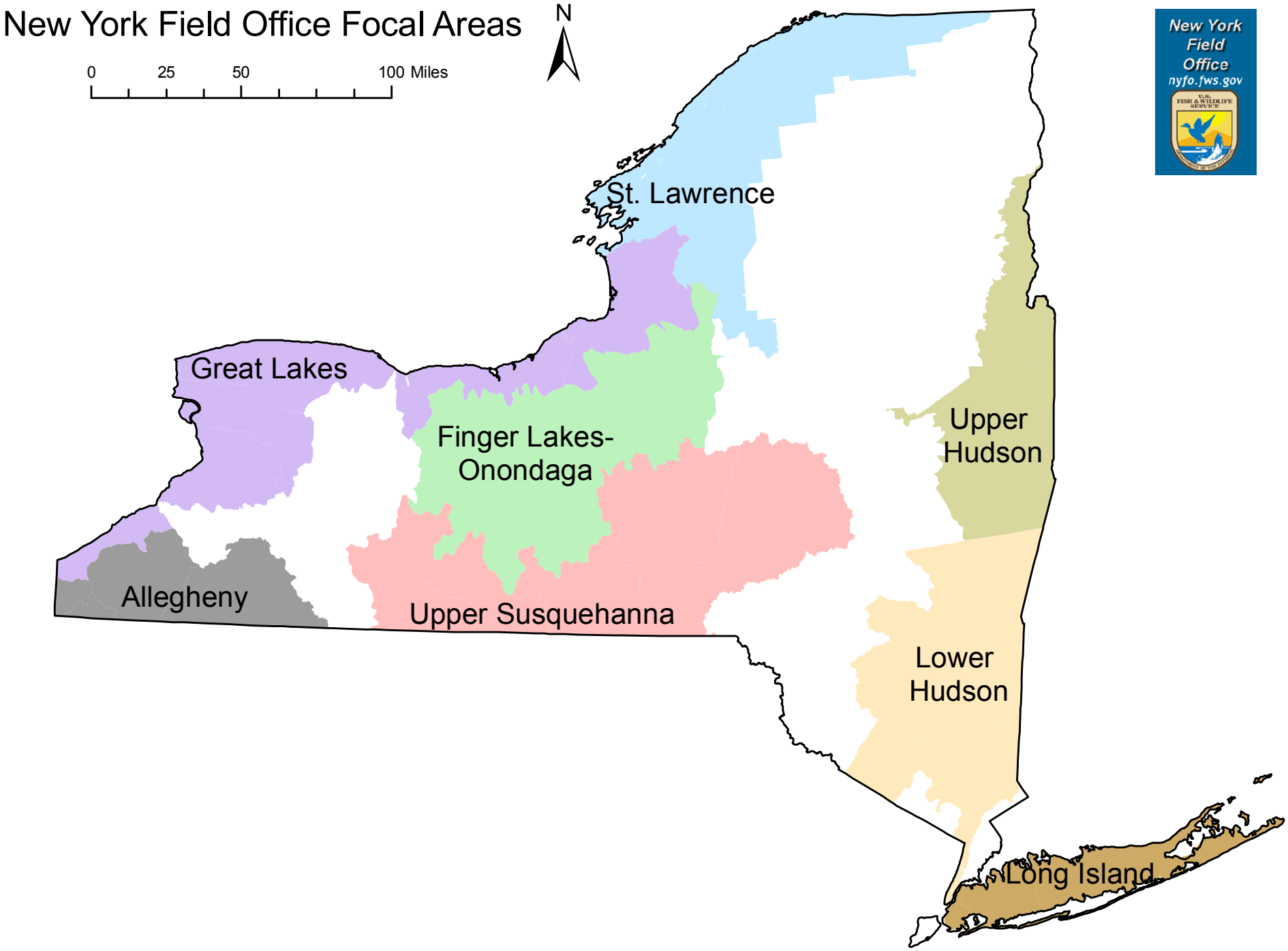
The timeline over which this plan will be implemented is biologically based, that is, our planning timeframe will be consistent with the timeline it will take to reach the specific goal we have identified. We are taking the long view.

Every fiscal/performance year we will identify those actions from our plan we are committing to undertake. Those actions will constitute our annual work plan. You will see those actions identified within the document in blue text. For convenience they are also extracted from the text and placed in appendices organized by office program and by species.

Our plan is a living document. Using an adaptive management strategy means we will modify the plan as appropriate as we coordinate with our conservation partners, evaluate new

information and our monitoring results, and take stock of the resources available to us for implementation. We strive to improve the delivery of conservation in the most effective and efficient means possible. We are very interested in your feedback. We encourage those who read this plan to identify where we may have common goals and can work together. If you have information or insights that will help improve our plan, please share those with us. The way to the future is a shared one. We look forward to working with you.

New York Field Office Focal Areas



ALLEGHENY FOCAL AREA

The Allegheny Focal Area (AFA) is located in the southwestern corner of New York and contains 1,906 square miles or 3.5% of the state. The overall boundary is demarcated largely by the Allegheny River watershed, which drains into Pennsylvania. From west to east, the AFA transitions from the heavily glaciated Low Lime Drift Plains with a local relief of 250-400 feet to the unglaciated High Allegheny Plateau with a local relief of 500-1000 feet. Overall elevation range within the focal area is 1000-2350 feet. The AFA is characterized by the steep topography and the high overall elevation of the Allegheny Plateau as well as by Chautauqua Lake, the Allegheny Reservoir, and the Allegheny River.

The Allegheny River Basin is one of two principle tributaries to the Ohio River Valley and has historically been one of the most resource rich extractive areas in the United States. All of or portions of three New York counties are included within the AFA boundary including Allegany, Cattaraugus, and Chautauqua. Approximately 190,000 people live within this focal area, concentrated primarily southeast of Chautauqua Lake, including the City of Jamestown and in the Allegheny River Valley, including the City of Olean. Land uses transition from lesser areas of dairy, agriculture, and development to more predominate land uses related to forestry as topography increases.

This focal area was selected because it contains extensive forests as well as high quality aquatic systems. There are currently two Federally-listed species (endangered [E], candidate [C]) and six identified species of concern within the focal area. The heart of this focal area centers on the heavily forested 65,000-acre Allegany State Park, which is surrounded by state and privately-owned forested lands. These areas are important habitat for the cerulean warbler and, along with associated edges and shrublands, broad winged hawk and golden-winged warbler. This focal area is included within Bird Conservation Region 28 (Appalachian) and Partners in Flight Physiographic Area 24 (Allegheny Plateau). The AFA also contains 4,086 miles of freshwater rivers and streams including the French Creek sub-watershed, which is considered the most biologically rich aquatic system in the northeastern United States. The clubshell (E) and rayed bean (C) mussels, as well as the eastern hellbender salamander, are found here, all of which require low sediment, unpolluted streams. Additionally, important fish species, such as the brook trout and spotted darter, occur in the AFA.

The New York Field Office actively seeks to promote the above resources by addressing issues related to interactions with Marcellus shale drilling, oil drilling, water-level regulations, hydropower, wind power, forestry practices, and development. Specific threats include habitat loss (principally), fish barriers, hydrologic changes, habitat succession, invasive species, decreased habitat complexity, shoreline hardening, degraded water quality, nutrient and sediment loading, and climate change. Current projects include Federal and non-Federal permit review for wind power development and relicensing, endangered species consultation and recovery activities, and habitat restoration and invasive species control implemented by the Partners for Fish and Wildlife.

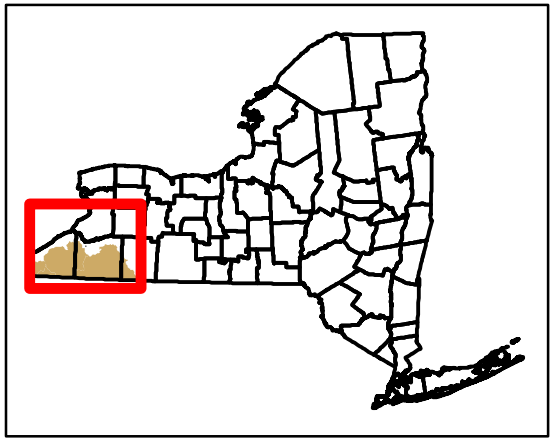
Allegheny Focal Area

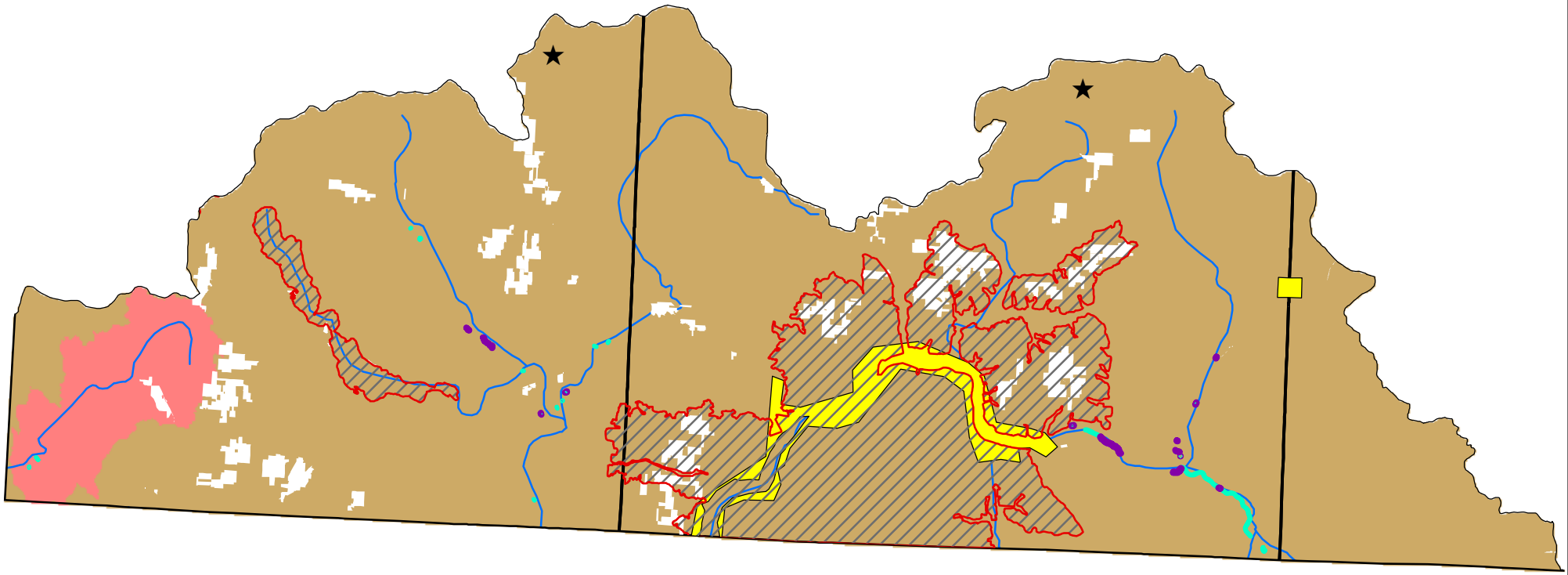
0 5 10 20 Miles

N

Legend

- Rayed Bean
- Endangered species
- Important bird areas
- Wind turbines
- Native American Lands
- Protected lands
- French Creek watershed
- Allegheny focal area





Bald Eagle (*Haliaeetus leucocephalus*): Allegheny Focal Area

Bald Eagle Species Action Plan

FOCAL AREA: ALLEGHENY

Other species benefitting:

turkey vultures, migrating raptors including golden eagle, sharp-shinned hawk, rough-legged hawk, red-tailed hawk, broad winged hawk, American kestrel, osprey

BIOLOGICAL PLANNING

Introduction to species

Species information: Although delisted from the Federal endangered species list in 2007, the bald eagle still faces threats from human intervention in their migration routes and foraging and breeding areas. Despite their fierce image, bald eagles are actually quite timid and opportunistic. Since their primary prey is fish, bald eagles are sometimes called sea eagles, though they will take some mammals, waterfowl, seabirds, and carrion, especially during winter. The bald eagle is a long-lived bird, with a life span in the wild of more than 30 years. Bald eagles mate for life, returning to nest in the general area (within 250 miles) from where they fledged. Once a pair selects a nesting territory, they use it for the rest of their lives. Although the Great Lakes shores are not known as important eagle roosting areas due to violent winter weather and icing over, there are increasingly more nests along the shore, including one in Irondequoit Bay and 5 more in Region 9 of the New York State Department of Environmental Conservation (NYSDEC). This region had the lowest nesting success rate at 64%, below the State average of 71%.

Justification for species selection: The bald eagle and golden eagle are still protected by the Bald and Golden Eagle Protection Act (BGEPA) which now requires authorization by the U.S. Fish and Wildlife Service (USFWS) for unavoidable take of nests and of eagles. The bald eagle is still a New York State listed and a new ESA permit program for authorization of unavoidable take is now in place (Article 11). The BGEPA program calls for Ecological Services (ES) offices to assist with early coordination and consultation with potential permittees because of our long history of working with eagles through Section 7 and our program which are delivered to the public from field stations, including providing technical assistance on minimizing impacts of development and policy actions on wildlife. Several areas in New York will involve New York Field Office (NYFO) work with bald and golden eagle conservation – along the shore of Lake Erie, the ridge (escarpment) just south of the shoreline of Lake Erie, along the shoreline of Lake Ontario and the St. Lawrence River valley where eagle migration is documented every year by three raptor watch sites in New York and several in Canada, and in the lower Hudson River where eagles nest and roost on mid-river islands and may forage along the shoreline in the vicinity of rail lines. The largest threat to nesting and migrating eagles in the Allegany Focal area is wind energy projects.

Bald Eagle (*Haliaeetus leucocephalus*): Allegheny Focal Area

Bird Conservation Region (BCR) 28 (Appalachian Mountains) includes the New York portion of the Allegheny Plateau.

State contribution to overall species population: The NYSDEC conducts an annual bald eagle count which, for 2009 statewide was 241 adults and 160 immature birds. State biologists assume that the number of resident eagles is growing each year, but no attempt is made to differentiate between resident eagles and seasonal migrants in the annual count in January.

Threats and threat assessment:

1. Modification or destruction of habitat(s), including migratory corridors, winter roosting areas, and breeding areas. This includes human disturbances from logging, wind farms and other developments, poorly planned public use (boating, canoe/kayak trails, jet skis, ATVs).

2. Disease or predation, including lead ingestion, botulism, predation from other eagles, death by shotgun.

3. Development: Habitat loss, modification or destruction of habitat. Collision or habitat loss from wind energy development, disturbance from oil and gas drilling, etc.

4. Inadequacy of existing regulatory protections. Endangered Species Act (ESA) and BGEPA protection is in the form of a permitting program that allows for "death by a thousand cuts" effects on bald eagles. Although take is prohibited without permits, it can be authorized with a permit; the success of various mitigation schemes to offset take is unknown.

5. Ingestion of environmental contaminants, impacts to reproduction.

Research needed:

- Identification of essential breeding and wintering habitats to target locations for habitat management and protection. |FY12-FY14 $3,000 BP CPA SLD Planned

- Identification of movement patterns, migratory pathways, and locations where New York's wintering eagles breed to target locations for habitat protection and to inform the wind industry about specific areas to avoid. This should include the heights at which eagles fly when riding thermals (in the vicinity of potential wind energy development sites) for both activity associated with breeding and migratory movements. |FY11-FY14 $0 BP CPA SLD Ongoing

- Research is needed to determine climate change impacts on habitat community structure and changes in prey base during breeding and migration seasons.

- Research is also needed to determine changes in species distribution and population sizes due to climate change.
- Research is needed to assess potential impacts of habitat fragmentation associated with Marcellus shale formation gas extraction.
- Monitor contaminant levels in eagles in New York. |FY? $0 BP EC,CPA ALS,SLD Future
- Continued pathology investigations to determine causes of mortality in bald eagles. |FY12-FY14 $0 BP CPA SLD Future
- Post-construction monitoring of developments that might affect eagles and their habitats and providing mitigation where needed. |FY13-FY14 $0 BP CPA SLD Future

Partners/potential funding:

NYSDEC, Region 9 Buffalo and Allegany Office, Olean, NY, New York State Energy Research and Development Agency (NYSERDA), USFWS, State Wildlife Grants (SWG), wind energy developers.

Population goal(s) for New York State:

Goal – to maintain a stable population of bald eagles in NY. Productivity of 1.0/eagle pair.

Research needed: Identification of a population goal for the New York State breeding population. |FY12-FY14 $0 BP CPA SLD Future

CONSERVATION DESIGN

1. **Loss of habitat.**

   a. Address modification or destruction of habitat(s) including winter roosting areas and breeding areas through public education programs and website postings in conjunction with the NYSDEC bald eagle recovery program. Assist the NYSDEC in identifying movement patterns, migratory pathways, and locations where New York's wintering eagles breed. |FY12-FY14 $0 DES CPA SLD Ongoing

   b. Continue engagement in Federal Clean Water Act permitting program and State Environmental Quality Review Act (SEQRA) program for wind power and development projects proposed in eagle concentration areas and wind resource areas that coincide with breeding and migratory routes. |FY12-FY14 $0 DES CPA SLD Ongoing

c. Assist NYSDEC in identifying, managing, and protecting essential breeding and wintering habitats. |FY12-FY14 $0 DES CPA SLD Ongoing

2. **Disease or predation, including lead ingestion, botulism, predation from other eagles, death by shotgun.**

   a. Through hunter education programs, address nest protection programs. |FY14 $0 DES CPA SLD Future

   b. Ensure continued monitoring of lead and other contaminant levels in eagle eggs and chicks. |FY? $? DES EC,CPA ALS,SLD Future

3. **Inadequacy of existing regulatory protections.**

   a. Address inadequacy of existing regulatory protections by providing information about the Federal BGEPA program as administered in New York by the NYFO and the Regional Office's Migratory Bird Program Office, and State protections under the State ESA. |FY12-FY13 $0 DES CPA SLD Ongoing

4. **Other man-made or natural factors.**

   a. Develop advanced conservation strategies and best management practices (BMP) for this industry and for the wind industry to avoid and minimize impacts to bald and golden eagles. |FY12-FY13 $0 DES CPA SLD Ongoing

   b. Address wind related mortalities (i.e., improve intraoffice coordination on development of BMP and other strategies). |FY12-FY13 $0 DES CPA SLD Ongoing

5. **Ingestion of environmental contaminants, impacts to reproduction**.

   a. Determine if there are impacts to bald eagles from environmental contaminants within the watershed and if so, implement mitigative measures. |FY11-FY14 $0 DES EC ? Future

   b. Seek to minimize loss of habitat due to contamination, by influencing regulatory agency decisions related to State and Federal Superfund sites. |FY11-FY13 $0 DES EC ASR Ongoing

   c. Evaluate USFWS Natural Resource Damage Assessments (NRDA) along the Allegheny River. |FY11-FY13 $0 DES EC,CPA ALS,SLD Ongoing

   d. Respond as appropriate to spills impacting fish and wildlife resources. |FY12-FY14 $0 DES EC ALS Planned

Bald Eagle (*Haliaeetus leucocephalus*): Allegheny Focal Area

Partner organizations:

NYSDEC, Onondaga Audubon Society, Rice Creek Field Station, Cornell Lab of Ornithology, Ripley Hawk Watch, NYSDEC, Haudenosaunee Confederacy.

CONSERVATION DELIVERY

1. **Loss/degradation of habitat.**

    a. Address modification or destruction of habitat(s) including winter roosting areas and breeding areas through public education programs and website postings in conjunction with the NYSDEC bald eagle recovery program. Assist the NYSDEC in identifying movement patterns, migratory pathways, and locations where New York's wintering eagles breed.

        i. Along with links to biological information about bald eagles, develop materials for the website to clarify for the public the connections between what humans do by way of development, forest clearing, use of motor boats, jet skis, etc., in bald eagle nesting areas and nest abandonment, loss of productivity, etc. |FY12-FY14 $0 DEL CPA SLD Future

        ii. Continue engagement in Federal Clean Water Act permitting program and SEQRA program for wind power and development projects proposed in eagle concentration areas and wind resource areas that coincide with breeding and migratory routes. |FY12-FY14 $0 DEL CPA SLD Ongoing

        iii. Participate in regional workgroup and other agencies' sponsored workgroups developing guidance for wind power project siting. |FY12-FY13 $0 DEL CPA SLD Ongoing

        iv. Develop maps for internal use that map out a "green infrastructure" of migratory, roosting and breeding areas for eagles in New York State to refer to when screening 404 and Federal projects reviews. |FY12-FY14 $0 DEL CPA SLD Ongoing

        v. Provide substantive comments to the regulatory agencies that provide BMP, mitigation recommendations for eagle conservation when in suitable habitat. |FY12-FY14 $0 DEL CPA SLD Ongoing

    b. Assist NYSDEC in identifying, managing, and protecting essential breeding and wintering habitats through NYSDEC-ESA/BGEPA Program that will result in a net benefit to eagles. |FY12-FY14 $0 DEL CPA SLD Ongoing

i. Obtain, prepare, and/or distribute maps outlining key conservation areas to coworkers who may be reviewing projects in bald eagle habitat. |FY12-FY13 $0 DEL CPA SLD Future

ii. Provide language for comment letters on a wide variety of regulated activities if they occur in known bald eagle habitats. |FY12-FY13 $0 DEL CPA SLD Ongoing

2. **Disease or predation, including lead ingestion, botulism, predation from other eagles, death by shotgun.**

   a. Through hunter education programs, address nest protection programs.

   b. Assist NYSDEC when possible, to ensure continued monitoring of lead and other contaminant levels in eagle eggs and chicks.

   c. Develop a strategy for addressing high levels of contaminants if found.

3. **Inadequacy of existing regulatory protections.**

   a. Address inadequacy of existing regulatory protections by providing information about the Federal BGEPA program as administered in New York by the NYFO and the Regional Office's Migratory Bird Program Office, and State protections under the State ESA. |FY12-FY13 $0 DEL CPA SLD Ongoing

4. **Other man-made or natural factors.**

   a. Address other factors.

      i. Develop advanced conservation strategies and BMP for this industry and for the wind industry to avoid and minimize impacts to bald and golden eagles. |FY12-FY13 $0 DEL CPA SLD Ongoing

      ii. Address wind-related mortalities by improved intraoffice coordination on development of BMP and other strategies. |FY12-FY13 $0 DEL CPA SLD Ongoing

      iii. Meet with new Northern BGEPA coordinator to discuss an approach to compliance. |FY12-FY14 $0 DEL CPA SLD Ongoing

      iv. Work with the NYSDEC, industry, other field offices, Regional Office, and species experts to identify advanced conservation practices that will avoid and minimize take of eagles and other large raptors. |FY12-FY14 $0 DEL CPA SLD Ongoing

5. **Ingestion of environmental contaminants, impacts to reproduction**.

    a. Determine if there are impacts to bald eagles from environmental contaminants within the watershed and if so, implement mitigative measures.

    b. Seek to minimize loss of habitat due to contamination by influencing regulatory agency decisions related to State and Federal Superfund sites.

    c. Provide substantive Federal agency comments on proposed actions with likely adverse impact to bald eagles and/or their habitat. |FY11-FY13 $0 DEL EC ASR Ongoing

    d. Evaluate USFWS NRDA along the Allegheny River.

        i. If/when possible, use NRDAR funds toward bald eagle habitat restoration. |FY? $0 DEL EC ASR Future

6. **Address disease or predation**, including lead ingestion, botulism, predation from other eagles, and death by shotgun, through hunter education programs, nest protection programs.

    a. Investigate whether bald and golden eagle fact sheets could be provided at hunter training programs run by the NYSDEC. Develop fact sheets and distribute. |FY12-FY14 $0 DEL CPA SLD Future

7. **Address inadequacy of existing regulatory protections** by providing information about the Federal BGEPA as administered in New York by the NYFO and the Regional Office's Migratory Bird Program Office, and State protections under the State ESA.

    a. Provide a New York highlighted fact sheet on the website to outline process for protection of bald and golden eagles through the BGEPA permit processes. |FY12-FY14 $0 DEL CPA SLD Ongoing

    b. Identify three organizations with whom we could meet to further BGEPA education – builders, wind industry, NYSERDA, outfitters, etc. |FY13 $0 DES CPA SLD Future

OUTREACH

See specific examples, above

Continue to make bald eagle recovery traveling exhibit available for exhibition; keep copy blocks current. |FY12-FY13 $0 OUT CPA SLD Planned

Develop an accompanying workbook for the exhibit based on the one the BOCES students started. |FY13 $0 OUT CPA SLD Ongoing

Bald Eagle (*Haliaeetus leucocephalus*): Allegheny Focal Area

MONITORING

Develop protocols to measure progress/success. |FY12-FY14 $0 MON CPA SLD Ongoing

Recommend monitoring to measure progress/success. |FY12-FY14 $0 MON CPA ? Ongoing

Investigate options for State bald eagle program funding to continue to monitor nests, concentration areas, productivity, and contaminant levels in eagles. |FY12-FY13 $0 MON CPA ? Ongoing

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Broad-winged Hawk (*Buteo platypterus*): Allegheny Focal Area

Broad-winged Hawk Species Action Plan

FOCAL AREA: ALLEGHENY

Other species benefitting:

bald eagle, red-shouldered hawk, red-tailed hawk, turkey vulture, Cooper's hawk, sharp-shinned hawk (buteos and accipiters in general), long-eared owl

BIOLOGICAL PLANNING

Introduction to species

Species information: The broad-winged hawk is a small, stocky buteo. It is one of the few North American raptors that flock during migration. It is a common breeder in large deciduous or mixed-deciduous forests throughout northeastern and north central North America (Goodrich et al. 1996). During breeding, the broad-winged hawk is secretive or rather, unobtrusive. It lives mainly in the woods, beneath the canopy or hidden among the foliage. Often one is made aware of it only through its call. Its food consists mainly of snakes, mice, frogs, and insects. Most breeding occurs in Canada, and requires large tracts of forest. Most broad-winged hawks breeding in the eastern United States and southeastern Canada migrate to wintering grounds in southern Central America and central South America (Hawk Mountain 2004). During the migration, the broad-winged hawk is seen in large congregations, and when wind conditions are ripe, form "kettles" of soaring raptors. Birds that congregate in large numbers like this species are vulnerable to catastrophic harm (e.g. if a wind power project were poorly sited in a migratory pathway, collision with a large number of birds possible).

Justification for species selection: Broad-winged hawk populations have been decreasing since the 1980s and the species is representative of other migratory raptors. Most raptors are not adequately covered by current monitoring methods, so basic distributions, population estimates, and trend data are lacking for many raptors during the appropriate seasons – breeding, migration, staging, or wintering. Targeted monitoring programs should be established to understand the status of those species that require them, especially if there is evidence that the species has suffered or is suffering either long-term or dramatic population declines. Hawk Mountain broad-winged hawk status report, 2007 (http://hawkmountain.org/media/broadwingCSR_June07.pdf).

Prominent spring migration locations occur along the southern shores of Lake Erie and Lake Ontario in New York, which is an area of high potential wind energy development.

Bird Conservation Region (BCR) 28 (Appalachian Mountains) includes the New York portion of the Allegheny Plateau. No population estimates for this species were found for New York's portion of the BCR. Nesting density in western New York reported as 1 pair/2 km^2 (Goodrich et al. 1996). The BCR 13 (Lower Great Lakes/St. Lawrence) population is estimated at 3,000 individuals (in New York).

Broad-winged Hawk (*Buteo platypterus*): Allegheny Focal Area

State contribution to overall species population: Range extends across New York. State estimated population of 32,000 individuals.

Threats and threat assessment:

1. **Loss of habitat due to development.**

2. **Fragmentation of habitat** (wind power projects, pipelines, transmission lines along migration corridors, and stop over habitat).

3. **Collision or habitat loss** from wind energy projects.

4. **Energy development** (potential – oil and gas drilling, Marcellus shale gas extraction).

5. **Predation.**

6. **Changes in habitat community structure** and changes in prey base during breeding and migration seasons, including declines in amphibian populations (National Audubon Society [NAS] 2009).

7. **Changes in species distribution and population sizes** due to climate change.

   Research needed:

   - Research is needed to determine climate change impacts on habitat community structure and changes in prey base during breeding and migration seasons.

   - Research is also needed to determine changes in species distribution and population sizes due to climate change.

   - Research is needed to assess potential impacts of habitat fragmentation associated with Marcellus shale formation gas extraction.

   (WHO: U.S. Fish and Wildlife Service [USFWS] Landscape Conservation Cooperatives [LCC] proposal for landscape scale evaluation of this species which is representative of migratory, forest-dwelling raptors)

Partners/potential funding:

Haudenosaunee Confederacy, U.S. Geological Survey (USGS), Natural Resources Conservation Service (NRCS), New York State Department of Environmental Conservation (NYSDEC), County Soil and Water Conservation Districts (SWCD), The Nature Conservancy (TNC), Audubon New York, Cornell Lab of Ornithology, New York State Department of Transportation (NYSDOT), utilities, State University of New York-College of Environmental Science and Forestry (SUNY-ESF), Hawk Migration Association of North America

Broad-winged Hawk (*Buteo platypterus*): Allegheny Focal Area

Population goal(s) for New York State:

Maintain/increase basin populations

- Maintain stable populations
- Increase breeding pairs

Research needed:

- Develop targeted monitoring of population status of forest breeding raptors to establish population goals.
- Conduct studies of reproductive success, lingering impacts of pesticide use, prey population levels, habitat characteristics of nest sites, migration areas, preferred foraging areas, and interactions with competitors.

  (WHO: landscape scale research by LCC)

CONSERVATION DESIGN

Strategies for addressing those threats

1. **Loss of sufficient quantity/quality of habitat** and/or fragmentation of habitat.

   a. Prioritize permit review in breeding areas of this species (forests and lakeshore) (Conservation Planning Assistance [CPA]); and influence regulatory agency decisions regarding projects that will result in loss of habitat and habitat functions for this species. |FY12 $0 DES CPA TRS Ongoing

   b. Participate in and support yearly migration monitoring and surveys.

   c. Prioritize forest habitat enhancement and restoration projects that would benefit this species (Partners for Fish and Wildlife [PFW]).

   d. Initiate discussions regarding a thorough inventory of potential nest sites and preferred migration and foraging area habitats to determine the most important sites for this species, including information on number of territorial pairs and reproductive outcome.

   e. Work with partners to study reproductive success, lingering impacts of pesticide use, prey population levels, habitat characteristics of nest sites and preferred foraging areas, and interactions with competitors. |FY? $0 DES EC ALS Future

   f. Use telemetry to monitor distributions and identify essential habitats.

g. Analyze existing areas of habitat and recently altered forest landscapes to determine potential breeding areas for this species.

h. Obtain breeding bird survey data for this species to focus efforts.

i. Create map or shapefile for possible broad-winged hawk sites for all New York Field Office (NYFO) programs.

2. **Collision or habitat loss** from wind energy projects.

   a. Review wind energy projects to minimize impacts to this species by directing turbine placement away from large tracts of intact forest (CPA). |FY12 $0 DES CPA TRS Ongoing

3. **Energy development.**

   a. Review energy development projects proposed in large intact blocks of forest habitat and recommend siting adjustments (CPA). |FY12 $0 DES CPA TRS Ongoing

4. **Predation.**

   a. Additional studies are needed to assess the degree to which predation impacts the species.

5. **Changes in habitat community structure** and changes in prey base.

   a. Seek to influence regulatory agency decisions by providing input into conservation measures that would minimize impacts of development in forested areas near the lakeshore (CPA). |FY12 $0 DES CPA TRS Ongoing

6. **Climate change.**

   a. Strategy will depend on results of research need noted above. Seek to influence regulatory agency decisions by providing comments on projects that may result in long-term impacts on habitat structure (CPA).

Partners/potential funding:

Haudenosaunee Confederacy, USGS, NRCS, NYSDEC, County SWCD, TNC, Audubon New York, Cornell Lab of Ornithology, NYSDOT, utilities, Buffalo Niagara Riverkeeper, Niagara Greenway Committee, SUNY-ESF, Hawk Watch Coordinators (Ripley, Derby Hill, etc.), Braddock Bay Banding Station

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats FY 2010 – 2012

Broad-winged Hawk (*Buteo platypterus*): Allegheny Focal Area

1. **Loss of sufficient quantity/quality of habitat** and/or fragmentation of habitat.

    a. Provide substantive Federal agency comments on proposed Federal agency actions (including land development) with likely adverse impacts to this species and/or its habitat (CPA). |FY12 $0 DEL CPA TRS Ongoing

    b. Provide information to the U.S. Army Corps of Engineers (USACE) project managers to convey the importance of maintaining large intact blocks of forest habitat.

    c. Participate in and support yearly migration monitoring and surveys.

        i. Participate in Hawk Watch sites/banding stations (Ripley). |FY11 $0 DEL CPA TRS Completed

        ii. Support Hawk Watch sites/banding stations (CPA).

    d. Develop information related to minimizing the impacts of development, land management, and silviculture on forest raptors, and post on NYFO web site.

        i. Develop fact sheets with best management practices (BMP) to minimize impacts to broad-winged hawks from silvicultural activities, and use these to influence landowners regarding habitat needs of this species and to encourage landowner protection of forests.

2. **Collision or habitat loss** from wind energy projects.

    a. Provide substantive Federal agency comments on proposed Federal actions regarding wind energy projects to minimize impacts to this species.

        i. Coordinate with other offices involved in wind power project siting to assess potential for additive effects to the species in other parts of the species range, including the length of their migratory routes (through Pennsylvania for example) (CPA). |FY12 $0 DEL CPA TRS Ongoing

3. **Energy development.**

    a. Review energy development projects proposed in large intact blocks of forest habitat (CPA). |FY12 $0 DEL CPA TRS Ongoing

4. **Predation.**

    a. No work is planned to address this threat; more information will be available once further studies are conducted.

5. **Changes in habitat community structure** and changes in prey base.

    a. Seek to influence regulatory agency decisions.

i. Seek to ensure that new developments provide for conservation areas including large tracts of intact forest habitat with conservation and protection of wetlands. |FY12 $0 DEL CPA TRS Ongoing

ii. Provide recommendations to minimize use of pesticides in new developments to ensure viable populations of amphibian prey. |FY12-FY13 $0 DEL CPA,EC TRS,ALS Planned

iii. Provide recommendations to minimize use of pesticides to control mosquitoes. Sprays will also impact larger insects which are an important prey item for broad-winged hawks (CPA and Environmental Contaminants [EC]). |FY12-FY13 $0 DEL CPA,EC TRS,ALS Planned

6. **Climate change.**

   a. Delivery will depend upon strategy determined from research above.

Partners/potential funding:

Haudenosaunee Confederacy, USGS, NRCS, NYSDEC, County SWCD, TNC, Audubon New York, Cornell Lab of Ornithology, NYSDOT, utilities, SUNY-ESF, Hawk Watch Coordinators (Ripley, Derby Hill, etc.), Braddock Bay Banding Station

OUTREACH

Potential outreach needs:

- Landowner education
- Public involvement
- Promote wind power traveling exhibit
- Create Fact Sheet
- Meet with non-governmental organizations (NGO) such as Hawk Watch groups, Audubon chapters, etc., to deliver conservation message

Partners/potential funding:

Haudenosaunee Confederacy, USGS, NRCS, NYSDEC, County SWCD, TNC, Audubon New York, Cornell Lab of Ornithology, NYSDOT, utilities, SUNY-ESF, Hawk Watch Coordinators (Ripley, Derby Hill, etc.), Braddock Bay Banding Station

MONITORING

- Develop protocols to measure success of all conservation delivery activities.

- Work with partners to identify leads for accomplishing monitoring activities.

Broad-winged Hawk (*Buteo platypterus*): Allegheny Focal Area

- Develop BMP from results of monitoring to inform future broad-winged hawk population restoration activities.

References

Dettmers, R. and K.V. Rosenberg. 2003. Partners in Flight Landbird Conservation Plan: Physiographic Area 15: Lower Great Lakes Plain. Version 1.1: August 2003. (http://www.partnersinflight.org/bcps/plan/pl_15_10.pdf).

Goodrich, L.J., S.C. Crocoll, and S.E. Senner. 1996. Broad-winged Hawk (*Buteo platypterus*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/218.

Hawk Mountain. 2004. Broad-winged hawk. http://hawkmountain.org/media/BWHA.pdf.

Hawk Mountain. 2007. Broad-winged Hawk Conservation Status Report. http://hawkmountain.org/media/broadwingCSR_June07.pdf.

National Audubon Society. 2009. Broad-winged hawk: Guidance for Conservation. Audubon New York, Ithaca, New York. Accessed 8 March 2010. (http://ny.audubon.org/PDFs/HRVC_BROADWINGEDHAWK.pdf).

NYSDEC. 2005. Comprehensive Wildlife Conservation Strategy: A Strategy for Conserving New York's Fish and Wildlife Resources, Final Submission Draft, September 2005. (http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf).

Robertson, B. and K.V. Rosenberg. 2003. Partners In Flight Landbird Conservation Plan: Physiographic Area 24: Allegheny Plateau. Version 1.1: August 2003 (http://www.partnersinflight.org/bcps/plan/pl_24_10.pdf).

USFWS. 2007. Final Draft Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Area (BCR 13). January, 2007. (http://www.acjv.org/BCR_13/BCR13_Final_Plan_July07.pdf).

Existing strategies for broad-winged hawk restoration:

Please refer to the following documents for existing strategies:

- Partners in Flight Landbird Conservation Plan: Physiographic Area 15: Lower Great Lakes Plain (Dettmers and Rosenberg 2003) http://www.partnersinflight.org/bcps/plan/pl_15_10.pdf.

- NYS Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf.

- Bird Conservation Plan for the Lower Great Lakes/

St. Lawrence Plain Bird Conservation Region (USFWS 2007) http://www.acjv.org/BCR_13/BCR13_Final_Plan_July07.pdf.

- Broad-winged Hawk Conservation Status Report (Hawk Mountain 2007) http://hawkmountain.org/media/broadwingCSR_June07.pdf.

Brook Trout (*Salvelinus fontinalis*): Allegheny Focal Area

Brook Trout Species Action Plan

FOCAL AREA: ALLEGHENY

Other species benefitting:

American eel, American shad, longtail salamander, hellbender, wood turtle

BIOLOGICAL PLANNING

Introduction to species

Species information: The brook trout is a native salmonid that prefers cold, clean streams in eastern North America and is the only native trout that inhabits this habitat. The species prefers clear waters of high purity and a narrow *p*H range in lakes, rivers, and streams, being sensitive to poor oxygenation, pollution, and changes in *p*H caused by environmental effects, such as acid rain. Its diverse diet includes crustaceans, frogs and other amphibians, insects, molluscs, smaller fish, and even small aquatic mammals such as voles. The brook trout is a short-lived species, rarely surviving beyond 4 or 5 years in the wild.

Intact stream populations of brook trout, where wild brook trout occupy > 90% of historical habitat, exist in only 5% of the watersheds assessed in 2005 by the Eastern Brook Trout Joint Venture (EBTJV) (see below). Populations of stream-dwelling brook trout are greatly reduced or have been extirpated from nearly half of the watersheds in their native range. The vast majority of historically occupied large rivers no longer support self-reproducing populations of brook trout. In New York, 5% of the watersheds that historically contained brook trout in streams and rivers remain intact, located primarily in portions of the Adirondacks and the Tug Hill Plateau. Western and South Central New York have suffered the greatest losses of brook trout. Data gaps remain in the central part of the State from Albany to Syracuse. While many lakes and ponds still contain brook trout, losses have been substantial due to competition with non-native fish and acid deposition, particularly in parts of the State where soils and bedrock provide little buffering capacity to offset acid precipitation. Furthermore, the EBTJV has identified several sub-watersheds within the Allegheny River watershed as highest priority for protection of brook trout populations.

Justification for species selection: The brook trout is a highly prized native sport fish**,** but intact populations of brook trout exist in only 5% of sub-watersheds in New York. Brook trout are an excellent sentinel of water quality and will also likely be a sentinel of the effects of climate change over the next century. Heritage brook trout populations are designated as a New York State (NYS) species of greatest conservation need, and the U.S. Fish and Wildlife Service (USFWS) and New York State Department of Environmental Conservation (NYSDEC) are partners in the EBTJV. The EBTJV is a partnership of State and Federal agencies, nongovernmental organizations, and academic institutions. This collaborative approach to brook trout management is justified because: (1) brook trout are declining across their entire eastern range; (2) causes for these declines are similar; (3) an integrated approach would be cost effective; and, (4) watersheds of concern span state borders and state and Federal jurisdictions.

Brook Trout (*Salvelinus fontinalis*): Allegheny Focal Area

State contribution to overall species population: Currently there are over 400 lakes and ponds that are managed by the NYSDEC for native and stocked brook trout, in which 100 or so contain naturally-reproducing brook trout. In addition, thousands of miles of tributary streams in the Adirondacks, Tug Hill Region, and Catskill Mountains, and a lesser number in western New York, east of the Hudson River, on Long Island, and in the Upper Susquehanna watershed support brook trout. Although watershed-wide population numbers are not known for the Allegheny watershed, several sub-watersheds (HUC12s) support healthy populations of native brook trout.

Research needed:

A. Conduct surveys to determine current population levels and presence/absence.

   (Who: NYSDEC and Trout Unlimited [TU] to assist with brook trout surveys to determine presence/absence and population densities, coupled with habitat investigation; Cost: use existing staff)

B. Determine genetic diversity of brook trout in the watershed

   (Who: Lamar Fish Health Unit, EBTJV; Cost: unknown at this time)

Threats and threat assessment:

1. **Loss of habitat and habitat function**; habitat degradation and alteration-nutrients, sediment, development/clearing of riparian zone (medium/low threat, agriculture; medium threat, urbanization).

   Research needed:

   - Extensive and frequent stream surveys to determine population size.

     (Who: NYSDEC, TU, New York Field Office [NYFO]; Cost: NYFO staff time)

   - Identify priority stream reaches for habitat restoration by evaluating water quality criteria, habitat, and other requirements of brook trout.

     (Who: TU, EBTJV, NYSDEC, NYFO (GIS), Landscape Conservation Cooperatives [LCC]; Cost: unknown at this time)

   - Need to locate heritage streams and heritage populations.

     (Who: U.S. Geological Survey [USGS], EBJTV, NYSDEC; Cost: unknown at this time)

Brook Trout (*Salvelinus fontinalis*): Allegheny Focal Area

2. **Barriers to Migration** (including dams and impassable culverts).

   Research needed:

   - Assess importance of isolating heritage populations versus providing passage for stocked brook trout and other salmonids

     (Who: NYSDEC, TU, EBTJV; Cost: unknown at this time)

   - Identify which known barriers are having an influence on brook trout distribution

     (Who: EBTJV, NYSDEC, NYFO, TU; Cost: unknown at this time)

3. **Competition from non-native salmonids.**

   Research needed:

   - Assess impact of competition from stocked and/or naturally reproducing non-native salmonids. Competition/interbreeding with stocked brook trout.

     (Who: EBTJV, NYSDEC, TU; Cost: unknown at this time)

   - Determine genetic diversity of brook trout in the watershed.

     (Who: Lamar Fish Health Unit, EBTJV; Cost: unknown at this time)

4. **Climate change; increased water temperatures.**

   Research needed:

   - Identification of climate change related impacts to brook trout.

     (Who: National Weather Service, LCC, academics; Cost: unknown at this time)

Partners/potential funding:

NYSDEC, New York State Office of Parks, Recreation & Historic Preservation (NYSOPRHP), TU, Alleghany County Soil and Water Conservation District (SWCD), Cattaraugus County SWCD, Chautauqua County SWCD, The Nature Conservancy (TNC), Chautauqua Watershed Conservancy.

Population goal(s) for New York State:

The EBTJV has numerous conservation goals, including "Conserve, enhance or restore brook trout populations", and "…to perpetuate and restore brook trout populations throughout their

historic range"; however, specific population goals have not been quantified. Although population goals have not been established for New York, the NYFO will continue to collaborate with EBTJV, USGS, and NYSDEC to establish target population numbers for the Allegheny watershed. Establishing population goals remains a research need.

CONSERVATION DESIGN

Strategies for addressing those threats

1. **Loss of habitat.**

    a. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding stream relocation and modifications, including bulkheading; operation of hydroelectric power producing facilities; and, "unnatural" erosion mitigation practices, agricultural practices that diminish stream and wetland values for wildlife, dredging, and placement of fill in streams and wetlands.

    b. Target USFWS habitat restoration and enhancement projects to benefit brook trout, including adding enhancements to natural stream design projects (including planting trees and shrubs to provide shade for water temperature control); promoting habitat restoration projects which also control sediment entering streams; provide technical assistance on stream restoration projects via natural stream design in the watershed (Partners for Fish and Wildlife [PFW]).

    c. Facilitate habitat preservation through coordination with land trusts.

    d. Preserve, restore, and/or enhance streams known to support heritage strains of brook trout.

    e. If possible, use Natural Resource Damage Assessment and Restoration (NRDAR) funds to restore and protect streams identified. |FY? $0 DES EC ? Future

    f. Respond as appropriate to spills impacting fish and wildlife resources. |FY12-FY14 $0 DES EC ALS Planned

    g. Seek to minimize loss of habitat function when habitat is degraded by adjacent land uses by influencing regulatory agency decisions.

    h. Seek to minimize loss of habitat value by influencing Federal Energy Regulatory Commission (FERC) minimum flow decisions.

2. **Barriers to migration** (including dams and impassable culverts).

    a. Working with partners, identify and remove barriers.

b. Work with New York State Department of Transportation (NYSDOT) and Federal Highway Administration (FHWA) to develop criteria for designation of culverts, the modification of which would improve brook trout passage.

c. Work with NYSDOT and FHWA to correct bridge abutments from being undermined by stream erosion; design and construct natural stream design features that will change stream bottom elevation and facilitate fish passage.

3. Competition from non-native salmonids.

a. Target USFWS natural stream design stream restoration projects for smaller streams most likely to support only one or two salmonid species.

4. Climate change; increased water temperatures.

a. Identify sub-watersheds likely to be refugia for cold water fish in the future, and protect or restore the habitat for brook trout.

Partner organizations:

NYSDEC, NYSOPRHP, TU, Alleghany County SWCD, Cattaraugus County SWCD, Chautauqua County SWCD, TNC, Chautauqua Watershed Conservancy.

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY 2010 – 2012

1. Loss of habitat.

a. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding wetland draining, stream relocation, and modifications, including bulkheading; operation of hydroelectric power producing facilities; and, "unnatural" erosion mitigation practices, agricultural practices that diminish stream and wetland values for wildlife, dredging, and placement of fill in streams and wetlands.

i. Develop fact sheets and best management practices (BMP) to minimize impacts to brook trout from a suite of different construction activities.

ii. Post these fact sheets/BMPs on our website.

iii. Write substantive comments on proposed Federal agency actions with likely adverse impacts on brook trout (Conservation Planning Assistance [CPA]).

iv. Develop a poster for the New York State Wetlands Forum which targets brook trout conservation.

v. Provide recommendations on culvert design via CPA review.

vi. Develop stream buffer guidelines/BMPs and post on website.

b. Target USFWS habitat restoration and enhancement projects to benefit brook trout, including adding enhancements to natural stream design projects (including planting trees and shrubs to provide shade for water temperature control); promoting habitat restoration projects which also control sediment entering streams; provide technical assistance on stream restoration projects via natural stream design in the watershed (PFW).

i. Add enhancements to natural stream design projects, including planting trees and shrubs to provide shade for water temperature control (CPA, PFW).

ii. Restoration work on McIntosh Brook, with Lower Great Lakes Fish and Wildlife Conservation Office (LGLFWCO).

c. Facilitate habitat preservation through coordination with land trusts or non-governmental organizations (NGO).

d. Promote habitat restoration projects which also control sediment entering streams (CPA) (PFW).

i. McIntosh Brook project will accomplish this strategy.

ii. Statewide - Conduct a training session for County SWCD staff on natural stream design - PFW - March 2011. |FY10 $0 DEL PFW CS,GD Completed

e. Provide technical assistance on stream restoration projects via natural stream design in the watershed.

i. McIntosh Brook project will accomplish this strategy.

ii. Meet with NYSDEC fisheries biologists to provide technical assistance on proposed and ongoing stream restoration/habitat enhancement work (PFW). |FY11 $0 DEL PFW CS,GD Completed

iii. Provide comments to USACOE and Cattaraugus County Highway regarding proposed 3 miles of stream relocation. |FY12 $0 DEL PFW GD Ongoing

2. **Barriers to migration** (including dams and impassable culverts).

a. Working with partners, identify and remove barriers.

i. No work indentified at this time.

b. Work with NYSDOT and FHWA to develop criteria for designation of culverts, the modification of which would improve brook trout passage.

   i. No work indentified at this time.

c. Work with NYSDOT and FHWA to correct bridge abutments from being undermined by stream erosion, design and construct natural stream design features that will change stream bottom elevation and facilitate fish passage.

   i. No work indentified at this time.

3. Competition from non-native salmonids.

a. Target USFWS natural stream design stream restoration projects for smaller streams most likely to support only one or two salmonid species.

   i. No work indentified at this time.

4. Climate change; increased water temperatures.

a. Identify sub-watersheds likely to be refugia for cold water fish in the future, and protect or restore the habitat for brook trout.

   i. Work with the National Weather Service to create models for determining temperature impacts to brook trout within the watershed.

OUTREACH

In addition to the web site, there is an EBTJV Google Group (http://groups.google.com/group/ebtjv).

The EBTJV also has a blog, a Facebook page, and is on two other social networking sites (including Twitter).

The NYFO can create a brook trout page of "ongoing activities" on our website.

Work with SUNY Cortland, or other university, students to get volunteers for surveys and restoration portions of planned projects.

See also Finger Lakes Onondaga pilot classroom project – trout in the classroom.

MONITORING

- Work with NYSDEC and LGLFWCO to monitor brook trout habitat after restoration is complete. This includes electroshocking restored site to determine if brook trout are

successfully using site, as well as conducting macroinvertebrate surveys to identify any changes in benthic community.

- Establish benchmarks for success based on EBTJV.
- Evaluate reclamation of streams (i.e. - remove non-native salmonids) and resulting effects on brook trout population levels, as well as cessation in stocking non-native salmonids.
- With NYSDEC, develop protocol for pre-construction and post-construction surveys of streams targeted for natural stream design.
- Seek funding and support for monitoring.

Partners

TU, NYSDEC, LGLFWCO

References

Eastern Brook Trout Joint Venture main website (http://www.wasternbrooktrout.org)

Eastern Brook Trout Joint Venture data and maps (http://sain.utk.edu/ebtjv/index.php)

Eastern Brook Trout Joint Venture webpage for priority sub-watersheds in New York (http://sain.utk.edu/ebjtv/download/priorityscores.php)

Trout Unlimited Brook Trout Conservation Strategy (http://www.tu.org/conservation/eastern-conservation/brook-trout)

New York State Brook Trout Conservation Strategies
(http://www.easternbrooktrout.org/docs/EBTJV_NewYork_CS.pdf)
(http://www.easternbrooktrout.org/docs/brookie_NY.pdf)

Cerulean Warbler (*Dendroica cerulea*): Allegheny Focal Area

Cerulean Warbler Species Action Plan

FOCAL AREA: ALLEGHENY

Other species benefitting:

American redstart, red-headed woodpecker, American black duck, bald eagle, Baltimore oriole, black-billed cuckoo, Cooper's hawk, eastern wood-pewee, red-shouldered hawk, wood duck, wood thrush, Indiana bat

BIOLOGICAL PLANNING

Introduction to species

Species information: The cerulean warbler lives high in mature and older deciduous forests with broken canopies in bottomland forests as well as forests on dry slopes and ridges. Common tree species used include oak, sycamore, cottonwood, maple, black locust, and elm. It prefers large tracts of at least 50 – 75 acres, but is more productive in tracts greater than 600 acres. This species is insectivorous and eats caterpillars, beetles, wasps, and bees.

The Partners in Flight (PIF) Lower Great Lakes Plain Conservation Plan (Physiographic Area 15) (Dettmers and Rosenberg 2003) identifies this species as one of 7 priority species in the area. Comparisons between the 1980–1985 and 2000–2005 breeding bird surveys for New York indicate that the Allegheny region is an important breeding area in New York for cerulean warblers, with the incidence of confirmed breeding stable to declining. According to the Cerulean Warbler Atlas Project (CEWAP), the Allegheny River-Salamanca region in Cattaraugus County is an important breeding area for the cerulean warbler, having the second highest number of birds counted within New York for this study. Range-wide, cerulean warblers have experienced a long-term population decline. Analysis of North American Breeding Bird Survey (BBS) data indicates that over the last 40 years, the decline has been steep and steady at a rate of about -3.0% per year. Remaining forest tracts in this area are extremely valuable to cerulean warblers, which also have expanded into the region in recent decades.

Justification for species selection: The cerulean warbler was chosen as a priority species because of its importance in the eastern U.S. as well as in New York. It is a New York State Species of Greatest Conservation Need; a Special Concern Species in New York; classified as High-High on the Bird Conservation Region (BCR) 13 Priority List (USFWS 2007); and, a Species of National Conservation Concern, listed as "yellow" on the Audubon watch list. According to the PIF North American Landbird Conservation Plan, 97% of the breeding population is within the eastern avifaunal biome, and the cerulean warbler is among the most specialized and threatened birds of the deciduous forest and is in need of focused conservation attention throughout its range.

State contribution to overall species population: In New York State the cerulean warbler is mostly rare, but remains common in areas where suitable habitat still exists (NYSDEC 2010).

Cerulean Warbler (*Dendroica cerulea*): Allegheny Focal Area

Some principal breeding areas for the cerulean warbler remain in New York within the lowland plain south of Lake Ontario (NYSDEC 2010). Cerulean warblers are found in areas including the Montezuma Wetlands Complex, Allegany State Park and National Forest, and the Hudson River Valley and Highlands of southeastern New York (Rosenberg et al. 2000).

Research needed:

- Survey suitable habitat to determine most important breeding sites and potential breeding sites.

- Determine the use of forest patches by transient cerulean warblers in the spring and fall, include urban greenbelts.

Threats and threat assessment:

1. **Forest fragmentation.**

   Research needed:

   - Further study is needed to determine the degree of fragmentation tolerated by cerulean warbler populations and to define the minimum forest tract size needed to support breeding populations of this species (NYSDEC 2010).

2. **Loss of habitat;** at breeding and wintering grounds, as well as migratory stopover habitat.

   Research needed:

   - Research is needed to identify specific target areas within the focal area for habitat conservation efforts in support of population goals.

   - Research is needed on the life history of the cerulean warbler. The biology's of both male and female cerulean warblers: their conservation needs and any differences between them; factors affecting post-fledging survival; dispersal patterns and their extent as well as patterns of migratory connectivity.

   - Research is needed on invasive species such as wood burrowing insects that have the potential of altering a forest ecosystem.

   - Research is needed on the shift in forest dynamics within prime breeding habitats due to the increased levels of wind generated by wind turbines.

3. **Collision with structures.**

   Research needed:

   - Research is needed to assess and reduce/mitigate risks from collisions (including off-shore oil platforms, wind farms, communication towers, etc.) Currently, little is known about the specifics on migratory behavior. More research is needed in this area to help reduce the risk of collisions with structures.

4. **Environmental contaminants.**

   Research needed:

   - There are no known contaminant issues in this focal area at this time.

5. **Climate change – changes in habitat community structure or prey base.**

   Research needed:

   - Investigate correlations between climate change and forest availability as a potential tool for predicting future changes in cerulean warbler distribution and management needs.

   - Investigate correlations between climate change and timing of spring arrival.

   - Investigate a change in frequency of catastrophic weather events, particularly hurricanes during the fall migratory period.

Partners/potential funding:

Haudenosaunee Confederacy, Refuges, U.S. Geological Survey (USGS), U.S. Forest Service (USFS), New York State Department of Transportation (NYSDOT), Natural Resources Conservation Service (NRCS), New York State Department of Environmental Conservation (NYSDEC), The Nature Conservancy (TNC), Cornell Laboratory of Ornithology, Audubon New York, Universities, PIF.

Population goal(s) for New York State:

Objectives:

- Range-wide, protect or manage at least 1,500 continuous hectares of habitat to support 1,200-1,500 pairs of cerulean warblers in PIF Lower Great Lakes Plain (Physiographic Area 15).

Cerulean Warbler (*Dendroica cerulea*): Allegheny Focal Area

- Achieve less imperiled status on BCR Priority Bird Species list or New York State Species of Greatest Conservation Need List.

- Double cerulean warbler population in next 50 years (Cerulean Warbler Conservation Action Plan [USFWS 2007]).

- Increase continental population by 100% (PIF goal).

Research needed:

- Current goals are broad, therefore, research is needed to refine population goals for cerulean warblers, and reduce critical knowledge gaps regarding demographics, population size and trends, and life history.

CONSERVATION DESIGN

Strategies for addressing the threats

1. **Forest fragmentation.**

   a. Develop and implement forest management plans for cerulean warbler. Support comprehensive forest planning on all public lands, incorporating needs and objectives to reverse declines of cerulean warbler.

   b. Reduce forest fragmentation and loss on breeding grounds by protecting large contiguous forest tracts via influencing regulatory agency decisions.

   c. Identify and manage for high quality post fledging habitat.

   d. Protect habitat – mature forest with multi-level, diverse canopies.

   e. Evaluate sites within the focal area where Marcellus Shale drilling is anticipated and assess affects this will have on breeding habitat for the warbler (CPA).

2. **Loss of habitat** (breeding, wintering, migratory stopover).

   a. Influence regulatory agency decisions regarding projects that will result in loss of habitat and habitat functions for this species (CPA). |FY12 $0 DES CPA TRS Ongoing

   b. Target U.S. Fish and Wildlife Service (USFWS) habitat restoration/enhancement projects to benefit this species (ex. areas within and surrounding Iroquois National Wildlife Refuge [NWR], Oak Orchard Wildlife Management Area [WMA], Tonawanda Indian Reservation, and Galen WMA.

c. Leverage money and partners to protect and improve winter habitat (Refuges, communities, Audubon, Natural Resource Damage Assessment and Restoration [NRDAR] funds).

3. Collision with structures.

a. Evaluate impact of wind turbines at specific sites (Hamlin, Hammond, Lake Erie, and Lake Ontario, etc.); assist with monitoring (CPA). |FY12 $0 DES CPA TRS Ongoing

b. Address direct species mortality associated with wind power project operation by participating in evaluation of individual permits, through the State Environmental Quality Review Act [SEQRA] process (CPA). |FY12 $0 DES CPA TRS Ongoing

4. Environmental contaminants.

a. Include cerulean warblers in contaminants analysis for NRDAR and other projects (EC). |FY? $0 DES EC ? Future

5. Climate change.

a. Strategy will depend upon results of research needs noted above.

Partner organizations

Haudenosaunee Confederacy, Refuges, USGS, USFS, NYSDOT, NRCS, NYSDEC, TNC, Cornell Laboratory of Ornithology, Audubon New York, Universities, PIF.

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY 2010 - 2012

1. Forest fragmentation.

a. Develop Fact Sheets with best management practices (BMP) for Marcellus Shale drilling to reduce fragmentation (CPA 2012).

b. Develop Fact Sheets with BMP in conjunction with NYSDOT, pipeline, and utility companies to reduce forest fragmentation (CPA 2012).

2. Loss of habitat (breeding, migratory, winter stopover).

a. Provide substantive Federal agency comments on proposed Federal agency actions with likely adverse impacts to cerulean warblers and/or their habitat.

b. Post on New York Field Office (NYFO) web site Fact Sheets with BMP to minimize impacts to cerulean warblers and/or their habitat.

c. Use the complete inventory of most important breeding sites and potential breeding sites to protect, restore, or enhance breeding and migration stopover habitat.

d. Conservation delivery should focus on important areas for breeding cerulean warblers in New York as follows (from Rosenberg et al. 2000): Montezuma Wetlands Complex, Allegheny River-Salamanca region, Galen WMA, Iroquois NWR, Salmon Creek near Cayuga Lake, Allegany State Park and vicinity, Tonawanda Indian Reservation, Bear Mountain State Park, Castleton Island State Park, Letchworth State Park, West Point Military Reservation, Murray-Hulberton Area, and Chittenango Creek.

e. Become a member of the Northeast PIF Working Group: Various PIF working groups have been established to deliver the PIF Landbird Conservation Plan, including the PIF Northeast Working Group. A NYFO Outreach representative will join the Northeast PIF Working Group. |FY11 $0 DEL CPA SLD Completed

3. Collision with structures.

a. Provide substantive Federal agency comments on proposed Federal agency actions with likely adverse impacts to cerulean warblers and/or their habitat. Projects identified to date include: Cape Vincent, Hounsfield, Hamlin, Hammond, Lake Erie, and Lake Ontario.

i. Evaluate impact of wind turbines in Allegany (Allegany Wind Farm in the Town of Allegany); assist with monitoring. |FY11-FY13 $0 DEL CPA TRS Ongoing

b. Address direct species mortality associated with wind power project construction by developing potential conservation measures and guidelines for turbine placement to minimize impacts. |FY11 $0 DEL CPA TRS Completed

i. Develop the CPA website with links to all national guidance and guidelines (CPA 2012). |FY11 $0 DEL CPA,IT TRS,AFL Completed

ii. Explore development of additional guidance based on species found in New York State; geographic patterns of migratory bat and bird use. (CPA)

4. Environmental contaminants.

a. Delivery will depend upon results of cerulean warbler contaminant analyses (which will provide an indication of potential effects).

5. Climate change.

a. Delivery will depend upon strategy determined from research noted above.

Cerulean Warbler (*Dendroica cerulea*): Allegheny Focal Area

Partners/potential funding:

- Haudenosaunee Confederacy, Refuges, USGS, USFS, NYSDOT, NRCS, NYSDEC, TNC, Cornell Laboratory of Ornithology, Audubon New York, Universities, PIF.

OUTREACH

- Develop the CPA website with links to all national guidance and guidelines.

- Become a member of the Northeast PIF Working Group: Various PIF working groups have been established to deliver the PIF Landbird Conservation Plan, including the PIF Northeast Working Group. A NYFO Outreach representative will join the Northeast PIF Working Group. |FY11 $0 DEL CPA SLD Completed

- Develop Fact Sheets with BMP for Marcellus Shale drilling to reduce fragmentation.

- Develop Fact Sheets with BMP in conjunction with NYSDOT, pipeline, and utility companies to reduce forest fragmentation.

MONITORING

- As actions are undertaken, monitoring will need to be identified up front in order to implement it as part of the overall action.

- Develop protocols to measure success of all conservation delivery activities.

- Work with Partners to identify leads for accomplishing monitoring activities.

- Develop BMP from results of monitoring to inform future cerulean warbler population restoration activities.

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Cerulean Warbler (*Dendroica cerulea*): Allegheny Focal Area

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NYSDEC. 2010. Cerulean warbler fact sheet. (http://www.dec.ny.gov/animals/59560.html).

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USFWS. 2007. Final Draft Bird Conservation Plan for the Lower Great Lakes/St Lawrence Plain Bird Conservation Area (BCR 13). January, 2007. (http://www.acjv.org/BCR_13/BCR13_Final_Plan_July07.pdf).

USFWS. 2007. A Conservation Action Plan for the Cerulean Warbler (*Dendroica cerulea*) produced for the USFWS, Division of Migratory Bird Management Focal Species Program. Revised version – 30 June 2007.

Existing strategies for cerulean warbler restoration:

Please refer to the following documents for existing strategies:

- Partners in Flight Landbird Conservation Plan: Physiographic Area 15: Lower Great Lakes Plain (Dettmers and Rosenberg 2003). http://www.partnersinflight.org/bcps/pl_15sum.htm.

- Partners in Flight North American Landbird Conservation Plan http://www.partnersinflight.org/cont_plan/

- New York State Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf

- Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Region (USFWS 2007) http://www.acjv.org/BCR_13/BCR13_Final_Plan_July07.pdf

- Conservation Action Plan for Cerulean Warbler (USFWS 2007) http://www.fws.gov/migratorybirds/CurrentBirdIssues/Management/FocalSpecies/Plans/CeruleanWarbler.pdf

Clubshell (*Pleurobema clava*): Allegheny Focal Area

Clubshell Species Action Plan

FOCAL AREA: ALLEGHENY

Other species benefitting:

rayed bean, yellow lampmussel, northern riffleshell, and other mussels; spotted darter, bluebreast darter, longhead darter, and variegate darter

BIOLOGICAL PLANNING

Introduction to species

Species information: Clubshell prefers clean, loose sand and gravel in medium to small rivers and streams. This mussel will bury itself in the bottom substrate to depths of up to 4 inches. Typically found in gravelly riffles, this species cannot tolerate mud or slackwater. In fact, it is very susceptible to siltation. Reproduction requires a stable, undisturbed habitat and a sufficient population of fish hosts to complete the mussel's larval development. When the male discharges sperm into the current, females downstream siphon in the sperm to fertilize their eggs, which they store in their gill pouches until the larvae hatch. The females then expel the larvae when a host fish is within close proximity.

Host fish may include common shiner, river chub, fantail darter, and central stoneroller). The related the Tennessee clubshell also uses these species as fish hosts (Weaver et al. 1991). In addition, the striped shiner, blackside darter, and logperch are also host fish. The larvae which manage to attach themselves by means of tiny clasping valves to the gills of a host fish grow into shelled juveniles. At that point they detach from the host fish and burrow into the stream sediment where they can grow and live for up to 50 years.

Justification for species selection: Clubshell is a Federally-listed (listing date Feb. 22, 1993) and a New York State-listed endangered species. The New York Field Office (NYFO) has ongoing partnerships with The Nature Conservancy (TNC) and New York State Department of Environmental Conservation (NYSDEC) to survey areas with the goal of recovering this species. The Nature Conservancy has been surveying streams in western New York for clubshell mussels, as well as French Creek tributaries in Pennsylvania.

State contribution to overall species population: The clubshell mussel lived throughout the Ohio River basin and in a few streams in the Maumee River basin, a tributary to western Lake Erie. In New York, it has been seen at only one site. Certain areas may be important to address the need for viable populations in “two additional drainages” as per the Clubshell and Northern Riffleshell Recovery Plan (1994) (USFWS 2009).

Clubshell (*Pleurobema clava*): Allegheny Focal Area

Threats and threat assessment:

Threats[1] (See 5 listing factors in Recovery Plan)

Factor A. Destruction, modification, or curtailment of its habitat or range.

A. The clubshell is threatened by runoff and channelization, sedimentation, domestic and commercial pollution, infrastructure (including pipelines, highways), in-stream sand and gravel mining, and impoundments.

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes.

A. Mussels were historically collected for use in buttons and for scientific study.

Factor C. Disease or predation.

A. Some site-specific impacts from predation (i.e., muskrats).

Factor D. Inadequacy of existing regulatory mechanisms.

A. The Endangered Species Act (ESA) does not provide land use regulatory tools that are needed for long term maintenance of habitat and long term protection of species habitat.
B. Federal and State Regulations (i.e., Clean Water Act, Article 15) that authorize activities such as in-stream mining, bridge piers, pipelines, etc., need conditions in regulatory permits that avoid take and protect suitable habitat.

Factor E. Other natural or manmade factors affecting its continued existence.

A. Invasive species such as zebra mussel/quagga mussel infestation.
B. Flooding - excess sediments to bury mussel populations.
C. Droughts - decrease in water levels, leave mussels suspended.
D. Water quality - impacts include pollutants, sewage, and development.
E. Climate change - water level rise, higher water temps, increased velocity, increase transport of bedload material and sediment.

Recovery Goals

Range-wide Recovery Goals/Objectives:

Maintain and restore viable populations of the endangered clubshell to a portion of its historical range in order to remove the species from the Federal list of endangered and threatened species.

[1] Refers to 5 listing factors A-E in Section 4 of Endangered Species Act

Clubshell (*Pleurobema clava*): Allegheny Focal Area

Recovery Criteria (*see Recovery Plan*)

In order to reclassify the clubshell to threatened, the following criterion must be met:

Viable populations must be documented in 10 separate drainages for this species. A viable population consists of sufficient numbers of reproducing individuals to maintain a stable or increasing population. These populations should include as many subpopulations as possible to maintain whatever fraction of the original genetic variability that remains.

The following drainages are identified as necessary to achieve recovery: Tippecanoe River (IN), East Fork West Branch, St. Joseph River (MI/OH), Fish Creek (IN/OH), Green River (KY), Little Darby Creek (OH), Elk River (WV), **French Creek (PA), Allegheny River (PA),** and two additional drainages.

This criterion has been partially met (see 5 year review)

Research/Actions needed:

A. Determine life history, ecology, and status for identified hosts (Recovery Action 3.22).

1. Identify and map both actual and potential threats at existing sites, and identify activities or practices that may affect the clubshell. |FY12-FY13 $5,000 BP ESA SLD Ongoing

2. Assess the effects of stream regulation on the existing populations in the Allegheny, and develop recommendations for dam operators to protect and enhance downstream clubshell habitat. |FY14 $? BP ESA SLD Future

3. Work with USFWS White Sulphur Springs Fish Hatchery to determine contaminant sensitivity for each life stage, particularly silt concentrations. |FY13-FY14 $3,000 BP ESA SLD Future

4. Continue genetic analysis to define the ranges of clubshell (*Pleurobema clava*) and Tennessee clubshell (*Pleurobema oviforme*) in the Cumberland and Tennessee Rivers. Partners include USGS, Pennsylvania Field Office (PAFO)/West Virginia Field Office (WVFO). |FY14 $? BP ESA SLD Future

5. Captive holding/rearing of clubshell may provide additional options for the species' recovery and re-establishment into historic mussel habitat. Captive husbandry methods should be developed and an assessment of historic habitat completed to identify sites where clubshell augmentation and re-establishment can be achieved. Partners include USGS, TNC, USFWS. |FY14-FY15 $? BP ESA SLD Ongoing

6. NYFO to work with TNC, WPLC, PANH, and PAFO to identify specific research needs (i.e., define population viability, separation distance, population protection, and habitat protection) to better understand the needs of the species. |FY12-FY14 $0 BP ESA SLD Ongoing

7. Assist PAFO with the next 5-year status assessment. Work with PAFO to develop a recovery action plan for the population in New York. |FY12-FY13 $0 BP ESA SLD Ongoing

B. Conduct surveys, as warranted, for additional populations (Recovery Action 2.5).

1. Conduct additional surveys as recommended by UFWS and partners. |FY12-FY14 $10,000 BP ESA SLD Ongoing

2. Use Geographic Information System (GIS) tools to predict suitable habitat in New York to assist in identifying where to conduct surveys and to use in reviewing Conservation Planning Assistance (CPA) activities. |FY12-FY13 $0 BP ESA SLD Ongoing

3. Create GIS map where clubshell is known to occur. |FY10 $0 BP ESA SLD Completed

C. Identify activities or practices within each ecosystem that may affect the clubshell (Recovery Action 1.3).

1. Identify and participate in ongoing environmental planning and regulatory compliance processes within each ecosystem. |FY12-FY14 $0 BP ESA,CPA SLD Ongoing

2. Consider impacts to clubshell and other aquatic species when reviewing permits or recommending mitigation opportunities for pipelines, bridge repair/replacement, stream mining, or excavation, etc. |FY12-FY15 $0 BP ESA,CPA SLD Ongoing

D. Identify activities or practices within each ecosystem that may affect the clubshell (Recovery Action 1.3).

1. Identify and participate in ongoing environmental planning and regulatory compliance processes within each ecosystem.

2. Work with Corps on conditions to incorporate into regulatory permits that avoid take, protect suitable habitat, and minimize impacts. Use mitigation tools for long-term protection. |FY12-FY14 $0 BP ESA,CPA SLD Ongoing

E. Other natural or manmade factors affecting its continued existence (Factor E)

Clubshell (*Pleurobema clava*): Allegheny Focal Area

F. Determine the response to zebra and/or quagga mussel invasions, and their control measures (Recovery Action 3.5).

1. Flooding - Examine potential opportunities for stream restoration via natural stream design to reduce sedimentation and erosion of streambanks and to reconnect the streams to floodplains to reduce flood impacts. |FY12-FY14 $0 BP CPA,PFW SLD,CS,GD Ongoing

2. Invasive Species - Identify areas with zebra mussel/quagga mussel infestation. |FY12-FY14 $0 BP CPA,ESA SLD Ongoing

CONSERVATION DESIGN

Strategies for addressing those threats

Please go to these documents for existing strategies:

- Federal recovery plan (1994) http://www.fws.gov/northeast/nyfo/es/clubshell.pdf
- 5-year review completed (USFWS, ECOS 2009) http://www.fws.gov/northeast/nyfo/es/clubshell.pdf
    - Assist PAFO with Recovery Plan and 5-year assessment
- TNC Upper Allegheny River Basin Conservation Action Plan (2008) NYFO P:\Endangered Species\Mussels\Allegany http://www.alleghenybasin.org/
    - Assist with update to TNC Conservation Action Plan
        a. Map known mussel populations for use in evaluating projects (Action 2.5). |FY11 $0 DES ESA SLD Completed
        b. Assist with the identification of areas that threaten water quality. Identify areas of high risk for hazardous spills and point and non-point runoff.
        c. Determine best approaches for the reintroduction and relocation of rare mussels. As a result of the ORVMG meeting in 2011, not a priority.

Research /Recovery Actions needed: (as per the 5-year assessment)

Revise recovery plan and recovery criteria.

- Work with PAFO on Recovery Plan and 5-year review status in 2014. |FY14 $0 DES ESA SLD Future

CONSERVATION DELIVERY

Clubshell (*Pleurobema clava*): Allegheny Focal Area

Factor A. **Destruction, modification, or curtailment of its habitat or range.**

A. As needed, restore habitats and reintroduce the species to suitable areas (many subactions in Recovery Plan associated with this, see Action 4).

1. Pilot project:

a. Conduct initial conference call with PAFO, TNC, and NYSDEC. |FY10 $0 DEL ESA SLD,RAN Completed

b. Contact PAFO and NYSDEC to discuss the potential to augment/relocate clubshell into Cassadaga Creek. |FY10 $0 DEL ESA SLD,RAN Completed

c. Conduct follow up calls in February 2011. |FY11 $0 DEL ESA SLD,RAN Completed

d. Work with NYSDEC/PAFO to evaluate an augmentation program for this species. PAFO interested, NYS has final decision. |FY10 $0 DEL ESA SLD,RAN

e. Submit proposal to Regional Office and NYFO for funding consideration. |FY10 $0 DEL ESA SLD,RAN Completed

B. PAFO - Augmentation project.

1. Northern riffleshell augmentation project for Pennsylvania Department of Transportation (PENNDOT) successful of augmentation of Allegheny River clubshell to Darby Creek in the Ohio River basin in Fall 2010 (ORVMG meeting). |FY11 $0 DEL ESA SLD Completed

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes. No action

Factor C. Disease or predation. No action

Factor D. Inadequacy of existing regulatory mechanisms.

A. Federal and State Regulations (i.e., Clean Water Act, Article 15) that authorize activities such as in stream mining, bridge piers, pipelines, etc.

1. Develop BMP for development (pipelines, bridges, and culverts) and provide recommendations to State and Federal agencies. |FY12-FY14 $0 DEL ESA SLD Future

Factor E. Other natural or manmade factors affecting its continued existence.

Clubshell (*Pleurobema clava*): Allegheny Focal Area

A. Determine the response to zebra and/or quagga mussel invasions, and their control measures (Action 3.5).

   1. Contact PANH, WPALC, TNC, and PAFO regarding known locations of invasive species. |FY12-FY13 $0 DEL ESA SLD Ongoing

- Flooding – use stream restoration techniques to reduce sediment and reconnect streams to floodplains to reduce flood impacts. |FY12-FY14 $0 DEL CPA,PFW SLD,? Ongoing

- Water quality impacts include pollutants, sewage, and development.

   1. Identify discharges (point source) in the vicinity of mussel populations, identify areas where contaminants may be, and minimize impacts to mussels due to development using sediment and erosion plans, reduce fill into waters of the U.S., and minimize bank stabilization. |FY13-FY14 $0 DEL ESA SLD Future

- Climate change. No action at this time.

Partners

USGS - Review and comment on proposed activities.
TNC - Conduct research and monitoring.
NYSDEC - Conduct monitoring, SWG projects, coordinate project proposals.
Natural Heritage Program (NHP) - Update database annually with new survey information.
NYSDOT - recommend avoidance, minimization of impacts during project evaluation, conduct surveys when appropriate, and relocate mussels into New York (if required).

OUTREACH

Encourage public support for the recovery process through an outreach program and incentives Action 5. If identified as a priority for this focal area, evaluate the following ideas:

1. Create fact sheet for clubshell and upload to website. |FY12 $0 OUT ESA SLD Planned

2. Create Eastern hellbender/mussel display using tanks. |FY14 $1,000 OUT ESA SLD Future

3. Increase public awareness of the recovery needs for these species via website. |FY14 $0 OUT ESA SLD Future

4. Design an exhibit that educates the public on species threats and the need for ecosystem protection. |FY14 $5,000 OUT ESA SLD Future

Clubshell (*Pleurobema clava*): Allegheny Focal Area

5. Focus PFW restoration work in areas that may be suitable for clubshell augmentation if a priority. |FY? $? OUT ESA,PFW ? Future

6. Attend ORVMG meeting in November 2011. |FY11 $257 OUT ESA SLD Completed

MONITORING

- Continue to review and track recovery progress.
- Secure funding for presence/absence studies.
- Set up monitoring plan for surveys.

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USFWS 2010. Clubshell Fact Sheet website:
http://www.fws.gov/midwest/Endangered/clams/clubs_fc.html.

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Eastern Hellbender (*Cryptobranchus a. alleganiensis*): Allegheny Focal Area

Eastern Hellbender Species Action Plan

FOCAL AREA: ALLEGHENY

Other species benefitting:

brook trout, long-tailed salamander, rayed bean, clubshell, yellow lampmussel, Northern riffleshell, spotted darter, bluebreast darter, longhead darter, variegate darter

BIOLOGICAL PLANNING

Introduction to species

Species information: The hellbender is an obligately aquatic salamander whose populations have substantially declined in 14 of 17 states within its geographic range over the past several decades. Hellbenders are listed as vulnerable, imperiled, or critically imperiled in these states. The two subspecies of hellbender, the Eastern (*Cryptobranchus a. alleganiensis*) and the Ozark hellbender (*Cryptobranchus a. bishopi*), were listed as "near threatened" on the IUCN (The World Conservation Union) Red List of Threatened Species in 2004. The listing was primarily due to loss of habitat from agricultural practices, mining, clear cutting of riparian, recreation and transportation development, as well as dam construction. In 2011, the U.S. Fish and Wildlife Service (USFWS) has listed the Ozark hellbender as endangered. A Federal candidate assessment was completed in 2003 for the Eastern hellbender (Mayasich *et al*. 2003) and a second assessment is currently underway by the USFWS Columbus Field Office to consider potentially listing under the Endangered Species Act. The Eastern hellbender is also included in a 404-species petition to the USFWS. Both subspecies are listed in Appendix III of the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) to protect them from international trade pressures. New York State has the Eastern subspecies which is only found in a few populations in the Allegheny and Susquehanna River watersheds. The hellbender has been State listed as special concern since 1983; current review of the State listings by the New York State Department of Environmental Conservation (NYSDEC) indicate that the listing level may be raised to threatened or endangered. Historically, hellbenders were found in substantial numbers, especially in the Allegheny River watershed. Similar to many amphibians, hellbenders are indicators of stream health and with populations at the most northern extent of their range, they face many threats and are vulnerable because they reside in sparse habitat and require flat rocks > 30 cm. They are a long-lived species and are late maturity breeders. Hellbenders are a high priority for the NYSDEC. The New York State recovery plan is in draft (Bell *et al*. 2010). In Pennsylvania, hellbenders are listed in the State Wildlife Action Plan. They are of immediate concern in that state and in need of a status assessment to determine distribution and abundance. Pennsylvania is seeking higher protection, although currently hellbenders can be collected with a fishing license.

Justification for species selection: The Eastern hellbender is one species included in a multi-species petition to the USFWS. It is listed as special concern in New York and will likely

be elevated under current listing review. The NYSDEC has drafted a recovery plan to increase conservation efforts in the state. Because of its specialized habitat requirements and being an edge-of-range species (exists in patchy habitat), population levels in New York will naturally be low in comparison to core populations. Laboratory work has indicated high genetic diversity in the Allegheny River watershed versus other areas of their geographic range. Fourteen of 17 states indicate population declines. The hellbender is the largest amphibian in the state and it only occurs in two watersheds in the state. They are a long-lived (25+ years) species, and are late maturity breeders (5-7 yrs).

Actions/Research needed:

1. Assist NYSDEC with generating priority site map. |FY11-FY12 $0 BP ESA NR Ongoing

2. Provide technical assistance pertaining to State recovery plan. |FY10-FY12 $0 BP ESA NR Ongoing

3. Coordinate with the Regional Office, Pennsylvania Field Office, and other Ecological Services (ES) Field Offices for the states of Maryland, Virginia, and West Virginia regarding hellbender conservation efforts to tie-in with greater USFWS strategic habitat planning. |FY11-FY12 $0 BP ESA NR Ongoing

4. Coordinate with the NYSDEC to identify appropriate size of self-sustaining population in each watershed (modeling). |FY13? $? BP ESA NR Future

5. Coordinate with the NYSDEC, the University of Buffalo (UB), and other partners to identify new sites with required specialized habitat. |FY12-FY14 $? BP ESA NR Planned

6. Coordinate with the NYSDEC and UB to implement larval searches using established protocols for bank searching. |FY12-FY14 $? BP ESA NR Planned

7. Coordinate with the NYSDEC, UB, and other partners to survey deeper water areas using SCUBA. |FY12-FY14 $? BP ESA NR Planned

8. Assist NYSDEC, UB, and other partners with conducting surveys of historic and new sites to estimate current population sizes. |FY12-FY14 $5,000? BP ESA NR Planned

9. Work with the NYSDEC to identify threats at sites. |FY12-FY14 $? BP ESA NR Planned

10. Explore possible contaminants research to identify causes for abnormalities. Many individuals have been observed with abnormalities (i.e., missing or extra limbs/digits). |FY14? $? BP ESA,EC? NR Future

Eastern Hellbender (*Cryptobranchus a. alleganiensis*): Allegheny Focal Area

11. Captive propagation is already in place for Allegheny. NYSDEC released 50 individuals in the Fall of 2011; subsequent releases will take place in Summer 2012. |FY12 $0 BP ESA NR Ongoing

State contribution to overall species population: Currently, many hellbenders are known to be found in the Allegheny River watershed and several tributaries. Over 400 individuals are marked with Passive Integrated Transponder tags (aka PIT tags) for long-term monitoring.

Threats and threat assessment:

1. **Loss of Habitat.**
   a. Increased sedimentation (i.e. causes embeddedness of natural flat rock habitat)
      i. Road construction.
      ii. Development.
      iii. Riparian clearing - riparian trees provide necessary shade to lower water temperature and provide bank stability to prevent erosion and increased sedimentation at a site.
2. **Lack of recruitment.**
   a. Recent surveys in the watershed have indicated a shift in age class structure to older individuals. Few larvae and juveniles are found at sites.
3. **Stream barriers.**
   a. Dams and/or possible culverts may impede movement.
4. **Illegal collection.**
   a. Collection is primarily for the pet trade. This is a problem in parts of the hellbender geographic range and is likely a problem in New York. NYSDEC Conservation Officers were actively involved in a past collection case that occurred in the Allegheny River watershed.
5. **Environmental Contaminants.**
   a. Heavy metals, pesticides, and herbicide use are potential threats, sewage treatment plants, and thermal pollution. Endocrine disruptors could be impacting hellbenders, but more research is needed.

i. Further research is needed to determine whether environmental contaminants are impacting hellbender populations. |FY14? $? BP ESA,EC NR Future

6. Predation.

a. Predation by fishes (i.e. northern pike), habitat disturbance by carp, or predation by other animals such as otter, waterbirds, or snapping turtles may have some impact on populations.

7. Disease.

a. *Batrachochytrium dendrobatidis*, also known as chytrid fungus, has been discovered in the Allegheny watershed in New York. Some hellbender sites have tested positive for chytrid in this watershed, but not all. It is unknown what impacts chytrid has on hellbenders.

i. Further research is needed to determine if chytrid fungus affects hellbenders in New York. |FY13? $? BP ESA NR Future

8. Climate change.

a. Climate change may lead to flashy streams, stream dry-up, increased UV-B radiation, potential for the increased risk of *Saprolegnia* fungus, less oxygen with increased water temps, and increased mortality due to chytrid fungus. Research is needed to determine any impact climate change may have.

i. Further research is needed to determine if climate change impacts hellbenders (i.e., identify whether flashy streams change macroinvertebrate populations). |FY14? $? BP ESA NR Future

ii. Provide technical assistance to the NYSDEC and the National Zoological Park on a project titled, "Identify biological constraints to climate change adaptation for effective management of Appalachian salamanders". |FY11 $0 BP ESA NR Completed

Recovery Goal for NYFO:

Prevent Federal listing by implementing work identified under Conservation Delivery.
Focus for Allegheny River watershed – priority focus should be to maintain or enhance existing populations and preserve genetic diversity.

Example metric:

Eastern Hellbender (*Cryptobranchus a. alleganiensis*): Allegheny Focal Area

For known occupied site in Susquehanna River tributary – 900 m site, estimate ~30 individuals (data based on Blais 1996). As of 2008, one individual has been found at this site.

Recovery Criteria (as stated in State Recovery Plan):

To maintain self-sustaining populations within the Allegheny River watershed in New York.

To maintain or enhance sufficient quality habitat in the Allegheny River watershed in New York.

See Bell *et al.* 2010

Eastern Hellbender Status Assessment Report (Mayasich *et al.* 2003)
http://www.fws.gov/midwest/eco_serv/soc/amphibians/eahe-sa.pdf.
For a partial list of publications and current research see:

http://www.hellbenders.org/publications.html (Humphries 2006).
http://www.caudata.org/cig/ (CIG undated).

Partners/potential funding:

NYSDEC, Seneca Nation of Indians, Trout Unlimited (TU), New York State Department of Transportation (NYSDOT), The Nature Conservancy (TNC), BSC, Lycoming College (PA), Buffalo Zoo, Bronx Zoo, Binghamton Zoo

Population goal(s) for New York State:

Unknown at this time

CONSERVATION DESIGN

Strategies for addressing those threats

1. Develop standardized data collection sheets for surveys. Partners include NYFO, NYSDEC, BSC, UB, and others. |FY12 $0 DES ESA NR Planned

2. Assist NYSDEC with developing a database repository. Partners include the NYFO NYSDEC, BSC, UB, USC, and others. |FY12 $0 DES ESA NR Planned

3. Develop decontamination protocol to counter disease (*B.d.*). Partners include NYFO, NYSDEC, BSC, UB, and others. |FY12 $0 DES ESA NR Planned

4. Develop a surveyor list. Refer to bog turtle surveyor guidance as a model. Partners include NYFO, NYSDEC, and others. |FY13? $0 DES ESA NR Future

Eastern Hellbender (*Cryptobranchus a. alleganiensis*): Allegheny Focal Area

5. Develop schedule scheme to set priorities for surveys. Partners include NYFO, NYSDEC, BSC, UB, USC, and others. |FY12 $0 DES ESA NR Planned

6. Develop protocols for surveys. Refer to bog turtle survey guidance as model. Partners include NYFO, NYSDEC, BSC, UB, and others. |FY13? $0 DES ESA NR Future

7. Develop protocol for PIT tagging. Partners include NYFO, NYSDEC, BSC, UB, and others. |FY12 $0 DES ESA NR Planned

8. Develop sampling protocol for DNA collection. Partners include NYFO, NYSDEC, BSC, UB, and others. |FY12 $0 DES ESA NR Planned

9. Adopt existing protocol to sample for chytrid fungus. Partners include NYFO, NYSDEC, BSC, and others. |FY12 $0 DES ESA NR Planned

10. Develop a training program for hellbender surveys (to produce a list of recommended surveyors). Partners include NYFO, NYSDEC, and others. |FY13? $0 DES ESA NR Future

11. Develop conditions to accompany scientific collectors permits for hellbender work. Partners include NYFO, NYSDEC, and others. |FY13? $0 DES ESA NR Future

12. Provide technical assistance as needed on the USFWS status assessment that is being done by the Columbus Field Office (Jeromy Applegate). |FY10-FY12 $0 DES ESA NR Ongoing

13. Research what types of funding sources exist in order to conduct surveys, enhance hellbender habitat, captively raise hellbenders, etc. Partners include NYFO, NYSDEC, BSC, UC, USC, SUNY ESF, and others.

    a. Regional Conservation Needs Grant - submit proposal for survey needs and additional captive management work. Partners include NYFO, NYSEC, BSC, USC, Western Pennsylvania Conservancy, and the Good Zoo, Wheeling, WV. |FY11 $0 DES ESA NR Completed

    b. Regional Conservation Needs Grant - submit proposal for 2012. Host conference calls with partners to discuss needs. |FY12 $0 DES ESA NR Planned

    c. Section 6 Tradition Grant - submit proposal for 2012. Host conference calls with partners to discuss needs. |FY12 $0 DES ESA NR Planned

Please refer to the following document for existing strategies:

Eastern Hellbender (*Cryptobranchus a. alleganiensis*): Allegheny Focal Area

Draft *Cryptobranchus alleganiensis* Recovery Plan* (Bell *et al*. 2010)

****The following are some of the ideas outlined in the NYSDEC Recovery Plan. Many details still require further development.**

General:

- Hold Recovery Meeting with NYSDEC and partners March 2010. |FY10 $0 DES ESA NR Completed

- Attend NYSDEC Recovery Meeting (date and location to be determined). |FY13? $0 DES ESA NR Future

- Host periodic conference call with the New York hellbender working group to continue completing identified actions. |FY10-FY12 $0 DES ESA NR Ongoing

- Host/attend periodic meeting with the New York hellbender working group to continue completing identified actions. |FY10-FY12 $0 DES ESA NR Ongoing

1. **Loss of Habitat.**

   a. **Increased sedimentation.**

      i. Seek to minimize loss of habitat in the following areas that support hellbenders by influencing regulatory agency decisions regarding stream modifications, agricultural practices that diminish water quality in adjacent streams, and development including infrastructure construction.

         - Develop a training program for State and Federal permit processors to increase awareness of hellbender conservation. Partners include NYFO, NYSDEC, U.S. Army Corps of Engineers [USACE], and others. |FY13? $0 DES ESA,CPA NR,SLD Future

         - Develop a training program for the NYSDOT to consider hellbender impacts when doing bridge repair/replacement or any stream modifications/riparian work. Partners include NYFO, NYSDOT, and others. |FY13? $0 DES ESA,CPA NR,SLD Future

         - Develop conservation measures to minimize impacts and post on website in the form of fact sheets. Partners include NYFO, NYSDEC, UB, USC, and others. |FY13? $0 DES ESA,IT NR,AFL Future

Eastern Hellbender (*Cryptobranchus a. alleganiensis*): Allegheny Focal Area

- Conduct study to determine appropriate buffer size needed to protect sites. Partners include NYFO, NYSDEC, UB, USC, SUNY-ESF, and others. |FY13? $0 DES ESA NR Future

- Develop fact sheets, other information about appropriate stream buffers, conservation measures for landowners, etc. Partners include NYFO, NYSDEC, UB, USC, and others. |FY13? $0 DES ESA NR Future

2. **Lack of Recruitment.**

   a. NYSDEC is enhancing hellbender habitat by placing additional large rock slabs at sites. NYSDOT is a major partner as they purchased and stock piled large rock for habitat improvement. Details of future plans for additional sites are currently being outlined by NYSDEC. This project was initiated as part of the captive propagation plan to add habitat for captive reared individuals.

      i. Assist NYSDEC with rock placement in new stream locations. |FY11-FY12 $0 DES ESA NR Ongoing

      ii. Purchase additional large rock slabs. |FY13? $20,000? DES ESA NR Future

3. **Stream barriers.**

   Need to identify barriers to remove, if any:

   a. Work with the NYSDEC to identify dams and culverts that are problematic to migration that could be removed or replaced. Potential to utilize priority culvert list drafted by TNC. |FY13? $0 DES ESA NR Future

   b. Work with the NYSDEC to determine the feasibility of providing fish passage for hellbenders where barriers cannot be removed. |FY14? $0 DES ESA NR Future

   c. Work with the NYSDEC, UB, and BSC to collect DNA samples from above and below barriers to determine if removal is warranted in order to maintain/increase genetic diversity. |FY14? $0 DES ESA NR Future

4. **Illegal collection.**

   a. No work planned in the next 2-3 years.

5. **Environmental contaminants.**

   a. Work with the NYSDEC and NYFO to develop an emergency response plan for contaminant spills in hellbender streams. |FY14? $0 DES ESA,EC NR Future

b. Work with the NYSDEC and USC to develop conservation measures and fact sheets regarding the potential impacts of Marcellus and Utica shale drilling on water quality and increased sedimentation in streams supporting hellbender populations. |FY13? $0 DES ESA,EC NR Future

c. Work with the NYSDEC to conduct fish sampling to evaluate emerging contaminants. |FY14? $0 DES ESA,EC NR Future

6. Predation.

a. Work with the NYSDEC to determine carp impact. |FY14? $? DES ESA NR Future

b. Work with the NYSDEC to identify impacts of predatory fish (i.e., northern pike). |FY14? $? DES ESA NR Future

7. Disease.

a. Research existing chytrid sampling protocols to adopt for surveying hellbender streams within the watershed. |FY12 $0 DES ESA NR Planned

b. Test hellbender sites to determine presence of chytrid fungus. |FY12 $0 DES ESA NR Planned

8. Climate change.

a. Research is needed to determine any impact climate change may have. |FY14? $? DES ESA NR Future

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats FY2010-2012

1. Loss of Habitat.

a. Influence regulatory agency decisions regarding stream modifications, agricultural practices that diminish water quality in adjacent streams, and development including infrastructure construction by:

i. Develop fact sheets and best management practices (BMP) to minimize impacts to hellbenders. |FY13? $0 DEL ESA NR Future

ii. Write substantive comments on proposed Federal agency actions with likely adverse impacts on hellbenders. |FY12 $0 DEL ESA,CPA NR,SLD Ongoing

iii. Post these fact sheets/BMP on our website. |FY13? $0 DEL ESA,IT NR,AFL Future

b. Enhance stream habitat by placing large flat rocks and stabilizing stream banks with riparian buffers.

i. Assist NYSDEC with enhancement project in tributary to Allegheny River. Potential for additional rock placement. |FY11-FY12 $0 DEL ESA NR Ongoing

c. Fence off problematic areas due to cattle grazing along stream margins. Partners include NYFO, NYSDEC, and others. |FY13? $0 DEL ESA,PFW? NR Future

2. Lack of Recruitment.

a. Captive propagation is underway at the Buffalo Zoo (an action currently underway based on tasks of recovery plan) (Bell *et al.* 2010).

i. Provide any technical assistance needed to NYSDEC and Zoo on captive propagation program. |FY11-FY12 $0 DEL ESA NR Ongoing

ii. Provide technical assistance when NYSDEC is prepared for first release of captive propagated individuals. The first release of individuals occurred in August 2011. |FY11 $0 DEL ESA NR Completed

iii. Assist the NYSDEC with subsequent releases of individuals that are planned for Summer and Fall of 2012. |FY12 $0 DEL ESA NR Planned

iv. Assist the NYSDEC and Buffalo Zoo with seeking out additional funding, if needed, to continue captive program. |FY12 $0 DEL ESA NR Planned

3. Stream Barriers.

a. Nothing identified in the next 2-3 years.

4. Illegal collection.

a. Nothing identified in the next 2-3 years.

5. Environmental contaminants.

a. Nothing identified in the next 2-3 years.

Eastern Hellbender (*Cryptobranchus a. alleganiensis*): Allegheny Focal Area

6. **Predation.**

    a. Nothing identified in the next 2-3 years.

7. **Disease.**

    a. Nothing identified in the next 2-3 years.

8. **Climate change.**

    a. Nothing identified in the next 2-3 years.

OUTREACH

1. Develop a stream/water quality/habitat traveling exhibit. |FY14? $0 OUT ESA NR,SLD Future

2. Work with BSC on planning 2011 Hellbender Symposium. |FY11 $0 OUT ESA NR Completed

3. Develop a poster to use at National Fishing Day celebration. |FY11 $0 OUT ESA NR Completed

4. Develop a hellbender wind sock to accompany poster on hellbender ecology. |FY11 $0 OUT ESA NR Completed

5. Assist UB and the NYSDEC with development of a brochure that promotes recovery (target fishermen). |FY12 $0 OUT ESA NR Planned

6. Develop a website for hellbender or link to existing websites for outreach and contractors. |FY12 $0 OUT ESA,IT NR,AFL Planned

MONITORING

1. Assist the NYSDEC with development of protocols to measure progress/success of habitat restoration projects. |FY12 $0 MON ESA NR Planned

2. Assist the NYSDEC with development of protocols to measure progress/success of captive rearing and release of hellbenders. |FY12 $0 MON ESA NR Planned

3. Assist the NYSDEC, when needed, with monitoring to measure progress/success of restored habitat and captive reared individuals. |FY12 $0 MON ESA NR Planned

References

Eastern Hellbender (*Cryptobranchus a. alleganiensis*): Allegheny Focal Area

Bell, T., R. MacBlane, and B. Wheeler. 2010. Draft *Cryptobranchus alleganiensis* Recovery Plan. New York State Department of Environmental Conservation. Division of Fish, Wildlife and Marine Resources. 52 pp.

Cryptobranchid Interest Group. Undated. Building Partnerships for Giant Salamander Conservation http://www.caudata.org/cig/.

Humphries, J. 2006. The Hellbender Homepage http://www.hellbenders.org/publications.html.

Mayasich, D.A., D. Grandmaison, and C. Phillips. 2003. Eastern Hellbender Status Assessment Report. NRRI/TR-2003/09. U.S. Fish and Wildlife Service. 43 pp. http://www.fws.gov/midwest/eco_serv/soc/amphibians/eahe-sa.pdf.

Rayed Bean (*Villosa fabalis*): Allegheny Focal Area

Rayed Bean Species Action Plan

FOCAL AREA: ALLEGHENY

BIOLOGICAL PLANNING

Other species benefitting:

clubshell, northern riffleshell, yellow lampmussel, and other mussels

Introduction to species

Species information: The rayed bean is proposed for listing on the endangered species list as of November 2, 2010. The rayed bean belongs to the Unionidae family, North America's most imperiled major faunal group. Its current range includes Indiana, Michigan, New York, Pennsylvania, Ohio, and Ontario, Canada. The historical range of the rayed bean included Illinois, Indiana, Kentucky, Michigan, New York, Pennsylvania, Ohio, Tennessee, Virginia, West Virginia, and Ontario, Canada.

French Creek is a major tributary of the middle Allegheny River that supports the rayed bean. The headwaters of French Creek originate in western New York and flows into northwestern Pennsylvania where it drains into Lake Erie. This mussel is often found in shallow riffles in creeks or small rivers, often among aquatic plants. One of the largest known rayed bean populations is found in much of the lower portions of French Creek located in four Pennsylvania counties. The species is not known in the New York portion of French Creek. Surveys will help us identify known locations and habitat for protection, restoration, and possible augmentation.

Justification for species selection: The New York State Department of Environmental Conservation (NYSDEC) lists the rayed bean as a State-endangered mussel. The U.S. Fish and Wildlife Service (USFWS) New York Field Office (NYFO) is the Region 5 lead for this species. The rayed bean historically was found across a wide expanse that included parts of the Midwest, the eastern United States, and north to Ontario, Canada. Once found in at least 112 streams, canals, and lakes, the rayed bean now occurs in only 28 streams and 1 lake; a 75 percent reduction in the number of occupied streams and lakes. The species has been extirpated from Illinois, Kentucky, Tennessee, and Virginia, but is still found in Indiana, Michigan, New York, Ohio, Pennsylvania, West Virginia and Ontario, Canada. The Allegheny River in Pennsylvania and French Creek in Pennsylvania appear to have the largest, best viable populations remaining. Several other smaller, but considered viable, populations occur in isolated and generally short stream reaches.

State contribution to overall species population: Rayed bean is listed as endangered in New York State and as a Wildlife Species of Regional Conservation Concern in the northeastern United States with typically 5 or fewer occurrences.

Rayed Bean (*Villosa fabalis*): Allegheny Focal Area

Threats and threat assessment:

Threats[2] (See 5-year review for full assessment):

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Like the clubshell, rayed bean is threatened by habitat loss, runoff, channelization, sedimentation, domestic and commercial pollution, contaminants (i.e., ammonia), infrastructure (including dams, pipelines, highways), instream sand and gravel mining, and impoundments.

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:

A. Mussels were historically collected for food, use in buttons (in low numbers), and for scientific study.

Factor C. Disease or predation

A. Some site-specific impacts from predation (i.e. fish, drum, and sunfish, muskrats), parasites include water mites, trematode, leeches, bacteria, and some protozoa.

Factor D. The inadequacy of existing regulatory mechanisms:

A. Listing will provide protection under the Endangered Species Act (ESA); however, ESA does not provide land use regulatory tools needed for long-term maintenance of habitat and long-term protection of species habitat.

B. Federal and State Regulations (i.e., Clean Water Act, Article 15) that authorize activities such as instream mining, bridge piers, pipelines, etc., need conditions in regulatory permits that avoid take and protect suitable habitat.

Factor E. Other natural or manmade factors affecting its continued existence:

A. Population fragmentation and genetic diversity between populations.
B. Flooding – excess sediments to bury mussel populations.
C. Water quality impacts include pollutants, sewage, and development.
D. Climate Change – water level rise, higher water temperatures, increased velocity, increased transport of bedload material, and sediment.
E. Invasive species such as zebra mussel/quagga mussel and Asian clam infestation.

[2] Refers to 5 listing factors A-E in Section 4 of Endangered Species Act

Rayed Bean (*Villosa fabalis*): Allegheny Focal Area

Recovery Goals:

Range-wide Recovery Goals/Objectives:

Maintain and restore viable populations of the rayed bean to a portion of its historical range in order to preclude listing.

Conservation goal(s) for New York State:

Work with TNC to prioritize streams for restoration/protection. Clear goals are needed for the New York portion of the range.

Research/Actions needed:

Factor A. Destruction, modification, or curtailment of its habitat or range:

A. Several drainages are identified for presence/absence surveys to determine whether there are additional populations in New York.

B. Genetic studies are needed to determine population fragmentation and isolation.

C. Determine contaminant sensitivity for each life stage.

D. Monitor population status, including demographics, at existing sites through a collecting protocol.

E. Monitor habitat and populations. Establish programs in streams with extant populations to monitor their status, document changes in immanency, and magnitude of threats, etc.

F. Additional studies on life history and impacts to rayed bean from activities on specific life stage.

G. Disease or predation – the occurrence of disease in mussels is virtually unknown.

Factor B. The inadequacy of existing regulatory mechanisms:

A. Review and comment on 2012 Nationwide permits (U.S. Army Corps of Engineers [USACE]) Federal and State Regulations (i.e., Clean Water Act, Article 15) that authorize activities such as instream mining, bridge piers, pipelines, etc., need conditions in regulatory permits that avoid take and protect suitable habitat.

Rayed Bean (*Villosa fabalis*): Allegheny Focal Area

Factor C. Other natural or manmade factors affecting its continued existence:

A. Identify the potential effects of and responses to zebra and/or quagga mussel invasions, and their control measures.

B. Zebra mussels have attached in large numbers to the shells of live native mussels and have been implicated in the loss of mussel beds. Asian clams may ingest large numbers of unionid sperm, glochidia, and newly-metamorphosed juveniles. They actively disturb sediments, so dense populations may reduce habitable space for juvenile native mussels.

CONSERVATION DESIGN

Strategies for addressing those threats

Proposed rule to list the rayed bean as endangered (see Federal Register notice November 2, 2010).

1. Review proposed rule to list rayed bean as endangered. |FY11 $0 DES ESA SLD Completed
2. Conduct outreach to New York interested parties for proposed rule to list rayed bean as endangered. |FY11 $0 DES ESA SLD Completed

Please go to these documents for the existing strategies:

- Candidate Notice of Review (2010)
- Status Assessment Report for the rayed bean, *Villosa fabalis,* occurring in the Mississippi River and Great Lakes systems (USFWS Regions 3, 4, and 5, and Canada) (2002) http://www.fws.gov/midwest/Endangerd/clams/pdf/rayed-bean-sa.pdf
- TNC Upper Allegheny River Basin Conservation Action Plan 2008

1. Assist with update to the TNC Conservation Action Plan

   a. Map known mussel populations for use in evaluating projects. |FY10-FY13 $0 DES ESA SLD Ongoing

2. Research or actions needed (see status assessment): Specific actions for the next 3 years addressing conservation design include the following:

   a. Help develop/influence existing comprehensive watershed plans where threats to the rayed bean are highest. |FY11-FY14 $0 DES ESA SLD Ongoing
   b. Implement comprehensive watershed plans by including best management practices (BMP) in written correspondence. |FY11-FY14 $0 DES ESA SLD Ongoing
   c. Once listed, work with USFWS, White Sulphur Springs, Ohio River Valley Mussel Group (ORVMG) to:

Rayed Bean (*Villosa fabalis*): Allegheny Focal Area

i. Determine stable population levels.
ii. Design and recommend BMP for pipelines, bridges, and culvert projects that threaten rayed bean populations.
iii. Reduce mining impacts through permit review.
iv. Adjust numerical criteria for pollutants (when reviewing water quality standards).
v. Create Geographic Information Systems (GIS) database of known and potential habitat. |FY11 $0 DES ESA SLD Completed
vi. Determine fish hosts (i.e., darters and other fishes) for rayed bean (White Sulphur Springs).
vii. Propagation technology needs to be developed to facilitate population, augmentation, and reintroduction into historical habitat.
viii. Evaluate the potential for species augmentation and reintroduction at protected sites.
ix. Identify areas with zebra mussel/quagga mussel infestation.
x. Communicate with NYSDEC regarding Section 6 grant application. |FY12-FY14 $0 DES ESA SLD Ongoing
xi. Continue to read literature on species life history and habitat needs. |FY12-FY14 $0 DES ESA SLD Ongoing
xii. Research demographic structure, effective population size, etc. The effective population size needed for long-term population viability is crucial information for recovery. |FY12-FY14 $0 DES ESA SLD Ongoing

CONSERVATION DELIVERY

Factor A. Destruction, modification, or curtailment of its habitat or range:

A. Contact TNC, NYSDEC, and Western Pennsylvania Land Conservancy (WPLC) regarding quantitative surveys and potential restoration projects. |FY12 $0 DEL ESA SLD Planned

B. Conduct a survey in Upper Allegheny River system in New York (TNC, WPLC), if funding becomes available. |FY12-FY14 $3,000 DEL ESA SLD Ongoing

C. Prioritize streams and watersheds for restoration of habitat. |FY11 $0 DEL ESA SLD Completed

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes: No action

Factor C. Disease or predation: No action

Factor D. The inadequacy of existing regulatory mechanisms:

A. Federal and State Regulations (i.e., Clean Water Act, Article 15) that authorize activities such as instream mining, bridge piers, pipelines, etc., need conditions in regulatory permits that avoid take and protect suitable habitat.

Rayed Bean (*Villosa fabalis*): Allegheny Focal Area

1. Work with PAFO, TNC, WPLC, and PANH to develop BMP to minimize impacts to the species during construction. Recommend BMP to USACE and incorporate into permit conditions.

Factor E. Other natural or manmade factors affecting its continued existence:

A. Determine the response to zebra and/or quagga mussel invasions, and their control measures.

B. Flooding – stream restoration techniques to reduce sediment and reconnect streams to floodplains to reduce flood impacts (CPA, Partners for Fish and Wildlife [PFW]).

C. Water quality impacts include pollutants, sewage, and development.

1. Identify discharges (point source pollution) in the vicinity of known mussel populations, identify areas where contaminants may be, and minimize impacts to mussels by using sediment and erosion plans, reduce fill into waters of the U.S., and minimize bank stabilization. |FY13-FY14 $0 DEL ESA SLD Future

D. Climate Change

No action

OUTREACH

1. Conduct outreach after final rule is published. |FY12-FY13? $0 OUT ESA SLD Future

Ideas include:

- Educate local communities through use of fact sheets and post on website.
- Identify stakeholders.
- Develop posters and videos highlighting aquatic faunal groups, a riparian restoration and conservation video for streamside landowners, endangered species pamphlets, and mussel trunks (outreach/education kits) for educators.
- Design, construct Eastern hellbender/mussel display.
- Provide training for agencies/organizations/municipalities in western New York.

MONITORING

1. Monitor habitat and populations after surveys are completed. |FY12-FY13? $0 OUT ESA SLD Future
2. Establish programs in streams with extant populations to monitor their status, document changes in immanency, and magnitude of threats, etc. |FY12-FY13? $0 OUT ESA SLD Future

Rayed Bean (*Villosa fabalis*): Allegheny Focal Area

3. Monitor zebra/quagga mussel population (local watershed groups, TNC?).
4. Monitor New York State Department of Transportation (NYSDOT) projects as necessary. |FY12-FY13 $0 MON ESA,CPA SLD Ongoing
5. Determine potential impacts from lampricide on freshwater mussels. |FY12-FY13? $0 OUT ESA SLD Future

Partners

USGS: Review and comment on proposed activities
TNC: Conduct research and monitoring
NYSDEC: Conduct monitoring, State Wildlife Grant (SWG) projects, coordinate project proposals
New York Natural Heritage Program (NYNHP): Update database annually with new survey info.
NYSDOT: recommend avoidance, minimization of impacts during project evaluation, conduct surveys when appropriate, and relocate mussels into New York (if required).

References

NYSDEC website http://www.dec.ny.gov/animals/9406.html
Strayer, D. and K.J. Jirka. 1997. The Pearly Mussels of New York State. New York State Museum. New York State Education Dept., Albany, NY.
TNC. Upper Allegheny River Basin Conservation Action Plan. 2008.
http://www.fws.gov/northeast/nyfo/es/clubshell.pdf
http://www.alleghenybasin.org/

USFWS. Status Assessment Report for the rayed bean, *Villosa fabalis*, occurring in the Mississippi River and Great Lakes systems (U.S. Fish and Wildlife Service Regions 3, 4, and 5, and Canada) http://www.fws.gov/midwest/Endangered/clams/pdf/rayed-bean-sa.pdf

USFWS. Status Assessment for Three Imperiled Mussel Species: Spectaclecase (*Cumberlandia monodonta*), Sheepnose (*Plethobasus cyphyus*), and Rayed Bean (*Villosa fabalis*)
http://www.fws.gov/orve/online_symposium_three_mussels.html

Spotted Darter (*Etheostoma* maculatum): Allegheny Focal Area

Spotted Darter Species Action Plan

FOCAL AREA: ALLEGHENY

Other species benefitting:

Brook trout, Hellbender (New York State [NYS] special concern), Longtail salamander (NYS special concern), mussels (clubshell and rayed bean mussels), darters (including bluebreast and gilt darters (reintroduction)

BIOLOGICAL PLANNING

Introduction to species

Species information: The spotted darter (*Etheostoma maculatum*) is part of the largest and most diverse darter genera, Etheostoma, of the family Percidae. Spotted darters are most commonly found in the faster, deeper riffles of medium to large streams with gravel and cobble substrate. This species spawns from May to early June in riffles 6-24 inches deep. Eggs are deposited in a wedge-shaped mass under flat stones 3-9 inches in diameter. The nests, guarded by males, are at least 4 feet apart. Females begin spawning at age 2 and spawn 2-4 times in a single 5 week spawning season. The primary food items are aquatic insect larvae, including immature Diptera (chironomids) and Trichoptera (caddisflies). In addition, larval Plecoptera (stoneflies), Ephemeroptera (mayflies), and Coleoptera (beetles) occurred frequently enough in diet studies to be considered important. Spotted darters may also be an important host species for Federally-listed mussel species in the Allegheny River.

Justification for species selection: Historical distribution of the spotted darter includes Indiana, Ohio, West Virginia, Pennsylvania, New York, and southward into Kentucky. In New York, the spotted darter occurred in the Allegheny River and the French Creek system. Today, the spotted darter occurs in the French Creek system in New York, and in Pennsylvania the species occurs in the French Creek system and remains present in the Allegheny River main stem (considered to be uncommon to rare). Overall, the range of the spotted darter has been reduced to 6 discrete watersheds in six states. Spotted darters are State-listed as either threatened or endangered in four of the six states where they occur. In New York, the spotted darter is listed as a threatened species and will likely be reclassified as endangered. The species is not Federally-listed, although a Status Assessment was completed in 2004. The spotted darter was also selected for this system as a surrogate for the gilt darter (*Percina evides*), which is believed to be extirpated from the State (last specimen captured was in 1937 in the Allegheny River). Gilt darter recolonization of the Allegheny River in New York from populations in Pennsylvania is being limited by the Kinzua Dam and Allegheny Reservoir. The New York State Department of Environmental Conservation (NYSDEC) is working with Conservation Fisheries, Inc., (Tennessee) to propagate gilt darters for re-introduction into the New York section of the Allegheny River.

Spotted Darter (*Etheostoma* maculatum): Allegheny Focal Area

State contribution to overall species population: In New York, the spotted darter only inhabits a 14-mile section of the New York portion of the French Creek system. From its origin in New York, French Creek flows approximately 117 miles to the confluence with the Allegheny River in Pennsylvania. In Pennsylvania, the spotted darter occurs in the Allegheny River and the French Creek system. The spotted darters that occur in French Creek (New York/Pennsylvania) and the Allegheny River (Pennsylvania) together comprise one of the six disjunct populations across their range.

Research needed:

- Determination of current population levels and presence/absence. |FY? $0 BP CPA,ESA ? Future

(Who: NYSDEC, The Nature Conservancy [TNC], U.S. Fish and Wildlife Service – New York Field Office [USFWS-NYFO] to assist with spotted darter surveys to determine presence/absence, population densities, and habitat utilization; Cost: use existing staff)

- Develop target population goals for this species in New York waters. |FY? $0 BP CPA,ESA ? Future

(Who: NYSDEC, TNC, USFWS-NYFO; Cost: use existing staff)

Threats and threat assessment:

1. **Loss of habitat and habitat function**; habitat degradation and alteration - nutrients, sediment, development/clearing of riparian zone.

   Research needed:

   a. Extensive and frequent stream surveys to determine population size, presence/absence, and habitat utilization. |FY? $0 BP CPA,ESA ? Future

      (Who: NYSDEC, Trout Unlimited [TU], USFWS-NYFO; Cost: NYFO staff time)

   b. Determine available habitat in Allegheny River and associated tributaries. |FY? $0 BP CPA,ESA ? Future

      (Who: NYSDEC, USFWS-NYFO; Cost: unknown at this time)

   c. Determine feasibility of reintroduction of spotted darter to known former range and to create new populations where existing habitat occurs.

      (Who: NYSDEC; Cost: unknown at this time)

d. Identify priority stream reaches for habitat restoration, including stream bank stabilization and stream buffers. |FY? $0 BP CPA,ESA ? Future

(Who: NYSDEC, TNC, USFWS-NYFO, U.S. Department of Agriculture-Natural Resources Conservation Service [USDA-NRCS]; Cost: unknown at this time)

2. **Barriers to Migration** (including dams and impassable culverts).

Research needed:

- Identify which known barriers are having an influence on spotted darter distribution. |FY? $0 BP CPA,PFW TRS,SLD,CS Future

(Who: NYSDEC, TNC, USFWS-NYFO; Cost: unknown at this time)

3. **Climate change; increased water temperatures and changes in riverine discharge regimes.**

Research needed:

1. Identification of climate change related impacts to spotted darter.

(Who: National Weather Service, Landscape Conservation Cooperatives [LCC], academics; Cost: unknown at this time)

Partners/potential funding:

NYSDEC, TNC, Alleghany County Soil and Water Conservation District, Chautauqua County Soil and Water Conservation District, Chautauqua Watershed Conservancy.

Population goal(s) for New York State:

At this time, current population levels and trends for spotted darters in New York are unknown. The most intensive study completed in New York (1991-1992), yielded an average estimated abundance of 0.1 individuals per square meter with a range of 0.03 to 0.33 individuals per square meter for 9 sites. An overall conclusion of this study suggested that the abundance and age structure data were indicative of a healthy, self-supporting population of spotted darters. However, two repeat survey efforts (1994-1996, 1999-2000) captured only two spotted darters in total, so the conclusion of the 1991-1992 may not be accurate. Although population goals have not been established for New York, the NYFO will continue to collaborate with partners to establish target population goals for the Allegheny River watershed.

Spotted Darter (*Etheostoma* maculatum): Allegheny Focal Area

CONSERVATION DESIGN

Strategies for addressing those threats

A. **Loss of habitat and habitat function**; habitat degradation and alteration - nutrients, sediment, development/clearing of riparian zone.

   1. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding stream relocation and modifications, "unnatural" erosion mitigation practices, agricultural practices that diminish stream and wetland values for wildlife, dredging, placement of fill in streams and wetlands, and natural gas/oil extraction. |FY? $0 BP CPA TRS,SLD Future

   2. Target USFWS habitat restoration and enhancement projects to benefit spotted darter, including adding enhancements to natural stream design projects (including planting trees and shrubs to provide shade for water temperature control); promoting habitat restoration projects which also control sediment entering streams; provide technical assistance on stream restoration projects via natural stream design in the watershed (Partners for Fish and Wildlife [PFW]). |FY? $0 BP PFW CS Future

   3. Conduct stream surveys to determine population size, presence/absence, and habitat utilization. |FY? $0 BP ESA ? Future

   4. Preserve, restore, and/or enhance streams known to support spotted darter, including habitat preservation through coordination with land trusts. |FY? $0 BP CPA TRS,SLD,SS Future

B. **Barriers to Migration** (including dams and impassable culverts).

   1. Working with partners, identify and remove barriers. |FY? $0 BP PFW CS Future

   2. Work with New York State Department of Transportation (NYSDOT) and Federal Highway Administration (FHWA), to develop criteria for design of culverts, the modification of which would improve spotted darter passage. |FY? $0 BP CPA SLD Future

   3. Working with partners, determine the feasibility of reintroduction of spotted darter to known former range and to create new populations where existing habitat occurs. |FY? $0 BP ESA ? Future

C. **Climate change; increased water temperatures and changes in riverine discharge regimes.**

Spotted Darter (*Etheostoma* maculatum): Allegheny Focal Area

1. Identify sub-watersheds likely to be refugia for cold water fish in the future, and protect or restore the habitat for the spotted darter. |FY? $0 BP ESA ? Future

Partner organizations:

NYSDEC, TNC, USFWS-NYFO and Lower Great Lakes Fish and Wildlife Conservation Office [LGLFWCO], USDA-NRCS, NYSDOT, FHWA, TU, Alleghany County Soil and Water Conservation District, Chautauqua County Soil and Water Conservation District, Chautauqua Watershed Conservancy.

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY 2010 – 2012

1. **Loss of habitat and habitat function**; habitat degradation and alteration - nutrients, sediment, development/clearing of riparian zone.

   a. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding stream relocation and modifications, "unnatural" erosion mitigation practices, agricultural practices that diminish stream and wetland values for wildlife, dredging, placement of fill in streams and wetlands, and natural gas/oil extraction.

      i. Develop fact sheets and best management practices (BMP) to minimize impacts to spotted darters from a suite of different construction activities (Conservation Planning Assistance [CPA]). |FY? $0 DEL CPA TRS,SLD Future

      ii. Provide substantive comments on proposed Federal agency actions with likely adverse impacts on spotted darter, including natural gas/oil extraction (CPA). |FY12 $0 DEL CPA TRS,SLD Ongoing

      iii. Develop stream buffer guidelines/BMPs and post on website (CPA). |FY? $0 DEL CPA TRS,SLD Future

   b. Target USFWS habitat restoration and enhancement projects to benefit spotted darter, including adding enhancements to natural stream design projects (including planting trees and shrubs to provide shade for water temperature control); promoting habitat restoration projects which also control sediment entering streams; provide technical assistance on stream restoration projects via natural stream design in the watershed (PFW).

      i. Add enhancements to natural stream channel design projects, including planting trees and shrubs to provide shade for water temperature control (PFW). |FY? $0 DEL PFW CS Future

ii. Complete PFW projects that involve stream bank stabilization projects to reduce sediment input entering streams and reducing the quality of habitat (PFW). |FY? $0 DEL PFW CS Future

iii. Provide substantive comments on proposed Federal agency actions with likely adverse impacts on spotted darter, including natural gas/oil extraction (CPA). |FY12 $0 DEL CPA TRS,SLD Ongoing

iv. Work with USDA-NRCS and County Soil and Water Conservation Districts to utilize their program efforts to reduce agricultural impacts to streams, fencing, and stream buffers (CPA, PFW). |FY? $0 DEL CPA,PFW TRS,SLD,CS Future

v. Develop stream buffer guidelines/BMPs and post on website (CPA). |FY? $0 DEL CPA TRS,SLD Future

c. Conduct stream surveys to determine population size, presence/absence, and habitat utilization.

i. Assist the NYSDEC in conducting stream surveys to determine population size, presence/absence, and habitat utilization (Endangered Species [ESA]). |FY? $0 DEL CPA TRS,SLD,SS Future

d. Preserve, restore, and/or enhance streams known to support spotted darter, including habitat preservation through coordination with land trusts

i. Work with Land Trusts and TNC to identify parcels for protection (ESA). |FY? $0 DEL CPA,PFW TRS,SLD,CS Future

2. **Barriers to Migration** (including dams and impassable culverts).

a. Working with partners, identify and remove barriers. |FY? $0 DEL CPA,PFW TRS,SLD,SS,CS Future

b. Work with NYSDOT and FHWA, to develop criteria for design of culverts, the modification of which would improve spotted darter passage.

i. Work on culvert design criteria as a member of the New York Culvert Working Group (CPA). |FY12 $0 DEL CPA SLD Ongoing

c. Working with partners, determine the feasibility of reintroduction of spotted darter to known former range and to create new populations where existing habitat occurs. |FY? $0 DEL CPA,PFW TRS,SLD,SS,CS Future

Spotted Darter (*Etheostoma* maculatum): Allegheny Focal Area

i. NYSDEC has contracted with Conservation Fisheries, Inc. (Tennessee) to begin to understand the small-scale aquaculture requirements of the gilt darter with goals of production and reintroduction into former known ranges. No work identified for USFWS-NYFO at this time.

3. **Climate change; increased water temperatures.**

   a. Identify sub-watersheds likely to be refugia for cold water fish in the future, and protect or restore the habitat for the spotted darter. |FY? $0 DEL PFW CS,SS Future

OUTREACH

The USFWS-NYFO can create a spotted darter page of "ongoing activities" on our website. |FY? $0 OUT CPA,ESA TRS,SLD,SS Future

Partner with TNC on their ongoing Allegheny River and French Creek public awareness and outreach program. |FY? $0 OUT CPA,ESA TRS,SLD,SS Future

Complete stream outreach materials that include the importance of non-game species, such as the spotted darter. |FY? $0 OUT CPA TRS,SLD,SS Future

MONITORING

- Work with NYSDEC to monitor spotted darter populations and trends. |FY? $0 MON ESA ? Future

- Work with the NYSDEC and TNC to monitor spotted darter habitat and utilization after restoration projects are complete. This includes electroshocking restored site to determine if spotted darters are successfully using site, as well as conducting macroinvertebrate surveys to identify any changes in benthic community. |FY? $0 MON PFW,ESA CC,SS Future

- Evaluate potential reintroduction efforts as strategy to increase spotted darter population levels. |FY? $0 MON ESA ? Future

- Seek funding and support for monitoring. |FY? $0 MON ESA ? Future

Partners

NYSDEC, TNC, USFWS-NYFO/LGLFWCO, USDA-NRCS, TU, Alleghany County Soil and Water Conservation District, Chautauqua County Soil and Water Conservation District, Chautauqua Watershed Conservancy, academia (Allegheny College, Cornell University, etc.).

Spotted Darter (*Etheostoma* maculatum): Allegheny Focal Area

References

Please refer to the following documents for existing strategies:

- Spotted Darter Status Assessment (USFWS 2004)
  http://www.fws.gov/Midwest/eco_serv/soc/fish/spda-sa.pdf

- Conservation Assessment for the Spotted Darter (USDA Forest Service 2005)
  http://www.fs.fed.us/r9/wildlife/tes/ca-overview/docs/Fish/Spotted%20Darter.pdf

USDA Forest Service. 2005. Conservation Assessment for the Spotted Darter. Prepared by T. Simon, Division of Fisheries, Aquatic Research Center, Indiana Biological Survey, Bloomington, Indiana.

USFWS. 2004. Spotted Darter Status Assessment. Prepared by J. Mayasich and D. Grandmaison, Natural Resources Research Institute, University of Minnesota, Duluth, MN.

NYSDEC. 2010. Spotted Darter Fact Sheet (online).
http://www.dec.ny.gov/animals/26008.html

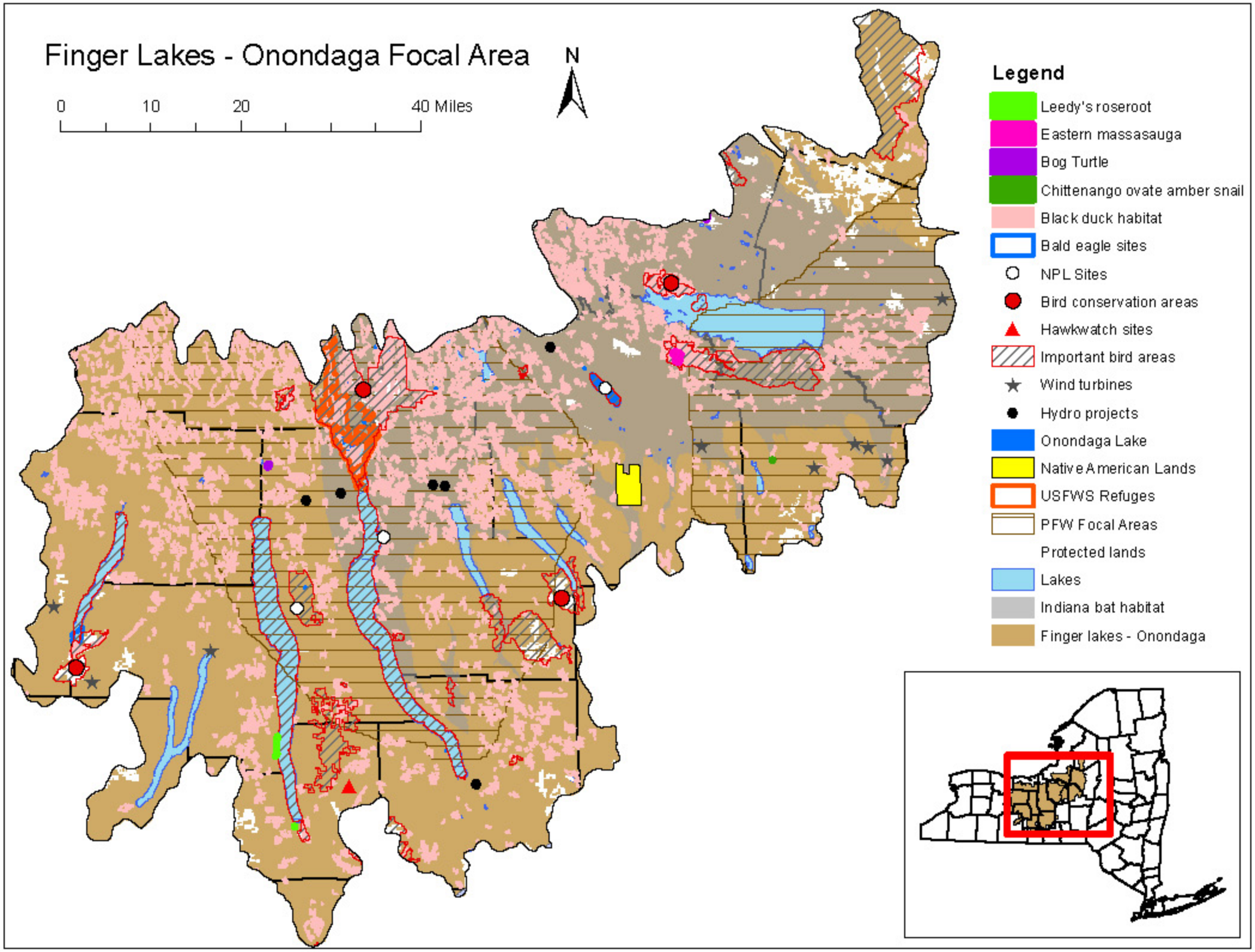
FINGER LAKES ONONDAGA FOCAL AREA

The Finger Lakes Onondaga Focal Area (FLOFA) is located in central and west-central New York and contains approximately 3,455 square miles or 6.3% of the state. The overall boundary is largely demarcated by the Seneca-Oswego River watershed, which drains into Lake Ontario. The FLOFA contains the transition from the Allegheny Plateau to the south with a local relief of 200-600 feet to the Ontario Lake Plain to the north with a local relief of 20-200 feet. Overall elevation range within the Finger Lakes region is 380-2200 feet. This FLOFA is characterized by the large lakes and glacial valleys that dominate this region of New York including the six main Finger Lakes – Canandaigua, Keuka, Seneca, Cayuga, Owasco, and Skaneateles Lakes, as well as Otisco, Onondaga, Cazenovia, and Oneida Lakes. These bodies of water represent some of the largest freshwater systems entirely within the state.

All of, or portions of, fifteen New York counties are included within the FLOFA boundary including Wayne, Ontario, Yates, Steuben, Schuyler, Chemung, Tompkins, Seneca, Cayuga, Cortland, Onondaga, Oswego, Madison, Oneida, and Lewis counties. Approximately 1,080,000 people live within this focal area, concentrated primarily in the Syracuse metropolitan area, with other concentrations in smaller cities such as Auburn and Ithaca. Land uses transition from agriculture and tourism to transportation and commercial/industrial uses in the more urban areas.

This focal area was selected because it contains significant aquatic resources supported by the extensive lake and river system. The focal area also contains the Montezuma National Wildlife Refuge and Northern Montezuma State Wildlife Management Area, part of the 50,000-acre Montezuma Wetlands Complex. There are currently one Federally-listed endangered (E) species, four threatened (T) species, one candidate (C) species, and four species of concern. Located within Bird Conservation Region 13 (Lower Great Lakes/St. Lawrence Plain) and Partners in Flight Physiographic Region 15 (Lower Great Lakes Plain), the FLOFA supports significant habitat for migrating, over-wintering, and nesting waterfowl species, such as the American black duck. Extensive forested areas provide habitat for species such as the cerulean warbler and Indiana bat (E). The lakes and streams provide habitat for a diversity of fish species, including remnant populations of the once widespread brook trout and lake sturgeon populations. Extensive wetlands support important herpetofauna including the bog turtle (T) and massasauga rattlesnake (C). Additionally, limestone cliff habitats contain a diverse species assemblage including American hart's-tongue fern (T), Leedy's roseroot (T), and Chittenango ovate amber snail (T). The latter is restricted to one known location in the world.

The New York Field Office actively seeks to promote the above resources by addressing issues related to interactions with industry, transportation, navigation, water-level regulations, hydropower, wind power, contaminants (PBCs and mercury), and development. Specific threats include habitat loss, fish barriers, hydrologic changes, habitat succession, invasive species, decreased habitat complexity, degraded water quality, and climate change. Current projects include the Onondaga Lake Natural Resource Damage Assessment and Restoration (NRDAR), Federal and non-federal permit review for hydroelectric and wind power development and relicensing, endangered species consultation and recovery activities, and habitat restoration and invasive species control implemented by the Partners for Fish and Wildlife.


Finger Lakes - Onondaga Focal Area
N
0
10
20
40 Miles
Legend
Leedy's roseroot
Eastern massasauga
Bog Turtle
Chittenango ovate amber snail
Black duck habitat
Bald eagle sites
NPL Sites
Bird conservation areas
Hawkwatch sites
Important bird areas
Wind turbines
Hydro projects
Onondaga Lake
Native American Lands
USFWS Refuges
PFW Focal Areas
Protected lands
Lakes
Indiana bat habitat
Finger lakes - Onondaga

American Hart's-tongue Fern (*Asplenium scolopendrium* var. *americanum*): Finger Lakes Onondaga Focal Area

American Hart's-tongue Fern Species Action Plan

FOCAL AREA: FINGER LAKES/ONONDAGA

Other species benefitting:

walking-fern spleenwort, maidenhair spleenwort, lady fern, bulbet fern, silvery spleenwort, glade fern, Goldie's woodfern, evergreen woodfern, marginal woodfern, eastern helleborine, Canada wild ginger, spotted jewelweed, pale jewelweed, Clayton's sweetroot, longstyle sweetroot, and broad-leaved goldenrod

BIOLOGICAL PLANNING

Introduction to species

Species information: American hart's tongue fern (AHTF) is a rare fern associated with dolomitic limestone, north to northeast-oriented steep, mesic slopes, and deciduous canopy cover (Faust 1960; Cinquemani Kuehn and Leopold 1993). Cinquemani Kuehn and Leopold (1993) found sporelings more associated with soil dominated by bryophytes which retain moisture. Mature plants require less bryophyte substrate cover, although rock crevices are necessary to reach maturation. Different light requirements are needed for the growth stages of AHTF. Sporelings are more associated with higher light intensity than mature plants. Greater exposure to light and evapotransporation can deteriorate mature plants due to having a large leaf surface. Spring snow cover may prevent AHTF from growing on lower slopes, but winter snow pack is necessary to protect roots. Herbaceous overstory (26-50%) is needed for sporeling growth as the vegetation regulates humidity and temperature near the ground. As plants mature, they require less than 25% herbaceous cover. AHTF has evergreen strap-shaped fronds that are 5 to 17 inches long, 1.75 inches wide, and auriculate (lobed) at their base. Ferns recognized as belonging to the species *Asplenium scolopendrium* were first discovered in the U.S. in 1807, when Pursh found the species growing in central New York (Faust 1960). Surveys for this fern have been ongoing in New York since 1916 (Cinquemani Kuehn and Leopold 1992), and a large data-set exists.

Justification for species selection: American hart's tongue has been Federally-listed as threatened since 1989 and is State-listed as threatened. Although the U.S. Fish and Wildlife Service (USFWS) Region 4 has overall species lead, the New York Field Office (NYFO) is the Region 5 lead. In the southern part of its range, it is found only in entrances to pit caves. The entrances to these caves provide humidity and moisture levels that are associated with the populations found at more northern latitudes. It is threatened throughout most of its range by trampling, habitat alteration, or destruction by timber removal, quarry, or residential development, and in New York, the invasive swallow-wort. Five sites have been extirpated in New York since 1924 due to quarry operations and other unknown reasons. Kelsall *et al.* (2004) report that overall, the New York population declined between 1995 and 2002. The New York Natural Heritage Program (NYNHP) (2007) states that there appears to be a slight decrease in

the number of individuals in New York's population due primarily to competition from the invasive swallow-wort.

State contribution to overall species population: Approximately 92% of rangewide population exists within New York (Kelsall *et al.* 2004). Currently within Region 5, this species only occurs in New York. New York is only one of 4 states with AHTF; others include Alabama, Tennessee and Michigan, as well as along the Niagara Escarpment in Ontario, Canada. The fern is known from a limited area within Madison and Onondaga Counties representing 17 distinct populations.

Threats and threat assessment:

Threats[3] (See 5-year review for full assessment):

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Habitat alteration - four types:

1. Destruction by timber removal – removing trees opens up canopy, reduces needed shade and decreases humidity.
2. Quarrying – operations destroyed three of New York's populations in the past and still remains a threat to at least one site.
3. Residential development
4. Trampling and placement of debris/garbage on populations

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:

A. Inappropriate collecting remains a threat to populations.

Factor C. Disease or predation: NA

Factor D. The inadequacy of existing regulatory mechanisms: NA

Factor E. Other natural or manmade factors affecting its continued existence:

A. Encroachment of invasive plant species (i.e. swallow-wort, Asian honeysuckle, and European buckthorn). Swallow-wort is a significant threat in New York.

B. Encroachment of invasive insect species – insect infestations that temporarily remove the leaves of the canopy or result in long-term damage to the trees found at a site remain a threat.

[3] Refers to 5 listing factors A-E in Section 4 of Endangered Species Act

C. Encroachment of evergreen tree species – AHTF is less associated with areas where evergreens (i.e. *Tsuga canadensis*) are present as these species lower soil pH, reduce winter snow pack, and reduce light penetration needed for sporelings (Cinquemani *et al.* 1988; Cinquemani Kuehn and Leopold 1993).

D. Drought – may affect younger plants (sporelings) more adversely than more mature plants (Cinquemani Kuehn and Leopold 1992). Droughts occurring before spring leaf-out may prematurely expose plants to increased light intensity, soil temperature, and loss of soil moisture.

E. Climate change – a potential threat to the health of AHTF colonies, but no one has yet quantified the possible impacts. Lower precipitation levels decreasing moisture in AHTF habitat, or a decrease in snow-pack during the winter months could have deleterious consequences for AHTF. New unfurling fronds may be susceptible to rain/snow damage during early spring. Reduced snow-pack may harm overwintering plants.

Recovery Goals

Range-wide Recovery Goals/Objectives: AHTF will be considered for delisting when there are at least 15 self-sustaining populations of the species in the U.S. (2 in Alabama, 2 in Tennessee, 4 in Michigan, and 7 in New York) which are protected to such a degree that the species no longer qualifies for protection under the ESA.

Conservation goal(s) for New York State: To have seven self-sustaining populations in New York that occur on sufficiently large tracts to ensure their perpetuation with a minimal amount of active management.

Research/Actions needed: Research is necessary to determine any impact climate change may have.

A. Search for additional populations and characterize all known populations (Recovery Action 1.2)

   1. Develop grant agreement with State University of New York College of Environmental Science and Forestry (SUNY-ESF) to conduct additional survey work on two New York State Parks properties. |FY12 $0 BP ESA RAN,JW Completed

   2. Provide grant oversight. |FY12-FY14 $0 BP ESA RAN,JW Ongoing

B. Determine population size and stage-class distribution for all populations (Recovery Action 2.1)

   1. 2008 census was done at all past known sites by SUNY-ESF and funded by the USFWS. Census should be done at least every 5 years (to inform future 5-year reviews).

2. Continue to fund and coordinate rangewide surveys of all populations at least every two years. |FY13 $10,000? BP ESA RAN,NR Future

C. Conduct long-term demographic studies and determine genetic variability within and between populations (Recovery Action 2.3)

1. Coordinate with NYSOPRHP to establish a system for marking/flagging mature ferns for long-term study that will not be disrupted by outside parties. |FY13 $? BP ESA RAN,NR Future

2. Coordinate with NYSOPRHP to monitor mature ferns on two of their properties. |FY13 $? BP ESA RAN,NR Future

3. Coordinate with SUNY-ESF under GLRI project to conduct genetic analysis of populations at two New York State Parks locations and offsite populations in and out of New York. |FY12-FY14 $0 BP ESA RAN,JW Ongoing

CONSERVATION DESIGN

Strategies for addressing those threats

Please go to these documents for the existing strategies:

- Recovery Plan completed 1993
- 5-year review completed 2007
    - Provide technical assistance on 5-year review as requested. |FY12 $0 DES ESA RAN,JW Planned

Research or Actions needed: Specific actions for the next 3 years addressing conservation design include the following:

A. Develop plan of action for NY populations

1. Coordinate annually with NYSOPRHP regarding species management on their properties. |FY12 $0 DES ESA RAN,NR Planned

B. Further discuss possibility with Regional Office of changing Regional lead for this species to R5. |FY12 $0 DES ESA RAN,NR Planned

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats FY 2010 - 2012

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

American Hart's-tongue Fern (*Asplenium scolopendrium* var. *americanum*): Finger Lakes Onondaga Focal Area

A. Develop and implement a program to control swallow-wort in the New York AHTF populations.

   1. Coordinate with NYSOPRHP regarding their planned invasive species management at two locations. |FY12 $0 DEL ESA RAN,NR Planned

      (Partners: USFWS, NYSOPRHP, NYSDEC, NYSFA, SUNY-ESF, State Parks; Costs: staff time) (ESA)

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:

No work in New York planned in next 2-3 years.

Factor C. Other natural or manmade factors affecting its continued existence:

No work in New York planned in next 2-3 years.

OUTREACH

To be determined.

MONITORING

Review and track recovery progress.

Provide annual Recovery Data Call (RDC) information to R4 as requested. |FY10-FY12 $0 MON ESA RAN,NR Ongoing

Partners

NYSDEC, NYSOPRHP, NYNHP

References

Cinquemani, D.M., M.E. Faust, and D.J. Leopold. 1988. Periodic censuses (1916-1986) of *Phyllitis scolopendrium* var. *americana* in Central New York State. American Fern Journal. 78(2): 37-43.

Cinquemani Kuehn, D.M. and D.J. Leopold. 1992. Long-term demography of *Phyllitis scolopendrium* (L.) Newm. Var. *americana* Fern. in Central New York. Bulletin of the Torrey Botanical Club. 119(1): 65-76.

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Faust, M. 1960. Survival of Hart's Tongue Fern in Central New York. American Fern Journal. 50: 55-62.

Kelsall, N., C. Hazard, and D.J. Leopold. 2004. Influence of climate factors on demographic changes in the New York populations of the federally-listed *Phyllitis scolopendrium* (L.) Newm. Var. *americana*. Journal of the Torrey Botanical Society. 131(2): 161-168.

New York Natural Heritage Program. 2007. Hart's Tongue fern conservation guide. Albany, New York. 5 pp.

U.S. Fish and Wildlife Service. 1993. American Hart's-tongue Recovery Plan. U.S. Fish and Wildlife Service, Atlanta, Georgia. 33 pp.

U.S. Fish and Wildlife Service. 2007. American hart's tongue fern (*Asplenium scolopendrium* var. *americanum*) 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service, Asheville, North Carolina.

American Black Duck (*Anas rubripes*): Finger Lakes Onondaga Focal Area

American Black Duck Species Action Plan

FOCAL AREA: FINGER LAKES/ONONDAGA

Other species benefitting:

American bittern, bald eagle, king rail, least bittern, waterfowl (canvasback, common goldeneye, greater and lesser scaup, long-tailed duck)

BIOLOGICAL PLANNING

Introduction to species

Species information: The American black duck (black duck) was once a common breeder in the U.S. portion of Bird Conservation Region (BCR) 13 (the Lower Great Lakes/St. Lawrence Plain), but densities have dramatically declined over the years with the conversion and subsequent destruction of forested wetlands. Black ducks breed in a variety of North American wetlands, including freshwater wetlands created by beaver (*Castor canadensis*); brooks lined by speckled alder (*Alnus incana*); lakes, ponds, and bogs throughout mixed hardwood and boreal forests; and, salt marshes. Migrants eat seeds, foliage, and tubers of aquatic plants, seeds and fruits of terrestrial species, and a variety of invertebrates, agricultural grains, and occasionally fish and amphibians.

Justification for species selection: The black duck was chosen as a priority species because of its importance in the northeast as well as in New York. The black duck is a New York State Species of Greatest Conservation Need and is also rated High-High in the Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain BCR13 (USFWS 2007). The high continental concern and precipitous decline in the northeast make freshwater wetlands and their relationship to local agriculture a key conservation concern. (Dettmers and Rosenberg 2003). The Lower Great Lakes Plain population is estimated at 200 pairs in freshwater wetland habitat, with populations declining at approximately 15% per year (Dettmers and Rosenberg 2003).

State contribution to overall species population: Range extends across New York in freshwater habitat.

Research needed:

- Develop GIS tools to determine how much habitat remains.

  (Who: New York Field Office [NYFO], Ducks Unlimited (DU) to assist with wetland surveys to determine presence/absence and population densities, coupled with habitat investigation; Cost: use existing staff).

American Black Duck (*Anas rubripes*): Finger Lakes Onondaga Focal Area

- Need to complete population modeling and habitat suitability indices to ascertain how much habitat is needed and where.

  (Who: U.S. Fish and Wildlife Service [USFWS] [Ralph Tiner] and Buffalo District, U.S. Army Corps of Engineers [USACE]; Cost: unknown at this time).

- Design a regional management program, including increased coordination among managers and biologists, to prevent duplication of research efforts and to share current information (Fish and Wildlife Information Needs System [FWINS]).
- Regional monitoring program to provide better abundance and population trend information needed for secretive wetland birds.

  (Who: Audubon, Cornell Lab of Ornithology, NYFO (GIS); Cost: use existing staff).

- Evaluate habitat requirements, including nest site characteristics, water quality, and minimum wetland area needed during breeding.

  (Who: State University of New York – College of Environmental Science and Forestry [SUNY-ESF], Audubon, Cornell Lab of Ornithology).

Threats and threat assessment:

1. **Loss of habitat and habitat function.** Loss of sufficient quality/quantity habitat within the basin due to water level alternations, draining, dredging, filling, pollution (including combined sewer overflows [CSO]), acid rain, agricultural practices, siltation, and invasive species).

   Research needed:

   - Need to characterize habitat loss.

   - Analyze existing areas of wetland habitat and recently altered wetland landscapes to determine potential breeding areas.

   - Develop GIS tools to determine how much high value habitat remains and how much is needed and where.

   - Characterize loss in habitat function (i.e. determine the cause).

   - Investigate wetland management alternatives that provide a variety of habitat conditions suitable to the needs of black ducks.

2. **Invasive species.** Invasive species, such as *Lythrum salicaria or Phragmites australis,* have impacts on wetland habitat, potentially adversely affecting black ducks.

American Black Duck (*Anas rubripes*): Finger Lakes Onondaga Focal Area

Research needed:

- Complete population modeling and habitat suitability indices to quantify invasive species' impacts on black duck productivity.
- Assess the extent and nature of infestation by invasives (Natural Heritage, The Nature Conservancy [TNC], and other data gathering institution).
- Evaluate effects of invasive plants.
- Develop GIS tools to determine how much habitat remains free of invasives.
- Need to characterize habitat loss due to invasives (i.e. what is causing it).

3. **Hybridization with mallards.** Hybridization between mallards (*Anas platyrhynchos*) and black ducks has been linked as one cause of the decline of the black duck (Ankney et al. 1987).

   Research needed:

   - Assess the extent of hybridization within New York (Natural Heritage, TNC, and other data gathering institution).

4. **Climate change.** Most existing climate change models predict less runoff and, therefore, lower water levels in the region.

   Research needed:

   - Assess changes in habitat community structure.
   - Determine climate change impacts on prey base during breeding season.

5. **Public use** (recreational disturbances).

6. **Environmental contaminants.** Assess the effects of contaminants on black ducks, especially at Great Lakes Areas of Concern (AOC) and Confined Disposal Facilities that are used by black ducks. |FY? $0 BP EC ? Future

7. **Changes in prey base** during breeding season.

American Black Duck (*Anas rubripes*): Finger Lakes Onondaga Focal Area

Population goal(s) for New York State:

No New York-specific objectives have been articulated in the Joint Venture plans due to lack of reliable population estimates for most of the species in this habitat suite; numerical population and habitat-area objectives have not been determined (Dettmers and Rosenberg 2003).

Research needed:

- To determine the population management goal for New York, work with the Division of Migratory Birds and local partners (Audubon, Cornell, etc.) to determine appropriate goal for Great Lakes in New York.

CONSERVATION DESIGN

Strategies for addressing those threats

1. **Loss of habitat.**

    a. Locate high quality migratory stopover habitat in the watershed utilizing GIS tools (Partners for Fish and Wildlife [PFW] and IT). |FY12-FY13 $0 DES PFW,IT CS,AFL Planned

    b. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding wetland draining, agricultural practices that diminish wetland values for wildlife, and dredging and placement of fill in wetlands with a focus on coastal wetlands.

    c. Target USFWS habitat restoration and enhancement projects to benefit black ducks.

    d. Work closely with Montezuma National Wildlife Refuge (NWR) staff on landscape scale wetland restoration planning, and project construction and management.

    e. Work closely with Montezuma Audubon Center staff to develop shared restoration projects with shared goals and objectives.

    f. Facilitate habitat preservation through coordination with land trusts.

    g. Preserve, restore, and/or enhance freshwater wetlands in Atlantic Coast Joint Venture (ACJV) and North American Waterfowl Management Plan (NAWMP) in breeding areas and migratory corridors.

    h. Protecting all remaining habitat. Use GIS or develop new tools to help identify and target especially the wetlands that have the highest potential to produce black ducks.

i. If possible, use Natural Resource Damage Assessment and Restoration (NRDAR) funds to accomplish black duck habitat restoration and protection. |FY12-FY13 $0 DES EC ALS Planned

2. **Loss of habitat function** (values diminished).

   a. Seek to minimize loss of habitat function when habitat is degraded by adjacent land uses by influencing regulatory agency decisions.

   b. Participate in evaluation of invasive species invasion and control in Finger Lakes/Onondaga area.

   c. Providing substantive comments on proposed wind farms, including the Alabama Ledge, Bishop, Cortland, Leicester, Enfield, and Paragon, among other proposals, to both Federal, State, and local agencies with regulatory influence over wind power project siting and operation.

3. **Environmental contaminants.**

   a. Coordinate Onondaga Lake Superfund Site BTAG activities to maximize potential for a remedy that protects wildlife (with USEPA [Environmental Contaminants (EC)]. |FY11-FY13 $0 DES EC ASR Ongoing

   b. Continue to manage the Onondaga Lake NRDAR case. |FY11-FY13 $0 DES EC ALS Ongoing

   c. Respond as appropriate to spills impacting fish and wildlife resources. |FY12-FY14 $0 DES EC ALS Planned

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY 2010 - 2012

1. **Loss of habitat.**

   a. Influence regulatory agency decisions regarding wetland draining, agricultural practices that diminish wetland values for wildlife, dredging, and placement of fill in wetlands by:

      i. Develop fact sheets and best management practices (BMP) to minimize impacts to black ducks.

      ii. Post these Fact Sheets/BMP on our website.

iii. Provide substantive comments on proposed Federal agency actions with likely adverse impacts on black ducks.

b. Deliver habitat restoration and enhancement projects by:

i. Develop a poster for the New York State Wetlands Forum (NYSWF) which targets black duck conservation.

ii. Develop Onondaga NRDAR case; consider black duck habitat restoration when developing restoration. |FY11-FY13 $0 DEL EC ALS Ongoing

iii. Restore – 10 acres of emergent wetlands and associated uplands to benefit black ducks in the Great Lakes watershed (GLRI) which includes the Finger Lakes drainage basin. |FY11 $0 DEL PFW CS,GD,ER Completed

iv. Identify additional restoration opportunities in Owasco Inlet and Owasco Lake (PFW). |FY11-FY13 $0 DEL PFW CS,GD,ER Ongoing

v. Survey Owasco Flats to obtain baseline information.

d. Influence regulatory agency decisions regarding siting, construction, and operation of wind turbines proposed for the Great Lakes watershed by:

i. Develop Fact Sheets and BMP to minimize impacts to black ducks and other waterfowl.

ii. Post these Fact Sheets/BMP on our website.

iii. Provide substantive comments on proposed wind farms.

2. **Loss of habitat function** (values diminished).

a. Influence regulatory agency decisions regarding wetland draining, agricultural practices that diminish wetland values for wildlife, dredging, and placement of fill in wetlands by:

i. Develop Fact Sheets and BMP to minimize impacts to black ducks. (Conservation Planning Assistance [CPA], PFW).

ii. Post these Fact Sheets/BMP on our website (IT).

iii. Provide substantive comments on proposed Federal agency actions with likely adverse impacts on black ducks (CPA).

American Black Duck (*Anas rubripes*): Finger Lakes Onondaga Focal Area

3. **Environmental contaminants.**

   a. Coordinate Onondaga Lake Superfund Site BTAG activities to maximize potential for a remedy that protects wildlife (with USEA [Environmental Contaminants (EC)].

      i. Provide substantive Federal agency comments on proposed actions with likely adverse impacts to black ducks (2010-2013) (EC). |FY11-FY13 $0 DEL EC ASR Ongoing

   b. Continue to manage the Onondaga Lake NRDAR case.

      i. Complete the 2008 Onondaga Lake Bird Mercury Report. |FY12 $0 DEL EC ALS Planned
      ii. Complete the 2009 Onondaga Lake Bird Mercury Report. |FY12 $0 DEL EC ALS Planned
      iii. Complete the Onondaga Lake Wintering Waterfowl Survey Report. |FY12 $0 DEL EC ALS Planned
      iv. Complete the Onondaga Lake Bat Mercury Report. |FY12 $0 DEL EC ALS Planned

Partners/potential funding:

Haudenosaunee Confederacy, U.S. Geological Survey (USGS), Natural Resources Conservation Service (NRCS), NYSDEC, Onondaga Audubon Society, County Soil and Water Conservation Districts (SWCD), TNC, DU, Audubon New York, Cornell Lab of Ornithology, New York State Department of Transportation (NYSDOT), Finger Lakes Land Trust (FLLT), New York Power Authority (NYPA), Syracuse University, SUNY-ESF.

OUTREACH

A. Participate in the New York Wetlands Forum to coordinate wetland restoration/protection activities that would benefit black ducks.
   - Landowner education
   - Public involvement

Create Outdoor Classroom wetland projects in the Finger Lakes watershed.

Develop a traveling exhibit which conveys information about impacts of environmental contaminants on wildlife and how habitat can be restored.

Continue to work with Owasco Watershed Association on public outreach events and activities.

MONITORING

Develop protocols to measure success of all conservation delivery activities.

American Black Duck (*Anas rubripes*): Finger Lakes Onondaga Focal Area

Work with Partners to identify leads for accomplishing monitoring activities.

Develop BMP from results of monitoring to inform future black duck population restoration activities.

References

Dettmers, R., and K.V. Rosenberg. 2003. Partners in Flight Landbird Conservation Plan: Physiographic Area 18: Lower Great Lakes Plain. Version 1.1: August 2003. (http://www.blm.gov/wildlife/plan/pl_15_10.pdf).

NYSDEC. 2005. Comprehensive Wildlife Conservation Strategy: A Strategy for Conserving New York's Fish and Wildlife Resources, Final Submission Draft, September 2005. (http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf).

USFWS. 2007. Final Draft Bird Conservation Plan for the Lower Great Lakes/St.Lawrence Plain Bird Conservation Area (BCR 13). January, 2007. (http://www.acjv.org/BCR_13/BCR13_Final_Plan_July07.pdf).

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North American Waterfowl Management Plan: UMR/GL Region Joint Venture Implementation Plan (1998).http://www.fws.gov/midwest/NAWMP/documents/WaterfowlManagementPlan.pdf.

North American Waterfowl Management Plan: Atlantic Coast Joint Venture Implementation Plan (2005) http://www.acjv.org/wip/acjv_wip_main.pdf.

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Zimpfer, N.L., Rhodes, W.E., Silverman, E.D., Zimmerman, G.S., and M.D. Kone. 2009. Trends in Duck Breeding Populations, 1955-2009. USFWS, Laurel, MD http://www.fws.gov/migratorybirds/NewReportsPublications/PopulationStatus/Trends/Trend%20Report%202009.pdf.

Existing strategies for American black duck restoration:

American Black Duck (*Anas rubripes*): Finger Lakes Onondaga Focal Area

Please refer to the following document for existing strategies:

- Partners in Flight Landbird Conservation Plan: Physiographic Area 18: St Lawrence Plain (Rosenberg 2000). (http://www.blm.gov/wildlife/plan/pl_18_10.pdf)

- New York State Comprehensive Wildlife Conservation Strategy (NYSDEC 2005). (http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf)

- Bird Conservation Plan for the Lower Great Lakes/ St. Lawrence Plain Bird Conservation Region (USFWS 2007). (http://www.acjv.org/BCR_13/BCR13_Final_Plan_July07.pdf)

- North American Waterfowl Management Plan: Strategic Guidance (2004). http://www.fws.gov/birdhabitat/NAWMP/files/NAWMP2004.pdf

- North American Waterfowl Management Plan: Implementation Framework (2004). http://www.fws.gov/birdhabitat/NAWMP/files/ImplementationFramework.pdf

- North American Waterfowl Management Plan: UMR/GL Region Joint Venture Implementation Plan (1998). http://www.fws.gov/midwest/NAWMP/documents/WaterfowlManagementPlan.pdf

- North American Waterfowl Management Plan: Atlantic Coast Joint Venture Implementation Plan (2005). http://www.acjv.org/wip/acjv_wip_main.pdf

- North American Waterfowl Management Plan: Atlantic Coast Joint Venture Strategic Plan Update (2009). http://www.acjv.org/documents/ACJV_StrategicPlan_2009update_final.pdf

Bog Turtle (*Clemmys [=Glyptemys] muhlenbergii*): Finger Lakes Onondaga Focal Area

Bog Turtle Species Action Plan

FOCAL AREA: FINGER LAKES/ONONDAGA

Other species benefitting:

spotted turtle, bog buckmoth, fen plant communities including Eastern Larch, black huckleberry, *Vaccinium corymbosum, Acer rubrum, Carex lasiocarpa, Sphagnum spp.*

BIOLOGICAL PLANNING

Introduction to species

Species information: Bog turtles often hibernate communally with other bog turtles and with spotted turtles. The bog turtle emerges from hibernation which is often spent in an abandoned muskrat lodge or other burrow, by mid-April, when both the air and water temperatures exceed 50ºF. Sexual maturity may be reached between 8-11 years old. Mating occurs in the spring (primarily) or fall, and may be focused in or near the hibernaculum (winter shelter). In early to mid-June, a clutch of two to four eggs is laid in a nest (tussocks). The eggs hatch around mid-September and the adults enter hibernation in late October. Bog turtles live for 30 years or more in wetland (fen) communities and may use adjacent upland areas. Although generally very secretive, the bog turtle can be seen basking in the open, especially in the early spring just after emerging from hibernation. It is an opportunistic feeder, although it prefers invertebrates such as slugs, worms, and insects. Seeds, plant leaves, and carrion are also included in its diet.

Justification for species selection: The bog turtle was Federally-listed as threatened in 1997 and listed as endangered by the State of New York. The bog turtle is a U.S. Fish and Wildlife Service (USFWS) Spotlight Species and Region 5 of the USFWS has a new bog turtle initiative.

State contribution to overall species population: There are 2 Recovery Units (RU) in New York – the Prairie Peninsula/Lake Plain (PPLP) RU (New York has all known extant sites) and the Hudson Housatonic RU.

Threats and threat assessment:

Threats[4] (See 5-year review for full assessment):

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Residential and commercial development continues to be a leading cause of habitat loss and degradation. Most direct effects to bog turtles and their habitat are now avoided. Indirect effects to wetlands remain.

[4] Refers to 5 listing factors A-E in Section 4 of Endangered Species Act.

Bog Turtle (*Clemmys [=Glyptemys] muhlenbergii*): Finger Lakes Onondaga Focal Area

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:

A. Collection is an ongoing threat.

Factor C. Disease or predation:

A. New concerns about potential disease issues in New York and Massachusetts.

B. Predation is a threat at certain sites.

Factor D. The inadequacy of existing regulatory mechanisms:

A. Continues to pose a threat.

Factor E. Other natural or manmade factors affecting its continued existence:

A. Beaver use of sites, weather events (flooding, drought).

B. Invasive species.

C. Climate Change may or may not be a threat to the species.

Recovery Goals

Range-wide Recovery Goals/Objectives: Protect and maintain the northern population of this species and its habitat, enabling the eventual delisting of the species.

Conservation goal(s) for New York State: Long range protection is secured for at least 10 populations in PPLPRU. We have 5 extant populations in New York.

Research/Actions needed:

A. Coordinate annually with the Pennsylvania Field Office (PAFO), New Jersey Field Office (NJFO), New England Field Office (NEFO), and partners on updating goals for New York for PPLPRU subunit. |FY12 $0 BP ESA SLD Planned

    1. Hold and participate in annual meeting with partners within the PPLPRU. |FY12 $? BP ESA SLD Planned

B. Conduct surveys to locate additional populations of bog turtles (Recovery Action 3.4).

    1. Recommend surveys during project reviews. |FY12 $0 BP ESA RAN,SLD,NR Ongoing

Bog Turtle (*Clemmys [=Glyptemys] muhlenbergii*): Finger Lakes Onondaga Focal Area

C. Re-evaluate the presence of bog turtles at historical sites in PPLPRU (Recovery Action 3.3.1) and conduct surveys to locate additional populations of bog turtles (Recovery Action 3.4). |FY12 $0 BP ESA RAN,SLD,NR Ongoing

   1. State University of New York (SUNY)-Oswego 2010 Great Lakes Restoration Initiative (GLRI) Phase 1 survey project.

      a. Provide technical assistance for GLRI funding request for SUNY-Oswego proposal to address Action 3.4 and possibly Action 3.3.1 in Wayne and Cayuga Counties. |FY10 $0 BP ESA RAN Completed

      b. Develop grant agreement. |FY10 $0 BP ESA RAN Completed

      c. Manage grant agreement. |FY11 $0 BP ESA RAN Ongoing

      d. Provide technical assistance to SUNY-Oswego to develop follow-up proposal for Phase 2 surveys for GLRI grant (FY2011, New York Field Office. |FY10 $0 BP ESA RAN Completed

      e. Provide technical assistance for GLRI funding request to address Action 3.4 and possibly Action 3.3.1 in Genesee and/or Seneca Counties. |FY12 $0 BP ESA RAN Planned

D. Monitor status of and threats to extant populations (Recovery Actions 3.5 and 6.1).

   1. Monitor potential new disease (see Conservation Delivery).

   2. Conduct bog turtle surveys at all extant sites.

   3. Meet with State University of New York College of Environmental Science and Forestry (SUNY-ESF) to learn more about population estimates. |FY11 $0 BP ESA RAN,SLD,NR Completed

   4. Work with Kevin Shoemaker (Stony Brook University) to develop a protocol for assessing viability of sites. |FY12 $0 BP ESA RAN,SLD,NR Planned

CONSERVATION DESIGN

Strategies for addressing those threats

Please go to these documents for the existing strategies:

- Recovery Plan completed 2001 (Service 2001).
- 5-year review drafted 2008 (Service 2008).

- Provide assistance to Regional Coordinator for development of 5-year review. |FY12 $0 DES ESA SLD Planned

- Spotlight Species Action Plan 2009 (Service 2009).

- Subunit Team Plan (2011)

Research or Actions needed: Specific actions for the next 3 years addressing conservation design include the following:

A. Participate in Bog Turtle Initiative (NYFO ESA, Partners for Fish and Wildlife [PFW]).

   1. Participate in monthly/regional conference calls. |FY11-FY14 $0 DES ESA RAN,NR,SLD Ongoing

   2. Host and attend periodic PPLPRU subunit meetings. |FY12 $0 DES ESA NR,RAN Ongoing

   3. Attend March 10, 2010, meeting. |FY10 $0 DES ESA RAN,SLD Completed

   4. Assist Alison Whitlock in planning and convening November 2011 regional workshop. |FY11 $0 DES ESA NR,SLD Completed

   5. Attend November 2011 regional workshop. |FY11 $0 DES ESA SLD,NR Completed

   6. Attend 2012 regional workshop (location and date TBD). |FY12 $1,000? DES ESA SLD,NR Planned

B. In each recovery unit, identify and prioritize sites for appropriate conservation efforts (Recovery Action 2.1) **All sites are priorities in PPLPRU at this time given the number of sites**.

   1. Initiate PPLPRU recovery implementation team. |FY11 $0 DES ESA SLD Completed

      a. Hold initial call/meeting to reinvigorate Hudson/Housatonic team and discuss drafting subunit plans (first call is done; periodic calls are addressed above). |FY11-FY12 $0 DES ESA NR Completed

   2. Complete 1-3 year implementation plan for PPLPRU recovery implementation plan by August 1, 2011. |FY11 $0 DES ESA SLD Completed

   3. Develop site-specific management plans for each extant site is needed. |FY13 $0 DES ESA SLD Future

C. Conduct research/studies to understand and identify the degree to which land-use activities alter bog turtle habitat (Recovery Action 6.2).

   1. Conduct research to help understand indirect effects such as hydrological changes from residential and commercial development.

      a. Coordinate with Alison Whitlock regarding development of a funding request for U.S. Geological Survey (USGS) Science Support Partnership (SSP) to help understand hydrological changes in bog turtle sites from residential and commercial development. |FY13 $0 DES ESA RAN,SLD,NR Future

      b. Request U.S. Geological Survey (USGS) Science Support Partnership (SSP) funding through Fish and Wildlife Information Needs and Studies (FWINS) posting (FY2011).

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threat FY2010-2012

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Protect bog turtle sites through purchase and conservation easements (Recovery Action 2.3).

   1. Provide technical assistance to partners that may be able to protect sites (Recovery Land Acquisition grant, New York State Department of Environmental Conservation [NYSDEC] Environmental Protection Fund [EPF], The Nature Conservation [TNC] or land trusts).

      a. Coordinate with land trusts.

         i. Hold landowner protection meetings in PPLP to engage individual land trusts in bog turtle conservation. |FY13 $? DEL ESA SLD Future
         ii. Assist land trusts in PPLP with land parcel selection. |FY13-FY14 $0 DEL ESA SLD Future
         iii. Provide technical assistance to partners in PPLP regarding land acquisition funding. |FY13-FY14 $0 DEL ESA SLD Future

      b. Coordinate with the NYSDEC

         i. Assist the NYSDEC with applying for land acquisition funding. |FY13-FY14 $0 DEL ESA SLD Future

2. Coordinate with the U.S. Army Corps of Engineers regarding bog turtle conservation.

    a. Target Section 404 mitigation projects. |FY11-FY14 $0 DES ESA SLD Ongoing

B. Improve the effectiveness of regulatory reviews in protecting bog turtles and their habitats, specifically to address agencies working at cross purposes when permitting activities in wetlands (Recovery Action 1.2) and Avoid and minimize direct and indirect adverse effects to bog turtles and their habitat (Recovery Action 1.3).

1. Develop standardized avoidance, minimization, and compensation measures (AMM).

    a. Pipelines

        i. Utilize materials on pipelines (AMM's, best management practices [BMP]) from NiSource Habitat Conservation Plan [HCP] to develop pipeline fact sheet. |FY11-FY12 $0 DEL ESA RAN Ongoing

        ii. Post BMP on website. |FY12 $0 DEL IT AFL Planned

    b. Marcellus shale drilling.

        i. Assess potential threat – coordinate with PAFO. Site visit conducted; bog turtle meeting held in November. |FY11 $0 DEL ESA SLD Completed

    c. Residential/Commercial Development.

        i. Develop standardized exposure/response table and narratives to explain threats. |FY12-FY14 $0 DEL ESA SLD Future

C. Coordinate with the New York State Department of Transportation (NYSDOT) to address potential problems with culverts/crossings at sites.

1. Attend site visit to look at problematic culverts. Partners include Partners for Fish and Wildlife (PFW) and NYSDOT. |FY12 $? DEL ESA,CPA,PFW SLD Planned

2. Coordinate with TNC (Michelle Brown) regarding their list of priority culverts to see if any could be replaced for bog turtle conservation. |FY12 $0 DEL ESA,CPA,PFW SLD,NR Planned

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes: No work in LPPRU planned in next 2-3 years.

Factor C. Disease or predation: Funding health assessment with Wildlife Conservation Society (WCS) – no samples planned from PPLPRU at this time.

Bog Turtle (*Clemmys [=Glyptemys] muhlenbergii*): Finger Lakes Onondaga Focal Area

Factor D. The inadequacy of existing regulatory mechanisms: No work planned in next 2-3 years.

Factor E. Other natural or manmade factors affecting its continued existence:

A. Manage, restore, and maintain bog turtle habitat, as appropriate (Recovery Action 6.4) and control succession and invasive exotic plants (Recovery Action 6.3.1).

   1. Consult with SUNY-Oswego (Dr. Rosenbaum) and NYSDEC to identify priority sites for invasive plant control. |FY11 $0 DEL ESA SLD Completed

OUTREACH

Current ideas include:

- Update website with BMP. |FY11-FY14 $0 OUT ESA SLD Future
- Target nature centers located in the Recovery Unit and research the need for educational opportunities. |FY11-FY14 $0 OUT ESA SLD Future
- Design outreach exhibit to inform the public on bog turtle life history, threats (including Climate Change), avoidance, minimization, and conservation measures.

MONITORING

- Review and track recovery progress in PPLP annually. |FY12 $0 MON ESA SLD Ongoing
- Provide annual Recovery Data Call (RDC) information to Alison Whitlock as requested. |FY12 $0 MON ESA SLD,NR Planned
- Coordinate with NYSDEC/SUNY-Oswego to monitor vegetation and turtle response at restoration projects in the PPLPRU. |FY12 $0 MON ESA SLD Future
- Coordinate with the NYSDEC and partners to draft a rotational schedule (e.g., every 5 or 10 years) for blitz surveys at known bog turtle locations in the PPLP. |FY12 $0 MON ESA SLD Planned

Partners

NYSDEC, New York Natural Heritage Program (NYNHP), Natural Resources Conservation Service (NRCS), Finger Lakes Land Trust (FLLT), The Nature Conservancy(TNC), New York State Department of Transportation (NYSDOT), U.S. Army Corps of Engineers (USACE)

Bog Turtle (*Clemmys [=Glyptemys] muhlenbergii*): Finger Lakes Onondaga Focal Area

References

U.S. Fish and Wildlife Service. 2001. Bog Turtle (*Clemmys muhlenbergii*) Northern Population Recovery Plan. Hadley, Massachusetts. 103 pp.

U.S. Fish and Wildlife Service. 2008. Draft Bog Turtle Northern Population 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service, State College, Pennsylvania

U.S. Fish and Wildlife Service. 2009. Draft Spotlight Species Action Plan.

Brook Trout (*Salvelinus fontinalis)*: Finger Lakes Onondaga Focal Area

Brook Trout Species Action Plan

FOCAL AREA: FINGER LAKES/ONONDAGA

Other species benefitting:

American eel, American shad, longtail salamander, wood turtle

BIOLOGICAL PLANNING

Introduction to species

Species information: The brook trout is a native salmonid that prefers cold, clean streams in eastern North America and is the only native trout that inhabits this habitat. The species prefers clear waters of high purity and a narrow *p*H range in lakes, rivers, and streams, being sensitive to poor oxygenation, pollution, and changes in *p*H caused by environmental effects, such as acid rain. Its diverse diet includes crustaceans, frogs and other amphibians, insects, molluscs, smaller fish, and even small aquatic mammals such as voles. The brook trout is a short-lived species, rarely surviving beyond 4 or 5 years in the wild.

Intact stream populations of brook trout, where wild brook trout occupy > 90% of historical habitat, exist in only 5% of the watersheds assessed in 2005 by the Eastern Brook Trout Joint Venture (EBTJV) (see below). Populations of stream-dwelling brook trout are greatly reduced or have been extirpated from nearly half of the watersheds in their native range. The vast majority of historically occupied large rivers no longer support self-reproducing populations of brook trout. In New York, 5% of the watersheds that historically contained brook trout in streams and rivers remain intact, located primarily in portions of the Adirondacks and the Tug Hill Plateau. Western and South Central New York have suffered the greatest losses of brook trout. Data gaps remain in the central part of the State from Albany to Syracuse. While many lakes and ponds still contain brook trout, losses have been substantial due to competition with non-native fish and acid deposition, particularly in parts of the State where soils and bedrock provide little buffering capacity to offset acid precipitation. Furthermore, the EBTJV has identified several sub-watersheds as highest priority for protection of brook trout populations.

Justification for species selection: The brook trout is a highly prized native sport fish**,** but intact populations of brook trout exist in only 5% of sub-watersheds in New York. Brook trout are an excellent sentinel of water quality and will also likely be a sentinel of the effects of climate change over the next century. Heritage brook trout populations are designated as a New York State (NYS) species of greatest conservation need, and the U.S. Fish and Wildlife Service (USFWS) and New York State Department of Environmental Conservation (NYSDEC) are partners in the EBTJV. The EBTJV is a partnership of State and Federal agencies, nongovernmental organizations, and academic institutions. This collaborative approach to brook trout management is justified because: (1) brook trout are declining across their entire eastern range; (2) causes for these declines are similar; (3) an integrated approach would be cost effective; and, (4) watersheds of concern span state borders and state and Federal jurisdictions.

Brook Trout (*Salvelinus fontinalis)*: Finger Lakes Onondaga Focal Area

State contribution to overall species population: Currently there are over 400 lakes and ponds that are managed by the NYSDEC for native and stocked brook trout, in which 100 or so contain naturally-reproducing brook trout. In addition, thousands of miles of tributary streams in the Adirondacks, Tug Hill Region, and Catskill Mountains, and a lesser number in western New York, east of the Hudson River, on Long Island, and in the Upper Susquehanna watershed support brook trout. Although watershed-wide population numbers are not known for the Finger Lakes/Onondaga watershed, several sub-watersheds (HUC12s) support healthy populations of native brook trout.

Research needed:

- Conduct surveys to determine current population levels and presence/absence.

  (Who: NYSDEC and Trout Unlimited [TU] to assist with brook trout surveys to determine presence/absence and population densities, coupled with habitat investigation; Cost: use existing staff)

- Determine genetic diversity of brook trout in the watershed.

  (Who: Lamar Fish Health Unit, EBTJV; Cost: unknown at this time)

Threats and threat assessment:

1. **Loss of habitat and habitat function**; habitat degradation and alteration-nutrients, sediment, development/clearing of riparian zone (medium/low threat, agriculture; medium threat, urbanization).

   Research needed:

   - Extensive and frequent stream surveys to determine population size.

     (Who: NYSDEC, TU, New York Field Office [NYFO]; Cost: NYFO staff time)

   - Identify priority stream reaches for habitat restoration by evaluating water quality criteria, habitat, and other requirements of brook trout.

     (Who: TU, EBTJV, NYSDEC, NYFO (GIS), Landscape Conservation Cooperatives [LCC]; Cost: unknown at this time)

   - Need to locate heritage streams and heritage populations.

     (Who: U.S. Geological Survey [USGS], EBJTV, NYSDEC; Cost: unknown at this time)

2. **Barriers to Migration** (including dams and impassable culverts).

   Research needed:

   - Assess importance of isolating heritage populations versus providing passage for stocked brook trout and other salmonids.

     (Who: NYSDEC, TU, EBTJV; Cost: unknown at this time)
   - Identify which known barriers are having an influence on brook trout distribution.

     (Who: EBTJV, NYSDEC, NYFO, TU; Cost: unknown at this time)

3. **Competition from non-native salmonids.**

   Research needed:

   - Assess impact of competition from stocked and/or naturally reproducing non-native salmonids. Competition/interbreeding with stocked brook trout.

     (Who: EBTJV, NYSDEC, TU; Cost: unknown at this time)

   - Determine genetic diversity of brook trout in the watershed.

     (Who: Lamar Fish Health Unit, EBTJV; Cost: unknown at this time)

4. **Climate change; increased water temperatures.**

   Research needed:

   - Identification of climate change related impacts to brook trout.

     (Who: National Weather Service, LCC, academics; Cost: unknown at this time)

Partners/potential funding

NYSDEC, New York State Office of Parks, Recreation & Historic Preservation (NYSOPRHP), TU, Onondaga County Soil and Water Conservation District (SWCD), Cayuga County SWCD, Seneca County SWCD, Tompkins County SWCD, The Nature Conservancy (TNC).

Population goal(s) for New York State:

The EBTJV has numerous conservation goals, including "Conserve, enhance or restore brook trout populations", and "…to perpetuate and restore brook trout populations throughout their historic range"; however, specific population goals have not been quantified. Although population goals have not been established for New York, the NYFO will continue to collaborate

with EBTJV, USGS, and NYSDEC to establish target population numbers for the Finger Lakes/Onondaga watershed. Establishing population goals remains a research need.

CONSERVATION DESIGN

Strategies for addressing those threats

1. **Loss of habitat.**

    a. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding stream relocation and modifications, including bulkheading; operation of hydroelectric power producing facilities; and, "unnatural" erosion mitigation practices, agricultural practices that diminish stream and wetland values for wildlife, dredging, and placement of fill in streams and wetlands.

    b. Target USFWS habitat restoration and enhancement projects to benefit brook trout, including adding enhancements to natural stream design projects (including planting trees and shrubs to provide shade for water temperature control); promoting habitat restoration projects which also control sediment entering streams; provide technical assistance on stream restoration projects via natural stream design in the watershed (Partners for Fish and Wildlife [PFW]). Be mindful of the need to consider providing additional access to heritage streams if they are blocked in a way that keeps stocked fish out.

    c. Facilitate habitat preservation through coordination with land trusts.

    d. Preserve, restore, and/or enhance streams known to support heritage strains of brook trout.

    e. If possible, use Natural Resource Damage Assessment and Restoration (NRDAR) funds to restore and protect streams identified. |FY? $0 DES EC ALS Future

    f. Continue case management of the Onondaga Lake NRDAR. |FY11-FY13 $0 DES EC ALS Ongoing

    g. Seek to minimize loss of habitat function when habitat is degraded by adjacent land uses by influencing regulatory agency decisions.

    h. Respond as appropriate to spills impacting fish and wildlife resources. |FY12-FY14 $0 DES EC ALS Planned

    i. Seek to minimize loss of habitat value by influencing Federal Energy Regulatory Commission (FERC) minimum flow decisions.

2. **Barriers to migration** (including dams and impassable culverts).

a. Working with partners, identify and remove barriers.

b. Work with New York State Department of Transportation (NYSDOT) and Federal Highway Administration (FHWA) to develop criteria for designation of culverts, the modification of which would improve brook trout passage.

c. Work with NYSDOT and FHWA to correct bridge abutments from being undermined by stream erosion; design and construct natural stream design features that will change stream bottom elevation and facilitate fish passage.

3. Competition from non-native salmonids.

a. Target USFWS natural stream design stream restoration projects for smaller streams most likely to support only one or two salmonid species.

4. Climate change; increased water temperatures.

a. Coordinate with partners to identify sub-watersheds likely to be refugia for cold water fish in the future, and protect or restore the habitat for brook trout (USGS, NYSDEC, Lower Great Lakes Fish and Wildlife Conservation Office [LGLFWCO]; 2011-2013) (CPA, PFW). |FY11-FY12 $0 BP CPA,PFW ? Ongoing

b. Design habitat enhancement projects which provide increased flow, stream shading, pool cover, increased availability of riffle habitat (NYFO PFW staff, one project 2011). |FY11 $0 DES PFW CS Completed

Partner organizations

NYSDEC, NYSOPRHP, TU, Alleghany County SWCD, Cattaraugus County SWCD, Chautauqua County SWCD, TNC, Chautauqua Watershed Conservancy.

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY 2010 – 2012

1. Loss of habitat.

a. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding wetland draining, stream relocation, and modifications, including bulkheading; operation of hydroelectric power producing facilities; and, “unnatural” erosion mitigation practices, agricultural practices that diminish stream and wetland values for wildlife, dredging, and placement of fill in streams and wetlands.

i. Design habitat enhancement projects which provide increased flow, stream shading, pool cover, increased availability of riffle habitat (PFW). |FY11-FY12 $0 DEL PFW CS,GD Ongoing

ii. Develop fact sheets and best management practices (BMP) to minimize impacts to brook trout from a suite of different construction activities.

iii. Post these fact sheets/BMPs on our website.

iv. Writing substantive comments on proposed Federal agency actions with likely adverse impacts on brook trout (Conservation Planning Assistance [CPA], Environmental Contaminants-Biological Technical Assistance Group to U.S. Environmental Protection Agency [EPA]). |FY12-FY13 $0 DEL CPA,EC TRS,ASR Planned

v. Develop a poster for the New York State Wetlands Forum which targets brook trout conservation.

vi. Develop recommendations and BMPs for culvert design and placement of structures based on NYS Culvert Working Group recommendations, the U.S. Forest Service's Stream Simulation Model, and Fish-Xing software, via CPA review (CPA). |FY11 $0 DEL CPA ? Completed

vii. Develop stream buffer guidelines/BMP and post on website.

viii. Apply for EBTJV money for the implementation of 0.5 miles of in-stream restoration (PFW, LGLFWCO). |FY!! $0 DEL PWF CS Completed

b. Target USFWS habitat restoration and enhancement projects to benefit brook trout, including adding enhancements to natural stream design projects (including planting trees and shrubs to provide shade for water temperature control); promoting habitat restoration projects which also control sediment entering streams; provide technical assistance on stream restoration projects via natural stream design in the watershed (PFW).

i. Add enhancements to natural stream design projects, including planting trees and shrubs to provide shade for water temperature control (Owasco Inlet, Cayuga Inlet; ½ mile) (PFW) (Funding – base funds, partnership with NYSDOT-PFW). |FY11 $0 DEL PFW CS Completed

ii. Restoration work via natural channel design on Fall Creek (500 feet) (PFW and Cornell). |FY12 $0 DEL PFW GD Ongoing

iii. Restoration work via natural stream design on Ninemile Creek and tributaries. (PFW with funding from base funds and NYSDOT – 1,500’, 2011-2013).

iv. Restoration work via natural stream design on Onondaga Creek (PFW with funding from base funds and NYSDOT).

v. Restoration work via natural stream design to compensate for lost values from the Onondaga National Priorities List (NPL) site via NRDAR restoration projects. |FY? $0 DES EC ALS Future

c. Facilitate habitat preservation through coordination with land trusts or non-governmental organizations (NGO).

i. Work with TU's local chapters, Finger Lakes Land Trust, and Central New York Land Trust to identify parcels for protection.

d. Promote habitat restoration projects which also control sediment entering streams (CPA) (PFW).

i. Work with Owasco Flats Nature Reserve on a project in Owasco Inlet watershed to restore wetlands to form a buffer between agricultural activities and the waterway (PFW).

e. Provide technical assistance on stream restoration projects via natural stream design in the watershed.

i. Work with Owasco Flats Nature Reserve on a project in Owasco Inlet watershed to restore wetlands to form a buffer between agricultural activities and the waterway (PFW).

ii. Statewide – Conduct a training session for County SWCD staff on natural stream design (PFW – March 2011). |FY11 $0 DEL PFW CS,GD Completed

2. **Barriers to migration** (including dams and impassable culverts).

a. Working with partners, identify and remove barriers.

i. No work indentified at this time.

b. Work with NYSDOT and FHWA to develop criteria for designation of culverts, the modification of which would improve brook trout passage.

i. No work indentified at this time.

c. Work with NYSDOT Region 3 and FHWA to correct bridge abutments from being undermined by stream erosion, design and construct natural stream design features that will change stream bottom elevation and facilitate fish passage.

i. Design and install culvert baffle systems with NYSDOT Region 3; bury perched culverts as opportunities present themselves within this NYSDOT region (PFW 2011 – 2113).

3. Competition from non-native salmonids.

a. Target USFWS natural stream design stream restoration projects for smaller streams most likely to support only one or two salmonid species. If possible, seek opportunities in heritage trout streams to increase available habitat.

i. No work indentified at this time.

2. Climate change; increased water temperatures.

a. Identify sub-watersheds likely to be refugia for cold water fish in the future, and protect or restore the habitat for brook trout.

i. Work with the National Weather Service to create models for determining temperature impacts to brook trout within the watershed.

b. Add enhancements to natural stream design projects, including planting trees and shrubs to provide shade for water temperature control (CPA, PFW) (Funding – base funds, partnership with NYSDOT-PFW).

i. Owasco Inlet, Cayuga Inlet (2011 – 2013). |FY11 $0 DEL PFW CS Completed

OUTREACH

In addition to the web site, there is an EBTJV Google Group (http://groups.google.com/group/ebtjv).

The EBTJV also has a blog, a Facebook page, and is on two other social networking sites (including Twitter).

The NYFO can create a brook trout page of "ongoing activities" on our website.

Work with SUNY Cortland, or other university, students to get volunteers for surveys and restoration portions of planned projects.

Finger Lakes Onondaga pilot classroom project – TU's Trout in the Classroom (PFW 2011). |FY11 $0 OUT PFW GD Completed

Brook Trout (*Salvelinus fontinalis)*: Finger Lakes Onondaga Focal Area

Trout in the Classroom (TIC) is an environmental education program in which students in grades K-12:

- raise trout from eggs to fry.
- monitor tank water quality.
- engage in stream habitat study.
- learn to appreciate water resources.
- begin to foster a conservation ethic.
- grow to understand ecosystems.

Most programs end the year by releasing their trout in a State-approved stream near the school or within a nearby watershed.

During the year each teacher tailors the program to fit his or her curricular needs. Therefore, each program is unique. The TIC program has interdisciplinary applications in science, social studies, mathematics, language arts, fine arts, and physical education.

In each state, TIC is funded by a number of generous supporters and made more rich through varied partnerships. The NYFO role is to provide a mentor to a classroom teacher for technical assistance. |FY12 $0 OUT PFW GD Planned

MONITORING

- Work with NYSDEC and LGLFWCO to monitor brook trout habitat after restoration is complete. This includes electroshocking restored site to determine if brook trout are successfully using site, as well as conducting macroinvertebrate surveys to identify any changes in benthic community.

- Establish benchmarks for success based on EBTJV.

- Evaluate reclamation of streams (i.e. - remove non-native salmonids) and resulting effects on brook trout population levels, as well as cessation in stocking non-native salmonids.

- With NYSDEC, develop protocol for pre-construction and post-construction surveys of streams targeted for natural stream design.

- Seek funding and support for monitoring.

Partners

TU, NYSDEC, LGLFWCO

Brook Trout (*Salvelinus fontinalis)*: Finger Lakes Onondaga Focal Area

References

Eastern Brook Trout Joint Venture main website (http://www.wasternbrooktrout.org)

Eastern Brook Trout Joint Venture data and maps (http://sain.utk.edu/ebtjv/index.php)

Eastern Brook Trout Joint Venture webpage for priority sub-watersheds in New York (http://sain.utk.edu/ebjtv/download/prioritycores.php)

Trout Unlimited Brook Trout Conservation Strategy (http://www.tu.org/conservation/eastern-conservation/brook-trout)

New York State Brook Trout Conservation Strategies
(http://www.easternbrooktrout.org/docs/EBTJV_NewYork_CS.pdf)
(http://www.easternbrooktrout.org/docs/brookie_NY.pdf)

Cerulean Warbler (*Dendroica cerulea)*: Finger Lakes Onondaga Focal Area

Cerulean Warbler Species Action Plan

FOCAL AREA: FINGER LAKES/ONONDAGA

Other species benefitting:

American redstart, red-headed woodpecker, American black duck, bald eagle, Baltimore oriole, black-billed cuckoo, Cooper's hawk, eastern wood-pewee, red-shouldered hawk, wood duck, wood thrush, Indiana bat

BIOLOGICAL PLANNING

Introduction to species

Species information: The cerulean warbler lives high in mature and older deciduous forests with broken canopies in bottomland forests as well as forests on dry slopes and ridges. Common tree species used include oak, sycamore, cottonwood, maple, black locust, and elm. It prefers large tracts of at least 50 – 75 acres, but is more productive in tracts greater than 600 acres. This species is insectivorous and eats caterpillars, beetles, wasps, and bees.

The Partners in Flight (PIF) Lower Great Lakes Plain Conservation Plan (Physiographic Area 15) (Dettmers and Rosenberg 2003) identifies this species as one of 7 priority species in the area. Comparisons between the 1980–1985 and 2000–2005 breeding bird surveys for New York indicate that the Finger Lakes region is an important breeding area in New York for cerulean warblers, with the incidence of confirmed breeding stable to declining. Range-wide, cerulean warblers have experienced a long-term population decline. Analysis of North American Breeding Bird Survey (BBS) data indicates that over the last 40 years, the decline has been steep and steady at a rate of about -3.0% per year. Remaining forest tracts in this area are extremely valuable to cerulean warblers, which also have expanded into the region in recent decades.

Justification for species selection: The cerulean warbler was chosen as a priority species because of its importance in the eastern U.S. as well as in New York. It is a New York State Species of Greatest Conservation Need; a Special Concern Species in New York; classified as High-High on the Bird Conservation Region (BCR) 13 Priority List (USFWS 2007); and, a Species of National Conservation Concern, listed as "yellow" on the Audubon watch list. According to the PIF North American Landbird Conservation Plan, 97% of the breeding population is within the eastern avifaunal biome, and the cerulean warbler is among the most specialized and threatened birds of the deciduous forest and is in need of focused conservation attention throughout its range.

State contribution to overall species population: In New York the cerulean warbler is mostly rare, but remains common in areas where suitable habitat still exists (NYSDEC 2010). Some principal breeding areas for the cerulean warbler in New York are within the Finger Lakes highlands (NYSDEC 2010). Cerulean warblers are found in areas including the Montezuma

Cerulean Warbler (*Dendroica cerulea)*: Finger Lakes Onondaga Focal Area

Wetlands Complex, Allegany State Park and National Forest, and the Hudson River Valley and Highlands of southeastern New York (Rosenberg et al. 2000).

Research Needed:

- Survey suitable habitat to determine most important breeding sites and potential breeding sites.
- Determine the use of forest patches by transient cerulean warblers in the spring and fall, include urban greenbelts.

Threats and threat assessment:

1. **Forest fragmentation.**

   Research needed:

   - Further study is needed to determine the degree of fragmentation tolerated by cerulean warbler populations and to define the minimum forest tract size needed to support breeding populations of this species (NYSDEC 2010).

2. **Loss of habitat;** at breeding and wintering grounds, as well as migratory stopover habitat.

   Research needed:

   - Research is needed to identify specific target areas within the focal area for habitat conservation efforts in support of population goals.

   - Research is needed on the life history of the cerulean warbler. The biology's of both male and female cerulean warblers, their conservation needs and any differences between them; factors affecting post-fledging survival; dispersal patterns and their extent as well as patterns of migratory connectivity.

   - Research is needed on invasive species such as wood burrowing insects that have the potential of altering a forest ecosystem.

   - Research is needed on the shift in forest dynamics within prime breeding habitats due to the increased levels of wind generated by wind turbines.

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3. **Collision with structures.**

   Research needed:

   - Research is needed to assess and reduce/mitigate risks from collisions (including off-shore oil platforms, wind farms, communication towers, etc.) Currently, little is

known about the specifics on migratory behavior. More research is needed in this area to help reduce the risk of collisions with structures.

4. **Environmental contaminants.**

   Research needed:

   - Evaluate effect of Hg exposure on this species at Onondaga Lake (EC). |FY? $0 BP EC ALS Future

5. **Climate change – changes in habitat community structure or prey base.**

   Research needed:

   - Investigate correlations between climate change and forest availability as a potential tool for predicting future changes in cerulean warbler distribution and management needs.

   - Investigate correlations between climate change and timing of spring arrival as related to change in prey base.

   - Investigate a change in frequency of catastrophic weather events, particularly hurricanes during the fall migratory period.

Partners/potential funding

Haudenosaunee Confederacy, Refuges, U.S. Geological Survey (USGS), U.S. Forest Service (USFS), New York State Department of Transportation (NYSDOT), Natural Resources Conservation Service (NRCS), New York State Department of Environmental Conservation (NYSDEC), The Nature Conservancy (TNC), Cornell Laboratory of Ornithology, Audubon New York, Universities, PIF.

Population goal(s) for New York State:

Objectives:

- Range-wide, protect or manage at least 1,500 hectares of habitat to support 1,200-1,500 pairs of cerulean warblers in PIF Lower Great Lakes Plain (Physiographic Area 15).

- Achieve less imperiled status on BCR Priority Bird Species list or New York State Species of Greatest Conservation Need List.

- Double cerulean warbler population in next 50 years (Cerulean Warbler Conservation Action Plan [USFWS 2007]).

Cerulean Warbler (*Dendroica cerulea)*: Finger Lakes Onondaga Focal Area

- Increase continental population by 100% (PIF goal).

Research needed:

- Current goals are broad, therefore, research is needed to refine population goals for cerulean warblers, and reduce critical knowledge gaps regarding demographics, population size and trends, and life history.

CONSERVATION DESIGN

Strategies for addressing the threats

1. **Forest fragmentation.**

   a. Develop and implement forest management plans for cerulean warbler. Support comprehensive forest planning on all public lands, incorporating needs and objectives to reverse declines of cerulean warbler.

   b. Reduce forest fragmentation on breeding grounds by protecting large contiguous forest tracts via influencing regulatory agency decisions.

   c. Identify and manage for high quality post fledging habitat.

   d. Protect habitat – mature forest with multi-level, diverse canopies.

   e. Participate in Owasco Flats watershed planning. |FY12 $0 DES CPA SLD Ongoing

   f. Evaluate sites within the focal area where Marcellus Shale drilling is anticipated, and assess effects this may have on breeding habitat for the warbler.

2. **Loss of habitat** (breeding, wintering, migratory stopover).

   a. Influence regulatory agency decisions regarding projects that will result in loss of habitat and habitat functions for this species (CPA). |FY12 $0 DES CPA TRS Ongoing

   b. Target U.S. Fish and Wildlife Service (USFWS) habitat restoration/enhancement projects to benefit this species in core breeding areas (ex. areas within and surrounding Montezuma National Wildlife Refuge [NWR]).

   c. Leverage money and partners to protect and improve winter habitat (Refuges, communities, Audubon, Natural Resources Damage Assessment and Restoration [NRDAR] funds).

d. Evaluate international options for NRDAR restoration projects when opportunity arises (Environmental Contaminants [EC]). |FY11-FY13 $0 DES EC ALS Ongoing

3. **Collision with structures.**

   a. Address direct species mortality associated with wind power project operation by participating in evaluation of individual permits, through the State Environmental Quality Review Act (SEQRA) process (CPA). |FY12 $0 DES CPA TRS Ongoing

   b. Address direct species mortality associated with wind power project construction by developing potential conservation measures and guidelines for turbine placement to minimize impacts. (CPA). |FY11 $0 DES CPA TRS Completed

4. **Environmental contaminants.**

   a. Continue to manage the Onondaga Lake NRDAR case. |FY11-FY13 $0 DES EC ALS Ongoing

   b. Include cerulean warblers in contaminants analysis for NRDAR and other projects (EC). |FY11-FY13 $0 DES EC ALS Ongoing

5. **Climate change.**

   a. Strategy will depend upon results of research needs noted above.

Partner organizations:

Haudenosaunee Confederacy, Refuges, USGS, USFS, NYSDOT, NRCS, NYSDEC, TNC, Cornell Laboratory of Ornithology, Audubon New York, Universities, PIF

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats FY 2010 - 2012

1. **Forest fragmentation.**

   a. Develop Fact Sheets with best management practices (BMP) for Marcellus Shale drilling to reduce fragmentation (CPA). |FY12 $0 DEL CPA TRS Completed

   b. Develop Fact Sheets with BMP in conjunction with NYSDOT, pipeline, and utility companies to reduce forest fragmentation (CPA).

2. **Loss of habitat (breeding, migratory, winter stopover).**

Cerulean Warbler (*Dendroica cerulea)*: Finger Lakes Onondaga Focal Area

a. Provide substantive Federal agency comments on proposed Federal agency actions with likely adverse impacts to cerulean warblers and/or their habitat. |FY12 $0 DEL CPA TRS Ongoing

b. Post on New York Field Office (NYFO) web site Fact Sheets with BMP to minimize impacts to cerulean warblers and/or their habitat. |FY11 $0 DEL CPA TRS Completed

c. Use the complete inventory of most important breeding sites and potential breeding sites to protect, restore, or enhance breeding and migration stopover habitat.

d. Conservation delivery should focus on important areas for breeding cerulean warblers in New York as follows (from Rosenberg et al. 2000): Montezuma Wetlands Complex, Allegheny River-Salamanca region, Galen Wildlife Management Area, Iroquois NWR, Salmon Creek near Cayuga Lake, Allegany State Park and vicinity, Tonawanda Indian Reservation, Bear Mountain State Park, Castleton Island State Park, Letchworth State Park, West Point Military Reservation, Murray-Hulberton Area, and Chittenango Creek in Onondaga and Madison Counties.

e. Become a member of the Northeast PIF Working Group: Various PIF working groups have been established to deliver the PIF Landbird Conservation Plan, including the PIF Northeast Working Group. A NYFO Outreach representative will join the Northeast PIF Working Group. |FY11 $0 DEL CPA SLD Completed

f. Landscape planning for Owasco Flats (CPA). |FY12 $0 DEL CPA SLD Ongoing

3. Collision with structures.

a. Provide substantive Federal agency comments on proposed Federal agency actions with likely adverse impacts to cerulean warblers and/or their habitat. Projects identified to date include: Alabama Ledge, Bishop, Cortland, Leicester, Enfield, Paragon, etc.).

   i. Evaluate impact of wind turbines at specific sites (Alabama Ledge, Bishop, Cortland, Leicester, Enfield, Paragon, etc.); provide technical assistance and review monitoring reports (CPA). |FY12 $0 DEL CPA TRS Ongoing

b. Address direct species mortality associated with wind power project construction by developing potential conservation measures and guidelines for turbine placement to minimize impacts (CPA). |FY11 $0 DEL CPA TRS Completed

   i. Develop the CPA website with links to all national guidance and guidelines (CPA 2012). |FY11 $0 DEL CPA,IT TRS,AFL Completed

ii. Explore development of additional guidance based on species found in New York State, geographic patterns of migratory bat and bird use (CPA).

4. **Environmental contaminants.**

   a. Continue to manage the Onondaga Lake NRDAR case.

      i. Complete the 2008 Onondaga Lake Bird Mercury Report. |FY12 $0 DEL EC ALS Planned
      ii. Complete the 2009 Onondaga Lake Bird Mercury Report. |FY12 $0 DEL EC ALS Planned
      iii. Complete the Onondaga Lake Wintering Waterfowl Survey Report. |FY12 $0 DEL EC ALS Planned
      iv. Complete the Onondaga Lake Bat Mercury Report. |FY12 $0 DEL EC ALS Planned

5. **Climate change.**

   a. Delivery will depend upon strategy determined from research noted above.

Partners/potential funding:

- Haudenosaunee Confederacy, Refuges, USGS, USFS, NYSDOT, NRCS, NYSDEC, TNC, Cornell Laboratory of Ornithology, Audubon New York, Universities, PIF.

OUTREACH

- Develop the CPA website with links to all national guidance and guidelines.

- Become a member of the Northeast PIF Working Group: Various PIF working groups have been established to deliver the PIF Landbird Conservation Plan, including the PIF Northeast Working Group. A NYFO Outreach representative will join the Northeast PIF Working Group.

- Develop Fact Sheets with BMP for Marcellus Shale drilling to reduce fragmentation.

- Develop Fact Sheets with BMP in conjunction with NYSDOT, pipeline, and utility companies to reduce forest fragmentation.

MONITORING

- As actions are undertaken, monitoring will need to be identified up front in order to implement it as part of the overall action.

- Develop protocols to measure success of all conservation delivery activities.

Cerulean Warbler (*Dendroica cerulea)*: Finger Lakes Onondaga Focal Area

- Work with Partners to identify leads for accomplishing monitoring activities.
- Develop BMP from results of monitoring to inform future cerulean warbler population restoration activities.

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Cerulean Warbler Risk Assessment & Conservation Planning Workshop, Shepherdstown, WV, June, 2006.

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Rosenberg, Kenneth V., Sara E. Barker, and Ronald W. Rohrbaugh. 2000. An Atlas of Cerulean Warbler Populations. Final Report to USFWS: 1997–2000 Breeding Seasons. Cornell Lab of Ornithology, Ithaca, NY. December, 2000.

USFWS. 2007. Final Draft Bird Conservation Plan for the Lower Great Lakes/St.Lawrence Plain Bird Conservation Area (BCR 13). January, 2007. (http://www.acjv.org/BCR_13/BCR13_Final_Plan_July07.pdf).

USFWS. 2007. A Conservation Action Plan for the Cerulean Warbler (*Dendroica cerulea*) produced for the USFWS, Division of Migratory Bird Management Focal Species Program. Revised version – 30 June 2007.

Existing strategies for cerulean warbler restoration:

Please refer to the following documents for existing strategies:

Cerulean Warbler (*Dendroica cerulea)*: Finger Lakes Onondaga Focal Area

- Partners in Flight Landbird Conservation Plan: Physiographic Area 15: Lower Great Lakes Plain (Dettmers and Rosenberg 2003). http://www.partnersinflight.org/bcps/pl_15sum.htm.

- Partners in Flight North American Landbird Conservation Plan http://www.partnersinflight.org/cont_plan/.

- New York State Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf.

- Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Region (USFWS 2007) http://www.acjv.org/BCR_13/BCR13_Final_Plan_July07.pdf.

- Conservation Action Plan for Cerulean Warbler (USFWS 2007). http://www.fws.gov/migratorybirds/CurrentBirdIssues/Management/FocalSpecies/Plans/CeruleanWarbler.pdf.

Chittenango Ovate Amber Snail *(Novisuccinea chittenangoensis)*: Finger Lakes Onondaga Focal Area

Chittenango Ovate Amber Snail Species Action Plan

FOCAL AREA: FINGER LAKES/ONONDAGA

Other species benefitting: NA

BIOLOGICAL PLANNING

Introduction to species

Species information: The Chittenango ovate amber snail (COAS) is a terrestrial species that comprises one extant population at Chittenango Falls in central New York. The taxon was first discovered at Chittenango Falls in August 1905 by a field party from the Academy of Natural Sciences of Philadelphia. Its habitat lies within a ravine at the base of one 167-foot waterfall, and the ledges where it is found comprise an early successional sere that is periodically rejuvenated to a bare substrate by floodwaters. The COAS appears to be an obligate calciphile and is found within the spray zone adjacent to the Falls. Clean water may be necessary to maintain essential habitat; however, any effects of water quality on this snail are most likely indirect. Much is still unknown about the species' particular biological and physical needs.

The initial recovery plan for COAS was completed in March 1983. Although some progress toward recovery has been made since its listing, the species remains subject to environmental and stochastic events; of particular concern is another snail, *Succinea* Sp. B, which was possibly introduced from Europe and has an undefined negative interaction with COAS. The U.S. Fish and Wildlife Service's (USFWS) 2006 revised recovery plan focuses on these issues and recommends strategies for addressing them.

Justification for species selection: The COAS is Federally-listed as threatened (listed in 1978) and was listed as endangered by the State of New York in 1977. The New York Field Office (NYFO) is the USFWS's national lead office for the species. The most recent 5-year review (USFWS 2006) recommended the COAS be uplisted to endangered.

State contribution to overall species population: The entire known range of the COAS is located at one site in Madison County, New York. 2009 population estimates were 339.2 +/- 52.85.

Threats and threat assessment:

Threats[5] (See Service 2006 5-year review for full assessment):

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range: The only known habitat is protected from direct threats.

[5] Refers to 5 listing factors A-E in Section 4 of Endangered Species Act

Chittenango Ovate Amber Snail *(Novisuccinea chittenangoensis)*: Finger Lakes Onondaga Focal Area

A. Human disturbance.

B. Indirect effects from water quality (not considered a significant threat).

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes: NA

Factor C. Disease or predation: Predation at low levels may be occurring.

Factor D. The inadequacy of existing regulatory mechanisms: NA

Factor E. Other natural or manmade factors affecting its continued existence:

A. Competition from invasive snail Sp. B.

B. Single population.

C. Natural disasters like flooding and rockslides.

Recovery Goals

Range-wide Recovery Goal: To establish long-term sustainability of the species in the wild.

Range-wide Recovery Objectives:

Interim - Stabilize COAS in the wild and in captivity
Long-term - delist the species

Conservation goal(s) for New York State: Same as range-wide goals.

Research/Actions needed:

A. Establish long-term monitoring protocol for subsequent surveys at Chittenango Falls (based on recommendations from State University of New York-College of Environmental Science and Forestry [SUNY-ESF]) (Recovery Action 2.1.1)

   1. Revise the mark-release-recapture surveys from 2003-2005 and 2007-2010 to minimize human impacts to the COAS and its habitat. |FY12 $0 BP ESA RAN Planned

   2. Implement annual surveys based on the newly developed protocols (Who: NYFO or contract). |FY12 $0 BP ESA RAN Planned

B. Conduct surveys based on monitoring protocols in occupied habitats (Recovery Action 2.1.3)

1. Conduct COAS surveys every other week in summer (June-Sept) FY2010 - (Who: NYFO and volunteers). |FY10 $0 BP ESA RAN Completed

2. Enter data into Excel. |FY11 $0 BP ESA RAN Completed

3. Enter data into Program MARK. |FY12 $0 BP ESA RAN Planned

4. Using survey results and other pertinent data, conduct a population viability assessment (PVA) for COAS (FY2011) (Who: USFWS-Fisheries) (ESA). |FY11-FY12 $0 BP ESA RAN Ongoing

C. Expand data on the biological and environmental requirements of *Novisuccinea chittenangoensis*. (Recovery Action 3)

CONSERVATION DESIGN

Strategies for addressing those threats

Please go to these documents for the existing strategies:

- Revised recovery plan completed 2006 (USFWS 2006a)
- Last 5-year review completed 2006 (USFWS 2006b)
    - Complete 5-year review. |FY12 $0 DES ESA RAN Planned
- Spotlight Species Action Plan
    - Write Spotlight Species Action Plan. |FY10 $0 DES ESA RAN Completed

Research or Actions needed: Specific actions for the next 3 years addressing conservation design include the following:

A. Expand data on the biological and environmental requirements of *Novisuccinea chittenangoensis* (Recovery Action 3)

    1. Determine if *Succinea* Sp. B is having a negative impact on *Novisuccinea chittenangoensis* (Recovery Action 3.1) Preliminary research conducted in 2009 regarding the interaction of COAS and Sp. B (SUNY-ESF funded through coop agreement with NYFO)

B. Research techniques for removal of *Succinea* Sp. B from *Novisuccinea chittenangoensis*' habitat at the Falls (Recovery Action 4).

Chittenango Ovate Amber Snail *(Novisuccinea chittenangoensis)*: Finger Lakes Onondaga Focal Area

1. Preliminary research conducted in 2009 regarding the interaction of COAS and Sp. B (SUNY-ESF funded through coop agreement with NYFO).

C. Establish and refine the *Novisuccinea chittenangoensis* captive propagation program (Recovery Action 5.2)

1. Develop an initial captive propagation protocol (Recovery Action 5.2.1)

a. Genetics research is underway to assist with captive rearing (U.S. Geological Survey [USGS] Leetown funded by Quick Response)

i. Pursue final results of genetics research from USGS. |FY11 $0 DES ESA RAN Completed

ii. Invite USGS to captive management workshop. |FY11 $0 DES ESA RAN Completed

2. Conduct research experiments to refine rearing protocols (Recovery Action 5.2.3).

a. Captive rearing methodologies are being investigated (USGS Leetown funded by FY 08 Quick Response)

i. Pursue final results of captive methodology development from USGS. |FY11 $0 DES ESA RAN Completed

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats FY2010-2012

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Ensure consideration of habitat protection in any activities of Chittenango Falls State Park (Park) personnel (Recovery Action 2.2.1)

B. Inhibit or prevent, when possible, human-induced alterations that may adversely affect the snail's habitat at Chittenango Falls (Recovery Action 2.2.2)

1. Provide input into State- and Federally-permitted activities that involve Chittenango Creek upstream of the Falls, as well as other permitted activities that may impact water quality in the Creek. |FY10-FY13 $0 DEL ESA,CPA,EC ALL Ongoing

C. Continue to restrict access to the population and habitat at Chittenango Falls (Recovery Action 2.2.3)

1. Provide assistance to New York State Office of Parks, Recreation and Historic Preservation (NYSOPRHP) managers of the property as needed to minimize potential human disturbance at the site. |FY10-FY13 $0 DEL ESA RAN Ongoing

D. Develop a *Novisuccinea chittenangoensis* management/protection agreement for Chittenango Falls (Recovery Action 2.2.4) (Who: NYSOPRHP with assistance from NYFO, New York State Department of Environmental Conservation. |FY15 $0 DEL ESA RAN Future

Factor B. Other natural or manmade factors affecting its continued existence:

A. Continue to protect the *Novisuccinea chittenangoensis* population and its habitat at Chittenango Falls. (Recovery Action 2)

1. See Factor A actions above.

B. As feasible, increase the population size and broaden the distribution of the COAS (Recovery Action 5.).

1. Establish and refine captive propagation program (many steps associated with this) (Recovery Action 5.2)

a. Apply for Preventing Extinction grant to establish and refine captive propagation program. |FY11-FY12 $120,000 DEL ESA RAN Planned

b. Establish and maintain the captive-propagation program (dependent upon funding). (ESA)

i. Conduct necessary research to establish and maintain captive-propagation program (see above).

ii. Conduct a workshop to determine the feasibility of ex situ conservation and craft a captive rearing plan. |FY11 $5,000 DEL ESA RAN Completed

iii. Determine interested captive-propagation facilities. |FY11-FY12 $0 DEL ESA RAN Ongoing

iv. Initiate implementation of the captive rearing plan at 1-2 facilities. |FY12-FY13 $PEGRANT DEL ESA RAN Planned

v. Complete necessary contracts or cooperative agreements. |FY12 $0 DEL ESA RAN Planned

vi. Provide founders, track captive snail numbers, and survival, provide snails to return to the wild. |FY12-FY13 $PEGRANT DEL ESA RAN Planned

vii. Monitor success of pilot program (Who: graduate student). |FY13-FY14 $PEGRANT DEL ESA RAN Future

2. Introduce COAS to one or more additional sites at Chittenango Falls (dependent on funding and timing of funding announcements) (ESA)

   a. Conduct habitat surveys to determine the habitat suitability at alternative sites at Chittenango Falls for possible establishment of an additional COAS colony. Identify the most suitable site[s] for translocation of wild COAS and/or release of captive-reared COAS. |FY12-FY13 $PEGRANT DEL ESA RAN Planned

   b. Develop an experimental design for introducing snails to the selected site[s], using an adaptive management approach including controls and monitoring protocols. |FY12-FY13 $PEGRANT DEL ESA RAN Future

   c. Implement introduction of snails to the new site[s] in accordance with the experimental design. |FY13 $PEGRANT DEL ESA RAN Future

OUTREACH

Establish an information and education system conducive to achieving other recovery actions. Potential options: signage, fact sheets at the Park and Rosamond Gifford Zoo (Recovery Action 2.2). |FY13 $TBD OUT ESA RAN Future

Provide information to Park patrons and the local community as to the presence of the species and to acquaint them with regulations for its protection (Recovery Action 2.3.2). Assist with development of materials for the public at the Park and at the Rosamond Gifford Zoo. |FY13 $TBD OUT ESA RAN Future

Develop and fund printing a second COAS t-shirt (new phrase?); new artwork will emphasize habitat. |FY13 $TBD OUT ESA RAN Future

MONITORING

Review and track recovery progress (Recovery Action 6). |FY10-FY13 $0 MON ESA RAN Ongoing

Monitor success of pilot captive program. |FY13-FY14 $PEGRANT MON ESA RAN Future

Partners

Rosamond Gifford Zoo, Syracuse, New York
Other zoos
NYSDEC

Chittenango Ovate Amber Snail *(Novisuccinea chittenangoensis)*: Finger Lakes Onondaga Focal Area

SUNY-ESF, Syracuse, New York
NYSOPRHP
USGS

References

U.S. Fish and Wildlife Service. (2006a). Chittenango ovate amber snail recovery plan. http://www.fws.gov/northeast/nyfo/es/COASplan051006.pdf

U.S. Fish and Wildlife Service. (2006b). 5-year review for Chittenango ovate amber snail. http://ecos.fws.gov/docs/five_year_review/doc1011.pdf

U.S. Fish and Wildlife Service. (2010). Chittenango ovate amber snail (Novisuccinea chittenangoensis) Spotlight Species Action Plan

Indiana Bat (*Myotis sodalis)*: Finger Lakes Onondaga Focal Area

Indiana Bat Species Action Plan

FOCAL AREA: FINGER LAKES/ONONDAGA

Other species benefitting:

eastern small-footed, little brown, tri-colored, northern, big brown

BIOLOGICAL PLANNING

Introduction to species

Species information: The Indiana bat typically hibernates in caves/mines in the winter and roosts under bark or in tree crevices in the spring, summer, and fall. Suitable potential summer roosting habitat is characterized by trees (dead, dying, or alive) or snags with exfoliating or defoliating bark, or containing cracks or crevices that could potentially be used by Indiana bats as a roost. The minimum diameter of roost trees observed to date is 2.5 inches for males and 4.3 inches for females. However, maternity colonies generally use trees greater than or equal to 9 inches d.b.h. (diameter at breast height). Overall, roost tree structure appears to be more important to Indiana bats than a particular tree species or habitat type. Females appear to be more habitat specific than males presumably because of the warmer temperature requirements associated with gestation and rearing of young. As a result, they are generally found at lower elevations than males may be found. Roosts are warmed by direct exposure to solar radiation, thus trees exposed to extended periods of direct sunlight are preferred over those in shaded areas. However, shaded roosts may be preferred in very hot conditions. As larger trees afford a greater thermal mass for heat retention, they appear to be preferred over smaller trees. Additional information on potentially suitable summer habitat can be found on our website at http://www.fws.gov/northeast/nyfo/es/IndianaBatapr07.pdf.

Streams associated with floodplain forests and impounded water bodies (ponds, wetlands, reservoirs, etc.) where abundant supplies of flying insects are likely found provide preferred foraging habitat for Indiana bats, some of which may fly up to 2-5 miles from upland roosts on a regular basis. Indiana bats also forage within the canopy of upland forests, over clearings with early successional vegetation (*e.g.,* old fields), along the borders of croplands, along wooded fencerows, and over farm ponds in pastures (U.S. Fish and Wildlife Service [USFWS] 2007). While Indiana bats appear to forage in a wide variety of habitats, they seem to tend to stay fairly close to tree cover.

Justification for species selection: The Indiana bat is Federally- and New York State-listed as endangered. The New York Field Office (NYFO) has the Region 5 species lead.

State contribution to overall species population: New York used to have ~11% of wintering Indiana bats rangewide before White-nose syndrome (WNS). However, for now New York still has the largest number of wintering (and likely summering) Indiana bats in the region. The

Indiana Bat (*Myotis sodalis)*: Finger Lakes Onondaga Focal Area

USFWS has proposed recovery units in the draft recovery plan (Plan) (USFWS 2007) and New York is part of the Northeast Recovery Unit.

Threats and threat assessment:

Threats[6] (See 5-year review for full assessment):

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range: *See the Plan for in-depth discussion (USFWS 2007, page 71).*

A. Destruction and degradation of the bat's winter hibernacula (i.e., caves and mines) and summer habitat (i.e., forests) have been identified as long-standing and ongoing threats to the species.

B. Winter – potential to impact hibernacula with gas drilling, filling, etc.

C. Spring/summer (maternity colony roosts, travel corridors, foraging habitat) – residential and commercial development

D. Fall (swarming) – same pressures as spring/summer habitat

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:

See the Plan for in-depth discussion (USFWS 2007, page 80).

Human disturbance of hibernating bats was originally identified as one of the primary threats to the species and still remains a threat at several important hibernacula in the bat's range. The primary forms of human disturbance to hibernating bats result from cave commercialization (cave tours and other commercial uses of caves), recreational caving, vandalism, and research-related activities.

Factor C. Disease or predation: WNS is most significant threat in New York. Predation is also a threat.

Factor D. The inadequacy of existing regulatory mechanisms: *See the Plan for in-depth discussion (USFWS 2007, page 90).*

Generally, existing regulatory mechanisms are more effective at protecting Indiana bat hibernacula than summer habitat. Hibernacula are discrete and easily identified on the landscape, whereas summer habitat is more diffuse.

Factor E. Other natural or man-made factors affecting its continued existence: *See the Plan for in-depth discussion (USFWS 2007, page 91).*

[6] Refers to 5 listing factors A-E in Section 4 of Endangered Species Act

Indiana Bat (*Myotis sodalis)*: Finger Lakes Onondaga Focal Area

A. Several natural factors have threatened the existence of local bat populations including flooding and freezing events at winter hibernacula. These natural events typically are not wide-spread, but rather associated with specific flood/freeze-prone sites.

B. Anthropogenic factors that may affect the continued existence of Indiana bats include numerous environmental contaminants (e.g., organophosphate and carbamate insecticides, oil spills, and polychlorinated biphenyls [PCBs]), collisions with man-made objects (e.g., poorly constructed cave gates, vehicles, aircraft, communication towers, and wind turbines) and climate change.

Recovery Goals

Range-wide Recovery Goals/Objectives: Intermediate - reclassification, Long-term - delisting

Conservation goal(s) for New York State: The Plan does not have specific criteria for New York. However, New York has several P1 and P2 hibernacula and there are criteria for protecting 80% of P1 hibernacula in each Recovery Unit. In general, protection of wintering populations, summer populations, and areas for safe migration between those areas is needed.

Research/Actions needed:

A. Reduce current threats at known hibernacula (Recovery Action 1.1.1) (primarily WNS-related actions – not included in recovery plan – WNS will eventually have a separate plan).

B. WNS-related research is needed to better understand the threat.

   1. Assist with requests for proposals (RFPs) as requested. |FY11-FY12 $0 BP ESA NR,RAN Ongoing
   2. Review proposals if requested to be on review team. |FY11-FY12 $0 BP ESA RAN,NR Ongoing
   3. Provide grant oversight for FY08 and FY09 projects. |FY11-FY12 $0 BP ESA RAN,NR Ongoing
   4. Assist with WNS-related research field work as requested. |FY11-FY12 $0 BP ESA RAN,NR Ongoing

C. Develop models of Indiana bat population dynamics as tools to assess progress towards recovery in different geographic areas, to determine sensitivities of various life history attributes contributing to population growth rates, and to evaluate the impact of catastrophic losses at key hibernacula on time to recovery (Recovery Action 3.1.6)

   1. Assist with Indiana bat modeling shared decision-making (SDM) effort until completion (ESA).
      a. Respond to data requests from U.S. Geological Survey (USGS) and Region 3 (R3). |FY11 $0 BP ESA RAN Completed

b. Participate in calls during demographic model Beta testing. |FY11-FY12 $0 BP ESA RAN Ongoing
c. Attend workshop to test demographic model. |FY12 $0 BP ESA RAN Planned
d. Assist with roll-out of demographic model. |FY12 $0 BP ESA RAN Planned
e. Provide technical assistance to Field Offices (FOs) with use of demographic model. |FY12-FY13 $0 BP ESA RAN Planned

D. Conduct research on the potential impacts of environmental contaminants on Indiana bats (Recovery Action 3.4)

1. Environmental Contaminants (EC) WNS research - send all samples out for analysis. |FY11 $0 BP EC ALS Completed
2. Environmental Contaminants (EC) WNS research - review and interpret contaminants results. |FY12 $0 BP EC ALS Planned
3. Prepare 2009 bat mercury Natural Resource Damage Assessment and Restoration (NRDAR) report for Onondaga Lake. |FY11 $0 BP EC ALS Completed
4. Revise 2009 bat mercury NRDAR report for Onondaga Lake. |FY12 $0 BP EC ALS Planned
5. Present results from the 2008 and 2009 bat and bird mercury NRDAR reports for Onondaga Lake at the Region 5 Environmental Contaminants Workshop in Hadley, Massachusetts, November 29, 2011. |FY12 $0 BP EC ALS Planned
6. Present information on the effects of water quality factors on bioconcentrations (as opposed to bioaccumulation) of mercury in the aquatic food chain at the Region 5 Environmental Contaminants Workshop in Hadley, Massachusetts, November 29, 2011. |FY12 $0 BP EC DG Planned

CONSERVATION DESIGN

Strategies for addressing those threats

Please go to these documents for the existing strategies:

- Draft Recovery Plan 2007 (USFWS 2007)
- Last 5-year review completed 2009 (USFWS 2009)

Research or Actions needed: Specific actions for the next 3 years addressing conservation design include the following:

A. Assist R3 with finalizing Recovery Plan as requested. |FY12 $0 DES ESA RAN Planned

B. Assist with National WNS Response (not included in recovery plan - WNS will eventually have a separate plan).

1. Support development of WNS National Plan

a. Provide technical assistance during USFWS and/or public review periods of WNS National Plan. |FY11 $0 DES ESA RAN,NR Completed
b. Participate in Communications Group. |FY11-FY13 $0 DES ESA NR Ongoing
c. Participate in Conservation and Recovery Working Group. |FY11-FY13 $0 DES ESA RAN,NR Ongoing
   i. Develop Conservation and Recovery Implementation Plan. |FY11-FY12 $0 DES ESA RAN,NR Ongoing

2. Attend annual WNS Symposium. |FY11-FY13 $? DES ESA RAN,NR Ongoing
3. WNS-related research is needed to develop conservation strategies to respond to WNS.

   a. Assist with WNS captive bat management structured decision making effort. |FY11-FY12 $0 DES ESA RAN,NR Ongoing

C. Standardized approaches to evaluating wind projects and developing conservation measures are needed.

   1. Participate in multi-region project to develop Indiana bat/wind guidance. |FY10-FY11 $0 DES ESA RAN Completed
   2. Participate in team to update multi-region Indiana bat/wind guidance over time. |FY12-FY13 $0 DES ESA RAN Planned
   3. Coordinate first R3, Regions 4 and 5 (R4, R5) threatened and endangered species wind call - 2/3/10. |FY10 $0 DES ESA RAN Completed
   4. Participate in R5 Indiana bat wind guidance development. |FY11-FY13 $0 DES ESA RAN Ongoing

D. Develop guidance and template for how to complete a hibernacula management plan (Recovery Action 1.1.1.2.1)

   1. Assist R3 with development of guidance for how to complete hibernacula management plan. |FY13 $0 DES ESA RAN Future

E. Develop standardized protocols for conducting telemetry (Recovery Action 2.7.2.1)

   1. Participate in multi-region team to develop radio telemetry guidance. |FY11-FY12 $0 DES ESA RAN Ongoing

F. Develop standardized protocols for use of bat detection systems to survey for Indiana bats (Recovery Action 2.7.2.6)

   1. Assist with funding automation of acoustic survey data analysis.

      a. Participate in Regional WNS funding discussions and promote funding of acoustic automation system. |FY10 $0 DES ESA RAN Completed

b. Assist with USACE Phase 1 grant agreement for acoustic automation system. |FY10 $0 DES ESA RAN Completed

2. Determine whether netting guidelines should be revised to include acoustic detectors.

   a. Participate in multi-region Indiana bat/Wind Initiative survey protocol workgroup. |FY10 $0 DES ESA RAN Completed
   b. Participate in multi-region team to revise Indiana bat survey protocols. |FY11-FY12 $0 DES ESA RAN Ongoing
   c. Present revised draft Indiana bat survey protocols at Northeast Bat Working Group meeting. |FY12 $500 DES ESA RAN Planned

3. Assist New York State Department of Environmental Conservation (NYSDEC) with acoustic transect project.

   a. Conduct 1 acoustic transect route 2-3 nights. |FY10 $0 DES ESA RAN,NR Completed
   b. Conduct 1 acoustic transect route 2-3 nights if requested (not requested in FY11; ESA to coordinate). |FY12 $0 DES ESA RAN Planned

G. Determine land management practices that will increase or maintain suitability of habitat for maternity colonies of Indiana bats, and the impacts of habitat perturbations on persistence of maternity colonies (Recovery Action 3.3.9)

   1. Fund or otherwise coordinate wind project research
   2. Consider Indiana bat habitat restoration and protection during restoration planning of the Onondaga Lake NRDAR case. |FY12-FY13 $0 DES EC ALS Planned
   3. Coordinate Onondaga Lake Superfund Site Biological Technical Assistance Group activities to maximize potential for a remedy that protects Indiana bats and their habitat (with USEPA). |FY11-FY13 $0 DES EC ASR Ongoing

H. Regional coordination role

   1. Participate in R5 planning team to develop standardized roles/responsibilities for species leads as requested. |FY11 $0 DES ESA RAN Completed

   2. Act as Regional POC for Indiana bat issues and conduct the following activities.

      a. Provide updates to FOs on Indiana bat literature, information from other regions. |FY10-FY13 $0 DES ESA RAN Ongoing
      b. Provide technical assistance to FOs on Indiana Bat formal consultations/Habitat Conservation Plans (HCPs). |FY10-FY13 $0 DES ESA RAN Ongoing
      c. Provide R5 comments on national issues (e.g., survey protocol updates). |FY10-FY13 $0 DES ESA RAN Ongoing

d. Provide R5 Indiana bat end-of-year reporting info to R3. |FY10-FY13 $0 DES ESA RAN Ongoing
e. Maintain understanding of current Indiana bat literature. |FY10-FY13 $0 DES ESA RAN Ongoing
f. Participate in or provide technical assistance for WNS-related projects as needed. |FY10-FY13 $0 DES ESA RAN Ongoing
g. Coordinate Regional review of Indiana bat permit conditions. |FY10-FY13 $0 DES ESA RAN Ongoing

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats FY 2010 - 2012

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Encourage activities that enhance or improve summer habitat on private lands (Recovery Action 2.1.3)

B. Conserve and manage Indiana bats and their habitat on Federal lands (Recovery Action 2.2)

1. Provide technical assistance to Montezuma National Wildlife Refuge regarding bat surveys and management. |FY12-FY13 $0 DEL ESA RAN Ongoing

C. Encourage habitat protection through acquisition/easements

1. Provide technical assistance to NYSDEC for Recovery Land Acquisition grants. |FY11-FY13 $0 DEL ESA RAN Ongoing

2. Provide technical assistance to the Natural Resources Conservation Service (NRCS) for potential easements.

D. Minimize adverse impacts to Indiana bat during project reviews (Recovery Action 2.6)

1. Ensure implementation of conservation measures of existing BOs through follow up with Federal agency/project sponsor

2. Habitat protection through informal and formal consultations and HCPs (NYFO ESA).

a. Assist with development of Indiana bat conservation measures for NiSource HCP. |FY10-FY12 $0 DEL ESA RAN Ongoing

b. In coordination with the R5 IPAC Team, develop conservation framework, including standard conservation measures, for residential and commercial projects. |FY11-FY13 $0 DEL ESA RAN Ongoing
c. Develop conservation framework, including standard conservation measures, for wind energy development projects (see Ibat Wind Guidance). |FY11-FY13 $0 DEL ESA RAN Ongoing

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes: No work planned for FY2011-FY2013.

Factor C. Disease or predation: Need to determine what conservation measures will be available for WNS-response.

Factor D. The inadequacy of existing regulatory mechanisms: No work planned for FY2011-FY2013.

Factor E. Other natural or man-made factors affecting its continued existence: Wind project project work being addressed through consultations/HCPs (see above)

OUTREACH

A. Develop and implement outreach activities to enhance specific recovery tasks for the Indiana bat including development of guidelines, best management practices (BMP), land acquisition/easements efforts, landowner incentives programs, Endangered Species landowner programs, research activities, and Federal review activities. Employ appropriate communications goals and messages as outlined in comprehensive Indiana bat outreach plan. (Recovery Action 4.1)

B. Seek opportunities to raise awareness of the Indiana bat's special characteristics; foster a sense of appreciation for the bat, its habitat, and the unique life history of bats in general. (Recovery Action 4.2.3)

1. Current Indiana bat/WNS display

a. Rotate Indiana bat/WNS exhibit at nature centers. |FY10-FY11 $0 OUT ESA SLD Completed
b. Update Indiana bat/WNS exhibit at least once/year. |FY10-FY13 $0 OUT ESA RAN Ongoing

2. New Indiana bat display

a. Provide technical assistance to the U.S. Forest Service (USFS) in the development of a new display. |FY10-FY11 $0 OUT ESA SLD Completed
b. Provide technical assistance to RO to finalize display text and formatting. |FY12 $0 OUT ESA SLD Planned

3. New Indiana bat cave display

    a. Develop new cave display. |FY13 $? OUT ESA SLD Future

4. Attend meetings/workshops

    a. Present information on bats at the Ithaca Sciencenter. |FY12 $0 OUT ESA RAN Completed
    b. Present information on bats at Rice Creek. |FY12 $0 OUT ESA NR Completed

C. Use USFWS websites as a repository of information about the Indiana bat. This information should be organized so that it is easily located and accessible and specific to key audiences (i.e., educators, planners, industry representatives, consultants) (Recovery Action 4.2.5)

    1. Update NYFO Indiana bat fact sheets and web materials. |FY10-FY13 $0 OUT ESA,IT RAN,AFL Ongoing

D. Assist with Freedom of Information Act (FOIA) responses as needed.

    1. Assist with WNS FOIA request. |FY11 $0 OUT ESA NR Completed

MONITORING

A. Survey winter populations of Indiana bats at known hibernacula (monitor status of sites/impacts of WNS) (Recovery Action 1.3.1)

    1. Assist NYSDEC with 2012 hibernacula surveys at Jamesville. |FY12 $0 MON ESA RAN Planned

B. Review and track recovery progress. |FY10-FY13 $0 MON ESA RAN Ongoing

Partners

Partners - NYSDEC, R3, R4, R5 FOs, Montezuma National Wildlife Refuge (NWR), U.S. Army, USFS, New York State Department of Transportation (NYSDOT), Federal Highway Administration (FHWA), OBI, DU, USGS

References

U.S. Fish and Wildlife Service. 2007. Indiana Bat (*Myotis sodalis*) Draft Recovery Plan: First Revision. U.S. Fish and Wildlife Service, Fort Snelling, MN. 622 pp. (This document has been peer-reviewed and is available at http://www.fws.gov/midwest/Endangered/mammals/inba/index.html).

Indiana Bat (*Myotis sodalis)*: Finger Lakes Onondaga Focal Area

U.S. Fish and Wildlife Service. 2009. Indiana Bat 5-Year Review: Summary and Evaluation.

U.S. Fish and Wildlife Service, Bloomington, IN.

Lake Sturgeon (*Acipenser fulvescens)*: Finger Lakes Onondaga Focal Area

Lake Sturgeon Species Action Plan

FOCAL AREA: FINGER LAKES/ONONDAGA LAKE

Other species benefitting:

walleye, redhorse/white suckers, American eel

BIOLOGICAL PLANNING

Introduction to species

Species information: Lake sturgeon is a long-lived, late-maturing species that inhabits large river and lake systems primarily in the Mississippi River, Hudson Bay, and Great Lakes basins. Lake sturgeon are the only sturgeon species endemic to the Great Lakes basin and are the largest freshwater fish indigenous to that system. Lake sturgeon can be considered a nearshore, warm water species with water temperature and depth preferences of low 50s to mid-60ºF and 15-30 feet, respectively. Lake sturgeon are benthivores, feeding on small invertebrates such as insect larvae, crayfish, snails, clams, and leeches. Life history characteristics of lake sturgeon are unique with respect to other fishes. Females mature between 14 and 33 years, males between 8 and 12 years. Spawning occurs only once every 2-7 years for males and 4-9 years for females. As a consequence of interrupted spawning cycles, only 10-20% of adult lake sturgeon within a population spawns during a given season. Spawning occurs on clean, gravel shoals and stream rapids from April to June in preferred water temperatures of 55-60ºF. The typical life-span of lake sturgeon is 55 years for males and 80-150 years for females.

Justification for species selection: In the past, sturgeon have comprised an important biological component of the Great Lakes fish community. By the early 1900s many populations of lake sturgeon throughout their range had been greatly reduced or extirpated as a result of overfishing, habitat loss, the construction of dams, and reduced water quality. Within the Great Lakes basin, the lake sturgeon population is estimated to be at 1% of historic abundance levels. Lake sturgeon are listed as either threatened or endangered by 19 of the 20 states within its original range in the United States. In New York State and the Province of Ontario, lake sturgeon are listed as a threatened species. In addition, the lake sturgeon is a Federal trust species.

State contribution to overall species population: Currently there are remnant populations of lake sturgeon occurring in Upper Niagara River/Lake Erie, Lower Niagara River, St. Lawrence River (middle corridor), St. Lawrence River (lower corridor), and the Grasse River. Among these remnant populations we see varying population trends, ranging from populations that are recovering to populations that remain very low but apparently stable. Within the State, the populations maintaining themselves today are recognized as being in five geographic units, contrasted to more than 12 units historically. The New York State Department of Environmental Conservation (NYSDEC) Lake Sturgeon Recovery Plan states the goal of maintaining these 5 units and restoring populations in three other units. The NYSDEC has stocked 6 waterbodies in efforts to establish populations in three other units. Lake sturgeon have been reintroduced into

Lake Sturgeon (*Acipenser fulvescens)*: Finger Lakes Onondaga Focal Area

Cayuga Lake and Oneida Lake; these sturgeon have been shown to disperse with individuals being captured in Onondaga Lake.

Research needed:

- Conduct surveys to determine current population levels and presence/absence. |FY? $0 BP CPA SS Future

  (Who: NYSDEC, U.S. Geological Survey [USGS], Ontario Ministry of Natural Resources [OMNR], and U.S. Fish and Wildlife Service [USFWS], Lower Great Lakes Fish and Wildlife Conservation Office/New York Field Office [LGLFWCO/NYFO] to assist with lake sturgeon surveys to determine presence/absence and population densities, coupled with habitat investigation and evaluation of stocking initiatives; Cost: NYFO staff time)

- Assist with the completion of a New York State Lake Sturgeon Management Plan. |FY? $0 BP CPA SS Future

  (Who: USFWS [NYFO], NYSDEC, USGS, and Cornell University to assist with completion of New York State Lake Sturgeon Management Plan to address recovery, habitat restoration strategies, and population goals; Cost: < $30K, NYFO Fish Enhancement, Mitigation, and Research Fund [FEMRF] funding)

Threats and threat assessment:

1. **Loss of spawning habitat.**

   Research needed:

   - Conduct surveys to determine quantity and quality of known spawning habitat. |FY? $0 BP CPA SS Future

     (Who: NYSDEC, USGS, USFWS [NYFO], State University of New York-College of Environmental Science and Forestry [SUNY-ESF]; Cost: NYFO staff time)

   - Identify and prioritize areas for habitat restoration and enhancement. |FY? $0 BP CPA SS Future

     (Who: NYSDEC, USGS, USFWS [NYFO]; Cost: unknown at this time, Natural Resource Damage Assessment and Restoration [NRDAR] funding)

2. **Barriers to Migration** (including dams and impassable culverts).

   Research needed:

- Identify barriers having an influence on lake sturgeon spawning migration and prioritize barrier removal. |FY? $0 BP CPA SS Future

  (Who: NYSDEC, USGS, USFWS [NYFO]; Cost: unknown at this time, NRDAR funding)

- Conduct surveys to determine available sturgeon spawning habitat above existing barriers, in regards to both quantity and quality of habitat present. |FY? $0 BP CPA,EC SS,ALS Future

  (Who: NYSDEC, USGS, USFWS [NYFO] ; Cost: unknown at this time, NRDAR funding)

3. **Contaminants.**

   Research needed:

   - Investigate the effects of contaminants on the survival and reproductive success of lake sturgeon, specifically the effects from PCBs, mercury, and emerging contaminants. |FY? $0 BP EC,CPA ALS,SS Future

     (Who: USFWS [NYFO-Environmental Contaminants (EC)]; Cost: unknown at this time, NRDAR, Great Lakes Restoration Initiative [GLRI] funding)

4. **Invasive Species (and associated disease transmission).**

   Research needed:

   - Determine the effects invasive species have on lake sturgeon populations, including the disease transmission pathway and effects of type-E botulism. |FY? $0 BP CPA SS Future

   (Who: USGS, academics; Cost: unknown at this time)

5. **Climate change; changes in riverine discharge regimes.**

   Research needed:

   - Identification of climate change related impacts to lake sturgeon. |FY? $0 BP CPA SS Future

   (Who: National Weather Service, Landscape Conservation Cooperatives [LCC], academics; Cost: unknown at this time)

Lake Sturgeon (*Acipenser fulvescens)*: Finger Lakes Onondaga Focal Area

Partners/potential funding

USFWS (LGLFWCO), USGS, Onondaga Nation, NYSDEC, Cornell University

Population goal(s) for New York State:

Currently, several agencies have published three population goals for lake sturgeon in the Lake Ontario/St. Lawrence River basin and these goals vary. The NYSDEC Lake Sturgeon Recovery Plan states the goals are to increase the number of naturally reproducing sturgeon populations in New York to 8 (up from 5) and the removal of the species from State-listing. The Great Lakes Fishery Commission stated goals are the rehabilitation of lake sturgeon populations including the expansion of sturgeon populations into favorable habitats and to enhance sturgeon spawning habitat. Their metric for success is based on a catch per unit effort (CPUE) of 0.1 sturgeon/net/night; CPUE rates observed from 2000 to 2007 ranged from 0 to 0.06 sturgeon/net/night. The OMNR, in a draft Lake Sturgeon Rehabilitation Plan, state goals as conserve and/or rehabilitate the existing self-sustaining lake sturgeon spawning populations with a minimum target of at least 750 sexually mature sturgeon in each system. This number was selected because it represents the minimum number thought to be present in remnant Great Lakes populations that are considered to be either stable or increasing in abundance. Although population goals have not been established for New York, the NYFO will continue to collaborate with partners to establish target population goals for the Finger Lakes/Onondaga Lake focal area.

CONSERVATION DESIGN

Strategies for addressing those threats

1. **Loss of spawning habitat**

    a. Seek to minimize loss of spawning habitat by influencing regulatory agency decisions regarding locating/operating hydroelectric power generating facilities, stream alterations/fill, dredging, and poor agricultural practices. |FY12 $0 DES CPA SPP,TRS,SLD Ongoing

    b. Target habitat restoration and enhancement projects to benefit lake sturgeon including spawning substrate additions and enhancements (Partners for Fish and Wildlife [PFW]). |FY? $0 DES CPA,PFW SS,CS Future

    c. Promote habitat restoration projects that control sediment entering riverine environments and reduce quality of spawning habitat. |FY? $0 DES CPA,PFW SS,CS Future

    d. Conduct surveys to determine current population levels and presence/absence. |FY12 $0 DES CPA SS Ongoing

e. Facilitate reintroduction of lake sturgeon to their known former range. |FY12 $0 DES CPA SS Ongoing

2. **Barriers to migration** (including dams and impassable culverts).

   a. Seek to minimize loss of spawning habitat by influencing regulatory agency decisions regarding locating/operating hydroelectric power generating facilities, stream alterations/fill, dredging, and poor agricultural practices. |FY12 $0 DES CPA SPP,TRS,SLD Ongoing

   b. Work with partners to identify, prioritize, and remove sturgeon barriers. |FY12 $0 DES CPA,EC SS,ALS Ongoing

   c. Work with partners to investigate and implement methods of reintroduction of sturgeon to restored riverine systems. |FY? $0 DES CPA SS Future

3. **Contaminants.**

   a. Investigate the effects of contaminants on the survival and reproductive success of lake sturgeon, specifically polychlorinated biphenyls (PCBs), mercury, and emerging contaminants. |FY? $0 DES CPA,EC SS,ALS Future

   b. Continue to manage Onondaga Lake NRDAR case; consider restoration options that benefit lake sturgeon. |FY11-FY13 $0 DES EC ALS Ongoing

   c. Seek to minimize loss of habitat, due to contamination, by influencing regulatory agency decisions related to State and Federal Superfund sites. |FY11-FY13 $0 DES EC ASR Ongoing

   d. Respond as appropriate to spills impacting fish and wildlife resources. |FY12-FY14 $0 DES EC ALS Planned

4. **Invasive Species (and associated disease transmission)**

   a. Determine the effects invasive species have on lake sturgeon populations, including the disease transmission pathway and effects of type-E botulism. |FY? $0 DES CPA SS Future

5. **Climate change; changes in riverine discharge regimes.**

   a. Identify potential effects to lake sturgeon spawning habitat and water quality. |FY? $0 DES CPA SS Future

Lake Sturgeon (*Acipenser fulvescens)*: Finger Lakes Onondaga Focal Area

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY2010-2012

1. **Loss of spawning habitat and habitat function**.

    a. Seek to minimize loss of spawning habitat by influencing regulatory agency decisions regarding locating/operating hydroelectric power generating facilities, stream alterations/fill, dredging, and poor agricultural practices.

        i. Providing substantive comments on proposed Federal agency actions with likely adverse impacts on lake sturgeon (Conservation Planning Assistance. |FY12 $0 DEL CPA SPP,TRS,SLD Ongoing

    b. Target habitat restoration and enhancement projects to benefit lake sturgeon including spawning substrate additions and enhancements.

        i. Work with NYSDEC to begin to identify opportunities for the placement of spawning substrate beds for NRDA restoration (NRDAR funding) (EC). |FY11-FY13 $0 DEL EC ALS Ongoing

    c. Promote habitat restoration projects which also control sediment entering riverine environments.

        i. Work with U.S. Department of Agriculture-Natural Resources Conservation Service [USDA-NRCS] to focus their programmatic efforts to reduce sediment input and agricultural run-off (USDA-NRCS funding). |FY? $0 DEL CPA,PFW SS,CS Future

    d. Conduct surveys to determine current population levels and presence/absence.

        i. Assist the NYSDEC/USGS with surveys to determine current population levels and presence/absence. |FY12 $0 DEL CPA SS Ongoing

    e. Facilitate reintroduction of lake sturgeon to their known former range.

        i. Facilitate the writing of a New York State Lake Sturgeon Management Plan (FEMRF funding) (NYSDEC, USGS, FEMRF). |FY? $0 DEL CPA SS Future

        ii. Assist the NYSDEC on annual lake sturgeon gamete collection for sturgeon propagation. NYFO-FEMRF to provide equipment, assistance with Investigational New Animal Drugs (INAD) permits, and field assistance. Gametes collected from St. Lawrence River. (FEMRF funding) (FEMRF). |FY12 $0 DEL CPA SS Ongoing

Lake Sturgeon (*Acipenser fulvescens)*: Finger Lakes Onondaga Focal Area

2. **Barriers to migration** (including dams and impassable culverts).

   a. Seek to minimize loss of spawning habitat by influencing regulatory agency decisions regarding locating/operating hydroelectric power generating facilities, stream alterations/fill, dredging, and poor agricultural practices.

      i. Providing substantive comments on proposed Federal agency actions with likely adverse impacts on lake sturgeon (CPA). |FY12 $0 DEL CPA SPP,TRS,SLD Ongoing

   b. Work with partners to prioritize, identify, and remove sturgeon barriers.

      i. Work with NYSDEC to prioritize, identify, and remove barriers.

   c. Work with partners to investigate and implement methods of reintroduction of sturgeon to restored riverine systems.

      i. Investigate egg stocking, streamside hatchery systems, and stocking to determine most cost-effective and ecologically sound method to reintroduce lake sturgeon to their known former range (NYSDEC, FEMRF). |FY? $0 DEL CPA SS Future

3. **Environmental contaminants.**

   a. Investigate the effects of contaminants on the survival and reproductive success of lake sturgeon, specifically PCBs, mirex, dioxin, mercury, and emerging contaminants.

      i. Facilitate the investigation of the effects of contaminants on the survival and reproductive success of lake sturgeon (dependent on funding), GLRI funding (indirect benefit from Genesee River work). |FY? $0 DEL EC,CPA ALS,SS Future

   b. Continue to manage Onondaga Lake NRDAR case.

      i. Complete the 2008 Onondaga Lake Bird Mercury Report. |FY12 $0 DEL EC ALS Planned

      ii. Complete the 2009 Onondaga Lake Bird Mercury Report. |FY12 $0 DEL EC ALS Planned

      iii. Complete the Onondaga Lake Wintering Waterfowl Survey Report. |FY12 $0 DEL EC ALS Planned

      iv. Complete the Onondaga Lake Bat Mercury Report. |FY12 $0 DEL EC ALS Planned

c. Seek to minimize loss of habitat due to contamination by influencing regulatory agency decisions related to State and Federal Superfund sites.

i. Provide substantive Federal agency comments on proposed actions with likely adverse impacts to lake sturgeon and/or their habitat (CPA). |FY11-FY13 $0 DEL EC ASR Ongoing

4. Invasive species (and associated disease transmission).

a. Determine the effects invasive species have on lake sturgeon populations, including the disease transmission pathway and effects of type-E botulism. |FY? $0 DEL CPA SS Future

i. No work identified at this time.

5. Climate change; changes in riverine discharge regimes.

a. Identify potential effects to lake sturgeon spawning habitat and water quality. |FY? $0 DEL CPA SS Future

i. Work with National Weather Service to create models for determining climate change related precipitation impacts to spawning habitat and tributaries.

OUTREACH

The New York State Lake Sturgeon Recovery Plan (pending), when complete, will have an outreach component identifying our path forward. |FY? $0 OUT CPA SS Future

Assist NYSDEC with lake sturgeon placard placement and fisherman education. |FY? $0 OUT CPA SS Future

MONITORING

- Work with partners to monitor lake sturgeon habitat restoration and enhancement projects, including spawning substrate additions and use of habitat post-removal of barriers. |FY? $0 MON CPA SS Future

- Monitor status and contribution to the population of stocked eggs/sturgeon as part of reintroduction strategy. |FY12 $0 MON CPA SS Ongoing

- Establish benchmarks for success based on New York State Lake Sturgeon Management Plan (pending). |FY? $0 MON CPA SS Ongoing

Lake Sturgeon (*Acipenser fulvescens)*: Finger Lakes Onondaga Focal Area

Partners

USFWS/LGLFWCO, USGS, Onondaga Nation, NYSDEC, SUNY-ESF, Cornell University.

References

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Farrell, J.M., R. Colesante, D. Dittman, J. Johnson. 2009. Lake Sturgeon Population Enhancement as a Strategy for Improvement of Ecosystem Function and Controlling Invasive Species. Final Report. Submitted to the USFWS in fulfillment of a FEMRF award.

Leedy's Roseroot (*Sedum integrifolium spp. leedyi)*: Finger Lakes Onondaga Focal Area

Leedy's Roseroot Species Action Plan

FOCAL AREA: FINGER LAKES/ONONDAGA

Other species benefitting:

Northern maidenhair-fern, wild columbine, lyre-leaved rockcress, maidenhair spleenwort, American harebell, rock whitlow-grass, bulbet fern, Northern bush-honeysuckle, herb-robert, American water-pennywort, spotted jewelweed, true forget-me-not, broad beech fern, three-leaved rattlesnake root, bristly buttercup, skunk currant, northern woodsia, and blunt-lobe woodsia

BIOLOGICAL PLANNING

Introduction to species

Species information: Leedy's roseroot (*Rhodiola integrifolia* Raf. subsp. *leedyi* (Rosendahl & Moore) Kartesz, Crassulaceae) (LERR) is a succulent, perennial plant found in two widely-separated regions of the northern United States – the Driftless Region of Minnesota and the Finger Lakes Region of New York. In New York, Leedy's roseroot occurs in two populations (and a single plant at a third site) along or near the western shore of Seneca Lake, predominately in Yates County. A small portion of one population is contained within a Nature Conservancy easement managed by the Finger Lakes Land Trust as the Leedy's Roseroot Preserve. One additional plant is found within Watkins Glen State Park. The remainder and overwhelming majority of the population is located on private lands along the lakeshore.

The LERR is strongly associated with cliffside habitats that experience a cool, thermally-moderated temperature regime. These cliffside habitats are generally moist through portions of the year, more permanently near streams and in areas of groundwater discharge; however, periods of pronounced dryness do occur as the cliffs are often quite exposed (Olfelt *et al.* 1998). In New York, LERR is found predominately on east-facing cliffs at elevations between 136 and 141 m. These lakeside cliffs extend approximately 3.2 km and are thinly bedded shale with intermittent thicker beds of siltstone. At the level of the lake, the cliffs form a shaley talus of varying width then extend upward through more massive units to the treed cliff-tops. The largest concentration of LEER occurs in seepage areas, which may or may not remain moist throughout the year. Individual plants can be found anywhere on the cliff face and are known to occur in the talus at the base of the cliffs in sheltered areas.

Flowering LERR ranges in size from 15 - 45 cm high and occurs as individual stems to large, multi-stemmed clumps 20 - 30 cm across. LERR perenniates as large, scaly rhizomes after the annual flowering stems die back. Leaves are blue-green with a waxy coating and longer than wide. Plants flower in the early summer with flat-topped clusters of many small, dark red to yellow petals. LERR is generally dioecious, meaning that male and female flowers occur on separate plants, and reproduces sexually via insect pollination.

Leedy's Roseroot (*Sedum integrifolium spp. leedyi)*: Finger Lakes Onondaga Focal Area

The LERR is an isolated subspecies of a more common, western species. Due to its isolation and disjunct populations, this species is considered a glacial relict that may have had a much larger range prior to the most recent glaciation.

Justification for species selection: LEER is a Federally-listed threatened species (listed threatened 1992) as well as a New York State-listed threatened species. In the early 1990s, there were seven known populations between Minnesota and New York (USFWS 1998). The number of sites has remained constant with population levels within each site remaining fairly consistent over time. However, as mentioned above, the New York populations are almost exclusively on private lands, while the Minnesota populations are predominately on private lands with the smaller of four sites on public lands.

The LERR habitat is highly-specific, cliffsides extremely limited in their extent, and as a result there has been a fair amount of effort placed on habitat protection. The populations are generally found on steep, inaccessible terrain; therefore, impacts to the cliffs, themselves have been fairly limited. However, in New York, the construction of structures for lakes access and use on private lands including stairs, docks, water intake pipes, and cliffside burning of trash can result in damage to the cliffs and LERR. Additionally, upland surface and groundwater changes and alterations may have a significant impact on LERR as it often occurs in and around moist seepage areas.

Invasive species have become a prominent component of the cliffside habitats upon which LERR occurs. The most obvious of these are hemlock wooly adelgid, European swallow-wort, and Japanese knotweed. Hemlock wooly adelgid has impacted the hemlock trees that grow at the clifftops and shade the upper portions of the clifface. It is unknown at this time what impact this may have on LERR distribution. European swallow-wort is a relatively recent invader to the cliff habitats on which LERR grows establishing and spreading noticeably in the last decade. It has been known to form dense, competitive monocultures that can take up the limited available soil in rock-dominated surfaces. The most prevalent invasive species in New York is Japanese knotweed, which forms dense monocultures along the cliff base along Seneca Lake often shading LERR directly. In 2011, Great Lakes Restoration Initiative (GLRI) funding was acquired by SUNY ESF to investigate the effects of Japanese knotweed on LERR, evaluate possible control methods, and involve landowners in the conservation of the species.

State contribution to overall species population: There are only two disjunct population centers for LERR. In New York, LERR is found in Yates County and Watkins Glen in Schuyler County. As of 2010, New York had approximately 4281 plants distributed among three populations: The Yates County site has the largest population rangewide and appears to be relatively stable since the 1980s; however, the total population among the four sites in Minnesota may equal or surpass the total population in New York.

Leedy's Roseroot (*Sedum integrifolium spp. leedyi)*: Finger Lakes Onondaga Focal Area

Threats and threat assessment:

Threats[7] (See Recovery Plan):

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Habitat loss to physical destruction is a primary threat for LERR as its habitat is highly limited and the species has a very narrow range of occurrence worldwide. As the vast majority of the habitats of LERR populations are privately-owned, owner impacts due to construction of access structures may directly impact the species.

B. Surface and groundwater contamination and/or alteration could lead to population loss through contaminate uptake or a decrease in available water for photosynthesis. The main agents for this threat are herbicide, pesticide, and fertilizer application to agricultural lands, as well as irrigation and well systems that may lower the water table below the seeps that maintain LERR.

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:

NA

Factor C. Disease or predation:

NA

Factor D. The inadequacy of existing regulatory mechanisms:

A. The Endangered Species Act (ESA) provides protection for listed plant species on Federal lands, during Federally-funded activities, and during trespassing on private lands. However, listed plants on private-lands are not protected unless there is a violation of a state law. In New York, plant species protection is limited similarly to the ESA. The LERR in New York is on private lands and is, therefore, not directly protected by the ESA. The majority of the current landowners seem interested in the conservation of the species, but continued effort must be spent in order to coordinate with landowners with regard to LERR conservation.

Factor E. Other natural or manmade factors affecting its continued existence:

A. Due to the limited and unstable nature of LERR habitat, there are stochastic, natural processes that may pose a threat to population levels (e.g., landslides, erosion). However, these processes have been a natural component of the disturbance cycles this species has experienced during evolutionary time. The small population size of the species does make stochastic losses more severe, especially with regard to genetic diversity; however,

[7] Refers to 5 listing factors A-E in Section 4 of Endangered Species Act

baring a change in the fundamental processes controlling these stochastic events, there should not be any action required to limit their effects.

B. Invasive species are prevalent at the New York populations and may be impacting LERR through the reduction of available light, moisture, and substrate. Current and future investigations will attempt to determine the nature of these impacts and control the invasive species at the sites.

Recovery Goals

Range-wide Recovery Goals/Objectives: Delisting will be considered when (1) all three privately owned Minnesota populations are protected; (2) the population at the Whitewater Wildlife Management Area, Minnesota, has been demonstrated to be self-maintaining for five years; (3) the Yates County population is protected; and (4) habitat for 4,000 plants in multiple sites, evenly distributed along a 2-mile stretch in Yates County is protected. The two most distant subpopulations protected in Yates County must be at least 1.5 miles apart; (5) protected populations must be geographically distinct, self-sustaining, and have been protected for five consecutive years by measures that will remain effective following delisting.

Conservation goal(s) for New York State: Protect the known occurrences through conservation acquisitions and management of existing and potential threats.

Research/Actions needed:

- Contract with NYNHP through Section 6 funds to map the Yates County populations (Recovery Action 1.1). |FY11 $? BP ESA RAN Complete
- Obtain 2010 census and map data from NYNHP. Recovery Action 5.3. |FY11 $0 BP ESA RAN Complete
- Obtain map data and update GIS with 2010 population data. Recovery Action 5.3. |FY12 $0 BP ESA AFL,JW Planned
- Coordinate with partners to determine landowner identities at the Yates County populations in order to find participants in the GLRI RFP and seek future conservation acquisitions. Recovery Action 1.2. |FY12 $0 BP ESA JW Planned
- Research potential impacts of hemlock wooly adelgid and European swallow-wort on LERR and explore opportunities for funding research and / or control measures. |FY12-FY15 $0 BP ESA JW,RAN Ongoing

Leedy's Roseroot (*Sedum integrifolium spp. leedyi)*: Finger Lakes Onondaga Focal Area

CONSERVATION DESIGN

Strategies for addressing those threats

Please go to these documents for the existing strategies:

- Recovery Plan (U.S. Fish and Wildlife Service 1998) http://www.fws.gov/northeast/nyfo/es/leedy%27s.pdf

- 5-year review initiated in 2008. Schedule for completion not yet determined.

Research or Actions needed: Specific actions for the next 3 years addressing conservation design include the following:

- Develop a research design to study the impacts of Japanese knotweed on LERR. |FY11 $0 DES ESA JW Complete

- Compare in GIS the ownership and parcel locations with mapped population occurrences and develop priority sites for conservation acquisition. Recovery Action 1.2. |FY12 $0 BP ESA JW Planned

- Comment, provide requested sections, and review the Five-Year Review if Region 3 makes this available. Recovery Action 5.3. |FY12 $0 DES ESA JW Future

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats FY 2010 - 2012

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Prevent habitat loss through landowner involvement and conservation acquisitions.

   1. Coordinate with ESF in contacting landowners for Japanese knotweed invasive species research locations. |FY12 $0 DEL ESA JW Planned

   2. Participate in an ESF, FLLT lead LERR landowner workshop to discuss the results of the GLRI RFP and seek out identified priority conservation acquisitions. Funded through GLRI. Recovery action 4.1. |FY15 $0 DEL ESA JW Future

Factor B. Other natural or manmade factors affecting its continued existence:

A. Control invasive species impacts on LERR

   1. Write GLRI RFP with Dr. Don Leopold at SUNY ESF for evaluating the effects of Japanese knotweed on LERR, implementing invasive species control measures and

working with landowners of the Glenora Cliff population. |FY11 $0 DEL ESA JW Complete

2. Complete GLRI Grant Agreement with SUNY ESF. |FY11 $0 DEL ESA JW,RAN Complete

3. Receive and review interim (FY13-FY14) and final (FY15) reports. |FY13-FY15 $0 DEL ESA JW,RAN Future

4. Conduct a site visit to experimental units with SUNY ESF researcher during duration of study. |FY12-FY14 $0 DEL ESA JW Ongoing

5. Coordinate with ESF with regard to its contracting of an invasive species control contractor, if the study deems treatment needed. Otherwise assist ESF in exploring additional opportunities for invasive species control with regard to LERR. Funded through GLRI. |FY15-FY16 $0 DEL ESA JW,RAN Future

OUTREACH

- Construct a LERR web page for the NYFO site. Recovery Action 6. |FY12 $0 OUT ESA AFL,JW Planned

MONITORING

- Conduct five-year population count with NYNHP. Recovery Action 5.3. |FY15 $? MON ESA RAN Complete

- Review and track recovery progress. |FY10-FY13 $0 MON ESA JW Ongoing

- Provide survey information to Region 3 for annual Recovery Data Call (RDC). Recovery Action 5.3. |FY11-FY13 $0 MON ESA JW Ongoing

- Conduct five-year population count and population mapping update with NYNHP. Funded through GLRI. Recovery Action 5.3. |FY15 $0 MON ESA JW Future.

Partners

NYNHP, New York State Department of Environmental Conservation, FLLT, SUNY ESF

References

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U.S. Fish and Wildlife Service. 1998. *Sedum integrifolium* ssp. Leedyi (Leedy's roseroot) Recovery Plan. Ft. Snelling, Minnesota. vi + 31 pp.

Massasauga Rattlesnake (*Sistrurus catenatus catenatus)*: Finger Lakes Onondaga Focal Area

Massasauga Rattlesnake Species Action Plan

FOCAL AREA: FINGER LAKES/ONONDAGA

Other species benefitting:

Spotted turtle, mountain holly, highbush blueberry, leatherleaf, black spruce, American larch, and European birch

BIOLOGICAL PLANNING

Introduction to species

Species information: The eastern massasauga rattlesnake (EMR) is a Federal candidate species and a New York State-listed endangered species.

Justification for species selection: The eastern massasauga rattlesnake is a Federal Candidate species and our goal is to preclude listing the species. Due to threats and its natural patchy distribution within its range, the sub-species is listed as endangered in New York.

Threats and threat assessment:

Threats[8]:

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Habitat loss/degradation in the form of:

   1. succession of peatlands to closed canopy and forest regeneration
   2. wetland filling/draining and urbanization

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:

A. Illegal collecting is a threat.

Factor C. Disease or predation:

A. Predators include carnivorous species (Johnson 1995) such as "weasels, mink, and coyotes, as well as [birds of prey], owls, and turkey.

Factor D. The inadequacy of existing regulatory mechanisms:

[8] Refers to 5 listing factors A-E in Section 4 of Endangered Species Act

Massasauga Rattlesnake (*Sistrurus catenatus catenatus)*: Finger Lakes Onondaga Focal Area

A. This is a threat and part of the reason for consideration for listing.

Factor E. Other natural or manmade factors affecting its continued existence:

Other threats include:

A. Genetic viability, loss of genetic diversity due to isolation
B. Invasive species encroachment
C. Illegal collecting
D. Potential impacts from pesticide spraying for mosquito control (State)

Conservation Goals

Range-wide Goal: Preclude the need to list EMR

Conservation goal(s) for New York State:

Determine New York State goal for population

Research/Actions needed:

- State Recovery Plan and status assessment from NYSDEC
- NYSDEC/State University of New York-College of Environmental Science and Forestry (SUNY-ESF) EMR habitat requirements at the Onondaga County population (i.e., use of seasonal habitats)
- Other Habitat Management plans (NYSDEC)
- Genetics
- Survey sites outside the Onondaga County site for potential available habitat in New York

Partners/potential funding

U.S. Army Corps of Engineers (USACE), NYSDEC, SUNY-ESF, grants

CONSERVATION DESIGN

Strategies for addressing those threats

Please go to these documents for the existing strategies:

- USFWS Status Assessment for Eastern Massasauga *(Sistrurus c. catenatus)*1998
- NYSDEC Draft Recovery plan (NYSDEC 2009)
- State Wildlife Habitat Conservation Plan (NYSDEC 2009)

Massasauga Rattlesnake (*Sistrurus catenatus catenatus)*: Finger Lakes Onondaga Focal Area

Research or Actions needed:

Specific actions for the next 3 years addressing conservation design include the following:

A. Address threat of habitat loss due to succession of peatland to closed canopy, forest regeneration.

    1. With partners, prioritize potential habitat restoration projects in occupied habitat and unoccupied, but suitable habitat.

B. Address threats of habitat degradation due to invasive species encroachment.

    1. With partners, prioritize potential habitat restoration projects in occupied habitat and unoccupied but suitable habitat where invasive species encroachment limits habitat availability.

C. Address loss of habitat due to alternations in wetland hydrology, including wetland draining, urban run-off, and water quality degradation.

    1. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding wetland draining, agricultural practices that diminish wetland values for wildlife, dredging and placement of fill in wetlands with a focus on wetlands that have suitable habitat.

D. Address population decline including those due to loss of individual snakes due to illegal collecting.

    1. Develop a reintroduction plan using results of genetics research.
    2. Develop a captive rearing plan.
    3. Develop a plan for enhanced protection of existing population.

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats FY2010-2012.

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Threat of habitat loss due to succession of peatland to closed canopy, invasive species, and forest regeneration.

    1. With partners, prioritize potential habitat restoration projects in occupied habitat and unoccupied, but suitable habitat.

2. Respond to Candidate Notice of Review to U.S. Fish and Wildlife Service (USFWS) Region 3. |FY11 $0 DEL ESA SLD Completed

B. Habitat degradation and loss due to alternations in wetland hydrology, including wetland draining, urban run-off and water quality degradation.

1. Influence regulatory agency decisions regarding wetland draining, agricultural practices that diminish wetland values for wildlife, dredging, and placement of fill in wetlands by:

2. Develop fact sheets and best management practices to minimize impacts to this species (USFWS-New York Field Office [NYFO]) (Endangered Species [ESA])

3. Post fact sheets/best management practices (BMPs) for this species on our website (NYFO-Information Technology [IT])

4. Provide substantive comments on proposed actions with potential impacts on this species. |FY11-FY14 $0 DEL ESA SLD Ongoing

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:

A. Address loss of individual snakes due to illegal collecting.

Factor C. Other natural or manmade factors affecting its continued existence:

A. Threats of habitat degradation due to invasive species encroachment.

1. With partners, prioritize potential habitat restoration projects in occupied habitat and unoccupied but suitable habitat where invasive species encroachment limits habitat.

a. Assist NYSDEC in habitat management in the form of brush cutting, prescribed burning, herbicide use, mowing practices, and vehicular access by reviewing NYSDEC plans for Onondaga County as needed (i.e., burn plans) (FY 2010 completed)

b. Provide technical assistance to NYSDEC for Great Lakes Restoration Initiative (GLRI) proposal (FY 2010 completed)

c. Grant oversight. |FY11 $0 DEL ESA RAN,NR Completed

d. Pursue Candidate Conservation Agreement with Assurances (CCA) with NYSDEC and pursue CCA with R7.

e. Identify ways to protect habitat outside CSWMA and incorporate buffers.

B. Contaminants

1. Mosquito control pesticides that are sprayed due to Eastern Equine Encephalitis (EEE).

   a. Work with NYSDEC on draft recovery plan in 2012 and affects to EMR as a result of aerial spraying. |FY11 $0 DEL ESA SLD Planned

   b. Provide technical assistance to Onondaga County and request that they explore alternative mosquito control methods to minimize potential impacts to EMR.

OUTREACH

- Coordinate with NYSDEC, Tom Bell, to design outreach exhibit for use in NY. |FY11-FY14 $0 OUT ESA SLD Future

- Increase public awareness and knowledge of the species through fact sheets posted on NYFO website. 2011 website updated with 2011 Candidate Notice of Review, survey protocols, handbook for land managers, and link to NYSDEC website. |FY11 $0 OUT ESA,IT SLD,AFL Completed

- Massasauga Rattlesnake USFWS Fact Sheet. http://www.fws.gov/midwest/endangered/reptiles/conserve.html |FY11 $0 OUT ESA SLD Completed

MONITORING

SUNY-ESF Summer monitoring completed pre-surveys 2010 and post 2011-2012 post surveys (K. Shoemaker) 2006-2010. Completed pre-habitat monitoring at Cicero Swamp. Brent Johnson (MS work) will look at response of snakes to habitat restoration 2011-2012.

NYSDEC to monitor EMR response to habitat management. NYFO to conduct site visit 5/25.2011. |FY11 $0 MON ESA NR,RAN Completed

NYSDEC - Recovery plan draft will be revised by Spring 2012 and sent out for peer review. NYFO to review. |FY12 $0 MON ESA SLD Planned

Partners

NYSDEC, SUNY-ESF (Dr. James Gibbs/K. Shoemaker), Al Breisch, retired NYSDEC

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U.S. Fish and Wildlife Service. 2008. Species Assessment and Listing Priority Assignment Form for Eastern Massasauga (*Sistrurus catenatus catenatus*).

GREAT LAKES FOCAL AREA

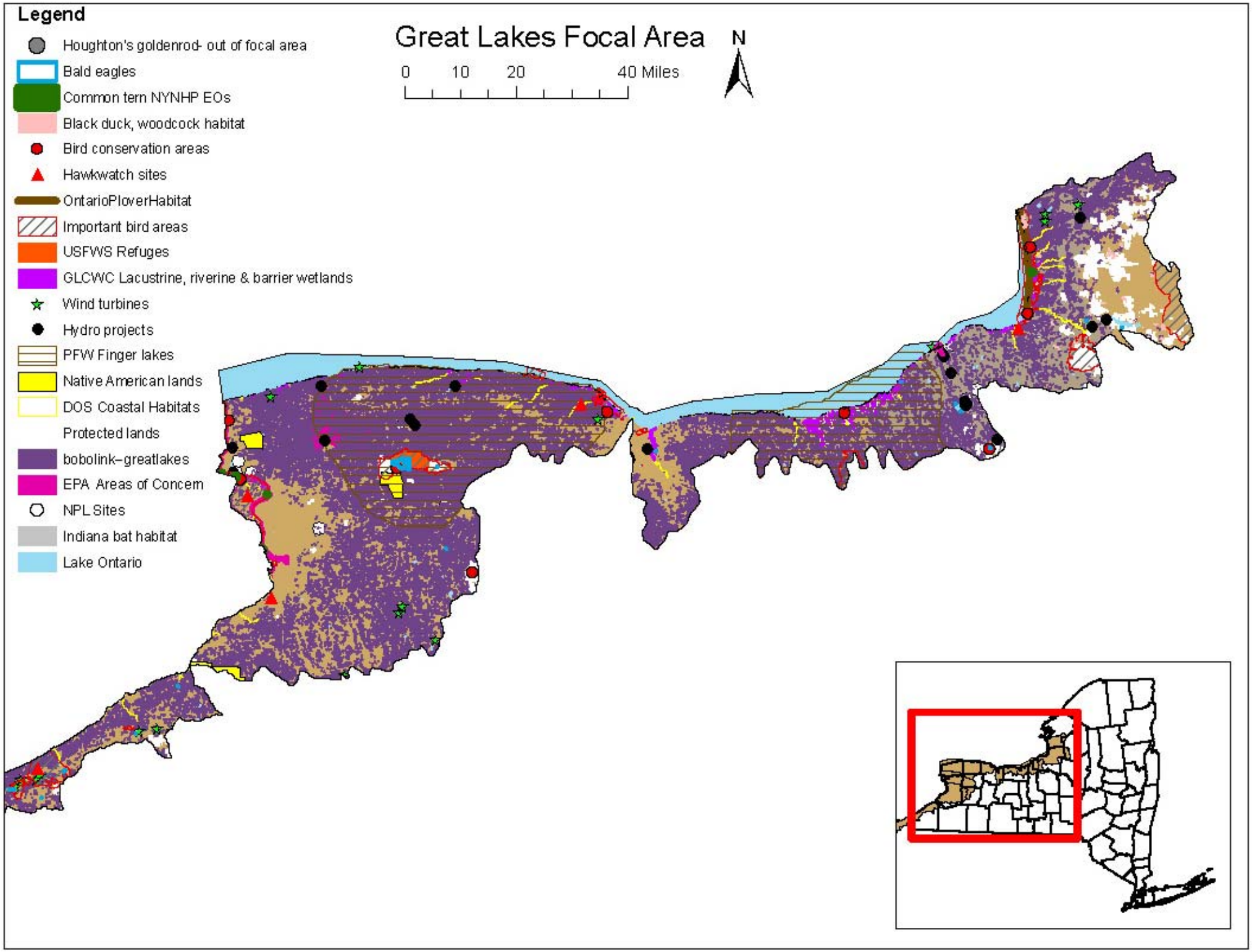
The Great Lakes Focal Area (GLFA) is located adjacent to the shores of Lake Erie and Lake Ontario in western and north-central New York and contains 6,118 square miles or 11.2% of the state. The overall boundary is largely demarcated by the Great Lakes watershed that drains immediately into either Lake Erie or Lake Ontario, excluding the Oswego River basin which is part of the Finger Lakes Focal Area, and the Black River basin which is included in the St. Lawrence River Focal Area. The GLFA contains the Lake Erie/Ontario Lake Plain and Ontario Lowlands with a local relief of 20-300 feet, the Cattaraugus Hills with a local relief of 200-500 feet, and the eastern portion of the Tug Hill Plateau with a local relief of 30-300 feet. Overall, elevation ranges within the focal area are 250-900 feet in the Lake Plains and up to 1800-2000 feet in the hills and plateaus. The GLFA is characterized by its association with the glacial and lacustrine landforms associated with the Great Lakes including beach ridges, moraines, and extensive areas of drumlin formation. Additionally, strong seasonal effects associated with the Great Lakes include altered growing season lengths and abundant snowfalls during the winter.

The Great Lakes Basin is the largest surface freshwater system on earth and contains 84% of the freshwater in North America. Covering 13,500 square miles, the basin also supports locally, nationally, and internationally significant fish and wildlife resources. More than 30 million people live within the basin representing 10% of the U.S. and 20% of the Canadian population. All of, or portions thereof, fifteen New York counties are included within the GLFA boundary including Chautauqua, Cattaraugus, Erie, Wyoming, Genesee, Niagara, Orleans, Monroe, Ontario, Wayne, Cayuga, Onondaga, Oswego, Jefferson, and Lewis counties. Approximately 1,950,000 people live within this focal area, concentrated primarily in the Buffalo and Rochester metropolitan areas, with other concentrations in smaller cities such as Lockport, Batavia, and Oswego. Land uses are divergent as two of the largest urban centers in New York are found in this focal area, but there are also extensive areas of forestland across the region and dairy and farmland in the Lake Plains, the most notable of the latter being the extensive fruit and specialty crops associated with the near-shore climate.

This focal area was selected because it contains significant aquatic, wetland, and lakeshore habitats as well as significant waterways. There are currently five Federally-listed species (endangered [E], threatened [T], candidate [C]) and nine identified species of concern within the focal area. Iroquois National Wildlife Refuge is located within the focal area, which includes one of seven state-listed Bird Conservation Areas within the focal area boundary. The focal area is important for migratory, stop-over, and breeding habitat for waterfowl, shorebirds, waterbirds, raptors, and passerines. The GLFA is within Bird Conservation Region 13 (Lower Great Lakes/St. Lawrence Plain) and Partners in Flight Physiographic Region 15 (Lower Great Lakes Plain). Significant shoreline areas support populations of common tern as well as critical habitat for piping plover (E), although the latter currently does not breed in this focal area. Successional and grassland habitats contain populations of bobolink and woodcock. Although not as heavily forested as other parts of New York, forests in this focal area and their associated foraging areas provide habitat for Indiana bat (E), cerulean warbler, and broad winged hawk. The lakes and almost 28,000 miles of streams support remnant populations of the once widespread lake sturgeon and brook trout populations. Most notably, the GLFO's extensive wetland habitats

contain populations of bog turtle (T), massasauga rattlesnake (C), Houghton's goldenrod (T), black duck, and bald eagle.

The New York Field Office actively seeks to promote the above resources by addressing issues related to interactions with industry, transportation, navigation, water level regulations, hydropower, wind power, contaminants (PBCs and mercury), and development. Specific threats include habitat loss (principally), fish barriers, hydrologic changes, habitat succession, invasive species, decreased habitat complexity, changes in agricultural practices, shoreline hardening, degraded water quality, and climate change. Current projects include the Fish Enhancement, Mitigation, and Research Fund (FEMRF), Buffalo and Niagara Natural Resource Damage Assessment and Restoration (NRDAR) cases, Federal and non-federal permit review for hydroelectric and wind power development and relicensing, endangered species consultation and recovery activities, and habitat restoration and invasive species control implemented by the Partners for Fish and Wildlife.


Great Lakes Focal Area
N
0 10 20 40 Miles
Legend
Houghton's goldenrod- out of focal area
Bald eagles
Common tern NYNHP EOs
Black duck, woodcock habitat
Bird conservation areas
Hawkwatch sites
OntarioPloverHabitat
Important bird areas
USFWS Refuges
GLCWC Lacustrine, riverine & barrier wetlands
Wind turbines
Hydro projects
PFW Finger lakes
Native American lands
DOS Coastal Habitats
Protected lands
bobolink–greatlakes
EPA Areas of Concern
NPL Sites
Indiana bat habitat
Lake Ontario

American Woodcock (*Scolopax minor)*: Great Lakes Focal Area

American Woodcock Species Action Plan

FOCAL AREA: GREAT LAKES

Other species benefitting:

American black duck, mallard, Canada warbler, willow flycatcher, wood duck (scrub-shrub wetlands); brown thrasher, field sparrow, golden-winged warbler, blue-winged warbler, northern oriole, northern flicker, prairie warbler, ruffed grouse, red-headed woodpecker, song sparrow (shrub/early successional habitat); wood turtle

BIOLOGICAL PLANNING

Introduction to species

Species information: This shorebird species, also known as timber doodle, is a popular game bird. It is a migratory species, nesting in young forests and old fields; courtship displays and nesting span a 6 month period beginning in mid-winter in the south and extending into June in the north (Keppie & Whiting 1994). Across its northern range, woodcock appear to be the earliest migrant species to breed. It is strongly associated with both upland and wetland habitat types in BCR13. Woodcock are most abundant where available habitats include a mix of fields or openings, forests of different ages, and feeding habitat with moist soils and high shrub cover.

Justification for species selection: Since woodcock surveys began in 1966, it is estimated that woodcock numbers have declined 1% annually within their geographic range. Land-use changes such as wetland drainage and land conversion from early succession to mature forest are likely causes of population declines. However, hunter harvest may contribute, as roughly two million birds are shot annually. As a result, national and international bird conservation organizations consider the American woodcock a species of continental concern, and protecting the woodcock is a high priority in its habitat ranges. The American woodcock was chosen as a priority species because of its importance in the eastern U.S. as well as in New York. It is ranked "High" (H) on the BCR 13 list of "Priority Bird Species in Bird Conservation Regions partially or wholly within the Atlantic Coast Joint Venture". It is ranked as highly imperiled in the Northern Atlantic Regional Shorebird Plan, and is identified as a "Bird in Trouble" in the Eastern Forest in the North American Bird Conservation Initiative's 2009 report, "The State of the Birds, United States of America."

The population estimate for this species for the U.S. and Canada is 5,000,000, with no estimate available of the population in BCR 13 (Rich et al. 2004).

There has been a loss of over 829,000 singing male woodcock since the early 1970s (Kelley et al. 2008). According to Breeding Bird Survey data during the period from 1966-2002 (NYSDEC 2005), in New York, the American woodcock has exhibited a precipitous decline of 64% over this time period.

American Woodcock (*Scolopax minor)*: Great Lakes Focal Area

State contribution to overall species population: Woodcock are managed on the basis of two regions or populations, Eastern and Central (Cooper 2008), with New York in the eastern population. Singing-ground survey data for the eastern region for 1998-2008 indicate no significant trend in the population (Cooper 2008); however, in New York the species has declined. Annual spring surveys of their breeding grounds show that woodcock numbers in the eastern flyway and in New York have been falling by about 2 percent since the 1960s - a loss of over 55 percent in the last 40 years. The New York State Department of Environmental Conservation (NYSDEC) manages for early successional species on several Wildlife Management Areas (WMA) or Bird Conservation Areas (BCA).

The woodcock's range extends across New York in upland and wetland habitats. Relatively high concentrations of woodcock can found in WMA and BCA in the eastern Adirondacks, Lower Hudson, St. Lawrence Valley, and Central and Western New York.

Threats and threat assessment:

1. **Loss of habitat and habitat function**. The woodcock's decline is attributed to loss of upland and wetland habitat due to development, succession, and forest maturation. In addition, the reduction in forestry practices, especially in riparian areas (critical for breeding and migrating), contributes to loss of woodcock. In BCR 13 there has been a net loss of 2.3 million acres (0.9 M hectares [ha]) of early-successional habitats since the 1970s, resulting in declines in bird species such as American woodcock that utilize this habitat type. Loss of sufficient quality/quantity habitat within the focal areas and the function the habitat provides has adversely affected this species. As the rate of change from farmland into young growth forests increases, there is a decrease in quantity and quality of habitat for this species (NAS 2009).

2. **Decline in food supply** (i.e. earthworms) from changes in soil pH due to acid deposition (NAS 2009).

   Research needed:

   - Per McAuley et al. 2005, specific research is needed to evaluate if low recruitment observed on northeast sites is caused by contaminants, habitat fragmentation, or habitat degradation (such as decline in food supply).

3. **Contaminants.** Lead contamination that is either ingested as shot or ingested through contaminated earthworms after being spread through the food chain adversely affects this species (NAS 2009).

   Research needed:

   - Determine extent of lead contamination in current and potential habitat areas by conducting a literature review and, if necessary, conducting limited soil sampling. |FY? $0 BP EC ? Future

- Determine impacts of other contaminants on American woodcock by conducting a literature review. |FY? $0 BP EC ? Future

4. **Climate change.** Early successional habitat sequesters more carbon than mature forest. Climate change effects could include decreased water levels in rivers and lakes, changes in seasonal climate that could shift migration patterns of birds such as woodcock, and changes in food availability. Additional research would be needed to determine impacts due to climate change.

   Research needed:

   - Research is needed to determine the effects of climate change on this species.

Population goal(s) for New York State:

In New York, based on singing-ground surveys, there is a deficit of 72,249 males that would be needed to restore the population to 1970s levels. Of this, in BCR 13, there is a deficit of 51,804 males that would be needed to restore the population to 1970s levels. To restore woodcock densities in BCR 13 to those observed during the early 1970s, a total of nearly 3.6 million acres (1.4 million ha) of new woodcock habitat needs to be created. In BCR 13, the vast majority of timberland is under private ownership. Therefore, State and Federal resource agencies will need to enlist the help of individual and commercial private forestland owners in order to achieve habitat-management goals. This is a tremendous amount of acreage to manage and will require a monumental undertaking and cooperation from a diverse group of parties, as well as considerable monetary investment (Kelley et al. 2008).

Management Objectives for the Population:

A. Halt population declines by 2012 as measured by Singing Ground Surveys

B. Have positive population growth by 2022

   Note: Woodcock are banded from late spring through early fall. Birds are weighed, sexed, aged, and their bills are measured, and then each bird is banded. The U.S. Geological Survey (USGS) maintains a toll-free number so that banded birds that are recovered can be reported. Band return data are used to estimate population sizes and determine migration routes.

Overall Goal:

To halt the decline of woodcock populations and to return them to densities which provide adequate opportunity for utilization of the woodcock resource.

American Woodcock (*Scolopax minor)*: Great Lakes Focal Area

Management Objectives for Habitat for This Species:

A. Halt decline of early successional habitat by 2012 (includes creation of 4.7 million acres of new habitat per year)

B. To increase early successional habitat by 2022

CONSERVATION DESIGN

Strategies for addressing those threats

In 2001, Federal and State wildlife agencies, along with non-governmental organizations (NGO) including the Wildlife Management Institute (WMI), the Association of Fish and Wildlife Agencies, and the Ruffed Grouse Society (RGS), formed the Woodcock Task Force. Since then, using funding from the National Fish and Wildlife Foundation which is administered by the WMI, biologists and land managers have developed a Woodcock Conservation Plan.

1. **Loss of habitat and habitat function.**

   a. Influence regulatory agency decisions regarding proposed development, agricultural practices, etc., that result in loss of habitat and habitat functions for this species.

   b. Target U.S. Fish and Wildlife Service (USFWS) habitat creation, restoration, and enhancement projects to benefit woodcock.

      i. Use Natural Resource Damage Assessment and Restoration (NRDAR) funds to accomplish habitat restoration and protection using guidance found in Woodcock Conservation Plan.

      ii. Work with land trusts to target woodcock conservation.

      iii. In creating woodcock habitat, consider the management recommendation of the National Audubon Society (NAS) 2009 (appended to the end of this document). Facilitate habitat preservation through coordination with land trusts (Partners for Fish and Wildlife [PFW]).

      iv. Use geospatial tools to:

         - Analyze existing areas of habitat to determine potential breeding areas;
         - Analyze breeding bird survey data to focus efforts; and,
         - Create map for possible woodcock sites of concern.

2. **Decline in food supply.**

    a. Strategy will depend upon results of research need noted above.

3. **Contamination.**

    a. Use Natural Resource Damage Assessment and Restoration (NRDAR) funds to accomplish habitat restoration and protection using guidance found in Woodcock Conservation Plan. |FY? $0 DES EC ? Future

    b. Evaluate USFWS NRDAR along the Great Lakes. |FY12-FY13 $0 DES EC ASR Planned

    c. Seek to minimize loss of habitat due to contamination by influencing regulatory agency decisions related to State and Federal Superfund site. |FY12-FY13 $0 DES EC ASR Planned

    d. Strategy will depend upon results of research needs noted above.

4. **Climate change.**

    a. Strategy will depend upon results of research needs noted above.

Partners/potential funding:

RGS, WMI, USGS, Natural Resources Conservation Service (NRCS), NYSDEC, County Soil and Water Conservation Districts (SWCD), The Nature Conservancy (TNC), Audubon New York, Cornell Lab of Ornithology, New York State Department of Transportation (NYSDOT), and universities.

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY 2010 - 2012

1. **Loss of habitat and habitat function.**

    a. Provide substantive Federal agency comments on proposed Federal agency actions with likely adverse impacts to woodcock and/or their habitat.

    b. Prioritize permit review in early successional habitat types or areas that have the potential for restoration.

    c. Develop Fact Sheets with best management practices (BMP) to minimize impacts to woodcock, and use these to influence landowners regarding habitat needs of this

d. Post on New York Field Office (NYFO) web site Fact Sheets with BMP to minimize impacts to woodcock and/or their habitat.

e. Provide technical assistance to NRCS for the Wetlands Reserve Program (WRP) for the restoration and conservation of habitat that would also be suitable for woodcock. |FY12-FY13 $0 DEL PFW EJR Ongoing

f. Conduct restoration planning and implementation for the Hi View Terrace NRD settlement. |FY12 $29,000 DEL EC KJ Planned

g. Work with partners (RGS, NYSDEC, National Wildlife Refuges, [NWR], etc.) to enhance/create early successional habitat within the Focal Area.

   i. Restore 100 acres of early successional habitat within the St. Lawrence, Upper Susquehanna, Upper Hudson, and Great Lakes Focal Areas. |FY12-FY13 $20,000 DEL PFW EJR Planned

   ii. Coordinate logistics with NWR R5 Hydro-Ax. |FY12-FY13 $0 DEL PFW EJR Ongoing

2. Decline in food supply.

a. Delivery will depend upon strategy determined from research noted above.

3. Contamination.

a. Manage Buffalo/Niagara Rivers NRDAR case. |FY11-FY13 $0 DEL EC ASR Ongoing

   i. Continue settlement negotiations with the Buffalo River NRDAR potentially responsible parties. |FY11-FY13 $0 DEL EC ASR Ongoing

b. Seek to minimize loss of habitat due to contamination by influencing regulatory agency decisions related to State and Federal Superfund sites along the Great Lakes. |FY12-FY13 $0 DEL EC ASR Planned

c. Delivery will depend upon strategy determined from research noted above.

4. Climate change.

a. Delivery will depend upon strategy determined from research noted above.

American Woodcock (*Scolopax minor)*: Great Lakes Focal Area

Partners/potential funding:

To implement the Woodcock Conservation Plan, Woodcock Habitat Regional Initiatives have been set up: Northern Forest Initiative, Appalachian Mountains Initiative, and Upper Great Lakes Initiative. These initiatives are partnerships of agencies and organizations in geographic areas within the woodcock's range. None of these encompass the Upper Hudson River Focal Area or the St. Lawrence Focal Area.

Partners in the Woodcock Conservation Plan include: Connecticut Woodcock Council, Minnesota Woodcock, Woodcock Limited of Pennsylvania, Golden-Winged Warbler Working Group, RGS, and the WMI. Other potential partners include: USGS, NRCS, NYSDEC, County SWCD, TNC, Audubon New York, Cornell Lab of Ornithology, NYSDOT, New York Power Authority (NYPA), Thousand Islands Land Trust (TILT), universities.

OUTREACH

Landowner education during site visits when potential habitat projects are present (on-going) (PFW).

Public involvement and education regarding the need for protection and restoration of shrubland and early successional habitat for woodcock and similar species. This could be addressed through the development of a new traveling exhibit.

The NYFO could develop an educational workbook devoted to early successional species. The NYFO could develop Fact Sheets aimed at some of the groups listed below (landowners, public).

Put Landowners Guide to Woodcock Management up on NYFO web site (FY2011) (IT).

Woodcock Conservation Plan notes the following: "Outreach will play a critical role in the northeast as woodcock and the entire early successional bird suite is more threatened, due to more widespread and greater declines in populations, than any other species suite (grassland suite is in similar predicament). This is contrary to the misconception that forest interior species are in most decline and most threatened. Managers, environmentalists and the public need to be educated that shrubland and early succession habitats are important to birds and need to be protected or managed for. These habitats provide critical diversity to the area. A program to develop demonstration sites throughout the various states and provinces would be beneficial in helping to educate the public and would provide habitat guidance to those interested in managing for woodcock and other early successional birds."

Potential Outreach Partners:

Audubon New York, Cornell Lab of Ornithology, NYSDEC, NWR, NRCS, RGS, Private Landowners, and NGOs.

American Woodcock (*Scolopax minor)*: Great Lakes Focal Area

MONITORING

- Develop protocols to measure success of all conservation delivery activities.
- Work with Partners to identify leads for accomplishing monitoring activities.
- Develop best management practices from results of monitoring to inform future American woodcock population restoration activities.

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NYS Ruffed Grouse Hunting Log to identify core woodcock habitat http://www.dec.ny.gov/animals/56849.html.

NYSDEC FAQs on Grouse Hunting and Management (with map) http://www.dec.ny.gov/outdoor/48393.html.

American Woodcock (*Scolopax minor)*: Great Lakes Focal Area

NYSDEC. 2005. Comprehensive Wildlife Conservation Strategy: A Strategy for Conserving New York's Fish and Wildlife Resources, Final Submission Draft, September 2005 (http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf).

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Thogmartin, W.E., J.R. Sauer and M.G. Knutson. 2007. Modeling and Mapping Abundance of American Woodcock Across the Midwestern and Northeastern United States. The Journal of Wildlife Management. 71(2): 376-382.

Existing strategies for American woodcock restoration:

Please refer to the following documents for existing strategies:

- Bird Conservation Plan for BCR13 (Atlantic Coast Joint Venture 2007)
  http://www.acjv.org/bcr13_plan.htm

- American Woodcock Conservation Plan (Kelley et al. 2008)
  http://www.timberdoodle.org/sites/default/files/woodcockPlan_0.pdf
- Partners in Flight Landbird Conservation Plan (Rich et al. 2004)
  http://www.partnersinflight.org/cont_plan/default.htm

- NYS Comprehensive Wildlife Conservation Strategy (NYSDEC 2005)
  http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf

Woodcock Management Recommendations (NAS 2009):

- Create or maintain the various types of habitat required for feeding, display, roosting, and nesting. Habitat types need to be in close proximity (e.g., within 1/2 mile).

- Maintain at least 0.5 acres of open habitat for singing displays through plowing, mowing, or prescribed burns. Suggestion of one patch per 20-25 acres. The goal is for fields to appear "patchy," rather than uniform in structure. Moderate use of livestock grazing can also accomplish this. Mow every 2-4 years.

- Encourage native trees and shrubs.

American Woodcock (*Scolopax minor)*: Great Lakes Focal Area

- Maintain larger areas, 3-5 acres, of open habitat for nighttime roosts. Suggestion of one patch per 100 acres. Plant shrubs in open fields and around the perimeter of cultivated fields to provide roosting and escape cover.

- Maintain young, dense forest of at least 5 acres for nesting and feeding.

- Maintain grassy areas near water sources for feeding and display grounds.

Bald Eagle (*Haliaeetus leucocephalus)*: Great Lakes Focal Area

Bald Eagle Species Action Plan

FOCAL AREA: GREAT LAKES

Other species benefitting:

turkey vultures, migrating raptors including golden eagle, sharp-shinned hawk, rough-legged hawk, red-tailed hawk, broad winged hawk, American kestrel, osprey

BIOLOGICAL PLANNING

Introduction to species

Species information: Although newly delisted from the Federal endangered species list, the bald eagle still faces threats from human intervention in their migration routes and foraging and breeding areas. Despite their fierce image, bald eagles are actually quite timid and opportunistic. Since their primary prey is fish, bald eagles are sometimes called sea eagles, though they will take some mammals, waterfowl, seabirds, and carrion, especially during winter. The bald eagle is a long-lived bird, with a life span in the wild of more than 30 years. Bald eagles mate for life, returning to nest in the general area (within 250 miles) from which they fledged. Once a pair selects a nesting territory, they use it for the rest of their lives. Although the Great Lakes shores are not known as important eagle roosting areas due to violent winter weather and icing over, there are increasingly more nests along the shore, including one in Irondequoit Bay and 5 more in Region 9 of the New York State Department of Environmental Conservation (NYSDEC). This region had the lowest nesting success rate at 64%, below the State average of 71%.

Justification for species selection: Once Federally delisted, the bald eagle and golden eagle are still protected by the Bald and Golden Eagle Protection Act (BGEPA) which now requires authorization by the U.S. Fish and Wildlife Service (USFWS) for unavoidable take of nests and of eagles. The bald eagle is still State listed and a new permit program for authorization of unavoidable take is slowly being utilized. The BGEPA program calls for Ecological Services (ES) offices to assist with early coordination and consultation with potential permittees because of our long history of working with eagles through Section 7 and our program which are delivered to the public from field stations, including providing technical assistance on minimizing impacts of development and policy actions on wildlife. Several areas in New York will involve New York Field Office (NYFO) work with bald and golden eagle conservation – along the ridge just south of the shoreline of Lake Erie, along the shoreline of Lake Ontario and the St. Lawrence River valley where eagle migration is documented every year by three raptor watch sites in New York and several in Canada, and in the lower Hudson River where eagles nest and roost on mid-river islands and may forage along the shoreline in the vicinity of rail lines.

State contribution to overall species population: The NYSDEC conducts an annual bald eagle count which, for 2009 statewide was 241 adults and 160 immature birds. State biologists assume that the number of resident eagles is growing each year, but no attempt is made to differentiate

between resident eagles and seasonal migrants in the annual count in January. The bald eagle is still State listed as threatened.

Threats and threat assessment:

1. Modification or destruction of habitat(s), including migratory corridors, winter roosting areas, and breeding areas. This includes human disturbances from logging, developments, poorly planned public use (boating, canoe/kayak trails, jet skis, ATVs).

2. Disease or predation, including lead ingestion, botulism, predation from other eagles, death by shotgun.

3. Inadequacy of existing regulatory protections. Endangered Species Act (ESA) and BGEPA protection is in the form of a permitting program that allows for "death by a thousand cuts" effects on bald eagles. Although take is prohibited without permits, it can be authorized with a permit; the success of various mitigation schemes to offset take is unknown.

4. Other man-made or natural factors including collisions with trains – in 2009, 10 (known) bald eagles were killed along the rail line along the Hudson River.

5. Ingestion of environmental contaminants, impacts to reproduction.

   Research needed**:**

   - Identification of essential breeding and wintering habitats to target locations for habitat management and protection. |FY12-FY14 $3,000 BP CPA SLD Planned

   - Identification of movement patterns, migratory pathways, and the locations where New York's wintering eagles breed to target locations for habitat protection and to inform the wind industry about specific areas to avoid. This needs to include the heights at which eagles fly when riding thermals (in the vicinity of potential wind energy development sites) for both activity associated with breeding and migratory movements. |FY11-FY14 $0 BP CPA SLD Ongoing

   - Monitor contaminant levels in eagles in New York. |FY? $0 BP EC ALS Future

   - Continued pathology investigations to determine causes of mortality in bald eagles. |FY12-FY14 $0 BP CPA SLD Future

   - Post-construction monitoring of developments that might affect eagles and their habitats and providing mitigation where needed. |FY13-FY14 $0 BP CPA SLD Future

Bald Eagle (*Haliaeetus leucocephalus)*: Great Lakes Focal Area

Partners/potential funding:

NYSDEC, New York State Energy Research and Development Agency (NYSERDA), USFWS, State Wildlife Grants (SWG), wind energy developers

Population goal(s) for New York State:

Goal – to maintain a stable population of bald eagles in New York. productivity of 1.0/eagle pair.

Research needed: Identification of a population goal for the New York State breeding population. |FY12-FY14 $0 BP CPA SLD Future

CONSERVATION DESIGN

1. **Loss of habitat.**

    a. Address modification or destruction of habitat(s) including winter roosting areas and breeding areas through public education programs and website postings in conjunction with the NYSDEC bald eagle recovery program. Assist the NYSDEC in identifying movement patterns, migratory pathways, and locations where New York's wintering eagles breed. |FY12-FY14 $0 DES CPA SLD Ongoing

    b. Continue engagement in Federal Clean Water Act permitting program and State Environmental Quality Review Act (SEQRA) program for wind power and development projects proposed in eagle concentration areas and wind resource areas that coincide with breeding and migratory routes. |FY12-FY14 $0 DES CPA SLD Ongoing

    c. Assist NYSDEC in identifying, managing, and protecting essential breeding and wintering habitats. |FY12-FY14 $0 DES CPA SLD Ongoing

2. **Disease or predation, including lead ingestion, botulism, predation from other eagles, death by shotgun.**

    a. Through hunter education programs, address nest protection programs.

    b. Ensure continued monitoring of lead and other contaminant levels in eagle eggs and chicks. |FY? $0 DES EC,CPA ALS,SLD Future

    c. Develop a strategy for addressing high levels of contaminants, if found. |FY? $0 DES EC,CPA ALS,SLD Future

Bald Eagle (*Haliaeetus leucocephalus)*: Great Lakes Focal Area

3. **Inadequacy of existing regulatory protections.**

    a. Address inadequacy of existing regulatory protections by providing information about the Federal BGEPA program as administered in New York by the NYFO and the Regional Office's Migratory Bird Program Office, and State protections under the State ESA. |FY12-FY13 $0 DES CPA SLD Ongoing

4. **Other man-made or natural factors.**

    a. Develop advanced conservation strategies and best management practices (BMP) for this industry and for the wind industry to avoid and minimize impacts to bald and golden eagles. |FY12-FY13 $0 DES CPA SLD Ongoing

    b. Address wind related mortalities by improved intraoffice coordination on development of BMP and other strategies. |FY12-FY13 $0 DES CPA SLD Ongoing

5. **Ingestion of environmental contaminants, impacts to reproduction**.

    a. Determine if there are impacts to bald eagles from environmental contaminants within the watershed and if so, implement mitigative measures. |FY? $0 DES EC ALS Future

    b. Seek to minimize loss of habitat due to contamination, by influencing regulatory agency decisions related to State and Federal Superfund sites. |FY11-FY13 $0 DES EC ASR Ongoing

    c. Investigate development of an On-/Off-Refuge proposal to address impact of contaminants on osprey and/or other avian species and seek funding for such work (EC FY2011). |FY11 $0 DES EC KJ Completed

    d. Evaluate USFWS Natural Resource Damage Assessments (NRDA) along the Great Lakes. |FY11-FY13 $0 DES EC ASR,ALS Ongoing

    e. As part of the GLRI, evaluate emerging contaminants at the Rochester Embayment AOC and evaluate the "Fish Tumors" Beneficial Use Impairment for the Niagara River AOC (potentially 2010-2014). |FY11-FY13 $0 DES EC DG,ASR Ongoing

    f. Respond as appropriate to spills impacting fish and wildlife resources. |FY12-FY14 $0 DES EC ALS Planned

Partner organizations:

Onondaga Audubon Society, Rice Creek Field Station, Cornell Lab of Ornithology, Ripley Hawk Watch, NYSDEC, Haudenosaunee Confederacy.

Bald Eagle (*Haliaeetus leucocephalus)*: Great Lakes Focal Area

CONSERVATION DELIVERY

1. **Loss/degradation of habitat.**

   a. Address modification or destruction of habitat(s) including winter roosting areas and breeding areas through public education programs and website postings in conjunction with the NYSDEC bald eagle recovery program. Assist the NYSDEC in identifying movement patterns, migratory pathways, and locations where New York's wintering eagles breed.

      i. Along with links to biological information about bald eagles, develop materials for the website to clarify for the public the connections between what humans do by way of development, forest clearing, use of motor boats, jet skis, etc., in bald eagle nesting areas and nest abandonment, loss of productivity, etc. |FY12-FY14 $0 DEL CPA SLD Future

      ii. Continue engagement in Federal Clean Water Act permitting program and SEQRA program for wind power and development projects proposed in eagle concentration areas and wind resource areas that coincide with breeding and migratory routes. |FY12-FY14 $0 DEL CPA SLD Ongoing

      iii. Participate in regional workgroup and other agencies' sponsored workgroups developing guidance for wind power project siting. |FY12-FY13 $0 DEL CPA SLD Ongoing

      iv. Develop maps for internal use that map out a "green infrastructure" of migratory, roosting, and breeding areas for eagles in New York State to refer to when screening 404 and Federal projects reviews. |FY12-FY14 $0 DEL CPA SLD Future

      v. Provide substantive comments to the regulatory agencies that provide BMP, mitigation recommendations for eagle conservation when in suitable habitat. |FY12-FY13 $0 DEL CPA SLD Ongoing

   b. Assist NYSDEC in identifying, managing, and protecting essential breeding and wintering habitats through NYSDEC-ESA/BGEPA Program that will result in a net benefit to eagles. |FY12-FY14 $0 DEL CPA SLD Ongoing

      i. Obtain, prepare, and/or distribute maps outlining key conservation areas to coworkers who may be reviewing projects in bald eagle habitat. |FY12-FY13 $0 DEL IT AFL Future

      ii. Provide language for comment letters on a wide variety of regulated activities if they occur in known bald eagle habitats. |FY12-FY13 $0 DEL CPA SLD Ongoing

iii. Develop/tweak national guidelines for land management agencies to ensure that their trail systems minimize impacts to bald and golden eagles in concentration areas. Prepare guidelines and distribute to State Parks, State Forests, and National Forests interpretation staff.

2. **Disease or predation, including lead ingestion, botulism, predation from other eagles, death by shotgun.**

   a. Through hunter education programs, address nest protection programs.

   b. Ensure continued monitoring of lead and other contaminant levels in eagle eggs and chicks.

   c. Develop a strategy for addressing high levels of contaminants if found.

3. **Inadequacy of existing regulatory protections.**

4. **Other man-made or natural factors.**

   a. Address other factors.

      i. Develop advanced conservation strategies and BMP for this industry and for the wind industry to avoid and minimize impacts to bald and golden eagles. |FY12-FY13 $0 DEL CPA SLD Ongoing

      ii. Address wind-related mortalities by improved intraoffice coordination on development of BMP and other strategies. |FY12-FY13 $0 DEL CPA SLD Ongoing

      iii. Meet with new Northern BGEPA coordinator to discuss an approach to compliance. |FY12-FY13 $0 DEL CPA SLD Ongoing

      iv. Work with the NYSDEC, industry, other field offices, Regional Office, and species experts to identify advanced conservation practices that will avoid and minimize take of eagles and other large raptors. |FY12-FY13 $0 DEL CPA SLD Ongoing

5. **Ingestion of environmental contaminants, impacts to reproduction**.

   a. Determine if there are impacts to bald eagles from environmental contaminants within the watershed and if so, implement mitigative measures.

   b. Seek to minimize loss of habitat due to contamination by influencing regulatory agency decisions related to State and Federal Superfund sites.

i. Provide substantive Federal agency comments on proposed actions with likely adverse impact to bald eagles and/or their habitat (EC) (2010-2013). |FY11-FY13 $0 DEL EC ASR Ongoing

c. Evaluate USFWS NRDA along the Great Lakes.

i. Manage Buffalo/Niagara Rivers NRDA case |FY11-FY13 $0 DEL EC ASR Ongoing

ii. Continue settlement negotiations with the Buffalo River potentially responsible parties. |FY11-FY13 $0 DEL EC ASR Ongoing

iii. If/when possible, use NRDAR funds toward bald eagle habitat restoration. |FY11-FY13 $0 DEL EC ASR Ongoing

d. As part of the GLRI, evaluate emerging contaminants at the Rochester Embayment AOC and evaluate the "Fish Tumors" Beneficial Use Impairment for the Niagara River AOC (potentially 2010-014).

i. Conduct pilot study on emerging contaminants in soil, water, and fish of Rochester embayment to determine potential impacts to fish and wildlife Trust resources and their supporting habitats (initiated in September 2010). |FY11-FY13 $0 DEL EC DG,ASR Ongoing

ii. Assess the "Fish Tumors" Beneficial Use Impairment in the Niagara River to determine potential impacts to fish and wildlife Trust resources and their supporting habitats. |FY11-FY13 $0 DEL EC DG,ASR Ongoing

iii. Coordinate with USEPA and AOC Remedial Action Committees on future directions with objective of improving and restoring habitat for Trust resources (dependent on USEPA funding: 2011-2013). |FY11-FY13 $0 DEL EC DG,ASR Ongoing

6. **Address disease or predation**, including lead ingestion, botulism, predation from other eagles, and death by shotgun, through hunter education programs, nest protection programs. |FY12-FY13 $0 DEL CPA SLD Ongoing

a. Investigate whether bald and golden eagle fact sheets could be provided at hunter training programs run by the NYSDEC. Develop fact sheets and distribute.

7. **Address inadequacy of existing regulatory protections** by providing information about the Federal BGEPA as administered in New York by the NYFO and the Regional Office's Migratory Bird Program Office, and State protections under the State ESA. |FY12-FY13 $0 DEL CPA ? Ongoing

a. Provide a New York highlighted fact sheet on the website to outline process for protection of bald and golden eagles through the BGEPA permit processes. |FY13 $0 DEL CPA,OUT SLD Future

b. Identify three organizations with whom we could meet to further BGEPA education – builders, outfitters, etc. |FY13 $0 DES CPA,OUT SLD Future

OUTREACH

See specific examples, above

Continue to make bald eagle recovery traveling exhibit available for exhibition; keep copy blocks current (CPA). |FY12-FY13 $0 OUT CPA SLD Ongoing

Develop an accompanying workbook based on the one the BOCES students started. |FY13 $0 OUT CPA SLD Ongoing

MONITORING

Develop protocols to measure progress/success. |FY12-FY14 $0 MON CPA SLD Ongoing

Recommend monitoring to measure progress/success. |FY12-FY14 $0 MON CPA SLD Ongoing

Investigate options for State bald eagle program funding to continue to monitor nests, concentration areas, productivity, and contaminant levels in eagles. |FY12-FY13 $0 OUT CPA SLD Ongoing

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American Black Duck (*Anas rubripes)*: Great Lakes Focal Area

American Black Duck Species Action Plan

FOCAL AREA: GREAT LAKES

Other species benefitting:

American bittern, bald eagle, king rail, least bittern, waterfowl (canvasback, common goldeneye, Greater and lesser scaup, long-tailed duck)

BIOLOGICAL PLANNING

Introduction to species

Species information: The American black duck (black duck) was once a common breeder in the U.S. portion of Bird Conservation Region (BCR) 13 (the Lower Great Lakes/St. Lawrence Plain), but densities have dramatically declined over the years with the conversion and subsequent destruction of forested wetlands. Black ducks breed in a variety of North American wetlands, including freshwater wetlands created by beaver (*Castor canadensis*); brooks lined by speckled alder (*Alnus incana*); lakes, ponds, and bogs throughout mixed hardwood and boreal forests; and, salt marshes. Migrants eat seeds, foliage, and tubers of aquatic plants, seeds and fruits of terrestrial species, and a variety of invertebrates, agricultural grains, and occasionally fish and amphibians.

Justification for species selection: The black duck was chosen as a priority species because of its importance in the northeast as well as in New York. The black duck is a New York State Species of Greatest Conservation Need and is also rated High-High in the Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain BCR 13 (USFWS 2007). The high continental concern and precipitous decline in the northeast make freshwater wetlands and their relationship to local agriculture a key conservation concern. (Dettmers and Rosenberg 2003).

The Lower Great Lakes Plain population is estimated at 200 pairs in freshwater wetland habitat, with populations declining at approximately 15% per year (Dettmers and Rosenberg 2003).

State contribution to overall species population: Range extends across New York in freshwater habitat.

Research needed:

- Develop GIS tools to determine how much habitat remains.

  (Who: New York Field Office [NYFO], Ducks Unlimited (DU) to assist with wetland surveys to determine presence/absence and population densities, coupled with habitat investigation; Cost: use existing staff)

American Black Duck (*Anas rubripes)*: Great Lakes Focal Area

- Need to complete population modeling and habitat suitability indices to ascertain how much habitat is needed and where.

  (Who: U.S. Fish and Wildlife Service [USFWS] (Ralph Tiner) and Buffalo District, U.S. Army Corps of Engineers [USACE]; Cost: unknown at this time).

- Design a regional management program, including increased coordination among managers and biologists, to prevent duplication of research efforts and to share current information (Fish and Wildlife Information Needs System [FWINS]).
- Regional monitoring program to provide better abundance and population trend information needed for secretive wetland birds.

  (Who: Audubon, Cornell Lab of Ornithology, NYFO (GIS); Cost: use existing staff)

- Evaluate habitat requirements, including nest site characteristics, water quality, and minimum wetland area needed during breeding.

  (Who: State University of New York – College of Environmental Science and Forestry [SUNY-ESF], Audubon, Cornell Lab of Ornithology)

Threats and threat assessment:

1. **Loss of habitat and habitat function**: Loss of sufficient quality/quantity habitat within the basin due to water level alternations, draining, dredging, filling, pollution (including combined sewer overflows [CSO]), acid rain, agricultural practices, siltation, and invasive species).

   Research needed:

   - Need to characterize habitat loss.

   - Analyze existing areas of wetland habitat and recently altered wetland landscapes to determine potential breeding areas.

   - Develop GIS tools to determine how much high value habitat remains and how much is needed and where.

   - Characterize loss in habitat function (i.e. determine the cause).

   - Investigate wetland management alternatives that provide a variety of habitat conditions suitable to the needs of black ducks.

2. **Invasive species:** Invasive species, such as *Lythrum salicaria or Phragmites australis,* have impacts on wetland habitat, potentially adversely affecting black ducks.

American Black Duck (*Anas rubripes)*: Great Lakes Focal Area

Research needed:

- Complete population modeling and habitat suitability indices to quantify invasive species' impacts on black duck productivity.
- Assess the extent and nature of infestation by invasives (Natural Heritage, The Nature Conservancy [TNC], and other data gathering institution).
- Evaluate effects of invasive plants.
- Develop GIS tools to determine how much habitat remains free of invasives.
- Need to characterize habitat loss due to invasives (i.e. what is causing it).

3. **Hybridization with mallards.** Hybridization between mallards (*Anas platyrhynchos*) and black ducks has been linked as one cause of the decline of the black duck (Ankney et al. 1987).

   Research needed:

   - Assess the extent of hybridization within New York (Natural Heritage, TNC, and other data gathering institution).

4. **Climate change.** Most existing climate change models predict less runoff and, therefore, lower water levels in the region**.**

   Research Needed:

   - Assess changes in habitat community structure.
   - Determine climate change impacts on prey base during breeding season.

5. **Public use** (recreational disturbances).

6. **Environmental contaminants.** Assess the effects of contaminants on black ducks, especially at Great Lakes Areas of Concern (AOC) and Confined Disposal Facilities that are used by black ducks. |FY? $0 BP EC ? Future

7. **Changes in prey base** during breeding season.

American Black Duck (*Anas rubripes)*: Great Lakes Focal Area

Population goal(s) for New York State:

No New York-specific objectives have been articulated in the Joint Venture plans due to lack of reliable population estimates for most of the species in this habitat suite; numerical population and habitat-area objectives have not been determined (Dettmers and Rosenberg 2003).

Research needed:

- To determine the population management goal for New York, work with the Division of Migratory Birds and local partners (Audubon, Cornell, etc.) to determine appropriate goal for Great Lakes in New York.

CONSERVATION DESIGN

Strategies for addressing those threats:

1. **Loss of habitat.**

    a. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding wetland draining, agricultural practices that diminish wetland values for wildlife, and dredging and placement of fill in wetlands with a focus on coastal wetlands.

    b. Target USFWS habitat restoration and enhancement projects to benefit black ducks.

    c. Participate in Mitigation Bank Review Teams (MBRT) for Rochester Cornerstone and Raymond Road mitigation banking teams to review and authorize mitigation banks. |FY11 $0 DES CPA ? Ongoing

    d. Participate in the New York State Wetlands Forum to coordinate wetland restoration/ protection activities that would benefit black ducks.

    e. Facilitate habitat preservation through coordination with land trusts.

    f. Preserve, restore and/or enhance freshwater wetlands in Atlantic Coast Joint Venture (ACJV) and North American Waterfowl Management Plan (NAWMP) in breeding areas and migratory corridors.

    g. Use GIS or develop new tools to help identify and target especially the wetlands that have the highest potential to produce black ducks. Protect all remaining high quality habitat.

2. **Loss of habitat function** (values diminished).

    a. Seek to minimize loss of habitat function when habitat is degraded by adjacent land uses by influencing regulatory agency decisions.

b. Seek to minimize loss of habitat value by influencing International Joint Commission decisions on river water level management.

c. Evaluate USFWS Natural Resource Damage Assessments (NRDA) along the Great Lakes. |FY11-FY13 $0 DES EC ASR,ALS Ongoing

d. Improve the quality of the prey base by addressing environmental contaminants in foraging areas.

e. Seek to minimize loss of habitat value as a result of invasive species invasion.

3. Invasive Species

a. Target invasive species control projects on wetland sites that would benefit black ducks. Seek to minimize success of invasives colonization in habitat in the Great Lakes. Determine how agency water management schedules may impact colonization of invasive species.

4. Environmental Contaminants

a. As part of the GLRI, evaluate emerging contaminants at the Rochester Embayment AOC and evaluate the "Fish Tumors" Beneficial Use Impairment for the Niagara River AOC (potentially 2010-2014). |FY11-FY13 $0 DES EC DG,ASR Ongoing

b. Seek to minimize loss of habitat due to contamination by influencing regulatory agency decisions related to State and Federal Superfund Sites. |FY11-FY13 $0 DES EC ASR Ongoing

c. Respond as appropriate to spills impacting fish and wildlife resources. |FY12-FY14 $0 DES EC ALS Planned

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY 2010 - 2012

1. Loss of habitat.

a. Influence regulatory agency decisions regarding wetland draining, agricultural practices that diminish wetland values for wildlife, and dredging and placement of fill in wetlands by:

i. Developing Fact Sheets and best management practices (BMP) to minimize impacts to black ducks.

ii. Posting these Fact Sheets/BMP on our website.

iii. Providing substantive comments on proposed Federal agency actions with likely adverse impacts on black ducks.

iv. Developing a poster for the New York State Wetlands Forum (NYSWF) which targets black duck conservation.

b. Deliver habitat restoration and enhancement projects by:

i. Manage Buffalo/Niagara Rivers NRDAR (Natural Resource Damage Assessment and Restoration) case. |FY11-FY13 $0 DEL EC ASR Ongoing
ii. Continue settlement negotiations with the potentially responsible parties (PRP). |FY11-FY13 $0 DEL EC ASR Ongoing
iii. If/when possible, use NRDAR funds toward black duck habitat restoration (Environmental Contaminants [EC]). |FY11-FY13 $0 DEL EC ASR Ongoing
iv. Restore – 30 acres of emergent wetlands and associated uplands to benefit black ducks in the Great Lakes watershed (GLRI) (PFW). |FY11 $0 DEL PFW CS,GD,ER Completed
v. Restore – 30 acres of grassland habitat to benefit black ducks in the Great lakes watershed (GLRI) (PFW). |FY11 $0 DEL PFW CS,GD,ER Completed
vi. Monitor wetland habitat at Joseph Davis State Park (Love Canal Settlement) (EC). |FY11-FY13 $0 DEL EC ALS Ongoing
vii. Facilitate habitat preservation of marsh habitat adjacent to tributary streams through coordination with the Thousand Island Land Trust and other non-governmental organizations (NGO).
viii. Working with partners and fellow trustee agencies, identify habitat that could be restored using NRDAR funds associated with the Buffalo/Niagara Rivers and St. Lawrence cases. |FY11-FY13 $0 DEL EC ASR,ALS Ongoing

c. Influence regulatory agency decisions regarding siting, construction and operation of wind turbines proposed for the Great Lakes watershed by:

i. Develop fact sheets and BMP to minimize impacts to black ducks and other waterfowl.
ii. Post these fact sheets/BMP on our website.
iii. Provide substantive comments on proposed wind farms, including the Cape Vincent, Hounsfield, Hamlin, Hammond, Lake Erie, and Lake Ontario Wind Farm proposals, to Federal, State, and local agencies with regulatory influence over wind power project siting and operation (CPA). |FY11-FY13 $0 DEL CPA ? Ongoing
iv. Coordinate with Region 3 relative to potential impacts from offshore wind projects (determine if offshore wind projects could have a negative impact to waterfowl (CPA). |FY11-FY13 $0 DEL CPA ? Ongoing

2. **Loss of habitat function** (values diminished).

   a. Influence regulatory agency decisions regarding wetland draining, agricultural practices that diminish wetland values for wildlife, dredging and placement of fill in wetlands by:

      i. Develop Fact Sheets and BMP to minimize impacts to black ducks (CPA, PFW).
      ii. Post these Fact Sheets/BMP on our website (IT).
      iii. Provide substantive comments on proposed Federal agency actions with likely adverse impacts on black ducks. |FY11-FY13 $0 DEL CPA ? Ongoing
      iv. Prepare expedited preassessment documents (EC). |FY11 $0 DEL EC ASR Completed

3. **Invasive Species**

   a. **Restore habitat impacted by invasive plant species or impacted by water level regulation.**

      i. Design, fabricate, and place a water control structure/fish ladder to provide a more natural water regime in tributary x of Lake Ontario.
      ii. See northern pike species action plan. Actions that are being implemented to benefit the northern pike in the St. Lawrence Valley would also benefit black ducks by opening up foraging areas within monotypic cattail stands. Use amphibious excavator to create openings in *Typha* monocultural stands through a stretch of river/marsh, according to overall habitat restoration plans for the area.

4. **Environmental Contaminants**

   a. As part of the GLRI, evaluate emerging contaminants at the Rochester Embayment AOC and evaluate the "Fish Tumors" Beneficial Use Impairment for the Niagara River AOC (potentially 2010-2014).

      i. Conduct pilot study on emerging contaminants in soil, water, and fish of Rochester embayment to determine potential impacts to fish and wildlife Trust resources and their supporting habitats (initiated in September 2010) (2011-2013) (EC). |FY11-FY13 $0 DEL EC DG,ASR Ongoing
      ii. Assess the "Fish Tumors" Beneficial Use Impairment in the Niagara River to determine potential impacts to fish and wildlife Trust resources and their supporting habitats; work will commence in early summer 2011 (2011-2013) (EC). |FY11-FY13 $0 DEL EC DG,ASR Ongoing
      iii. Coordinate with USEPA and AOC Remedial Action Committees on future directions with objective of improving and restoring habitat for Trust resources (dependent on USEA funding 2011-2013) (EC). |FY11-FY13 $0 DEL EC DG,ASR Ongoing

b. Seek to minimize loss of habitat due to contamination by influencing regulatory agency decisions related to State and Federal Superfund Sites.

   i. Provide substantive Federal agency comments on proposed actions with likely adverse impacts to black ducks and/or their habitat (2011-2013). |FY11-FY13 $0 DEL EC ASR Ongoing

Partners/potential funding:

Haudenosaunee Confederacy, U.S. Geological Survey (USGS), Natural Resources Conservation Service (NRCS), NYSDEC, County Soil and Water Conservation Districts (SWCD), TNC, DU, Audubon New York, Cornell Lab of Ornithology, New York State Department of Transportation (NYSDOT), New York Power Authority (NYPA), Buffalo/Niagara Riverkeeper, Niagara Greenway Committee, universities.

OUTREACH

- Landowner education
- Public involvement - Create Outdoor Classroom wetland projects in the Great Lakes watershed.

MONITORING

- Develop protocols to measure success of all conservation delivery activities.
- Work with Partners to identify leads for accomplishing monitoring activities.
- Develop BMP from results of monitoring to inform future black duck population restoration activities.

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American Black Duck (*Anas rubripes)*: Great Lakes Focal Area

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Existing strategies for American black duck restoration:

Please refer to the following document for existing strategies:

- Partners in Flight Landbird Conservation Plan: Physiographic Area 18: St Lawrence Plain (Rosenberg 2000). (http://www.blm.gov/wildlife/plan/pl_18_10.pdf).

- NYS Comprehensive Wildlife Conservation Strategy (NYSDEC 2005). (http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf).

- Bird Conservation Plan for the Lower Great Lakes/ St. Lawrence Plain Bird Conservation Region (USFWS 2007). (http://www.acjv.org/BCR_13/BCR13_Final_Plan_July07.pdf).

- North American Waterfowl Management Plan: Strategic Guidance (2004). http://www.fws.gov/birdhabitat/NAWMP/files/NAWMP2004.pdf.

American Black Duck (*Anas rubripes)*: Great Lakes Focal Area

- North American Waterfowl Management Plan: Implementation Framework (2004). http://www.fws.gov/birdhabitat/NAWMP/files/ImplementationFramework.pdf.

- North American Waterfowl Management Plan: UMR/GL Region Joint Venture Implementation Plan (1998). http://www.fws.gov/midwest/NAWMP/documents/WaterfowlManagementPlan.pdf.

- North American Waterfowl Management Plan: Atlantic Coast Joint Venture Implementation Plan (2005). http://www.acjv.org/wip/acjv_wip_main.pdf.

- North American Waterfowl Management Plan: Atlantic Coast Joint Venture Strategic Plan Update (2009). http://www.acjv.org/documents/ACJV_StrategicPlan_2009update_final.pdf.

Bobolink (*Dolichonyx oryzivorus*): Great Lakes Focal Area

Bobolink Species Action Plan

FOCAL AREA: GREAT LAKES

Other species benefitting:

northern harrier, rough-legged hawk, red-tailed hawk, American kestrel, loggerhead shrike, upland sandpiper, short-eared owl, Henslow's sparrow, grasshopper sparrow, vesper sparrow, horned lark, blue-winged teal

BIOLOGICAL PLANNING

Introduction to species

Species information: Bobolinks are neotropical migrants, traveling to South America each autumn and making a round-trip of approximately 12,500 mi. Bobolink habitat consists of open grasslands and hay fields. During migration and in winter, they use freshwater marshes, grasslands, and rice and sorghum fields. This ground nester looks for open grasslands and hay fields during the summer and builds a nest consisting of dead grass with a central lining of fine grass or sedges. Habitat patch size generally assumed to be a minimum 10 acres and can be well-managed by late season mowing. The nest may have a canopy of dead grass hanging over top. Clutch size ranges from 1-7 eggs that hatch in 11-13 days. Food consists primarily of seeds and insects. The bobolink is one of the few songbirds that undergo two complete molts each year, completely changing its feathers on both the breeding and wintering grounds. The bobolink is polygynous (Martin and Gavin 1995).

The bobolink is protected under Migratory Bird Treaty Act and listed as a Species of Greatest Conservation Need (SGCN) in New York State.

Justification for species selection: The bobolink was chosen as a priority species because of its importance in this geographic area. The bobolink is a grassland bird species targeted by the New York Grassland Bird Conservation Plan. It has been identified as a New York State "Species of Greatest Conservation Need" in New York (March 2003).

The population estimate for this species for the U.S. and Canada is 11,000,000 with 2,159,750 in Bird Conservation Region (BCR) 13 (Atlantic Coast Joint Venture [ACJV] 2007).

State contribution to overall species population: The bobolink's population trend is stable overall since 1966, but has shown 2-3% declines since 1980. It breeds throughout New York with the exception of the Adirondacks.

Threats and threat assessment:

1. **Habitat loss and fragmentation**, including farm abandonment, lack of prescribed fire, and haying/mowing practices that adversely affect this species. (In New York, primary disturbance to nesting is hay-cropping; 100% of nests with eggs and young nestlings affected by mowing were abandoned or destroyed).

Research needed:

- There is a need to develop methods and data for modeling distributions and abundance of grassland land cover across the landscape. |FY? $0 BP ? ? Future
- Research is needed to assess impacts of management on productivity of grassland birds to amplify existing information on grassland bird abundances associated with management.
- Research is needed to determine potential benefits of native grass species as grassland habitat in contrast with demonstrated benefit of non-native cool season grasses.

2. **Collision with wind energy projects.**

Research needed:

- Research is needed to assess and reduce/mitigate risks from collisions.

3. **Predation.**

Research needed:

- In South America, on wintering grounds, shooting and trapping is a probable factor as where species is considered a pest of agricultural crops and where males are sold in local pet trade. Needs further study.

4. **Climate change.** Changes in habitat community structure or prey base may affect this species.

Research needed:

- Research is needed to determine the effects of climate change on this species.

Partners/potential funding:

Ducks Unlimited (DU), land trusts, and non-governmental organizations (NGO), refuges, U.S. Geological Survey (USGS), New York State Department of Transportation (NYSDOT), Natural Resources Conservation Service (NRCS), New York State Department of Environmental Conservation (NYSDEC), The Nature Conservancy (TNC), Cornell Laboratory of Ornithology, Audubon New York, universities.

Population goal(s) for New York State:

680,000 pairs of bobolinks. Per Rosenberg 2000, objective is to provide 775,000 ha of suitable grassland habitat to support the entire habitat-species suite (e.g. 680,000 pairs of bobolinks), with 100,000 ha maintained in large enough patches to support 7,600 pairs of upland sandpipers, and 2,000 ha intensively managed to support 1,000 pairs of Henslow's sparrows in New York and Ontario.

Bobolink (*Dolichonyx oryzivorus*): Great Lakes Focal Area

CONSERVATION DESIGN

Strategies for addressing those threats

1. **Habitat loss and fragmentation**, including farm abandonment, lack of prescribed fire, and haying/mowing practices that adversely affect this species

    a. Influence regulatory agency decisions regarding proposed development, agricultural practices, etc., that result in loss of habitat and habitat functions for this species.

        i. Seek to minimize loss of habitat due to contamination by influencing regulatory agency decisions related to State and Federal Superfund sites. |FY11-FY13 $0 DES EC ASR Ongoing

    b. Prioritize permit review in grassland habitat (Conservation Planning Assistance [CPA]).

    c. Develop fact sheets with best management practices (BMP) to minimize impacts to bobolink and use these to influence landowners regarding habitat needs of this species, including providing guidance regarding haying and mowing practices. In developing BMP consider the management recommendation of the National Audubon Society (NAS) 2009 (appended to the end of this document).

    d. Target U.S. Fish and Wildlife Service (USFWS) habitat restoration and enhancement projects to benefit bobolink through creation of new habitat.

        i. If possible, use Natural Resource Damage Assessment and Restoration (NRDAR) funds to accomplish habitat restoration and protection. In creating bobolink habitat, consider the management recommendation of the NAS 2009 (appended to the end of this document). |FY? $0 DE EC ASR Future

        ii. Facilitate habitat preservation through coordination with land trusts.

    e. Other strategies may result from research needs noted above.

        i. Use geospatial tools to focus efforts: Audubon New York is involved in bobolink conservation and may have data layers we can use; check studies by Cornell – in vicinity of Madison Co. NRCS has shape files for priority areas for Conservation Reserve Program (CRP) and Wildlife Habitat Incentives Program (WHIP) (Information Technology [IT]).

        ii. Analyze existing areas of habitat to determine potential breeding areas – unlike woodcock, species does not have its own strategic plan; analyze breeding bird survey data to focus efforts (CPA, Partners for Fish and Wildlife [PFW], [IT]).

        iii. Create map for possible bobolink sites of concern (IT).

2. **Wind energy projects.**

    a. Strategy will depend on results of research need noted above.

3. **Predation.**

    a. Strategy will depend upon results of research need noted above.

4. **Climate change.**

    a. Strategy will depend upon results of research need noted above.

Partners/potential funding:

DU, land trusts, NGO, refuges, USGS, NYSDOT, NRCS, NYSDEC, TNC, Cornell Laboratory of Ornithology, Audubon New York, universities

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats FY2010-2012.

1. **Habitat loss and fragmentation.**

    a. Provide substantive Federal agency comments on proposed Federal agency actions with likely adverse impacts to bobolink and/or their habitat.

        i. Seek to minimize loss of habitat due to contamination by influencing regulatory agency decisions related to State and Federal Superfund sites by providing substantive Federal agency comments on proposed actions with likely adverse impacts to bobolinks and/or their habitat (2011-2013). |FY11-FY13 $0 DEL EC ASR Ongoing

    b. Post on New York Field Office (NYFO) web site fact sheets with BMP to minimize impacts to bobolink and/or their habitat.

    c. Restore 50 acres of early successional grassland habitat to benefit bobolink and other birds with similar habitat needs at project site patch size of ≥10 acres (PFW). |FY12-FY13 $10,000 DEL PFW CS Ongoing

    d. Manage Buffalo/Niagara Rivers NRDAR case. |FY11-FY13 $0 DEL EC ASR Ongoing

        i. Continue settlement negotiations with the Buffalo River potentially responsible parties. |FY11-FY13 $0 DEL EC ASR Ongoing

2. **Collision with wind energy projects.**

    a. Delivery will depend upon strategy determined from research noted above.

3. **Predation.**

    a. Delivery will depend upon strategy determined from research noted above.

4. **Climate change.**

    a. Delivery will depend upon strategy determined from research noted above.

Partners/potential funding:

DU, land trusts and NGO, refuges, USGS, NYSDOT, NRCS, NYSDEC, TNC, Cornell Laboratory of Ornithology, Audubon New York, universities

OUTREACH

Potential outreach needs:

- PFW Landowner Handouts
- NYFO Outreach (traveling exhibits)
- Local Newspaper/TV
- DU *Flyways* articles
- Other Federal and State agency referrals/coordination
- Working with NGO (land trusts, TNC)

Partners/potential funding:

DU, land trusts and NGO, refuges, USGS, NYSDOT, NRCS, NYSDEC, TNC, Cornell Laboratory of Ornithology, Audubon New York, universities

MONITORING

Develop protocols to measure progress/success of all conservation delivery activities.

Work with partners to identify leads for accomplishing monitoring activities.

Develop best management practices (BMP) from results of monitoring to inform future bobolink population restoration activities.

References

Atlantic Coast Joint Venture. 2007. Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Region (BCR 13). Atlantic Coast Joint Venture, U.S. Fish and Wildlife Service, Sunderland, Massachusetts.

Martin, S.G. and T.A. Gavin. 1995. Bobolink (*Dolichonyx oryzivorus*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/176.

Bobolink (*Dolichonyx oryzivorus*): Great Lakes Focal Area

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Rosenberg. K.V. 2000. Partners in Flight Landbird Conservation Plan: Physiographic Area 18: St. Lawrence River Plain. Version 1.0. Draft. 10 August 2000. (http://www.partnersinflight.org/bcps/plan/pl_18_10.pdf).

USFWS. 2007. Final Draft Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Area (BCR 13). January, 2007. (http://www.acjv.org/BCR_13/BCR13_Final_Plan_July07.pdf).

Existing strategies for bobolink restoration:

Please refer to the following documents for exiting strategies:

- Partners in Flight Landbird Conservation Plan: Physiographic Area 18: St. Lawrence Plain (Rosenberg 2000) http://www.blm.gov/wildlife/plan/pl_18_10.pdf.

- A Plan for Conserving Grassland Birds in New York," Final Report to NYSDEC (Morgan & Burger 2008) http://ny.audubon.org/PDFs/ConservationPlan-GrasslandBirds-NY.pdf.

- Partners in Flight North American Landbird Conservation Plan http://www.partnersinflight.org/cont_plan/.

- NYS Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf.

- Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Region (USFWS 2007) http://www.acjv.org/BCR_13/BCR13_Final_Plan_July07.pdf.

Bobolink Management Recommendations (NAS 2009):

- Create large habitat patches (greater than 20 acres) and minimize woody edges whenever possible. Suitable habitat includes grasslands of moderate height (8-12") and density, with adequate litter.

- Protect nesting habitat from disturbance during the breeding season (early May to August 1) by postponing haying, burning, and moderate or heavy grazing.

- Perform management activities in early spring, several weeks prior to the arrival of adults on the breeding grounds, or in the late summer or fall after the breeding season.

Bobolink (*Dolichonyx oryzivorus*): Great Lakes Focal Area

- Use a rotating management schedule on several nearby grassland fragments to provide a variety of habitat conditions. Adjacent patches of similar habitat provide refuge for fledglings to escape from mowed areas and for late-nesting females.

- Create or maintain patches of relatively sparse, grass-dominated vegetation resembling old hayfields (more than 8 years since planted).

- Encourage scattered forbs, such as clover, for nest-site cover and also for seeds and host plants for various invertebrates, which are critical for feeding rapidly growing nestlings.

- Mow or burn patches every 2-3 years to prevent development of woody vegetation.

- Avoid disturbance of suitable habitat (e.g., mowing) during the breeding season, May 1 to August 1.

Bog Turtle (*Clemmys [=Glyptemys] muhlenbergii*): Great Lakes Focal Area

Bog Turtle Species Action Plan

FOCAL AREA: GREAT LAKES

Other species benefitting:

spotted turtle, bog buckmoth, fen plant communities including Eastern Larch, black huckleberry, *Vaccinium corymbosum, Acer rubrum, Carex lasiocarpa, Sphagnum spp.*

BIOLOGICAL PLANNING

Introduction to species

Species information: Bog turtles often hibernate communally with other bog turtles and with spotted turtles. The bog turtle emerges from hibernation which is often spent in an abandoned muskrat lodge or other burrow, by mid-April, when both the air and water temperatures exceed 50ºF. Sexual maturity may be reached between 8-11 years old. Mating occurs in the spring (primarily) or fall and may be focused in or near the hibernaculum (winter shelter). In early to mid-June, a clutch of two to four eggs is laid in a nest (tussocks). The eggs hatch around mid-September and the adults enter hibernation in late October. Bog turtles live for 30 years or more in wetland (fen) communities and may use adjacent upland areas. Although generally very secretive, the bog turtle can be seen basking in the open, especially in the early spring just after emerging from hibernation. It is an opportunistic feeder, although it prefers invertebrates such as slugs, worms, and insects. Seeds, plant leaves, and carrion are also included in its diet.

Justification for species selection: The bog turtle was Federally-listed as threatened in 1997 and listed as endangered by the State of New York. The bog turtle is a U.S. Fish and Wildlife Service (USFWS) Spotlight Species and Region 5 of the USFWS has a new bog turtle initiative.

State contribution to overall species population: There are 2 Recovery Units (RU) in New York – the Prairie Peninsula/Lake Plain (PPLP) RU (NY has all known extant sites) and the Hudson Housatonic RU.

Threats and threat assessment:

Threats[9] (See 5-year review for full assessment):

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Residential and commercial development continues to be a leading cause of habitat loss and degradation. Most direct effects to bog turtles and their habitat are now avoided. Indirect effects to wetlands remain.

[9] Refers to 5 listing factors A-E in Section 4 of Endangered Species Act

Bog Turtle (*Clemmys [=Glyptemys] muhlenbergii*): Great Lakes Focal Area

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:

A. Collection is an ongoing threat.

Factor C. Disease or predation:

A. New concerns about potential disease issues in New York and Massachusetts.

B. Predation is a threat at certain sites.

Factor D. The inadequacy of existing regulatory mechanisms:

A. Continues to pose a threat.

Factor E. Other natural or manmade factors affecting its continued existence:

A. Beaver use of sites, weather events (flooding, drought)

B. Invasive species.

C. Climate change may or may not be a threat to the species. (consider Kevin Schumacher's research at State University of New York-College of Environmental Science and Forestry [SUNY-ESF])

Recovery Goals

Range-wide Recovery Goals/Objectives: Protect and maintain the northern population of this species and its habitat, enabling the eventual delisting of the species.

Conservation goal(s) for New York State: Long-range protection is secured for at least 10 populations in PPLPRU. We have 5 extant populations in New York.

Research/Actions needed:

A. Determine goal, with the Pennsylvania Field Office (PAFO), for NY/PA for PPLPRU. |FY11 $0 BP ESA SLD Ongoing

B. Conduct surveys to re-evaluate the presence of bog turtles at historical sites in PPLPRU (Recovery Action 3.3.1) and conduct surveys to locate additional populations of bog turtles (Recovery Action 3.4)

   1. SUNY-Oswego 2010 Great Lakes Restoration Initiative (GLRI) Phase 1 survey project.

a. Provide technical assistance for GLRI funding request for SUNY-Oswego proposal to address Action 3.4 and possibly Action 3.3.1 in Wayne and Cayuga Counties. |FY10 $0 BP ESA RAN Completed

b. Develop grant agreement. |FY10 $0 BP ESA RAN Completed

c. Manage grant agreement. |FY11 $0 BP ESA RAN Completed

2. Provide technical assistance to SUNY-Oswego to develop follow-up proposal for Phase 2 surveys for GLRI grant. |FY10 $0 BP ESA RAN Completed

C. Monitor status of and threats to extant populations (Recovery Actions 3.5 and 6.1)

1. Monitoring of potential new disease is needed – work being done in Hudson Valley.

2. Conduct bog turtle surveys at all extant sites.

a. Develop a schedule and assign monitors to adopt an extant site.

3. Develop a site plan for restoration of the Westbury Site; implementation contingent on landowner approval (Who: USFWS, SUNY-Oswego) (Partners for Fish and Wildlife [PFW], ESA). |FY11 $0 BP ESA SLD Completed

CONSERVATION DESIGN

Strategies for addressing those threats

Please go to these documents for the existing strategies:

- Recovery Plan completed 2001 (Service 2001)
- 5-year review drafted 2008 (Service 2008)
- Spotlight Species Action Plan 2009 (Service 2009)
- Subunit Team Plan (2011)

Research or Actions needed: Specific actions for the next 3 years addressing conservation design include the following:

A. Participate in Rangewide Bog Turtle Initiative (NYFO ESA, PFW). |FY11 $0 DES ESA RAN Completed

1. Participate in conference calls [ongoing]. |FY11 $0 DES ESA RAN,NR,SLD Completed

2. Attend March 10, 2010, meeting [completed FY2010].

3. Assist Alison Whitlock (RO) in planning and convening next workshop. |FY11 $0 DES ESA NR,SLD Completed

4. Attend November BT meeting. |FY11 $0 DES ESA SLD,NR Completed

B. In each recovery unit, identify and prioritize sites for appropriate conservation efforts (Recovery Action 2.1) **All sites are priorities in PPLPRU at this time given the number of sites**

1. Initiate PPLPRU recovery implementation team. |FY11 $0 DES ESA SLD Completed

2. Develop a PPLPRU recovery implementation plan by August 1, 2011. |FY11 $0 DES ESA SLD Completed

3. Develop site-specific management plans for each extant site is needed.

C. Conduct research/studies to understand and identify the degree to which land-use activities alter bog turtle habitat (Recovery Action 6.2).

1. Conduct research to help understand indirect effects such as hydrological changes from residential and commercial development.

a. Request U.S. Geological Survey (USGS) Science Support Partnership (SSP) funding through Fish and Wildlife Information Needs and Studies (FWINS) posting (ES).

D. Provide assistance to Regional Coordinator for development of 5-year review. |FY11 $0 DES ESA SLD Completed

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats FY2010-2012

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Protect bog turtle sites through purchase and conservation easements (Recovery Action 2.3).

1. Provide technical assistance to partners that may be able to protect sites (Recovery Land Acquisition grant, New York State Department of Environmental Conservation [NYSDEC] Environmental Protection Fund (EPF), The Nature Conservancy [TNC], or land trusts).

2. Target Section 404 mitigation projects

B. Improve the effectiveness of regulatory reviews in protecting bog turtles and their habitats, specifically to address agencies working at cross purposes when permitting activities in wetlands (Recovery Action 1.2) and avoid and minimize direct and indirect adverse effects to bog turtles and their habitat (Recovery Action 1.3)

1. Develop standardized avoidance, minimization, and compensation measures (AMM). |FY11 $0 DEL ESA SLD Completed

   a. Utilize materials on pipelines (AMMs, best management practices [BMP] from NiSource Habitat Conservation Plan [HCP]) to develop pipeline fact sheet. |FY11 $0 DEL ESA SLD Future

2. Identify opportunities to add features promoting bog turtle conservation for Clean Water Act (CWA) section 404 compensatory mitigation permit requirements for development projects in counties with bog turtle populations, and

3. Once identified, provide substantive comments on measures to avoid and minimize direct and indirect effects, including those effects associated with development that originate in uplands.

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes: No work in PPLPRU planned in next 2-3 years.

Factor C. Disease or predation: Funding health assessment with Wildlife Conservation Society (WCS) - no samples planned from PPLPRU at this time.

Factor D. The inadequacy of existing regulatory mechanisms: No work planned in next 2-3 years.

Factor E. Other natural or manmade factors affecting its continued existence:

A. Manage, restore, and maintain bog turtle habitat, as appropriate (Recovery Action 6.4) and control succession and invasive exotic plants (Recovery Action 6.3.1).

1. Consult with SUNY-Oswego (Dr. Rosenbaum) and NYSDEC to identify priority sites for invasive plant control. |FY11 $0 DEL ESA SLD Completed

2. **Site A**

   a. Conduct site visit - October 2009 (completed).

   b. Identify necessary restoration activities - October 2009 (completed)

c. Develop site plan for implementation of restoration .|FY11 $0 DEL ESA

d. Develop GLRI project proposal if NYSDEC is interested (PFW).

OUTREACH

Current ideas include:

- Update website with BMP. |FY11-FY14 $0 OUT ESA SLD Future
- Target nature centers located in the recovery unit and research the need for educational opportunities. |FY11-FY14 $0 OUT ESA SLD Future
- Design outreach exhibit to inform the public on bog turtle life history, threats (including Climate Change), avoidance, minimization, and conservation measures.

MONITORING

Review and track recovery progress.

Partners

NYSDEC, New York Natural Heritage Program (NYNHP), Natural Resources Conservation Service (NRCS), Finger Lakes Land Trust, The Nature Conservancy (TNC), New York State Department of Transportation (NYSDOT), U.S. Army Corps of Engineers (USACE)

References

U.S. Fish and Wildlife Service. 2001. Bog Turtle (*Clemmys muhlenbergii*) Northern Population Recovery Plan. Hadley, Massachusetts. 103 pp.

U.S. Fish and Wildlife Service. 2008. Draft Bog Turtle Northern Population 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service, State College, Pennsylvania

U.S. Fish and Wildlife Service. 2009. Draft Spotlight Species Action Plan.

Broad-winged Hawk (*Buteo platypterus*): Great Lakes Focal Area

Broad-winged Hawk Species Action Plan

FOCAL AREA: GREAT LAKES

Other species benefitting:

bald eagle, red-shouldered hawk, red-tailed hawk, turkey vulture, Cooper's hawk, sharp-shinned hawk (buteos and accipiters in general), long-eared owl

BIOLOGICAL PLANNING

Introduction to species

Species information: The broad-winged hawk is a small, stocky buteo. It is one of the few North American raptors that flock during migration. It is a common breeder in large deciduous or mixed-deciduous forests throughout northeastern and north central North America (Goodrich et al. 1996). During breeding, the broad-winged hawk is secretive or rather, unobtrusive. It lives mainly in the woods, beneath the canopy or hidden among the foliage. Often one is made aware of it only through its call. Its food consists mainly of snakes, mice, frogs, and insects. Most breeding occurs in Canada, and requires large tracts of forest. Most broad-winged hawks breeding in the eastern United States and southeastern Canada migrate to wintering grounds in southern Central America and central South America (Hawk Mountain 2004). During the migration, the broad-winged hawk is seen in large congregations, and when wind conditions are ripe, form "kettles" of soaring raptors. Birds that congregate in large numbers like this species are vulnerable to catastrophic harm (e.g. if a wind power project were poorly sited in a migratory pathway, collision with a large number of birds possible).

Justification for species selection: Broad-winged hawk populations have been decreasing since the 1980s and the species is representative of other migratory raptors. Most raptors are not adequately covered by current monitoring methods, so basic distributions, population estimates, and trend data are lacking for many raptors during the appropriate seasons – breeding, migration, staging, or wintering. Targeted monitoring programs should be established to understand the status of those species that require them, especially if there is evidence that the species has suffered or is suffering either long-term or dramatic population declines. Hawk Mountain broad winged hawk status report, 2007. http://hawkmountain.org/media/broadwingCSR_June07.pdf. Prominent spring migration locations occur along the southern shores of Lake Erie and Lake Ontario in New York, which is an area of high potential wind energy development. In addition, New York contains very important wintering habitat. The Bird Conservation Region (BCR) 13 (Lower Great Lakes/St. Lawrence) population is estimated at 3,000 individuals (in New York).

State contribution to overall species population: Range extends across New York. State estimated population of 32,000 individuals.

Threats and threat assessment:

1. **Loss of habitat due to urbanization and development** (especially along the lakeshore).

2. **Fragmentation of habitat** (wind power projects, pipelines, transmission lines along migration, corridors and stop over habitat).

3. **Collision or habitat loss** from wind energy projects.

4. **Energy development** (nuclear).

5. **Predation.**

6. **Changes in habitat community structure** and changes in prey base during breeding and migration seasons, including declines in amphibian populations (National Audubon Society [NAS] 2009).

7. **Changes in species distribution and population sizes** due to climate change.

   Research needed:

   - Research is needed to determine climate change impacts on habitat community structure and changes in prey base during breeding and migration seasons.

   - Research is also needed to determine changes in species distribution and population sizes due to climate change.

     (WHO: U.S. Fish and Wildlife Service [USFWS] Landscape Conservation Cooperative [LCC] proposal for landscape scale evaluation of this species which is representative of many migratory raptors)

Partners/potential funding:

Haudenosaunee Confederacy, U.S. Geological Survey (USGS), Natural Resources Conservation Service (NRCS), New York State Department of Environmental Conservation (NYSDEC), County Soil and Water Conservation Districts (SWCD), The Nature Conservancy (TNC), Audubon New York, Cornell Lab of Ornithology, New York State Department of Transportation (NYSDOT), utilities, Buffalo Niagara Riverkeeper, Niagara Greenway Committee, State University of New York-College of Environmental Science and Forestry (SUNY-ESF), Hawk Watch Coordinators (Ripley, Derby Hill, etc.), Braddock Bay Banding Station

Population goal(s) for New York State:

Maintain/increase basin populations

- Maintain stable regional populations

- Increase breeding pairs

Research needed:

- Establish targeted monitoring of population status of forest breeding raptors to establish population goals.

Broad-winged Hawk (*Buteo platypterus*): Great Lakes Focal Area

- Conduct studies of reproductive success, lingering impacts of pesticide use, prey population levels, habitat characteristics of nest sites, migration areas, preferred foraging areas, and interactions with competitors.

  (WHO: USFWS proposal to LCC for landscape scale evaluation)

CONSERVATION DESIGN

Strategies for addressing those threats

1. **Loss of sufficient quantity/quality of habitat** and/or fragmentation of habitat

   a. Prioritize permit review in breeding areas of this species (forests and lakeshore) and influence regulatory agency decisions regarding projects that will result in loss of habitat and habitat functions for this species (Conservation Planning Assistance [CPA]). |FY12 $0 DES CPA TRS Ongoing

   b. Participate in and support yearly migration monitoring and surveys. |FY11 $0 DES CPA TRS Completed

   c. Prioritize enhancement and restoration projects (forest & lakeshore) that would benefit this species (Partners for Fish and Wildlife [PFW]).

   d. Initiate discussions regarding a thorough inventory of potential nest sites and preferred migration and foraging area habitats to determine the most important sites for this species, including information on number of territorial pairs and reproductive outcome.

   e. Work with partners to study reproductive success, lingering impacts of pesticide use, prey population levels, habitat characteristics of nest sites and preferred foraging areas, and interactions with competitors. |FY? $0 DES EC ALS Future

   f. Use telemetry to monitor distributions and identify essential habitats.

   g. Analyze existing areas of habitat and recently altered forest landscapes to determine potential breeding areas for this species.

   h. Obtain breeding bird survey data for this species to focus efforts. |FY12 $0 DES CPA TRS Planned

   i. Create map or shapefile for possible broad-winged hawk sites for all New York Field Office (NYFO) programs.

2. **Collision or habitat loss** from wind energy projects.

   a. Review wind energy projects to minimize impacts to this species (by directing turbine placement away from large tracts of intact forest away from the lakeshore areas (CPA). |FY12 $0 DES CPA TRS Ongoing

Broad-winged Hawk (*Buteo platypterus*): Great Lakes Focal Area

3. **Energy development (nuclear).**

    a. Review energy development projects proposed in near lakeshore areas, and in large intact blocks of forest habitat (CPA). |FY12 $0 DES CPA TRS Ongoing

4. **Predation.**

    Additional studies are needed to assess the degree to which predation impacts the species.

5. **Changes in habitat community structure** and changes in prey base.

    a. Seek to influence regulatory agency decisions by providing input into conservation measures that would minimize impacts of development in forested areas near the lakeshore (CPA). |FY12 $0 DES CPA TRS Ongoing

6. **Climate change.**

    a. Strategy will depend on results of research need noted above. Seek to influence regulatory agency decisions by providing comments on projects that may result in long-term impacts on habitat structure (CPA).

Partners/potential funding:

Haudenosaunee Confederacy, USGS, NRCS, NYSDEC, County SWCD, TNC, Audubon New York, Cornell Lab of Ornithology, NYSDOT, utilities, Buffalo Niagara Riverkeeper, Niagara Greenway Committee, SUNY-ESF, Hawk Watch Coordinators (Ripley, Derby Hill, etc.), Braddock Bay Banding Station

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats FY 2010 – 2012

1. **Loss of sufficient quantity/quality of habitat** and/or fragmentation of habitat.

    a. Provide substantive Federal agency comments on proposed Federal agency actions (including land development) with likely adverse impacts to this species and/or its habitat (CPA). |FY12 $0 DEL CPA ? Ongoing

    b. Participate in and support yearly migration monitoring and surveys.

        i. Participate in Hawk Watch sites/banding stations (Derby Hill and Ripley [CPA] [T. Sullivan]). |FY11 $0 DEL CPA TRS Completed

        ii. Support Hawk Watch sites/banding stations (CPA).

    c. Develop information related to minimizing the impacts of development, land management, and silviculture on forest raptors, and post on NYFO web site.

i. Develop Fact Sheets with best management practices (BMP) to minimize impacts to broad-winged hawks from silvicultural activities, and use these to influence landowners regarding habitat needs of this species and to encourage landowner protection of forests.

2. **Collision or habitat loss** from wind energy projects.

   a. Provide substantive Federal agency comments on proposed Federal actions regarding wind energy projects to minimize impacts to this species (CPA).

      i. Coordinate with other offices involved in wind power project siting to assess potential for additive effects to the species in other parts of the species range, including the length of their migratory routes (through Pennsylvania for example) (CPA). |FY12 $0 DEL CPA TRS Ongoing

3. **Energy development** (nuclear).

   a. Review energy development projects proposed in near lakeshore areas and in large intact blocks of forest habitat (CPA).

      i. If expansion of the facilities at Nine Mile Point, Oswego County, goes forward, work with other agencies and the developer to provide for continued availability of broad-winged hawk breeding, foraging, and resting areas along the south shore of Lake Ontario. Provide recommendations for forest patch size that needs to be maintained and habitat connections to wetlands for foraging (CPA). |FY12 $0 DEL CPA SLD Future

4. **Predation.**

   No work is planned to address this threat; more information will be available once further studies are conducted.

5. **Changes in habitat community structure** and changes in prey base.

   a. Seek to influence regulatory agency decisions.

      i. Seek to ensure that new developments provide for conservation areas including large tracts of intact forest habitat with conservation and protection of wetlands ensured. Seek to minimize use of pesticides in new developments to ensure viable populations of amphibian prey; minimize use of pesticides to control mosquitoes. Sprays will also impact larger insects which are an important prey item for broad-winged hawks (CPA and Environmental Contaminants [EC]).

      ii. Provide recommendations to minimize use of pesticides in new developments to ensure viable populations of amphibian prey. |FY12-FY13 $0 DEL CPA,EC TRS,ALS Planned

      iii. Provide recommendations to minimize use of pesticides to control mosquitoes. Sprays will also impact larger insects which are an important prey item for

broad-winged hawks (CPA and Environmental Contaminants [EC]). |FY12-FY13 $0 DEL CPA,EC TRS,ALS Planned

6. **Climate change.**

    a. Delivery will depend upon strategy determined from research above.

Partners/potential funding:

Haudenosaunee Confederacy, USGS, NRCS, NYSDEC, County SWCD, TNC, Audubon New York, Cornell Lab of Ornithology, NYSDOT, utilities, Buffalo Niagara Riverkeeper, Niagara Greenway Committee, SUNY-ESF, Hawk Watch Coordinators (Ripley, Derby Hill, etc.), Braddock Bay Banding Station

OUTREACH

Potential outreach needs:

- Landowner education
- Public involvement
- Promote wind power traveling exhibit
- Create Fact Sheet
- Meet with non-governmental organizations (NGO) such as Hawk Watch groups, Audubon chapters, etc., to deliver conservation message

Partners/potential funding:

Haudenosaunee Confederacy, USGS, NRCS, NYSDEC, County SWCD, TNC, Audubon New York, Cornell Lab of Ornithology, NYSDOT, utilities, Buffalo Niagara Riverkeeper, Niagara Greenway Committee, SUNY-ESF, Hawk Watch Coordinators (Ripley, Derby Hill, etc.), Braddock Bay Banding Station

MONITORING

- Develop protocols to measure success of all conservation delivery activities.

- Work with partners to identify leads for accomplishing monitoring activities.

- Develop best management practices from results of monitoring to inform future broad-winged hawk population restoration activities.

References

Dettmers, R. and K.V. Rosenberg. 2003. Partners in Flight Landbird Conservation Plan: Physiographic Area 15: Lower Great Lakes Plain. Version 1.1: August 2003. (http://www.partnersinflight.org/bcps/plan/pl_15_10.pdf).

Broad-winged Hawk (*Buteo platypterus*): Great Lakes Focal Area

Goodrich, L.J., S.C. Crocoll, and S.E. Senner. 1996. Broad-winged Hawk (*Buteo* platypterus), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/218.

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National Audubon Society. 2009. Broad-winged hawk: Guidance for Conservation. Audubon New York, Ithaca, New York. Accessed 8 March 2010. (http://ny.audubon.org/PDFs/HRVC_BROADWINGEDHAWK.pdf).

NYSDEC. 2005. Comprehensive Wildlife Conservation Strategy: A Strategy for Conserving New York's Fish and Wildlife Resources, Final Submission Draft, September 2005. (http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf).

Robertson, B. and K.V. Rosenberg. 2003. Partners In Flight Landbird Conservation Plan: Physiographic Area 24: Allegheny Plateau. Version 1.1: August 2003 (http://www.partnersinflight.org/bcps/plan/pl_24_10.pdf).

USFWS. 2007. Final Draft Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Area (BCR 13). January, 2007. (http://www.acjv.org/BCR_13/BCR13_Final_Plan_July07.pdf).

Existing strategies for broad-winged hawk restoration:

Please refer to the following documents for existing strategies:

- Partners in Flight Landbird Conservation Plan: Physiographic Area 15: Lower Great Lakes Plain (Dettmers and Rosenberg 2003)
  http://www.partnersinflight.org/bcps/plan/pl_15_10.pdf.

- NYS Comprehensive Wildlife Conservation Strategy (NYSDEC 2005)
  http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf.

- Bird Conservation Plan for the Lower Great Lakes/
  St. Lawrence Plain Bird Conservation Region (USFWS 2007)
  http://www.acjv.org/BCR_13/BCR13_Final_Plan_July07.pdf.

- Broad-winged Hawk Conservation Status Report (Hawk Mountain 2007)
  http://hawkmountain.org/media/broadwingCSR_June07.pdf.

Brook Trout (*Salvelinus fontinalis*): Great Lakes Focal Area

Brook Trout Species Action Plan

FOCAL AREA: GREAT LAKES

Other species benefitting:

American eel, American shad, longtail salamander, wood turtle

BIOLOGICAL PLANNING

Introduction to species

Species information: The brook trout is a native salmonid that prefers cold, clean streams in eastern North America and is the only native trout that inhabits this habitat. The species prefers clear waters of high purity and a narrow *p*H range in lakes, rivers, and streams, being sensitive to poor oxygenation, pollution, and changes in *p*H caused by environmental effects, such as acid rain. Its diverse diet includes crustaceans, frogs and other amphibians, insects, molluscs, smaller fish, and even small aquatic mammals such as voles. The brook trout is a short-lived species, rarely surviving beyond 4 or 5 years in the wild.

Intact stream populations of brook trout, where wild brook trout occupy > 90% of historical habitat, exist in only 5% of the watersheds assessed in 2005 by the Eastern Brook Trout Joint Venture (EBTJV) (see below). Populations of stream-dwelling brook trout are greatly reduced or have been extirpated from nearly half of the watersheds in their native range. The vast majority of historically occupied large rivers no longer support self-reproducing populations of brook trout. In New York, 5% of the watersheds that historically contained brook trout in streams and rivers remain intact, located primarily in portions of the Adirondacks and the Tug Hill Plateau. Western and South Central New York have suffered the greatest losses of brook trout. Data gaps remain in the central part of the State from Albany to Syracuse. While many lakes and ponds still contain brook trout, losses have been substantial due to competition with non-native fish and acid deposition, particularly in parts of the State where soils and bedrock provide little buffering capacity to offset acid precipitation. Furthermore, the EBTJV has identified several sub-watersheds as highest priority for protection of brook trout populations.

Justification for species selection: The brook trout is a highly prized native sport fish**,** but intact populations of brook trout exist in only 5% of sub-watersheds in New York. Brook trout are an excellent sentinel of water quality and will also likely be a sentinel of the effects of climate change over the next century. Heritage brook trout populations are designated as a New York State (NYS) species of greatest conservation need, and the U.S. Fish and Wildlife Service (USFWS) and New York State Department of Environmental Conservation (NYSDEC) are partners in the EBTJV. The EBTJV is a partnership of State and Federal agencies, nongovernmental organizations (NGO), and academic institutions. This collaborative approach to brook trout management is justified because: (1) brook trout are declining across their entire eastern range; (2) causes for these declines are similar; (3) an integrated approach would be cost effective; and, (4) watersheds of concern span state borders and state and Federal jurisdictions.

Brook Trout (*Salvelinus fontinalis*): Great Lakes Focal Area

State contribution to overall species population: Currently there are over 400 lakes and ponds that are managed by the NYSDEC for native and stocked brook trout, in which 100 or so contain naturally-reproducing brook trout. In addition, thousands of miles of tributary streams in the Adirondacks, Tug Hill Region, and Catskill Mountains, and a lesser number in western New York, east of the Hudson River, on Long Island, and in the Upper Susquehanna watershed support brook trout. Although watershed-wide population numbers are not known for the Great Lakes watershed, several sub-watersheds (HUC12s) support healthy populations of native brook trout.

Research needed:

- Conduct surveys to determine current population levels and presence/absence.

(Who: NYSDEC and Trout Unlimited (TU) to assist with brook trout surveys to determine presence/absence and population densities, coupled with habitat investigation; Cost: use existing staff)

- Determine genetic diversity of brook trout in the watershed.

(Who: Lamar Fish Health Unit, EBTJV; Cost: unknown at this time)

Threats and threat assessment:

1. **Loss of habitat and habitat function**; habitat degradation and alteration-nutrients, sediment, development/clearing of riparian zone (medium/low threat, agriculture; medium threat, urbanization).

   Research needed:

   - Extensive and frequent stream surveys to determine population size.
   - Identify priority stream reaches for habitat restoration by evaluating water quality criteria, habitat, and other requirements of brook trout.
   - Need to locate heritage streams and heritage populations.

     (Who: U.S. Geological Survey [USGS], EBJTV, NYSDEC; Cost: unknown at this time)

2. **Barriers to Migration** (including dams and impassable culverts).

   Research needed:

   - Assess importance of isolating heritage populations versus providing passage for stocked brook trout and other salmonids.

- Identify which known barriers are having an influence on brook trout distribution.

3. **Competition from non-native salmonids.**

   Research needed:

   - Assess impact of competition from stocked and/or naturally reproducing non-native salmonids. Competition/interbreeding with stocked brook trout.

   - Determine genetic diversity of brook trout in the watershed.

4. **Climate change; increased water temperatures.**

   Research needed:

   - Identification of climate change related impacts to brook trout.

Partners/potential funding:

NYSDEC, New York State Office of Parks, Recreation & Historic Preservation (NYSOPRHP), TU, County Soil and Water Conservation Districts (SWCD), The Nature Conservancy (TNC).

Population goal(s) for New York State:

The EBTJV has numerous conservation goals, including "Conserve, enhance or restore brook trout populations", and "…to perpetuate and restore brook trout populations throughout their historic range"; however, specific population goals have not been quantified. Although population goals have not been established for New York, the NYFO will continue to collaborate with EBTJV, USGS, and NYSDEC to establish target population numbers for the Great Lakes watershed. Establishing population goals remains a research need.

CONSERVATION DESIGN

Strategies for addressing those threats

1. **Loss of habitat.**

   a. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding stream relocation and modifications, including bulkheading; operation of hydroelectric power producing facilities; and, "unnatural" erosion mitigation practices, agricultural practices that diminish stream and wetland values for wildlife, dredging, and placement of fill in streams and wetlands.

   b. Target USFWS habitat restoration and enhancement projects to benefit brook trout, including adding enhancements to natural stream design projects (including planting trees and shrubs to provide shade for water temperature control); promoting habitat

restoration projects which also control sediment entering streams; provide technical assistance on stream restoration projects via natural stream design in the watershed (Partners for Fish and Wildlife [PFW]). Be mindful of the need to consider providing additional access to heritage streams if they are blocked in a way that keeps stocked fish out.

c. Facilitate habitat preservation through coordination with land trusts.

d. Preserve, restore, and/or enhance streams known to support heritage strains of brook trout.

e. If possible, use Natural Resource Damage Assessment and Restoration (NRDAR) funds to restore and protect streams identified. |FY? $0 DES EC ASR Future

f. Respond as appropriate to spills impacting fish and wildlife resources. |FY12-FY14 $0 DES EC ALS Planned

g. Seek to minimize loss of habitat function when habitat is degraded by adjacent land uses by influencing regulatory agency decisions.

2. **Barriers to migration** (including dams and impassable culverts).

   a. Working with partners, identify and remove barriers.

   b. Work with New York State Department of Transportation (NYSDOT) and Federal Highway Administration (FHWA) to develop criteria for designation of culverts, the modification of which would improve brook trout passage.

   c. Work with NYSDOT and FHWA to correct bridge abutments from being undermined by stream erosion; design and construct natural stream design features that will change stream bottom elevation and facilitate fish passage.

3. **Competition from non-native salmonids.**

   a. Target USFWS natural stream design stream restoration projects for smaller streams most likely to support only one or two salmonid species.

4. **Climate change; increased water temperatures.**

   a. Identify sub-watersheds likely to be refugia for cold water fish in the future, and protect or restore the habitat for brook trout.

   b. Design and construct habitat enhancement projects which provide increased flow, stream shading, pool cover, and increased availability of riffle habitat

Brook Trout (*Salvelinus fontinalis*): Great Lakes Focal Area

Partner organizations:

NYSDEC, NYSOPRHP, TU, Allegheny County SWCD, Cattaraugus County SWCD, Chautauqua County SWCD, TNC, Chautauqua Watershed Conservancy.

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY 2010 – 2012

1. **Loss of habitat.**

   a. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding wetland draining, stream relocation, and modifications, including bulkheading; operation of hydroelectric power producing facilities; and, "unnatural" erosion mitigation practices, agricultural practices that diminish stream and wetland values for wildlife, dredging, and placement of fill in streams and wetlands.

      i. Developing fact sheets and best management practices (BMP) to minimize impacts to brook trout from a suite of different construction activities.

      ii. Post these fact sheets/BMP on our website.

      iii. Manage Buffalo/Niagara Rivers NRDAR case. |FY11-FY13 $0 DEL EC ASR Ongoing

      iv. Continue settlement negotiations with the Buffalo River potentially responsible parties (PRP). |FY11-FY13 $0 DEL EC ASR Ongoing

      v. If/when possible, use NRDAR funds toward brook trout habitat restoration. |FY11-FY13 $0 DEL EC ASR Ongoing

      vi. Provide substantive comments on proposed Federal agency actions with likely adverse impacts on brook trout (Conservation Planning Assistance [CPA], Environmental Contaminants-Biological Technical Assistance Group to U.S. Environmental Protection Agency [USEPA] FY 2011-2013) (CPA and Environmental Contaminants [EC]). |FY11-FY13 $0 DEL CPA,EC TRS,ASR Ongoing

      vii. Develop a poster for the New York State Wetlands Forum that targets brook trout conservation.

      viii. Develop recommendations and BMPs for culvert design and placement of structures based on NYS Culvert Working Group recommendations, the U.S. Forest Service's Stream Simulation Model, and Fish-Xing software, via CPA review (CPA). |FY11-FY13 $0 DEL CPA ? Ongoing

ix. Develop stream buffer guidelines/BMPs and post on website.

b. Target USFWS habitat restoration and enhancement projects to benefit brook trout, including adding enhancements to natural stream design projects (including planting trees and shrubs to provide shade for water temperature control); promoting habitat restoration projects which also control sediment entering streams; provide technical assistance on stream restoration projects via natural stream design in the watershed (PFW).

i. Add enhancements to natural stream design projects, including planting trees and shrubs to provide shade for water temperature control (CPA, PFW) (Funding – base funds, partnership with NYSDOT-PFW).

ii. Restoration work via natural stream design on about 0.5 miles of Salmon River and tributaries in FY2011 (total is about 1.5 miles). (PFW with funding from base funds, Great Lakes Restoration Initiative [GLRI] money through LGLFWCO and NYSDOT) (2011). |FY11-FY12 $0 DEL PFW CS Ongoing

iii. Restoration work via natural stream design on 2, 200 feet of Clear Creek. (PFW with funding from base funds, GLRI money through LGLFWCO, NYSDEC, NYSDOT) (2011). |FY11-FY12 $0 DEL PFW GD Ongoing

iv. Restoration work via natural stream design on 0.5 miles of Sandy Creek (PFW with funding from base funds, GLRI money through LGLFWCO and NYSDOS, NYSDOT, Jefferson County SWCD, Tug Hill Commission) (2011). |FY11-FY12 $0 DEL PFW CS Ongoing

v. Restoration work via natural stream design on 0.5 miles of Chittenango Creek (PFW with funding from base funds and NYSDOT) (2011). |FY11-FY12 $0 DEL PFW CS Ongoing

c. Facilitate habitat preservation through coordination with land trusts or NGOs.

i. Work with TU to identify parcels for protection.

d. Promote habitat restoration projects which also control sediment entering streams (CPA) (PFW).

e. Provide technical assistance on stream restoration projects via natural stream design in the watershed.

i. Statewide – Conduct a training session for County SWCD staff on natural stream design – March 2011 (PFW). |FY11 $0 DEL PFW CS,GD Completed

2. **Barriers to migration** (including dams and impassable culverts).

a. Working with partners, identify and remove barriers.

i. Work with LGLFWCO to identify additional projects in 2011 – 2013 (PFW) (GLRI). |FY11-FY13 $0 DEL PFW CS,GD Ongoing

b. Work with NYSDOT and FHWA to develop criteria for designation of culverts, the modification of which would improve brook trout passage.

i. No work indentified at this time.

c. Work with NYSDOT Region 3, 4, and 5 and FHWA to correct bridge abutments from being undermined by stream erosion, design and construct natural stream design features that will change stream bottom elevation and facilitate fish passage. (2011 – 2013) (PFW). (1 project confirmed for FY2011; potential for 1 additional project in FY2011). |FY11-FY12 $0 DEL PFW GD Ongoing

i. Design and install culvert baffle systems with NYSDOT Region 3, 4, and 5, bury perched culverts as opportunities present themselves within this NYSDOT region (PFW) (2011 – 2013). |FY11-FY13 $0 DEL PFW CS,GD Ongoing

3. Competition from non-native salmonids.

a. Target USFWS natural stream design stream restoration projects for smaller streams most likely to support only one or two salmonid species. If possible, seek opportunities in heritage trout streams to increase available habitat.

i. No work indentified at this time.

4. Climate change; increased water temperatures.

a. Identify sub-watersheds likely to be refugia for cold water fish in the future, and protect or restore the habitat for brook trout.

i. Work with the National Weather Service to create models for determining temperature impacts to brook trout within the watershed.

b. Add enhancements to natural stream design projects, including planting trees and shrubs to provide shade for water temperature control (CPA, PFW) (Funding – base funds, partnership with NYSDOT-PFW).

5. Marcellus Shale Natural Gas Extraction.

a. Identify sub-watersheds likely to be impacted by hydro fracturing gas extraction techniques.

Brook Trout (*Salvelinus fontinalis*): Great Lakes Focal Area

OUTREACH

In addition to the web site, there is an EBTJV Google Group (http://groups.google.com/group/ebtjv).

The EBTJV also has a blog, a Facebook page, and is on two other social networking sites (including Twitter).

The NYFO can create a brook trout page of "ongoing activities" on our website.

Work with SUNY Cortland, or other university, students to get volunteers for surveys and restoration portions of planned projects.

See also Finger Lakes Onondaga pilot classroom project Trout in the Classroom.

MONITORING

- Work with NYSDEC and LGLFWCO to monitor brook trout habitat after restoration is complete. This includes electroshocking restored site to determine if brook trout are successfully using site, as well as conducting macroinvertebrate surveys to identify any changes in benthic community.

- Establish benchmarks for success based on EBTJV.

- Evaluate reclamation of streams (i.e. - remove non-native salmonids) and resulting effects on brook trout population levels, as well as cessation in stocking non-native salmonids.

- With NYSDEC, develop protocol for pre-construction and post-construction surveys of streams targeted for natural stream design.

- Seek funding and support for monitoring.

Partners

TU, NYSDEC, LGLFWCO

References

Eastern Brook Trout Joint Venture main website (http://www.wasternbrooktrout.org).

Eastern Brook Trout Joint Venture data and maps (http://sain.utk.edu/ebtjv/index.php).

Eastern Brook Trout Joint Venture webpage for priority sub-watersheds in New York (http://sain.utk.edu/ebjtv/download/priorityscores.php).

Brook Trout (*Salvelinus fontinalis*): Great Lakes Focal Area

Trout Unlimited Brook Trout Conservation Strategy (http://www.tu.org/conservation/eastern-conservation/brook-trout).

New York State Brook Trout Conservation Strategies
(http://www.easternbrooktrout.org/docs/EBTJV_NewYork_CS.pdf)
(http://www.easternbrooktrout.org/docs/brookie_NY.pdf).

Cerulean Warbler (*Dendroica cerulea*): Great Lakes Focal Area

Cerulean Warbler Species Action Plan

FOCAL AREA: GREAT LAKES

Other species benefitting:

American redstart, red-headed woodpecker, American black duck, bald eagle, Baltimore oriole, black-billed cuckoo, Cooper's hawk, eastern wood-pewee, red-shouldered hawk, wood duck, wood thrush, Indiana bat

BIOLOGICAL PLANNING

Introduction to species

Species information: The cerulean warbler lives high in mature and older deciduous forests with broken canopies in bottomland forests as well as forests on dry slopes and ridges. Common tree species used include oak, sycamore, cottonwood, maple, black locust, and elm. It prefers large tracts of at least 50 – 75 acres, but is more productive in tracts greater than 600 acres. This species is insectivorous and eats caterpillars, beetles, wasps, and bees.

The Partners in Flight (PIF) Lower Great Lakes Plain Conservation Plan (Physiographic Area 15) (Dettmers and Rosenberg 2003) identifies this species as one of 7 priority species in the area. Comparisons between the 1980-1985 and 2000-2005 breeding bird surveys for New York indicate that the western Lake Ontario plain is an important breeding area in New York for cerulean warblers, with the incidence of confirmed breeding stable to declining. Range-wide, cerulean warblers have experienced a long-term population decline. Analysis of North American Breeding Bird Survey (BBS) data indicates that over the last 40 years, the decline has been steep and steady at a rate of about -3.0% per year. Remaining forest tracts in this area are extremely valuable to cerulean warblers, which also have expanded into the region in recent decades. Many of these forests are associated with wetland systems along the Erie Canal system or Great Lakes shorelines.

Justification for species selection: The cerulean warbler was chosen as a priority species because of its importance in the eastern U.S. as well as in New York. It is a New York State Species of Greatest Conservation Need; a Special Concern Species in New York; classified as High-High on the Bird Conservation Region (BCR) 13 Priority List (USFWS 2007); and, a Species of National Conservation Concern, listed as "yellow" on the Audubon watch list. According to the PIF North American Landbird Conservation Plan, 97% of the breeding population is within the eastern avifaunal biome, and the cerulean warbler is among the most specialized and threatened birds of the deciduous forest and is in need of focused conservation attention throughout its range.

State contribution to overall species population: In New York State the cerulean warbler is mostly rare, but remains common in areas where suitable habitat still exists (NYSDEC 2010).

Cerulean Warbler (*Dendroica cerulea*): Great Lakes Focal Area

Some principal breeding areas for the cerulean warbler remain in New York within the lowland plain south of Lake Ontario (NYSDEC 2010). Cerulean warblers are found in areas including the Montezuma Wetlands Complex, Alleghany State Park and National Forest, and the Hudson River Valley and Highlands of southeastern New York (Rosenberg et al. 2000).

Research needed:

- Survey suitable habitat to determine most important breeding sites and potential breeding sites.

- Determine the use of forest patches by transient cerulean warblers in the spring and fall, include urban greenbelts.

Threats and threat assessment:

1. **Forest fragmentation.**

   Research needed:

   - Further study is needed to determine the degree of fragmentation tolerated by cerulean warbler populations and to define the minimum forest tract size needed to support breeding populations of this species (NYSDEC 2010).

2. **Loss of habitat;** at breeding and wintering grounds, as well as migratory stopover habitat.

   Research needed:

   - Research is needed to identify specific target areas within the focal area for habitat conservation efforts in support of population goals.

   - Research is needed on the life history of the cerulean warbler. The biology's of both male and female cerulean warblers: their conservation needs and any differences between them; factors affecting post-fledging survival; dispersal patterns and their extent as well as patterns of migratory connectivity.

   - Research is needed on invasive species such as wood burrowing insects that have the potential of altering a forest ecosystem.

   - Research is needed on the shift in forest dynamics within prime breeding habitats due to the increased levels of wind generated by wind turbines.

3. **Collision with structures.**

   Research needed:

- Research is needed to assess and reduce/mitigate risks from collisions (including off-shore oil platforms, wind farms, communication towers, etc.) Currently, little is known about the specifics on migratory behavior. More research is needed in this area to help reduce the risk of collisions with structures.

4. **Environmental contaminants.**

   Research needed:

   - There are no known contaminant issues in this focal area at this time.

5. **Climate change – changes in habitat community structure or prey base.**

   Research needed:

   - Investigate correlations between climate change and forest availability as a potential tool for predicting future changes in cerulean warbler distribution and management needs.

   - Investigate correlations between climate change and timing of spring arrival.

   - Investigate a change in frequency of catastrophic weather events, particularly hurricanes during the fall migratory period.

Partners/potential funding:

Haudenosaunee Confederacy, Refuges, U.S. Geological Survey (USGS), U.S. Forest Service (USFS), New York State Department of Transportation (NYSDOT), Natural Resources Conservation Service (NRCS), New York State Department of Environmental Conservation (NYSDEC), The Nature Conservancy (TNC), Cornell Laboratory of Ornithology, Audubon New York, Universities, PIF.

Population goal(s) for New York State:

Objectives:

- Range-wide, protect or manage at least 1,500 continuous hectares of habitat to support 1,200-1,500 pairs of cerulean warblers in PIF Lower Great Lakes Plain (Physiographic Area 15).

- Achieve less imperiled status on BCR Priority Bird Species list or New York State Species of Greatest Conservation Need List.

- Double cerulean warbler population in next 50 years (Cerulean Warbler Conservation Action Plan [USFWS 2007]).

Cerulean Warbler (*Dendroica cerulea*): Great Lakes Focal Area

- Increase continental population by 100% (PIF goal).

Research needed:

- Current goals are broad, therefore, research is needed to refine population goals for cerulean warblers, and reduce critical knowledge gaps regarding demographics, population size and trends, and life history.

CONSERVATION DESIGN

Strategies for addressing the threats

1. **Forest fragmentation.**

    a. Develop and implement forest management plans for cerulean warbler. Support comprehensive forest planning on all public lands, incorporating needs and objectives to reverse declines of cerulean warbler.

    b. Reduce forest fragmentation and loss on breeding grounds by protecting large contiguous forest tracts via influencing regulatory agency decisions.

    c. Identify and manage for high quality post fledging habitat.

    d. Protect habitat –mature forest with multi-level, diverse.

    e. Evaluate sites within the focal area where Marcellus Shale drilling is anticipated, and assess affects this will have on breeding habitat for the warbler.

2. **Loss of habitat** (breeding, wintering, migratory stopover).

    a. Influence regulatory agency decisions regarding projects that will result in loss of habitat and habitat functions for this species (CPA). |FY12 $0 DES CPA TRS Ongoing

    b. Target U.S. Fish and Wildlife Service (USFWS) habitat restoration/enhancement projects to benefit this species, (ex. areas within and surrounding Iroquois National Wildlife Refuge [NWR], Oak Orchard Wildlife Management Area [WMA], Tonawanda Indian Reservation, and Galen WMA).

    c. Leverage money and partners to protect and improve winter habitat (Refuges, communities, Audubon, Natural Resource Damage Assessment and Restoration [NRDAR] funds).

    d. Evaluate international options for NRDAR projects when opportunity arises (Environmental Contaminants [EC]). |FY11-FY13 $0 DES EC ASR Ongoing

3. **Collision with structures.**

    a. Evaluate impact of wind turbines at specific sites (Hamlin, Hammond, Lake Erie, and Lake Ontario, etc.); assist with monitoring (CPA). |FY12 $0 DES CPA TRS Ongoing

    b. Address direct species mortality associated with wind power project operation by participating in evaluation of individual permits, through the State Environmental Quality Review Act (SEQRA) process (CPA). |FY12 $0 DES CPA TRS Ongoing

4. **Environmental contaminants.**

    a. Include cerulean warblers in contaminants analysis for NRDAR and other projects (EC). |FY? $0 DES EC ? Future

5. **Climate change.**

    a. Strategy will depend upon results of research needs noted above.

Partner organizations

Haudenosaunee Confederacy, Refuges, USGS, USFS, NYSDOT, NRCS, NYSDEC, TNC, Cornell Laboratory of Ornithology, Audubon New York, Universities, PIF.

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats FY 2010 - 2012

1. **Forest fragmentation.**

    a. Develop fact sheets with best management practices (BMP) for Marcellus Shale drilling to reduce fragmentation (CPA 2012). |FY12 $0 DEL CPA TRS Completed

    b. Develop fact sheets with BMP in conjunction with NYSDOT, pipeline, and utility companies to reduce forest fragmentation (CPA 2012).

2. **Loss of habitat (breeding, migratory, winter stopover).**

    a. Provide substantive Federal agency comments on proposed Federal agency actions with likely adverse impacts to cerulean warblers and/or their habitat. |FY12 $0 DEL CPA TRS Ongoing

    b. Post on New York Field Office (NYFO) web site Fact Sheets with BMP to minimize impacts to cerulean warblers and/or their habitat. |FY11 $0 DEL CPA TRS Completed

c. Use the complete inventory of most important breeding sites and potential breeding sites to protect, restore, or enhance breeding and migration stopover habitat.

d. Conservation delivery should focus on important areas for breeding cerulean warblers in New York as follows (from Rosenberg et al. 2000): Montezuma Wetlands Complex, Allegheny River-Salamanca region, Galen WMA, Iroquois NWR, Salmon Creek near Cayuga Lake, Allegany State Park and vicinity, Tonawanda Indian Reservation, Bear Mountain State Park, Castleton Island State Park, Letchworth State Park, West Point Military Reservation, Murray-Hulberton Area, and Chittenango Creek.

e. Become a member of the Northeast PIF Working Group: Various PIF working groups have been established to deliver the PIF Landbird Conservation Plan, including the PIF Northeast Working Group. A NYFO Outreach representative will join the Northeast PIF Working Group. |FY11 $0 DEL CPA SLD Completed

3. Collision with structures.

a. Provide substantive Federal agency comments on proposed Federal agency actions with likely adverse impacts to cerulean warblers and/or their habitat. Projects identified to date include: Cape Vincent, Hounsfield, Hamlin, Hammond, Lake Erie, and Lake Ontario.

i. Evaluate impact of wind turbines at specific sites (Hamlin, Hammond, Lake Erie, and Lake Ontario); assist with monitoring (CPA). |FY12 $0 DEL CPA TRS Ongoing

b. Address direct species mortality associated with wind power project construction by developing potential conservation measures and guidelines for turbine placement to minimize impacts. (CPA). |FY11 $0 DEL CPA TRS Completed

i. Develop the CPA website with links to all national guidance and guidelines (CPA 2012). |FY11 $0 DEL IT,CPA AFL,TRS Completed

ii. Explore development of additional guidance based on species found in New York State, geographic patterns of migratory bat and bird use (CPA).

4. Environmental contaminants.

a. Delivery will depend upon results of cerulean warbler contaminant analyses (which will provide an indication of potential effects).

5. Climate change.

a. Delivery will depend upon strategy determined from research noted above.

Cerulean Warbler (*Dendroica cerulea*): Great Lakes Focal Area

Partners/potential funding:

- Haudenosaunee Confederacy, Refuges, USGS, USFS, NYSDOT, NRCS, NYSDEC, TNC, Cornell Laboratory of Ornithology, Audubon New York, Universities, PIF.

OUTREACH

- Develop the CPA website with links to all national guidance and guidelines.

- Become a member of the Northeast PIF Working Group: Various PIF working groups have been established to deliver the PIF Landbird Conservation Plan, including the PIF Northeast Working Group. A NYFO Outreach representative will join the Northeast PIF Working Group. |FY11 $0 DEL CPA SLD Completed

- Develop Fact Sheets with BMP for Marcellus Shale drilling to reduce fragmentation.

- Develop Fact Sheets with BMP in conjunction with NYSDOT, pipeline and utility companies to reduce forest fragmentation.

MONITORING

- As actions are undertaken, monitoring will need to be identified up front in order to implement it as part of the overall action.

- Develop protocols to measure success of all conservation delivery activities.

- Work with Partners to identify leads for accomplishing monitoring activities.

- Develop BMP from results of monitoring to inform future cerulean warbler population restoration activities.

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Cerulean Warbler (*Dendroica cerulea*): Great Lakes Focal Area

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USFWS. 2007. A Conservation Action Plan for the Cerulean Warbler (*Dendroica cerulea*) produced for the USFWS, Division of Migratory Bird Management Focal Species Program. Revised version – 30 June 2007.

Existing strategies for cerulean warbler restoration:

Please refer to the following documents for existing strategies:

- Partners in Flight Landbird Conservation Plan: Physiographic Area 15: Lower Great Lakes Plain (Dettmers and Rosenberg 2003). http://www.partnersinflight.org/bcps/pl_15sum.htm.

- Partners in Flight North American Landbird Conservation Plan http://www.partnersinflight.org/cont_plan/.

- New York State Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf.

- Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Region (USFWS 2007) http://www.acjv.org/BCR_13/BCR13_Final_Plan_July07.pdf.

- Conservation Action Plan for Cerulean Warbler (USFWS 2007) http://www.fws.gov/migratorybirds/CurrentBirdIssues/Management/FocalSpecies/Plans/CeruleanWarbler.pdf.

Common Tern (*Sterna hirundo*): Great Lakes Focal Area

Common Tern Species Action Plan

FOCAL AREA: GREAT LAKES

Other species benefitting:

Bonaparte's gull, little gull, canvasback, common goldeneye, greater scaup, lesser scaup, long-tailed duck

BIOLOGICAL PLANNING

Introduction to species

Species information: The common tern is a colonial breeder, breeding in wetland-open water habitats throughout the Great Lakes and along the northern Atlantic Coast. The common tern is an opportunistic forager taking small (3-15 cm) forage fish, crustaceans, and insects within 50 cm of the water's surface. They nest on islands, marshes, and lake and ocean beaches. Common terns prefer nest sites with sand, gravel, shell, or cobble substrates with scattered vegetation, or other protected areas where chicks can shelter. The North American common tern population is migratory, wintering mainly in South America or western Central America.

A recent review (Morris *et al*. 2010) of Great Lakes common tern survey data from 1976-2000, indicates long-term declines in nest numbers and colony sites. Band recovery data indicate that the Great Lakes common tern population is endemic with little immigration from the east coast population or elsewhere (Haymes and Blokpoel 1978; Blokpoel and Courtney 1982, as cited within Morris *et al*. 2010). The authors (Morris *et al.* 2010) suggest that specific policy development and management action is urgently needed to stabilize numbers of common terns on the Great Lakes.

Justification for species selection: The common tern is a New York State Threatened Species and a New York State Species of Greatest Conservation Need. In the Great Lakes focal area, common tern is also rated as High in the Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Region [(BCR) 13, Atlantic Coast Joint Venture (ACJV) 2007]. The overall trend in Great Lakes common tern nest numbers between 1976 and 2000 was negative (−19.1%) and represents a net decrease of 2,140 nests and 18 active nesting sites (Morris *et al.* 2010).

State contribution to overall species population: ACJV (2007) notes an estimated common tern population for BCR 13 of greater than 6,484 pairs. The Thousand Islands area of the St. Lawrence River contains at least 28 colonies (~totaling 700 pairs) of common terns (NYSDEC 2005). An additional 400 pairs are located on Lake Oneida islands in New York (NYSDEC 2005). Common terns also breed along the northern and western shores of Lake Erie (including Buffalo Harbor), the U.S. waters of the Niagara River, and Lake Ontario (Morris *et al.* 2010).

Research needed: Increase knowledge/understanding of common tern in New York.

Common Tern (*Sterna hirundo*): Great Lakes Focal Area

- Great Lakes Colonial Waterbird Surveys conducted every 10 years - determine New York status: survey should be occurring soon (2011-2014). |FY11 $0 BP CPA TRS Completed

- Great Lakes Colonial Waterbird Survey conducted 2011 - obtain and review the 2011 data. |FY12-FY13 $0 BP CPA,EC TRS,ASR Planned

- Recommended monitoring: survey of known nest colonies every 5 years - determine New York status: survey should be occurring soon (2012-2013?). |FY12 $0 BP CPA TRS Planned

- Data on waterbird abundance, distribution, chronology, population trends, and factors affecting them (habitat availability and management). |FY? $0 BP ? ? Future

- Chronology and peaks of waterbird movements, temporal composition of migrants, and factors affecting turnover rates at stopover sites. |FY? $0 BP ? ? Future

- Distribution, abundance, conditions, and ownership of wetlands and other important waterbird habitats, how they are affected by climatic patterns and human activities, and where there is potential to restore and enhance additional waterbird habitat. |FY? $0 BP ? ? Future

- Analyze existing areas of breeding habitat and recently altered shoreline to determine potential breeding areas (FY 2012). |FY12 $0 BP CPA,EC TRS,ASR Planned

Threats and threats assessment:

1. **Competition and Predation** of nesting and foraging habitat.

   Research needed:

   - Research involving habitat availability, relationships with gulls (specifically, ring-billed gulls [*Larus delawarensis*]), double-crested cormorants (*Phalacrocorax auritus*), and other competitors and food requirements are key areas that need further study (Hyde 1997). |FY? $0 BP ? ? Future

   - Waterbird nutritional requirements/food preferences. |FY? $0 BP ? ? Future

2. **Loss of habitat** due to island/shoreline development, water level management of the Great Lakes, vegetation succession.

   Research needed: Assess how human disturbance affects waterbird foraging and breeding, and ways to reduce these impacts.

- Post-construction monitoring at Peace Bridge, related to habitat displacement of the structure. |FY? $0 BP CPA TRS Future

- Pre- and post-construction monitoring for on- and off-shore wind projects. |FY? $0 BP CPA TRS Future

- Survey to identify potential areas of overlap for nuclear development and common tern habitat. |FY? $0 BP ? ? Future

- Review Great Lakes water level data and impacts to existing habitat. |FY? $0 BP ? ? Future

3. **Fragmentation of habitat** due to the location of wind power projects, pipelines, and transmission lines along migration corridors and stop over habitat.

   Research needed:

   - Assess how human disturbance affects waterbird foraging and breeding, and ways to reduce these impacts. |FY? $0 BP ? ? Future

4. **Climate change;** changes in habitat community structure and changes in prey base during breeding season.

   Research needed:

   - Determine changes in species distribution and population sizes due to climate change (especially the impacts of flooding and rising water levels on existing habitat). |FY? $0 BP ? ? Future

5. **Environmental contaminants.**

   Research needed:

   - Assess the effects of contaminants on waterbirds, especially at Great Lakes Areas of Concern (AOCs) and Confined Disposal Facilities that are used by foraging birds. |FY? $? BP EC ? Future

Partners/potential funding:

Haudenosaunee Confederacy, USGS, Natural Resources Conservation Service (NRCS), NYSDEC, County Soil and Water Conservation Districts (SWCD), The Nature Conservancy (TNC), Ducks Unlimited (DU), Audubon New York, Cornell Lab of Ornithology, New York State Department of Transportation (NYSDOT), utilities, Buffalo Niagara Riverkeeper, Niagara Greenway Committee, USEPA through GLRI, and other Great Lakes funding sources.

Common Tern (*Sterna hirundo*): Great Lakes Focal Area

Population goal(s) for New York State:

Increase to 2,500 pairs (ACJV 2007). The State Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) indicated a need to develop a long-term plan that established population objectives for beach and island ground-nesting birds (common tern) and recommended appropriate management options. Currently, NYSDEC recommends protecting existing common tern habitat and creating new habitat to expand nesting opportunities (NYSDEC 2005).

CONSERVATION DESIGN

Strategies for addressing those threats

Objectives: Increase local populations through the protection, preservation, and/or restoration of common tern nesting and foraging habitat along the Great Lakes shoreline.

1. **Competition and Predation** of nesting and foraging habitat.

    a. Target USFWS habitat enhancement to benefit this species including gull deterrents, predator control, and nesting habitat improvement projects. |FY? $0 DES ? ? Future

    b. Other strategies may result from research need noted above.

2. **Loss of habitat** due to island/shoreline development, water level management of the Great Lakes, vegetation succession.

    a. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding new development, water level management, and vegetation management in breeding and foraging areas. |FY11-FY13 $0 DES CPA,IT SPP,TRS,AFL Ongoing

    b. Target USFWS habitat restoration and enhancement projects to benefit common terns, including habitat acquisition and preservation, predator control, and nesting habitat improvement projects (including artificial nesting platforms). |FY12-FY13 $0 DES EC ALS Planned

    c. Other strategies may result from research need noted above.

3. **Fragmentation of habitat** due to the location of wind power projects, pipelines, and transmission lines along migration corridors and stop over habitat.

    a. Seek to minimize fragmentation of habitat by influencing regulatory agency decisions regarding new development, water level management, and vegetation management in breeding, foraging, and migration areas. |FY11-FY13 $0 DEL CPA TRS Ongoing

    b. Other strategies may result from research need noted above.

4. **Changes in habitat community structure and changes in prey base during breeding season due to climate change.**

    a. Identify potential future habitat areas, above current water levels, and protect or restore the habitat for common terns. |FY? $0 DES ? ? Future

    b. Other strategies may result from research need noted above.

5. **Environmental contaminants.**

    a. Evaluate USFWS Natural Resource Damage Assessments (NRDA) along the Great Lakes. |FY11-FY13 $0 DES EC ASR Ongoing

    b. As part of the GLRI, evaluate emerging contaminants at the Rochester Embayment AOC and evaluate the "Fish Tumors" Beneficial Use Impairment for the Niagara River AOC (potentially 2010-2014). |FY11-FY13 $0 DES EC DG,ASR Ongoing

    c. Seek to minimize loss of habitat due to contamination by influencing regulatory agency decisions related to State and Federal Superfund sites. |FY11-FY13 $0 DES EC ASR Ongoing

    d. Respond as appropriate to spills impacting fish and wildlife resources. |FY12-FY14 $0 DES EC ALS Planned

    e. Other strategies may result from research need noted above.

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY 2010-2012

1. **Competition and Predation of nesting and foraging habitat.**

    a. Target USFWS habitat enhancement to benefit this species including gull deterrents, predator control, and nesting habitat improvement projects.

        i. No work identified at this time.

    b. Other actions may result from research need noted above.

2. **Loss of habitat** due to island/shoreline development, water level management of the Great Lakes, vegetation succession.

    a. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding new development, water level management, and vegetation management in breeding and foraging areas.

i. Create map or shapefile of existing and potential common tern breeding and foraging areas for all NYFO programs (2011-2012) (IT). |FY11 $0 DEL IT AFL Completed

ii. Provide substantive Federal agency comments on proposed development/actions with likely adverse impacts to common terns and/or their habitat (2011-2013) (CPA). |FY11-FY13 $0 DEL CPA SPP,TRS Ongoing

b. Target USFWS habitat restoration and enhancement projects to benefit common terns, including habitat acquisition and preservation, predator control, nesting habitat improvement projects (including artificial nesting platforms).

i. Restore common tern habitat in the Niagara River (Natural Resources Damage Assessment and Restoration [NRDAR] Love Canal Settlement: 2012-2013). |FY12-FY13 $0 DEL EC ALS Planned

c. Other actions may result from research need noted above.

3. **Fragmentation of habitat** due to the location of wind power projects, pipelines, and transmission lines along migration corridors and stop over habitat.

a. Seek to minimize fragmentation of habitat by influencing regulatory agency decisions regarding new development, water level management, and vegetation management in common tern breeding, foraging, and migration areas.

i. Provide substantive Federal agency comments on proposed development/actions with likely adverse impacts to common terns and/or their habitat (2011-2013) (CPA). |FY11-FY13 $0 DEL CPA TRS,SPP Ongoing

b. Other actions may result from research need noted above.

4. **Changes in habitat community structure and changes in prey base during breeding season due to climate change.**

a. Identify potential future habitat areas above current water levels and protect or restore the habitat for common terns.

i. No work identified at this time.

b. Other actions may result from research need noted above.

5. **Environmental contaminants.**

a. Evaluate and prioritize USFWS NRDA along the Great Lakes.

i. Manage Buffalo/Niagara Rivers NRDAR case. |FY11-FY13 $0 DEL EC ASR Ongoing

b. As part of the GLRI, evaluate emerging contaminants at the Rochester Embayment AOC and evaluate the "Fish Tumors" Beneficial Use Impairment for the Niagara River AOC (potentially 2010-2013).

i. Conduct pilot study on emerging contaminants in soil, water, and fish of Rochester embayment to determine potential impacts to fish and wildlife Trust resources and their supporting habitats (initiated in September 2010) (2011-2013) (EC). |FY11-FY13 $0 DEL EC DG,ASR Ongoing

ii. Assess the "Fish Tumors" Beneficial Use Impairment in the Niagara River to determine potential impacts to fish and wildlife Trust resources and their supporting habitats; work will commence in early summer 2011(2011-2013) (EC). |FY11-FY13 $0 DEL EC DG,ASR Ongoing

iii. Coordinate with USEPA and AOC Remedial Action Committees on future directions with objective of improving and restoring habitat for Trust resources (dependent on USEPA funding: 2011-2013) (EC). |FY11-FY13 $0 DEL EC DG,ASR Ongoing

c. Seek to minimize loss of habitat due to contamination by influencing regulatory agency decisions related to State and Federal Superfund sites.

i. Provide substantive Federal agency comments on proposed actions with likely adverse impacts to common terns and/or their habitat (2011-2013). |FY11-FY13 $0 DEL EC ASR,DG Ongoing

d. Other actions may result from research need noted above.

OUTREACH

- Create a fact sheet to educate and encourage landowners to control predators that represent significant threats to the viability of species-at-risk such as common tern. |FY? $0 OUT ? ? Future

MONITORING

- Development of protocols to measure progress/success for any common tern habitat enhancement and/or restoration projects developed and constructed. |FY? $0 MON ? ? Future

- Seek funding and support for monitoring. |FY? $0 MON ? ? Future

Common Tern (*Sterna hirundo*): Great Lakes Focal Area

Partners

USEPA, USGS, NRCS, NYSDEC, County SWCD, TNC, DU, Audubon New York, Cornell Lab of Ornithology, NYSDOT, utilities, Buffalo Niagara Riverkeeper, Niagara Greenway Committee, and Haudenosaunee Confederacy.

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Houghton's Goldenrod (*Solidago houghtonii*): Great Lakes Focal Area

Houghton's Goldenrod Species Action Plan

FOCAL AREA: GREAT LAKES

Other species benefitting:

Small white lady's slipper orchid, yellow lady's slipper orchid, beaked spike-rush, creeping juniper, grass-of-Parnassus, Labrador tea, low nut-rush, eastern massasauga, Ohio goldenrod, bog goldenrod, sticky false asphodel, tufted bulrush, marsh valerian, white camus

BIOLOGICAL PLANNING

Introduction to species

Species information: Houghton's goldenrod (*Solidago houghtonii* Torrey & A. Gray [alt. Oligoneuron houghtonii (Torr. & A. Gray) Nesom in New York], Asteraceae) (HOGO) is a clonal, perennial plant found almost exclusively along the northern shores of Lake Huron and Lake Michigan in the United States and Canada. The New York population is a distinct outlier and occurs in a rare marl fen in Genesee County, New York.

The HOGO occurs exclusively in calcium-rich wetlands ranging from calcareous beach flats and interdunal beach swales, limestone pavement alvars, and marl fens. These occupied habitats are functionally related to the Niagara Escarpment and its landforms. The New York population occurs in a marl fen that is actively depositing marl, which is extremely uncommon. In general, HOGO occurs in habitats experiencing some dynamism in disturbance levels either through wind and wave action or changing water levels resulting in periods of population decrease through destruction and increase through recolonization.

The HOGO forms dense, multistemmed genets (clumps) composed of many ramets (individual stems) that can fragment and promote vegetative propagation. This species is also known to be self-incompatible, and therefore, requires an insect vector for successful pollination. While sexual reproduction does not appear to be hindered in this species, vegetative propagation is an important component of its reproduction.

Flowering occurs in August through early September and is characterized by a flat-topped inflorescence comprised of approximately 20-30 heads of 20-30 pale to bright yellow flowers with 6-9 ray florets and several disc florets. Individual plants can reach 30-60 cm in height and have predominately elongated, acute, linear-oblanceolate basal leaves that are about 20 cm long and 20 mm wide with more scattered cauline leaves up the stem.

Among the possible candidates of similar species, grass-leaved goldenrod (*Solidago graminifolia*) and Ohio goldenrod (*Solidago ohioensis*) are among two of the most superficially similar and can be found in close proximity to HOGO populations. The former can be distinguished by its more leafy stem and lacking basal leaves as well as having narrower leaves and smaller floral parts. The latter can be distinguished by its larger size and broader leaves.

There are additional, more technical floral and pubescence characters that can be used to distinguish among these species.

The listing status of HOGO has been complicated by its uncertain taxonomic history and standing. It has been commonly accepted that HOGO is a genetically-isolated offspring of hybrid origin from other extant goldenrods (*Aster* and *Solidago* spp.). The debate concerning this species' origins was long and complex and involved several possible progenitors including Ohio goldenrod (*S. ohioensis*), upland white goldenrod (*A. ptarmicoides*), Riddell's goldenrod (*S. riddellii*), and giant goldenrod (*S. gigantea*) (e.g., Morton 1979, Semple et al. 1999, Laureto 2010). The taxonomic status of the New York population was considered an oddity within the species or a unique species unto itself by some authors (i.e. Pringle 1987). Laureto (pers. comm.) has stated that another inland, outlier population in Michigan is not HOGO and represents a unique species, putatively classified as *Solidago vossii*. Laureto and Barkman (2011) recently provided an in-depth genetic analysis of HOGO that points to a single speciation event and shared origin with Michigan populations; therefore, HOGO will maintain its listing status in its current form.

Justification for species selection: HOGO is a Federally-listed threatened species (listed threatened 1988), as well as a New York State-listed endangered species. As of 2010, including the putative *S. vossii* population, there were 92 reported sites predominantly in Michigan (74 sites) and Canada (17 sites), as well as one site in eastern New York. Approximately 27,000 mature, flowering individuals have been estimated to occur in Canada where HOGO has been down-listed to a species of special concern (COSEWIC 2005). There are no known quantitative estimates for total U.S. population sizes, although 41 (including New York) of the most viable occurrences are located entirely or partially on protected lands owned or managed by the State or Federal government, or non-governmental organizations.

The HOGO habitat is highly-specific, calcareous wetlands generally along the coast of the Great Lakes, and as a result, there has been a great deal of focus on habitat protection. This has been juxtaposed with a high concentration of impact from coastal development including infrastructure (the majority of sites in Michigan are closely paralleled by highways) and residential pressures that fragment and destroy populations. Concurrent changes in hydrology through these activities can permanently dewater or flood areas of suitable habitat, resulting in species loss. Additionally, changes in overall lake level regime can either case similar changes if maintained, or result in habitat degradation through increased competition if stabilized at a particular level. Although listing will not prevent private landowner loss, it has allowed for the recognition and protection of this species on Federal lands and in conjunction with Federal projects.

One of the most pertinent threats to HOGO is physical destruction through human activity. Off-road vehicle (ORV) use in coastal areas has resulted in destruction of habitat and HOGO individuals. Additionally, unauthorized and excessive foot traffic through sensitive areas has much the same effect. These activities are often difficult to control and prevent and have been a continuing struggle during this species' recovery.

Houghton's Goldenrod (*Solidago houghtonii*): Great Lakes Focal Area

Invasive species can be a significant detriment to rare plant conservation as they can crowd out native species, introduce allelopathic chemicals, and alter physical gradients in suitable habitats. This can be especially pronounced in highly productive wetland habitats where aggressive invaders can become a monoculture representing a significant proportion of the biomass. The quantities of excess evapotransporation and detritus input resulting from this level of invasion can dramatically alter water levels, nutrient cycling, and nutrient composition within these systems and cause significant habitat alteration and species loss.

Although there has been significant progress in identifying, and in some cases protecting, new and existing HOGO sites, the population status at most sites has not been updated for at least ten years. Even sites on public lands that are considered protected have little or no history of observation and may, in fact, be essentially unprotected due to unmonitored threats. HOGO occurrence in a highly-limited habitat and the continual pressures and destruction arising from these pressures indicates that any losses in this species cannot be replaced. It is unlikely that habitat will increase, and although this species can establish and spread readily, loss and fragmentation of this species' habitat will progressively decrease overall population size and continue to threaten HOGO recovery into the future.

State contribution to overall species population: HOGO is found predominantly in coastal Michigan and Canada along the northern shores of Lakes Michigan and Huron, although a few outliers are known to exist. The New York population is the most severe of these outliers as it occurs ~225 miles from the nearest population and in an atypical, noncoastal habitat. It may serve as an important genetic and physical refugium for this species in the event of losses in shoreline areas. The population was estimated in 1992 as "hundreds of plants" (as cited within U.S. Fish and Wildlife Service [USFWS] 1997), but a more recent quantitative census recorded 771 plants in two locations associated with the two marl rooms present at the site (Young 2008). After several successive attempts at additional surveys in the few suitable habitats this species prefers, it is felt that the western New York population is the only location in New York (Young, S.M., pers. comm.).

Threats and threat assessment:

Threats (See Recovery Plan for full assessment):

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Habitat loss to development and physical destruction (e.g., foot traffic, ORVs) are the primary threats to this species via destruction and degradation of coastal habitats. The New York population is located in an inland fen on a private nature reserve, so this threat is minimal with regard to physical destruction. However, as marl fens depend entirely on having an abundance of calcium-rich groundwater flowing through them, modifications or contamination of the groundwater could have a dramatic effect on this species.

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:

Houghton's Goldenrod (*Solidago houghtonii*): Great Lakes Focal Area

Factor C. Disease or predation:

A. As with other goldenrod species (*Solidago* spp.), herbivory and parasitism are common, but not chronic in this species.

Factor D. The inadequacy of existing regulatory mechanisms: NA.

Factor E. Other natural or manmade factors affecting its continued existence:

A. Hydrologic changes can dramatically impact HOGO. Limited disturbance cycles from flooding can result in excessive competition and population decline. Contamination can also negatively affect population numbers.

B. Invasive species have become a serious concern in the western New York population, specifically common reed (*Phragmites australis*) and more recently false brome (*Brachypodium sylvaticum*) (Young, S.M., pers. comm.).

Recovery Goals

Range-wide Recovery Goals/Objectives: Protect all known occurrences of the species or 30 distinct, self-sustaining occurrences. Protection, as defined in the recovery plan, consists of all actions necessary to conserve known occurrences, maintain ecosystem processes for the perpetuation of essential habitat, and enable each occurrence to be naturally self-sustaining.

Conservation goal(s) for New York State: Promote viability in the known population in order to contribute to the required viable population level needed to delist the species.

Research/Actions needed: Certain actions will focus primarily on biological planning research activities in order to understand the current and future status of this population and its threats. Specifically, the following:

- Coordinate with the East Lansing Field Office (ELFO) and species lead with regard to reviewing and completing the 2011 5-year review. Recovery Goal 1.1.2. |FY11 $0 BP ESA JW Completed

- Fully review taxonomic literature in order to assess the current knowledge about the species status and possible listing actions. Recovery Goal 5.1. |FY11 $0 BP ESA JW Completed

- Determine the groundwater watershed area and evaluate possible threats to groundwater quality and flow. Recovery Goal Task 4. |FY13 $0 BP ESA JW Future

- If needed, evaluate water chemistry at the site in order to determine if any determined groundwater threats are impacting HOGO. Recovery Goal 4. |FY14 $500 BP ESA,EC JW Future

Houghton's Goldenrod (*Solidago houghtonii*): Great Lakes Focal Area

CONSERVATION DESIGN

Strategies for addressing those threats

Please go to these documents for the existing strategies:

- Recovery Plan (1997) http://ecos.fws.gov/docs/recovery_plan/970917b.pdf
- 5-Year Review (2011), http://ecos.fws.gov/docs/five_year_review/doc3880.pdf
    - Next 5-year review anticipated in 2016

Research or Actions needed: Specific actions for the next 3 years addressing conservation design include the following:

- Research invasive species control methods and/or habitat manipulation methods for common reed (*Phragmites australis*) and false brome (*Brachypodium sylvaticum*). Recovery Goal 4. |FY12 $0 DES ESA JW Planned
- Explore funding opportunities for invasive species control methods. Recovery Goal 4. |FY12 $0 DES ESA JW Planned
- Based on the assessments of groundwatershed and chemistry, develop watershed management protocols, if necessary. Recovery Goal 4. |FY14 $0 DES ESA JW Future

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats FY 2010 - 2012

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Limit possible habitat and physical destruction

1. Maintain the integrity of the western New York site. Recovery Goal 1.4.1. |FY11-FY13 $0 DEL ESA JW Ongoing

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes: No actions planned

Factor C. Disease or predation: No actions planned

Factor D. The inadequacy of existing regulatory mechanisms: No actions planned

Factor E. Other natural or manmade factors affecting its continued existence:

Houghton's Goldenrod (*Solidago houghtonii*): Great Lakes Focal Area

A. Control invasive species

   1. Implement developed invasive species control measures, if needed and if funding is available. |FY13 $? DEL ESA JW Future

B. Work with partners and landowners to implement groundwater management protocols, if necessary. |FY15 $? DEL ESA JW Future

OUTREACH

- Construct a HOGO web page for the NYFO site. Recovery Goal 3.1. |FY12 $0 OUT IT,ESA AFL,JW Planned

MONITORING

A. Conduct five-year population count with NYNHP. |FY13 $2,000 MON ESA JW Future

B. Monitor/measure invasive species control method responses in conjunction with population counts. Recovery Goal 2.11. |FY13 $0 MON ESA JW Future

C. Review and track recovery progress. |FY10-FY13 $0 MON ESA JW Ongoing

D. Participate in the annual Regional Data Collection. |FY10-FY13 $0 MON ESA JW Ongoing

Partners

Bergen Swamp Preservation Society, New York State Department of Environmental Conservation (NYSDEC), New York Natural Heritage Program (NYNHP)

References

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Morton, J.K. 1979. Observations on Houghton's goldenrod (*Solidago houghtonii*). Michigan Botanist 18:31–35.

Houghton's Goldenrod (*Solidago houghtonii*): Great Lakes Focal Area

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U.S. Fish and Wildlife Service. 1997. Recovery Plan for Houghton's Goldenrod (Solidago houghtonii A. Gray). Page vii + 58 pp. Ft. Snelling, Minnesota.

Young, S.M. 2008. An update of the population status of Solidago houghtonii in 2008. A report submitted to the Bergen Swamp Preservation Society. New York Natural Heritage Program, Albany, NY.

Indiana Bat (*Myotis sodalis*): Great Lakes Focal Area

Indiana Bat Species Action Plan

FOCAL AREA: GREAT LAKES

BIOLOGICAL PLANNING

Other species benefitting:

Eastern small-footed, little brown, tri-colored, northern, big brown

Introduction to species

Species information: The Indiana bat typically hibernates in caves/mines in the winter and roosts under bark or in tree crevices in the spring, summer, and fall. Suitable potential summer roosting habitat is characterized by trees (dead, dying, or alive) or snags with exfoliating or defoliating bark, or containing cracks or crevices that could potentially be used by Indiana bats as a roost. The minimum diameter of roost trees observed to date is 2.5 inches for males and 4.3 inches for females. However, maternity colonies generally use trees greater than or equal to 9 inches d.b.h. (diameter at breast height). Overall, roost tree structure appears to be more important to Indiana bats than a particular tree species or habitat type. Females appear to be more habitat specific than males presumably because of the warmer temperature requirements associated with gestation and rearing of young. As a result, they are generally found at lower elevations than males may be found. Roosts are warmed by direct exposure to solar radiation, thus trees exposed to extended periods of direct sunlight are preferred over those in shaded areas. However, shaded roosts may be preferred in very hot conditions. As larger trees afford a greater thermal mass for heat retention, they appear to be preferred over smaller trees. Additional information on potentially suitable summer habitat can be found on our website at http://www.fws.gov/northeast/nyfo/es/IndianaBatapr07.pdf.

Streams associated with floodplain forests and impounded water bodies (ponds, wetlands, reservoirs, etc.) where abundant supplies of flying insects are likely found provide preferred foraging habitat for Indiana bats, some of which may fly up to 2-5 miles from upland roosts on a regular basis. Indiana bats also forage within the canopy of upland forests, over clearings with early successional vegetation (*e.g.,* old fields), along the borders of croplands, along wooded fencerows, and over farm ponds in pastures (U.S. Fish and Wildlife Service [USFWS] 2007). While Indiana bats appear to forage in a wide variety of habitats, they seem to tend to stay fairly close to tree cover.

Justification for species selection: The Indiana bat is Federally- and New York State-listed as endangered. The New York Field Office (NYFO) has the Region 5 species lead.

State contribution to overall species population: New York used to have ~11% of wintering Indiana bats rangewide before White-nose syndrome (WNS). However, for now New York still has the largest number of wintering (and likely summering) Indiana bats in the region. The USFWS has proposed recovery units in the draft recovery plan (Plan) (USFWS 2007) and New York is part of the Northeast Recovery Unit.

Indiana Bat (*Myotis sodalis*): Great Lakes Focal Area

Threats and threat assessment:
Threats[10] (See 5-year review for full assessment):

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range: *See the Plan for in-depth discussion (USFWS 2007, page 71).*

A. Destruction and degradation of the bat's winter hibernacula (i.e., caves and mines) and summer habitat (i.e., forests) have been identified as long-standing and ongoing threats to the species.

B. Winter – potential to impact hibernacula with gas drilling, filling, etc.

C. Spring/summer (maternity colony roosts, travel corridors, foraging habitat) – residential and commercial development

D. Fall (swarming) – same pressures as spring/summer habitat

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes: *See the Plan for in-depth discussion (USFWS 2007, page 80).*

A. Human disturbance of hibernating bats was originally identified as one of the primary threats to the species and still remains a threat at several important hibernacula in the bat's range. The primary forms of human disturbance to hibernating bats result from cave commercialization (cave tours and other commercial uses of caves), recreational caving, vandalism, and research-related activities.

Factor C. Disease or predation: WNS is most significant threat in New York. Predation is also a threat.

Factor D. The inadequacy of existing regulatory mechanisms: *See the Plan for in-depth discussion (USFWS 2007, page 90).*

A. Generally, existing regulatory mechanisms are more effective at protecting Indiana bat hibernacula than summer habitat. Hibernacula are discrete and easily identified on the landscape, whereas summer habitat is more diffuse.

Factor E. Other natural or man-made factors affecting its continued existence: *See the Plan for in-depth discussion (USFWS 2007, page 91).*

A. Several natural factors have threatened the existence of local bat populations including flooding and freezing events at winter hibernacula. These natural events typically are not wide-spread, but rather associated with specific flood/freeze-prone sites.

B. Anthropogenic factors that may affect the continued existence of Indiana bats include

[10] Refers to 5 listing factors A-E in Section 4 of Endangered Species Act

numerous environmental contaminants (e.g., organophosphate and carbamate insecticides, oil spills, and polychlorinated biphenyls [PCBs]), collisions with man-made objects (e.g., poorly constructed cave gates, vehicles, aircraft, communication towers, and wind turbines) and climate change.

Recovery Goals

Range-wide Recovery Goals/Objectives: Intermediate - reclassification, Long-term - delisting

Conservation goal(s) for New York State: The Plan does not have specific criteria for New York. However, New York has several P1 and P2 hibernacula and there are criteria for protecting 80% of P1 hibernacula in each Recovery Unit.

Research/Actions needed:

A. Reduce current threats at known hibernacula (Recovery Action 1.1.1) (primarily WNS-related actions – not included in recovery plan – WNS will eventually have a separate plan).

B. WNS-related research is needed to better understand the threat.

   1. Assist with requests for proposals (RFPs) as requested. |FY11-FY12 $0 BP ESA NR,RAN Ongoing
   2. Review proposals if requested to be on review team. |FY11-FY12 $0 BP ESA RAN,NR Ongoing
   3. Provide grant oversight for FY08 and FY09 projects. |FY11-FY12 $0 BP ESA RAN,NR Ongoing
   4. Assist with WNS-related research field work as requested. |FY11-FY12 $0 BP ESA RAN,NR Ongoing

C. Develop models of Indiana bat population dynamics as tools to assess progress towards recovery in different geographic areas, to determine sensitivities of various life history attributes contributing to population growth rates, and to evaluate the impact of catastrophic losses at key hibernacula on time to recovery (Recovery Action 3.1.6)

   1. Assist with Indiana bat modeling shared decision-making (SDM) effort until completion (ESA)

      a. Respond to data requests from U.S. Geological Survey (USGS) and Region 3 (R3). |FY11 $0 BP ESA RAN Completed
      b. Participate in calls during demographic model Beta testing. |FY11-FY12 $0 BP ESA RAN Ongoing
      c. Attend workshop to test demographic model. |FY12 $0 BP ESA RAN Planned
      d. Assist with roll-out of demographic model. |FY12 $0 BP ESA RAN Planned
      e. Provide technical assistance to Field Offices (FOs) with use of demographic model. |FY12-FY13 $0 BP ESA RAN Planned

D. Conduct research on the potential impacts of environmental contaminants on Indiana bats (Recovery Action 3.4)

   1. Environmental Contaminants (EC) WNS research - send all samples out for analysis. |FY11 $0 BP EC ALS Completed
   2. Environmental Contaminants (EC) WNS research - review and interpret contaminants results. |FY12 $0 BP EC ALS Planned
   3. Prepare 2009 bat mercury Natural Resource Damage Assessment and Restoration (NRDAR) report for Onondaga Lake. |FY11 $0 BP EC ALS Completed
   4. Revise 2009 bat mercury NRDAR report for Onondaga Lake. |FY12 $0 BP EC ALS Planned
   5. Present results from the 2008 and 2009 bat and bird mercury NRDAR reports for Onondaga Lake at the Region 5 Environmental Contaminants Workshop in Hadley, Massachusetts, November 29, 2011. |FY12 $0 BP EC ALS Planned
   6. Present information on the effects of water quality factors on bioconcentrations (as opposed to bioaccumulation) of mercury in the aquatic food chain at the Region 5 Environmental Contaminants Workshop in Hadley, Massachusetts, November 29, 2011. |FY12 $0 BP EC DG Planned

CONSERVATION DESIGN

Strategies for addressing those threats

Please go to these documents for the existing strategies:

- Draft Recovery Plan 2007 (USFWS 2007)
- Last 5-year review completed 2009 (USFWS 2009)

Research or Actions needed: Specific actions for the next 3 years addressing conservation design include the following:

A. Assist Region 3 with finalizing Recovery Plan as requested. |FY12 $0 DES ESA RAN Planned

B. Assist with National WNS Response (not included in recovery plan - WNS will eventually have a separate plan).

C. Reduce current threats at known hibernacula (primarily WNS-related actions - not included in recovery plan - WNS will eventually have a separate plan) (Recovery Action 1.1.1)

   1. Support development of WNS National Plan

      a. Provide technical assistance during USFWS and/or public review periods of WNS National Plan. |FY11 $0 DES ESA RAN,NR Completed

b. Participate in Communications Group. |FY11-FY13 $0 DES ESA NR Ongoing
c. Participate in Conservation and Recovery Working Group. |FY11-FY13 $0 DES ESA RAN,NR Ongoing
   i. Develop Conservation and Recovery Implementation Plan. |FY11-FY12 $0 DES ESA RAN,NR Ongoing

2. Attend annual WNS Symposium. |FY11-FY13 $? DES ESA RAN,NR Ongoing

3. WNS-related research is needed to develop conservation strategies to respond to WNS.

   a. Assist with WNS captive bat management structured decision making effort. |FY11-FY12 $0 DES ESA RAN,NR Ongoing

C. Standardized approaches to evaluating wind projects and developing conservation measures are needed.

1. Participate in multi-region project to develop Indiana bat/wind guidance. |FY10-FY11 $0 DES ESA RAN Completed
2. Participate in team to update multi-region Indiana bat/wind guidance over time. |FY12-FY13 $0 DES ESA RAN Planned
3. Coordinate first R3, Regions 4 and 5 (R4, R5) threatened and endangered species wind call - 2/3/10. |FY10 $0 DES ESA RAN Completed
4. Participate in R5 Indiana bat wind guidance development. |FY11-FY13 $0 DES ESA RAN Ongoing

D. Develop guidance and template for how to complete a hibernacula management plan (Recovery Action 1.1.1.2.1)

1. Assist R3 with development of guidance for how to complete hibernacula management plan. |FY13 $0 DES ESA RAN Future

E. Develop standardized protocols for conducting telemetry (Recovery Action 2.7.2.1)

1. Participate in multi-region team to develop radio telemetry guidance. |FY11-FY12 $0 DES ESA RAN Ongoing

F. Develop standardized protocols for use of bat detection systems to survey for Indiana bats (Recovery Action 2.7.2.6)

1. Assist with funding automation of acoustic survey data analysis.

   a. Participate in Regional WNS funding discussions and promote funding of acoustic automation system. |FY10 $0 DES ESA RAN Completed
   b. Assist with USACE Phase 1 grant agreement for acoustic automation system. |FY10 $0 DES ESA RAN Completed

2. Determine whether netting guidelines should be revised to include acoustic detectors

    a. Participate in multi-region Indiana bat/Wind Initiative survey protocol workgroup. |FY10 $0 DES ESA RAN Completed
    b. Participate in multi-region team to revise Indiana bat survey protocols. |FY11-FY12 $0 DES ESA RAN Ongoing
    c. Present revised draft Indiana bat survey protocols at Northeast Bat Working Group meeting. |FY12 $500 DES ESA RAN Planned

3. Assist New York State Department of Environmental Conservation (NYSDEC) with acoustic transect project

    a. Conduct 1 acoustic transect route 2-3 nights. |FY10 $0 DES ESA RAN,NR Completed
    b. Conduct 1 acoustic transect route 2-3 nights if requested (not requested in FY11; ESA to coordinate). |FY12 $0 DES ESA RAN Planned

G. Determine land management practices that will increase or maintain suitability of habitat for maternity colonies of Indiana bats, and the impacts of habitat perturbations on persistence of maternity colonies (Recovery Action 3.3.9)

1. Fund or otherwise coordinate wind project research
2. Consider Indiana bat habitat restoration and protection during restoration planning of the Onondaga Lake NRDAR case. |FY12-FY13 $0 DES EC ALS Planned
3. Coordinate Onondaga Lake Superfund Site Biological Technical Assistance Group activities to maximize potential for a remedy that protects Indiana bats and their habitat (with USEPA). |FY11-FY13 $0 DES EC ASR Ongoing

H. Regional coordination role

1. Participate in R5 planning team to develop standardized roles/responsibilities for species leads. |FY11 $0 DES ESA RAN Completed

2. Act as Regional POC for Indiana bat issues and conduct the following activities.

    a. Provide updates to FOs on Indiana bat literature, information from other regions. |FY10-FY13 $0 DES ESA RAN Ongoing
    b. Provide technical assistance to FOs on Indiana Bat formal consultations/Habitat Conservation Plans (HCPs). |FY10-FY13 $0 DES ESA RAN Ongoing
    c. Provide R5 comments on national issues (e.g., survey protocol updates). |FY10-FY13 $0 DES ESA RAN Ongoing
    d. Provide R5 Indiana bat end-of-year reporting info to R3. |FY10-FY13 $0 DES ESA RAN Ongoing
    e. Maintain understanding of current Indiana bat literature. |FY10-FY13 $0 DES ESA RAN Ongoing

f. Participate in or provide technical assistance for WNS-related projects as needed. |FY10-FY13 $0 DES ESA RAN Ongoing
g. Coordinate Regional review of Indiana bat permit conditions. |FY10-FY13 $0 DES ESA RAN Ongoing

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats FY 2010 - 2012

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Encourage activities that enhance or improve summer habitat on private lands (Recovery Action 2.1.3)

B. Conserve and manage Indiana bats and their habitat on Federal lands (Recovery Action 2.2)

1. Provide technical assistance to Montezuma National Wildlife Refuge regarding bat surveys and management. |FY12-FY13 $0 DEL ESA RAN Ongoing

C. Encourage habitat protection through acquisition/easements

1. Provide technical assistance to NYSDEC for Recovery Land Acquisition grants. |FY11-FY13 $0 DEL ESA RAN Ongoing

2. Provide technical assistance to the Natural Resources Conservation Service (NRCS) for potential easements.

D. Minimize adverse impacts to Indiana bat during project reviews (Recovery Action 2.6)

1. Ensure implementation of conservation measures of existing BOs through follow up with Federal agency/project sponsor

2. Habitat protection through informal and formal consultations and HCPs (NYFO ESA).

a. Assist with development of Indiana bat conservation measures for NiSource HCP. |FY10-FY12 $0 DEL ESA RAN Ongoing
b. In coordination with the R5 IPAC Team, develop conservation framework, including standard conservation measures, for residential and commercial projects. |FY11-FY13 $0 DEL ESA RAN Ongoing
c. Develop conservation framework, including standard conservation measures, for wind energy development projects (see Ibat Wind Guidance). |FY11-FY13 $0 DEL ESA RAN Ongoing

Indiana Bat (*Myotis sodalis*): Great Lakes Focal Area

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes: No work planned for FY2011-FY2013.

Factor C. Disease or predation: Need to determine what conservation measures will be available for WNS-response.

Factor D. The inadequacy of existing regulatory mechanisms: No work planned for FY2011-FY2013.

Factor E. Other natural or man-made factors affecting its continued existence: Wind project work being addressed through consultations/HCPs (see above)

OUTREACH

A. Develop and implement outreach activities to enhance specific recovery tasks for the Indiana bat including development of guidelines, best management practices (BMP), land acquisition/easements efforts, landowner incentives programs, Endangered Species landowner programs, research activities, and Federal review activities. Employ appropriate communications goals and messages as outlined in comprehensive Indiana bat outreach plan. (Recovery Action 4.1)

B. Seek opportunities to raise awareness of the Indiana bat's special characteristics; foster a sense of appreciation for the bat, its habitat, and the unique life history of bats in general. (Recovery Action 4.2.3)

    1. Current Indiana bat/WNS display

        a. Rotate Indiana bat/WNS exhibit at nature centers. |FY10-FY11 $0 OUT ESA SLD Completed
        b. Update Indiana bat/WNS exhibit at least once/year. |FY10-FY13 $0 OUT ESA RAN Ongoing

    2. New bat and WNS exhibit

        a. Provide technical assistance to the U.S. Forest Service (USFS) in the development of a new display. |FY10-FY11 $0 OUT ESA RAN Completed
        b. Provide technical assistance to RO to finalize display text and formatting. |FY12 $0 OUT ESA SLD Planned

    3. New Indiana bat cave exhibit.

        a. Develop new cave exhibit. |FY13 $? OUT ESA SLD Future

    4. Attend meetings/workshops

a. Present information on bats at the Ithaca Sciencenter. |FY12 $0 OUT ESA RAN Completed
b. Present information on bats at Rice Creek. |FY12 $0 OUT ESA NR Completed

C. Use USFWS websites as a repository of information about the Indiana bat. This information should be organized so that it is easily located and accessible and specific to key audiences (i.e., educators, planners, industry representatives, consultants) (Recovery Action 4.2.5)

1. Update NYFO Indiana bat fact sheets and web materials. |FY10-FY13 $0 OUT ESA,IT RAN,AFL Ongoing

D. Assist with Freedom of Information Act (FOIA) responses as needed.

1. Assist with WNS FOIA request. |FY11 $0 OUT ESA NR Completed

MONITORING

A. Survey winter populations of Indiana bats at known hibernacula (monitor status of sites/impacts of WNS) (Recovery Action 1.3.1)

1. Assist NYSDEC with 2012 hibernacula surveys at Jamesville. |FY12 $0 MON ESA RAN Planned

B. Review and track recovery progress. |FY10-FY13 $0 MON ESA RAN Ongoing

Partners

NYSDEC, R3, R4, R5 FOs, Montezuma National Wildlife Refuge (NWR), U.S. Army, USFS, New York State Department of Transportation (NYSDOT), Federal Highway Administration (FHWA), OBI, DU, USGS

References

U.S. Fish and Wildlife Service. 2007. Indiana Bat (*Myotis sodalis*) Draft Recovery Plan: First Revision. U.S. Fish and Wildlife Service, Fort Snelling, MN. 622 pp. (This document has been peer-reviewed and is available at http://www.fws.gov/midwest/Endangered/mammals/inba/index.html).

U.S. Fish and Wildlife Service. 2009. Indiana Bat 5-Year Review: Summary and Evaluation.

U.S. Fish and Wildlife Service, Bloomington, IN.

Lake Sturgeon (*Acipenser fulvescens*): Great Lakes Focal Area

Lake Sturgeon Species Action Plan

FOCAL AREA: GREAT LAKES

Other species benefitting:

American eel, walleye, redhorse/white suckers, mooneye

BIOLOGICAL PLANNING

Introduction to species

Species information: Lake sturgeon is a long-lived, late-maturing species that inhabits large river and lake systems primarily in the Mississippi River, Hudson Bay, and Great Lakes basins. Lake sturgeon are the only sturgeon species endemic to the Great Lakes basin and are the largest freshwater fish indigenous to that system. Lake sturgeon can be considered a nearshore, warm water species with water temperature and depth preferences of low 50s to mid-60ºF and 15-30 feet, respectively. Lake sturgeon are benthivores, feeding on small invertebrates such as insect larvae, crayfish, snails, clams, and leeches. Life history characteristics of lake sturgeon are unique with respect to other fishes. Females mature between 14 and 33 years, males between 8 and 12 years. Spawning occurs only once every 2-7 years for males and 4-9 years for females. As a consequence of interrupted spawning cycles, only 10-20% of adult lake sturgeon within a population spawns during a given season. Spawning occurs on clean, gravel shoals and stream rapids from April to June in preferred water temperatures of 55-60ºF. The typical life-span of lake sturgeon is 55 years for males and 80-150 years for females.

Justification for species selection: In the past, sturgeon have comprised an important biological component of the Great Lakes fish community. By the early 1900s many populations of lake sturgeon throughout their range had been greatly reduced or extirpated as a result of overfishing, habitat loss, the construction of dams, and reduced water quality. Within the Great Lakes basin, the lake sturgeon population is estimated to be at 1% of historic abundance levels. Lake sturgeon are listed as either threatened or endangered by 19 of the 20 states within its original range in the United States. In New York State and the Province of Ontario, lake sturgeon are listed as a threatened species. In addition, the lake sturgeon is a Federal trust species and has been identified as a priority species under the New York Field Office (NYFO)-Fish Enhancement, Mitigation, and Research Fund (FEMRF).

State contribution to overall species population: Currently there are remnant populations of lake sturgeon occurring in Upper Niagara River/Lake Erie, Lower Niagara River, St. Lawrence River (middle corridor), St. Lawrence River (lower corridor), and the Grasse River. Among these remnant populations we see varying population trends, ranging from populations that are recovering to populations that remain very low, but apparently stable. Within the State, the populations maintaining themselves today are recognized as being in five geographic units, contrasted to more than 12 units historically. The New York State Department of Environmental Conservation (NYSDEC) Lake Sturgeon Recovery Plan states the goal of maintaining these

5 units and restoring populations in three other units. The NYSDEC has stocked 6 waterbodies in efforts to establish populations in three other units.

Research needed:

- Conduct surveys to determine current population levels and presence/absence. |FY? $0 BP FMF SS Future

(Who: NYSDEC, U.S. Geological Survey [USGS], Ontario Ministry of Natural Resources [OMNR], and U.S. Fish and Wildlife Service/Lower Great Lakes Fish and Wildlife Conservation Office/NYFO [USFWS/LGLFWCO/NYFO] to assist with lake sturgeon surveys to determine presence/absence and population densities, coupled with habitat investigation and evaluation of stocking initiatives; Cost: NYFO staff time)

- Assist with completion of a New York State Lake Sturgeon Management Plan. |FY? $0 BP FMF SS Future

(Who: USFWS [NYFO], NYSDEC, USGS, and Cornell University to assist with completion of New York State Lake Sturgeon Management Plan to address recovery, habitat restoration strategies and population goals; Cost: < $30K, NYFO FEMRF funding)

Threats and threat assessment:

1. **Loss of Spawning Habitat**

   Research needed:

   - Conduct surveys to determine quantity and quality of known spawning habitat. |FY? $0 BP FMF SS Future

     (Who: NYSDEC, USGS, USFWS [NYFO]; Cost: NYFO staff time)

   - Identify and prioritize areas for habitat restoration and enhancement. |FY? $0 BP FMF SS Future

     (Who: NYSDEC, USGS, USFWS [NYFO]; Cost: unknown at this time, FEMRF funding)

2. **Barriers to Migration** (including dams and impassable culverts).

   Research needed:

   - Identify barriers having an influence on lake sturgeon spawning migration and prioritize barrier removal. |FY? $0 BP FMF SS Future

(Who: NYSDEC, USGS, USFWS [NYFO]; Cost: unknown at this time, FEMRF funding)

- Conduct surveys to determine available sturgeon spawning habitat above existing barriers, in regards to both quantity and quality of habitat present. |FY? $0 BP FMF SS Future

  (Who: NYSDEC, USGS, USFWS [NYFO] ; Cost : unknown at this time, FEMRF funding)

3. **Environmental Contaminants.**

   Research needed:

   - Assess the effects of contaminants on lake sturgeon, especially at Great Lakes Areas of Concern (AOC) that are used by lake sturgeon. |FY? $0 BP EC ? Future

     (Who: NYSDEC, USFWS [NYFO], U.S. Environmental Protection Agency [USEPA] through Great Lakes Restoration Initiative [GLRI]; NYFO staff time)

   - Investigate the effects of contaminants on the survival and reproductive success of lake sturgeon, specifically the effects from polychlorinated biphenyls (PCBs), mirex, dioxin, mercury, and emerging contaminants. |FY? $0 BP EC,FMF ASR,ALS,SS Future

     (Who: USFWS [NYFO-Environmental Contaminants [EC]); Cost: unknown at this time, Natural Resource Damage Assessment and Restoration [NRDAR], GLRI funding)

4. **Invasive Species (and associated disease transmission).**

   Research needed:

   - Determine the effects invasive species have on lake sturgeon populations, including the disease transmission pathway and effects of type-E botulism. |FY? $0 BP FMF SS Future

   (Who: USGS, academics; Cost: unknown at this time, FEMRF funding)

5. **Climate change; changes in riverine discharge regimes.**

   Research needed:

   - Identification of climate change related impacts to lake sturgeon. |FY? $0 BP FMF SS Future

Lake Sturgeon (*Acipenser fulvescens*): Great Lakes Focal Area

(Who: National Weather Service, Landscape Conservation Cooperatives [LCC], academics; Cost: unknown at this time)

Partners/potential funding:

USFWS/LGLFWCO, USGS, OMNR, St. Regis Mohawk Tribe, NYSDEC, New York Power Authority (NYPA) Cornell University, State University of New York-College of Environmental Science and Forestry (SUNY-ESF).

Population goal(s) for New York State:

Currently, several agencies have published three population goals for lake sturgeon in the Lake Ontario/St. Lawrence River basin and these goals vary. The NYSDEC Lake Sturgeon Recovery Plan states the goals are to increase the number of naturally reproducing sturgeon populations in New York to 8 (up from 5) and the removal of the species from State-listing. The Great Lakes Fishery Commission stated goals are the rehabilitation of lake sturgeon populations including the expansion of sturgeon populations into favorable habitats and to enhance sturgeon spawning habitat. Their metric for success is based on a catch per unit effort (CPUE) of 0.1 sturgeon/net/night; CPUE rates observed from 2000 to 2007 ranged from 0 to 0.06 sturgeon/net/night. The OMNR, in a draft Lake Sturgeon Rehabilitation Plan, state goals as conserve and/or rehabilitate the existing self-sustaining lake sturgeon spawning populations with a minimum target of at least 750 sexually mature sturgeon in each system. This number was selected because it represents the minimum number thought to be present in remnant Great Lakes populations that are considered to be either stable or increasing in abundance. Although population goals have not been established for New York, the NYFO will continue to collaborate with partners to establish target population goals for the Lake Ontario/St. Lawrence River basin.

CONSERVATION DESIGN

Strategies for addressing those threats

1. **Loss of spawning habitat.**

    a. Seek to minimize loss of spawning habitat by influencing regulatory agency decisions regarding locating/operating hydroelectric power generating facilities, stream alterations/fill, dredging, and poor agricultural practices. |FY12 $0 DES CPA SPP,TRS,SLD Ongoing

    b. Target habitat restoration and enhancement projects to benefit lake sturgeon including spawning substrate additions and enhancements (Partners for Fish and Wildlife [PFW]). |FY? $0 DES FMF,PFW SS,CS Future

    c. Facilitate habitat preservation in riverine systems with confirmed lake sturgeon spawning through coordination with land trusts or non-governmental organizations. |FY? $0 DES FMF SS Future

d. Promote habitat restoration projects that control sediment entering riverine environments and reduce quality of spawning habitat. |FY? $0 DES FMF,PFW SS,CS Future

e. Facilitate reintroduction of lake sturgeon to their known former range. |FY12 $0 DES FMF SS Ongoing

2. **Barriers to migration** (including dams and impassable culverts).

a. Seek to minimize loss of spawning habitat by influencing regulatory agency decisions regarding locating/operating hydroelectric power generating facilities, stream alterations/fill, dredging, and poor agricultural practices. |FY12 $0 DES CPA SPP,TRS,SLD Ongoing

b. Work with partners to identify, prioritize, and remove sturgeon barriers. |FY12 $0 DES FMF,PFW SS,CS Ongoing

c. Work with partners to investigate and implement methods of reintroduction of sturgeon to restored riverine systems. |FY? $0 DES FMF SS Future

3. **Environmental contaminants.**

a. Investigate the effects of contaminants on the survival and reproductive success of lake sturgeon, specifically PCBs, mirex, dioxin, mercury, and emerging contaminants. |FY? $0 DES FMF,EC SS,ASR,ALS Future

b. Evaluate USFWS NRDAs along the Great Lakes. |FY11-FY13 $0 DES EC ASR Ongoing

c. As part of GLRI, evaluate emerging contaminants at the Rochester Embayment AOC and evaluate the "Fish Tumors" Beneficial Use Impairment for the Niagara River AOC (potentially 2010-2014). |FY11-FY13 $0 DES EC DG,ASR Ongoing

d. Other strategies may result from research need noted above.

e. Seek to minimize loss of habitat due to contamination by influencing regulatory agency decisions related to State and Federal Superfund sites. |FY11-FY13 $0 DES EC DG,ASR Ongoing

f. Respond as appropriate to spills impacting fish and wildlife resources. |FY12-FY14 $0 DES EC ALS Planned

4. **Invasive Species (and associated disease transmission).**

a. Determine the effects invasive species have on lake sturgeon populations, including the disease transmission pathway and effects of type-E botulism. |FY? $0 DES FMF SS Future

5. **Climate change; changes in riverine discharge regimes.**

a. Identify potential effects to lake sturgeon spawning habitat and water quality. |FY? $0 DES FMF SS Future

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY2010-2012

1. **Loss of spawning habitat and habitat function.**

a. Seek to minimize loss of spawning habitat by influencing regulatory agency decisions regarding locating/operating hydroelectric power generating facilities, stream alterations/fill, dredging, and poor agricultural practices.

i. Provide substantive comments on proposed Federal agency actions with likely adverse impacts on lake sturgeon (CPA). |FY12 $0 DEL CPA SPP,TRS,SLD Ongoing

b. Target habitat restoration and enhancement projects to benefit lake sturgeon including spawning substrate additions and enhancements.

i. Work with PFW and NYSDEC to begin to identify opportunities for the placement of spawning substrate beds in tributaries to Lake Ontario (NYFO FEMRF funding) (PFW, FEMRF). |FY? $0 DEL FMF,PFW SS,CS Future

c. Facilitate habitat preservation in riverine systems with confirmed lake sturgeon spawning through coordination with land trusts or non-governmental organizations.

i. Work towards developing a FEMRF Geographic Information Systems (GIS) Decision Support Tool to focus preservation efforts (NYFO FEMRF funding) (FEMRF). |FY12 $0 DEL FMF SS Ongoing

d. Promote habitat restoration projects which also control sediment entering riverine environments.

i. Work with U.S. Department of Agriculture-Natural Resources Conservation Service (USDA-NRCS) to focus their programmatic efforts to reduce sediment input and agricultural run-off (USDA-NRCS funding). |FY12 $0 DEL FMF,PFW SS,CS Ongoing

e. Facilitate reintroduction of lake sturgeon to their known former range.

i. Facilitate the writing of a New York State Lake Sturgeon Management Plan (FEMRF funding) (NYSDEC, USGS, FEMRF). |FY12 $0 DEL FMF SS Ongoing

ii. Assist the NYSDEC on annual lake sturgeon gamete collection for sturgeon propagation. NYFO-FEMRF to provide equipment, assistance with INAD permits, and field assistance. (FEMRF funding) (FEMRF). |FY12 $0 DEL FMF SS Ongoing

iii. Assist the NYSDEC with 5-year population assessments through providing field assistance and PIT tagging supplies (FEMRF funding, , $10K) (NYSDEC, FEMRF). |FY12 $0 DEL FMF SS Ongoing

2. **Barriers to migration** (including dams and impassable culverts).

a. Seek to minimize loss of spawning habitat by influencing regulatory agency decisions regarding locating/operating hydroelectric power generating facilities, stream alterations/fill, dredging, and poor agricultural practices.

i. Provide substantive comments on proposed Federal agency actions with likely adverse impacts on lake sturgeon (CPA). |FY12 $0 DEL CPA SPP,TRS,SLD Ongoing

b. Work with partners to prioritize, identify, and remove sturgeon barriers.

i. Work towards developing a FEMRF GIS Decision Support Tool to prioritize tributaries for restoration activities (FEMRF funding) (FEMRF). |FY12 $0 DEL FMF SS Ongoing

c. Work with partners to investigate and implement methods of reintroduction of sturgeon to restored riverine systems.

i. Investigate egg stocking, streamside hatchery systems, and stocking to determine most cost-effective and ecologically sound method to reintroduce lake sturgeon to their known former range (NYSDEC, FEMRF). |FY? $0 DEL FMF SS Future

3. **Environmental Contaminants.**

a. Investigate the effects of contaminants on the survival and reproductive success of lake sturgeon, specifically PCBs, mirex, dioxin, mercury, and emerging contaminants.

i. Facilitate the investigation of the effects of contaminants on the survival and reproductive success of lake sturgeon (FEMRF, NRDAR, GLRI funding). |FY? $0 DEL FMF,EC SS,ASR,ALS Future

b. Evaluate and prioritize USFWS NRDA along the Great Lakes.

   i. Manage Buffalo/Niagara Rivers Case. |FY11-FY13 $0 DEL EC ASR Ongoing

c. As part of GLRI, evaluate emerging contaminants at the Rochester Embayment AOC and evaluate the "Fish Tumors" Beneficial Use Impairment for the Niagara River AOC (potentially 2010 – 2014).

   i. Evaluate emerging contaminants in Rochester Embayment AOC. Pilot study on emerging contaminants in sediment, water, and fish was initiated in September 2010 for Rochester embayment (CPA). |FY11-FY13 $0 DEL EC DG,ASR Ongoing

   ii. Assess the "fish tumors" Beneficial Use Impairment in the Niagara River to determine potential impacts to fish and wildlife Trust resources and their supporting habitats (Niagara River pilot study will commence in early summer 2011). |FY11-FY13 $0 DEL EC DG,ASR Ongoing

   iii. Coordinate with USEPA and AOC Remedial Action Committees on future directions with objective of improving and restoring habitat for Trust resources (dependant on USEPA funding) (EC). |FY11-FY13 $0 DEL EC ASR,DG Ongoing

d. Seek to minimize loss of habitat, due to contamination, by influencing regulatory agency decisions related to state and federal Superfund sites.

   i. Provide substantive Federal agency comments on proposed actions with likely adverse impacts to lake sturgeon and/or their habitat (2010-2013) (CPA). |FY12 $0 DEL CPA SPP,TRS,SLD Ongoing

4. Invasive Species (and associated disease transmission).

a. Determine the effects invasive species have on lake sturgeon populations, including the disease transmission pathway and effects of type-E botulism. |FY? $0 DEL FMF SS Future

5. Climate change; changes in riverine discharge regimes.

a. Identify potential effects to lake sturgeon spawning habitat and water quality. |FY? $0 DEL FMF SS Future

   i. Work with National Weather Service to create models for determining climate change related precipitation impacts to spawning habitat and tributaries.

Lake Sturgeon (*Acipenser fulvescens*): Great Lakes Focal Area

OUTREACH

The New York State Lake Sturgeon Recovery Plan (pending), when complete will have an outreach component identifying our path forward. |FY? $0 OUT FMF SS Future

Update the FEMRF web page with "ongoing projects" on our website. |FY12 $0 OUT FMF SS Ongoing

Assist NYSDEC with lake sturgeon placard placement and fishermen education. |FY? $0 OUT FMF SS Future

MONITORING

- Work with partners to monitor lake sturgeon habitat restoration and enhancement projects, including spawning substrate additions and use of habitat post-removal of barriers. |FY12 $0 MON FMF,CPA SS,SPP Ongoing

- Monitor status and contribution to the population of stocked eggs/sturgeon as part of reintroduction strategy. |FY? $0 MON FMF SS Future

- Establish benchmarks for success based on New York State Lake Sturgeon Management Plan (pending). |FY? $0 MON FMF SS Future

Partners

USFWS (LGLFWCO), USGS, OMNR, St. Regis Mohawk Tribe, NYSDEC, NYPA, Cornell University, SUNY-ESF

References

Bouton, D. 1994. A Recovery Plan for Lake Sturgeon (*Acipenser fulvescens*), NYSDEC publication.

Carlson, D. 2000. A Recovery Plan for the Lake Sturgeon in New York State, NYSDEC publication, updated.

LaPan, S.R., A. Mathers, T.J. Stewart, R.E. Lange, S.D. Orsatti. 2002. Fish-Community Objectives for the St. Lawrence River. Great Lakes Fish. Comm. Spec. Pub. 2002 http://www.glfc.org/lakecom/loc/slrfco.

Farrell, J.M., R. Colesante, D. Dittman, J. Johnson. 2009. Lake Sturgeon Population Enhancement as a Strategy for Improvement of Ecosystem Function and Controlling Invasive Species. Final Report. Submitted to the USFWS in fulfillment of a FEMRF award.

Massasauga Rattlesnake (*Sistrurus catenatus catenatus*): Great Lakes Focal Area

Massasauga Rattlesnake Species Action Plan

FOCAL AREA: GREAT LAKES

Other species benefitting:

spotted turtle, bog buckmoth, fen plant communities including Eastern larch, black huckleberry, *Vaccinium corymbosum, Acer rubrum, Carex lasiocarpa, Sphagnum spp.*

BIOLOGICAL PLANNING

Introduction to species

Species information: The eastern massasauga rattlesnake (EMR) is a Federal Candidate species and a New York State listed endangered species.

Justification for species selection: The eastern massasauga rattlesnake is a Federal Candidate species and our goal is to preclude listing the species. Due to threats and its natural patchy distribution within its range, the sub-species is listed as endangered in New York.

Threats and threat assessment:

Threats[11]:

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Habitat loss/degradation in the form of:

   1. succession of peatlands to closed canopy and forest regeneration
   2. wetland filling/draining and urbanization

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:

A. Illegal collecting is a threat.

Factor C. Disease or predation:

A. Predators include carnivorous species (Johnson 1995) such as "weasels, mink, and coyotes, as well as [birds of prey], owls, and turkey."

Factor D. The inadequacy of existing regulatory mechanisms:

[11] Refers to 5 listing factors A-E in Section 4 of Endangered Species Act

Massasauga Rattlesnake (*Sistrurus catenatus catenatus*): Great Lakes Focal Area

A. This is a threat and part of the reason for consideration for listing.

Factor E. Other natural or manmade factors affecting its continued existence:

Other threats include:

A. Genetic viability, loss of genetic diversity due to isolation
B. Invasive species encroachment
C. Illegal collecting

Conservation Goals

Range-wide Goal: Preclude the need to list EMR

Conservation goal(s) for New York State:

Determine New York State goal for population

Research/Actions needed:

Research needed:

- NYSDEC/State University of New York-College of Environmental Science and Forestry (SUNY-ESF) use of seasonal habitats
- Reintroduction
- Other habitat management plan
- Invasive species
- Genetics
- NYSDEC/SUNY-ESF EMR habitat requirements
- Survey sites for potential available habitat in New York

Partners/potential funding

U.S. Army Corps of Engineers (USACE), NYSDEC, Bergen-Byron Swamp Conservancy grants

CONSERVATION DESIGN

Strategies for addressing those threats

Please go to these documents for the existing strategies:

- U.S. Fish and Wildlife Service (USFWS) Status Assessment for Eastern Massasauga *(Sistrurus c. catenatus)*1998
- NYSDEC Draft Recovery Plan (NYSDEC 2009)
- Cicero Burn Plan (NYSDEC 2009)

Massasauga Rattlesnake (*Sistrurus catenatus catenatus*): Great Lakes Focal Area

- State Wildlife Habitat Conservation Plan (NYSDEC 2009)
- USFWS Status Assessment for Eastern Massasauga *(Sistrurus c. catenatus)*1998
- P:\Endangered Species\recovery plans
- NYSDEC Draft Recovery plan for EMR (NYSDEC 2009)
- State Wildlife Habitat Conservation Plan http://www.wildlifeactionplans.org/new_york.html
- Annual Candidate Notice of Review (2009) http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=C03P

Research or Actions needed: Specific actions for the next 3 years addressing conservation design include the following:

A. Address threat of habitat loss due to succession of peatland to closed canopy, forest regeneration.

   1. With partners, prioritize potential habitat restoration projects in occupied habitat and unoccupied but suitable habitat.

B. Address threats of habitat degradation due to invasive species encroachment.

   1. With partners, prioritize potential habitat restoration projects in occupied habitat and unoccupied but suitable habitat where invasive species encroachment limits habitat availability.

C. Address loss of habitat due to alternations in wetland hydrology, including wetland draining, urban run-off, and water quality degradation.

   1. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding wetland draining, agricultural practices that diminish wetland values for wildlife, dredging and placement of fill in wetlands with a focus on wetlands that have suitable habitat.

D. Address population decline including those due to loss of individual snakes due to illegal collecting.

   1. Develop a reintroduction plan using results of genetics research.
   2. Develop a captive rearing plan.
   3. Develop a plan for enhanced protection of existing population.

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats FY 2010-2012

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

Massasauga Rattlesnake (*Sistrurus catenatus catenatus*): Great Lakes Focal Area

A. Threat of habitat loss due to succession of peatland to closed canopy, invasive species, forest regeneration.

   1. With partners, prioritize potential habitat restoration projects in occupied habitat and unoccupied yet suitable habitat.

   2. Respond to Candidate Notice of Review to USFWS Region 3. |FY11 $0 DEL ESA SLD Completed

B. Habitat degradation and loss due to alternations in wetland hydrology, including wetland draining, urban run-off and water quality degradation.

   1. Influence regulatory agency decisions regarding wetland draining, agricultural practices that diminish wetland values for wildlife, dredging and placement of fill in wetlands by:

      a. Develop fact sheets and best management practices (BMPs) to minimize impacts to this species.

      b. Post these fact sheets/BMPs on our website.

      c. Provide substantive comments on proposed actions with potential impacts on this species. |FY11-FY14 $0 DEL ESA SLD Ongoing

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:

A. Address loss of individual snakes due to illegal collecting.

   1. Reintroduce after developing data on genetics and a reintroduction plan

Factor C. Other natural or manmade factors affecting its continued existence:

A. Threats of habitat degradation due to invasive species encroachment,

   1. With partners, prioritize potential habitat restoration projects in occupied habitat and unoccupied but suitable habitat where invasive species encroachment limits habitat availability.

      a. Assist with habitat management.

      b. Provide technical assistance regarding Great Lakes Restoration Initiative (GLRI) proposals (FY 2010 completed)

      c. Grant oversight. |FY11 $0 DEL ESA RAN,NR Completed

      d. Provide technical assistance

e. Pursue Candidate Conservation Agreement with Assurances (CCA)

f. Identify ways to protect habitat and incorporate buffers.

g. Consider the affects of slender false brome grass on EMR.

OUTREACH

Coordinate with NYSDEC to design outreach exhibit for use in New York. |FY11-FY14 $0 OUT ESA SLD Future

Increase public awareness and knowledge of the species through fact sheets posted on NYFO website. |FY11 $0 OUT ESA SLD Completed

Massasauga Rattlesnake USFWS Fact Sheet. |FY11 $0 OUT ESA SLD Completed

MONITORING

Monitor EMR response to habitat management

Partners

NYSDEC Regions 7 and 8

SUNY-ESF (Dr. James Gibbs/K. Shoemaker), Al Breisch, retired NYSDEC

References

Johnson, G., A.R. Breisch. 1992. The Eastern Massasauga Rattlesnake in New York: Occurrence and Habitat Management. Metro Toronto Zoo Rattlesnake Symposium http://www.brocku.ca/massasauga/Johnson%20and%20Breisch.pdf

NYSDEC Website - DRAFT Eastern Massasauga Recovery Plan- NYSDEC 2009
Fact Sheet: http://www.dec.ny.gov/animals/7154.html

NYSDEC State Wildlife Habitat Conservation Plan
http://www.wildlifeactionplans.org/new_york.html

Shoemaker, K.T., A.T. Krofta, and J.P. Gibbs. 2008. Population status and management needs of the Massasauga rattlesnake (*Sistrurus c. catenatus*) in New York State. State University of New York, College of Environmental Science and Forestry, Syracuse, New York, USA. 70 pp.

Shoemaker, K.T. 2007. Habitat manipulation as a viable strategy for the conservation of the Massasauga rattlesnake in New York State. Thesis. State University of New York, College of Environmental Science and Forestry, Syracuse, New York, USA. 111 pp.

Massasauga Rattlesnake (*Sistrurus catenatus catenatus*): Great Lakes Focal Area

Shoemaker, K.T., A.T. Krofta, and J.P. Gibbs. 2006. Management Recommendations for the Eastern Massasauga Rattlesnake at Cicero Swamp Wildlife Management Area based on Recent Population Surveys (2005-06). Draft Report. State University of New York, College of Environmental Science and Forestry, Syracuse, New York, USA. 8 pp.

Szymanski, J.A. 1998. Range-wide status assessment for the Eastern Massasauga (*Sistrurus c. catenatus*). U.S. Fish and Wildlife Service, Ft. Snelling, Minnesota. 39 pp.

USFWS Annual Candidate Notice of Review (2009)
http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=C03P
USFWS websites: Fact Sheet: http://www.fws.gov/midwest/endangered/reptiles/conserve.html

USFWS. 2008. Species Assessment and Listing Priority Assignment Form for Eastern Massasauga (*Sistrurus catenatus catenatus*).

USFWS Q and A's about the Conservation of EMR:
http://www.fws.gov/midwest/Endangered/reptiles/eama_qanda.html

USFWS - Handbook for Land Managers
2000http://www.fws.gov/midwest/Endangered/reptiles/pdf/eama-mgmt-guide.pdf

Piping Plover (*Charadrius melodus*): Great Lakes Focal Area

Piping Plover Species Action Plan

FOCAL AREA: GREAT LAKES

Other species benefitting:

killdeer (M/B), spotted sandpiper (M/B), migrants in high concentrations, and Bird Conservation Region (BCR) 13 is very important (least sandpiper, pectoral sandpiper, dunlin, short-billed dowitcher, long-billed dowitcher), other shorebirds

BIOLOGICAL PLANNING

Introduction to species

Species information: Great Lakes breeding population was listed as endangered in 1986. Critical habitat was designated for the Great Lakes breeding population in 2001. Piping plovers have not been seen using the eastern end of Lake Ontario for breeding since 1984.

Justification for species selection: Federally-listed endangered. State-listed endangered. New York Field Office (NYFO) is regional lead.

State contribution to overall species population: 17 miles of critical habitat along Lake Ontario. No current breeding population in New York - only occasional sightings during migration.

Threats and threat assessment:

Threats[12] (See 5-year review for full assessment):

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Shoreline development, vegetation encroachment, water level control

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes: NA

Factor C. Disease or predation:

A. Disease has emerged as a potential new threat (currently at a low level).

B. Predation is a threat to adults, chicks, and nests.

Factor D. The inadequacy of existing regulatory mechanisms:

[12] Refers to 5 listing factors A-E in Section 4 of Endangered Species Act

A. In the absence of the Endangered Species Act (ESA), there is insufficient regulatory protections.

Factor E. Other natural or manmade factors affecting its continued existence:

A. Disturbance by humans and pets.

B. Wind projects.

C. Climate change.

D. Small population size/genetic diversity.

Recovery Goals

Range-wide Recovery Goals/Objectives: To restore and maintain a viable population (95% or greater chance of persisting 100 years) to the Great Lakes region and remove the Great Lakes population from the list of Threatened and Endangered Species by 2020.

Conservation goal(s) for New York State: No specific goal for New York. Great Lakes states outside of Michigan need to have 50 breeding pairs total. New York may be able to contribute to that recovery criterion.

Research/Actions needed: Survey known, historic, and potential breeding sites to locate breeding piping plovers (Recovery Action 1.21).

- Provide training in identification of piping plovers to SeaGrant interns. |FY12 $0 BP ESA RAN Planned
- Assist with 2011 International Census (1 day). |FY11 $0 BP ESA,CPA RAN Completed

Target bird watching groups in each state and Ontario and request assistance in locating migrating piping plovers (Recovery Action 3.2). |FY12 $0 BP,OUT ESA RAN Planned

Quantify other factors (disturbance, predation) limiting piping plovers at current and historic breeding sites (Recovery Action 4.212). |FY13 $0 BP ESA RAN Future

CONSERVATION DESIGN

Strategies for addressing those threats

Please go to these documents for the existing strategies:

- Recovery Plan 2003 (Service 2003)
- 5-year review completed September 2009 (Service 2009a)
    - Next 5-year review anticipated in 2014

Piping Plover (*Charadrius melodus*): Great Lakes Focal Area

- Spotlight Species Action Plan 2009 (Service 2009b)
- Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain (BCR 13) (Service 2007)

Research/Actions needed:

- Coordinate with Service Region 3, LE, NYSOPRHP, NYSDEC to develop response plan for spring/summer plover sightings. |FY12 $0 DES ESA RAN Planned

- Develop a state-by-state wintering and migration habitat use atlas (Recovery Actions 2.12, 2.13, 2.16).

- Conduct studies to understand potential effects of wind turbine generators that may be located or proposed for the Great Lakes, nearshore, and within or between nesting or foraging habitats. Information needs include migration routes and altitude, flight patterns associated with breeding adults and post-fledged young of the year foraging at nearby sites that are not contiguous with nesting habitats, and avoidance rates under varying weather conditions.

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY 2010 - 2012

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Incorporate protection of breeding areas into land use plans and existing permitting processes (Recovery Action 1.341).

    1. Request surveys prior to work done in critical habitat areas. |FY10-FY13 $0 DEL ESA,CPA ALL Ongoing

Factor B. Disease or Predation: No work planned in next 2-3 years.

Factor C. The inadequacy of existing regulatory mechanisms: No work planned in next 2-3 years.

Factor D. Other natural or manmade factors affecting its continued existence:

A. Participate in Great Lakes Wind Conferences and Initiatives when possible. |FY10-FY13 $0 DEL ESA,CPA ALL Ongoing

OUTREACH

Assist with press release regarding 2011 plover sightings. |FY11 $0 OUT ESA RAN Completed

Piping Plover (*Charadrius melodus*): Great Lakes Focal Area

Develop FWS press release in advance of possible 2012 sightings. |FY12 $0 OUT ESA RAN Planned

MONITORING

Review and track recovery progress. |FY10-FY13 $0 MON ESA RAN Ongoing

Provide sighting information to Region 3 for annual Regional Data Collection. |FY10-FY13 $0 MON ESA RAN Ongoing

Partners

New York State Natural Heritage Program, New York State Department of Environmental Conservation, The Nature Conservancy, Audubon Society

References

U.S. Fish and Wildlife Service. 2003. Recovery plan for the Great Lakes piping plover (*Charadrius melodus*). Fort Snelling, Minnesota.

U.S. Fish and Wildlife Service. 2007. Final Draft Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Region (BCR 13).

U.S. Fish and Wildlife Service. 2009a. Piping Plover 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service, Northeast Region, Hadley, Massachusetts, and Midwest Regions' East Lansing Field Office, Michigan.

U.S. Fish and Wildlife Service. 2009b. Draft Spotlight Species Action Plan for the Great Lakes Population of the Piping Plover (*Charadrius melodus*). U.S. Fish and Wildlife Service, East Lansing, MI.

LONG ISLAND FOCAL AREA

The Long Island Focal Area (LIFA) is located in the extreme southeastern corner of New York and contains approximately 1,413 square miles or 2.6% of the state. The focal area is located entirely on Long Island and its associated islands. The LIFA contains the glacially-determined transition from the forested, Long Island Sound Coastal Lowland in the northwest with local relief of 20-50 feet to the sandy Long Island/Barrier Islands and Coastal Marshes to the south and east with a local relief of 0-10 feet. Overall elevation range within Long Island is 0-250 feet. This focal area is characterized by its maritime climate, coastal sounds and bays, barrier beaches, and barrier and bay island systems.

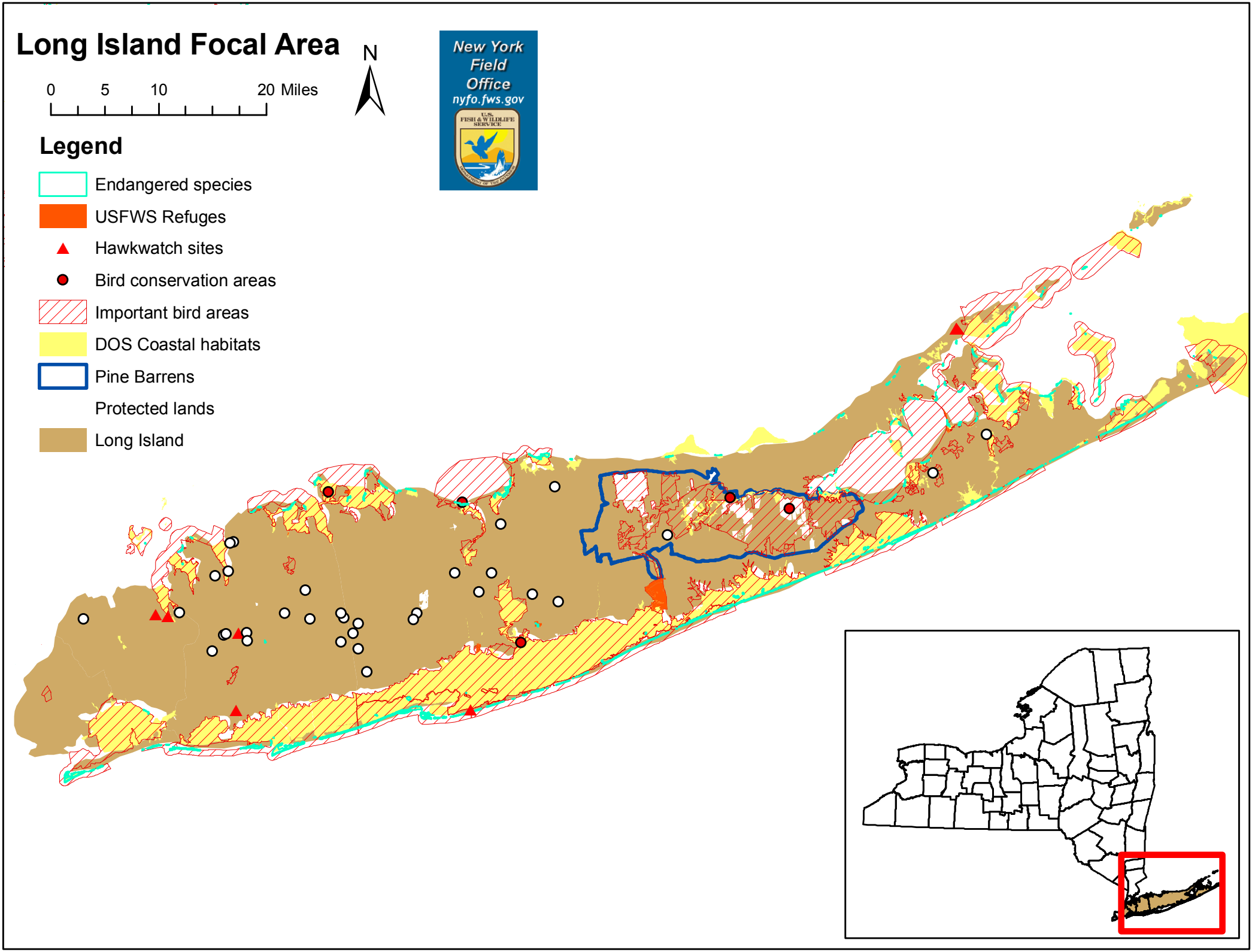
Long Island is the longest and largest island in the continental United States and represents one of the most important areas commercially and biologically in the United States. It is also one of the most populous islands in the world. Four New York counties are included within the LIFA boundary including Kings, Queens, Nassau, and Suffolk counties. Approximately 7,400,000 people live on Long Island, concentrated primarily in the western third of the island associated with the New York Metropolitan Area boroughs of Brooklyn and Queens. Land uses transition from heavily urbanized in the western portion of the island grading into successively less dense suburban areas eventually converting to primarily agricultural and forest lands in the eastern end.

This focal area was selected because it contains significant coastal and marine resources. The Long Island Wildlife Refuge Complex is located in this focal area and consists of nine National Wildlife Refuge Units – Amagansett (36 acres), Conscience Point (60 acres), Elizabeth A. Morton (187 acres), Oyster Bay (3,204 acres), Seatuck (209 acres), Target Rock (80 acres), Wertheim (2,572 acres), Sayville (26 acres), and Lido Beach (22 acres). There are currently five Federally-listed species (endangered [E], threatened [T], candidate [C]) and three identified species of concern within the focal area. Located in the Atlantic Flyway, Bird Conservation Region 30 (New England/Mid-Atlantic Coast), and Partners in Flight Physiographic Area 9 (Southern New England), the LIFA provides stopover, breeding, and wintering habitat for migrating bird species including piping plover (T), roseate tern (E), and red knot (C). Additionally, coastal saltmarshes provide breeding habitat for the saltmarsh sharp-tailed sparrow. Beach and dune habitats are used extensively by bird species for nesting; however, they are also necessary habitat for the reproduction of seabeach amaranth (T). Nearshore and offshore waters are important feeding and breeding grounds for a variety of important fish stocks including the historically overfished winter flounder. Upland habitats associated with sandplains and pine barrens also contain unique habitats that support species of concern including sandplain gerardia (E) and tiger salamander.

The Long Island and New York Field Offices actively seek to promote the above resources by addressing issues related to interactions with recreation, fishing, beach nourishment, navigation, transportation, wind power, and development. Specific threats include habitat loss, land conversion, shoreline hardening/development and dredging, overharvesting, invasive species, decreased habitat complexity, altered disturbance cycles, degraded water quality, and climate change. Current projects include the Fire Island Inlet to Montauk Point Beach Erosion Control

and Hurricane Protection Project (FIMP), Federal and non-federal permit review for U.S. Army Corps of Engineers projects and wind power development, and endangered species consultation and recovery activities.

Long Island Focal Area



Piping Plover (*Charadrius melodus*): Long Island Focal Area

Piping Plover Species Action Plan

FOCAL AREA: LONG ISLAND

Other species benefitting:

American oystercatcher, black skimmer, sanderling, gull-billed tern, red knot, least tern, common tern

BIOLOGICAL PLANNING

Introduction to species

Species information: Atlantic coast piping plovers breed on coastal beaches from Newfoundland and southeastern Quebec to North Carolina. After they establish nesting territories and conduct courtship rituals beginning in late March or early April, pairs form shallow depressions - nests - in the sand on the high beach close to the dunes. They sometimes line nests with small stones or fragments of shell. Piping plovers typically lay four eggs that hatch in about 25 days. The downy chicks are soon able to follow their parents in foraging for the marine worms, crustaceans, and insects that they pluck from the sand and eat.

Both the eggs and piping plover chicks blend into the beach so thoroughly that they are almost impossible to see. When predators or intruders come close, the chicks squat motionless on the sand while the parents attempt to attract the attention of the intruders, often by feigning a broken wing. Surviving chicks are able to fly in about 30 days.

Storm tides, predators, or intruding humans sometimes disrupt nests before the eggs hatch. When this happens, the plovers often lay another clutch of eggs. Chicks hatched from these late-nesting efforts may not fly until late August.

Piping plovers often gather in groups on undisturbed beaches before their southward migration. By mid-September, both adult and young plovers have departed for their wintering areas. These birds winter on the Atlantic coast from North Carolina south to Florida, along the Gulf coast, and in the Bahamas and West Indies.

Justification for species selection: The Atlantic coast piping plover is a Federally-listed threatened species (listing date 1986) and a New York State-listed endangered species. Within New York State, all occurrences of this species occur on Long Island, within the New York City boroughs, and occasionally in Westchester County. Within this geographical area, there are typically between 65 and 75 sites that support breeding piping plovers.

Piping plover nests are situated above the high tide line on coastal beaches, sandflats at the ends of sandspits and barrier islands, gently sloping foredunes, blowout areas behind primary dunes, and washover areas cut into or between dunes. They may also nest on areas where suitable dredged material has been deposited. Nest sites are shallow scraped depressions in substrates ranging from fine grained sand to mixtures of sand and pebbles, shells, or cobble (Bent 1929,

Burger 1987, Cairns 1982, Patterson 1988, Flemming *et al.* 1990, Maclvor 1990, Strauss 1990). Nests are usually found in areas with little or no vegetation, although on occasion, piping plovers will nest under stands of American beachgrass *(Ammophila breviligulata)* or other vegetation (Patterson 1988).

A number of anthropogenic factors affect the piping plover and their habitat on Long Island, including large scale fireworks events, un-regulated off-road vehicle (ORV) driving, and pedestrians spurred by residential and public land development projects. Further habitat modification and destruction caused by beach nourishment, and other shoreline and channel stabilization projects, can also adversely affect piping plover habitat.

Because threats to Atlantic coast piping plovers persist (and in many cases have increased since listing), reversal of gains in abundance and productivity would quickly ensue from diminishment of current protection efforts. Insufficiently reliable funding to support annual protection efforts poses a current threat. Considerable additional progress is required to accomplish recovery criterion 4 [of the recovery plan] - institution of long-term agreements among cooperating agencies, landowners, and conservation organizations to ensure sufficient protection and management to maintain population targets and average productivity in all recovery units (USFWS 2010).

Apart from being a major focus of the Long Island Field Office (LIFO) Endangered Species Recovery Program over the years, at the State level it has recently been identified as a "Species of Greatest Conservation Need" and recommendations to assist in its recovery are given in the New York State Department of Environmental Conservation's (NYSDEC) New York State Comprehensive Wildlife Conservation Strategy (see http://www.dec.ny.gov/docs/wildlife_pdf/lowerhudsontxt.pdf). The piping plover is also on the National Audubon Society's Red Watchlist, being identified as a species of "Highest Continental Concern." Audubon New York has stepped up its efforts on Long Island, recently installing a Bird Conservation Coordinator to focus on increasing the involvement of members of local Audubon Chapters in recovering this species.

State contribution to overall species population: The latest population data for 2008 showed New York contributing 443 pairs of piping plovers to the New York/New Jersey Recovery Unit. This equates to 79% of the population of this recovery unit and 23% of the Atlantic coast total.

Threats and threat assessment:

Threats[13] (See 2009 5-year review for full assessment):

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Shoreline development and stabilization; and, subsequent vegetation encroachment, long and short term shoreline erosion related to human attempts at shoreline stabilization, breach responses, preclusion of overwash/early successional habitat formation.

[13] Refers to 5 listing factors A-E in Section 4 of Endangered Species Act

Piping Plover (*Charadrius melodus*): Long Island Focal Area

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes: NA

Factor C. Disease or predation:

A. Mammalian and avian predators – human influenced changes to predator efficiency, and habitat (e.g. increases in feral cat populations, perching structures for avian predators, trash attracting mammalian predators to the nesting area).

Factor D. The inadequacy of existing regulatory mechanisms:

A. The Endangered Species Act (ESA) does not provide land use regulation tools that are needed for long term maintenance of habitat and long term protection of species breeding, foraging, and loafing habitat.

B. Disturbance by humans and pets, feral cats, unregulated or poorly regulated recreational activities including ORVs, kite flying, fireworks, chronic disturbances, and beach lighting.

Factor E. Other natural or manmade factors affecting its continued existence:

A. Sea level rise – potential loss of nesting habitat
B. Wind projects – potential direct mortality from the structures
C. Climate change – potential changes in prey availability and success of nesting
D. Small population size/genetic diversity

Recovery Goals

Range-wide Recovery Goals/Objectives:

Increase and maintain for 5 years a total of 2,000 breeding pairs, distributed among four recovery units as follows: Atlantic Canada, 400 pairs; New England, 625 pairs; **New York-New Jersey, 575 pairs;** Southern (DE-MD-VA-NC),400 pairs.

Achieve 5-year average productivity of 1.5 fledged chicks per pair in each of the four recovery units described in criterion 1, based on data from sites that collectively support at least 90% of the recovery units. As explained in the 1996 revised recovery plan and 5 year review document, modified productivity criteria that are specific to recovery units (rather than the "one-size-fits-all" measure of 1.5 chicks fledged per pair) should be developed in response to anticipated new information about the latitudinal variation in productivity needed to maintain a stationary population.

Institute long-term agreements to assure protection and management sufficient to maintain the population targets and average productivity in each recovery unit.

Piping Plover (*Charadrius melodus*): Long Island Focal Area

Conservation goal(s) for New York State:

Working with New Jersey Field Office (NJFO), NYSDEC, and Federal, State, and local cooperators achieve Piping Plover Recovery Plan goal of 575 pairs in New York-New Jersey Recovery Unit.

Achieve and maintain between 450 and 475 breeding pairs over the next 5 years.

Achieve and maintain productivity goal of 1.5 chicks fledged per pair over next 5 years.

Research/Actions needed:

- Identify sites most likely to maintain (or increase) characteristics of suitable piping plover breeding and/or migration habitat. Identify human coastal stabilization practices that increase or decrease adverse effects of sea-level rise on coastal piping plover habitats.

  (Who: USFWS will work with Recovery lead Anne Hecht on proposal to be submitted to the Landscape Conservation Cooperatives [LCC] through Fish and Wildlife Information Needs System [FWINS]; Cost: TBD)

- Conduct studies to understand potential effects of wind turbine generators that may be located or proposed for the Outer Continental Shelf, nearshore, and within or between nesting and foraging habitats. Information needs include migration routes and altitude; flight patterns associated with breeding adults and post-fledged young of the year foraging at nearby sites that are not contiguous with nesting habitats; and, avoidance rates under varying weather conditions.

  (Who: USFWS will work with Recovery lead Anne Hecht on proposal to be submitted to the LCC through FWINS; Cost: TBD)

- Conduct studies, including meta-analyses of local studies, to understand factors that affect latitudinal variation in productivity needed to maintain stationary populations of Atlantic coast piping plovers.

  (Who: USFWS will work with Recovery lead Anne Hecht on proposal to be submitted to the LCC through FWINS; Cost: TBD)

- Conduct studies of ecology and foraging behavior of key predators; for example, studies assessing the adequacy of buffers between feral cat colonies and piping plover nesting sites would be useful.

  (Who: USFWS will work with Recovery lead Anne Hecht on proposal to be submitted to the LCC through FWIN; Cost: TBD)

- Conduct demographic modeling to explore effects of latitudinal variation in productivity, survival rates, and the carrying capacity of habitat on population viability within individual recovery units and the Atlantic coast population as a whole.

  (Who: USFWS will work with Recovery lead Anne Hecht on proposal to be submitted to the LCC through FWINS; Cost: TBD)

CONSERVATION DESIGN

Strategies for addressing those threats

Please go to these documents for the existing strategies:

- Recovery Plan 1996 (Service 1996) http://ecos.fws.gov/docs/recovery_plan/960502.pdf

- 5-year review completed September 2009 (http://www.fws.gov/northeast/endangered/PDF/Piping_Plover_five_year_review_and_summary.pdf

- Spotlight Species Action Plan 2009 http://www.fws.gov/northeast/endangered/pdf/Piping%20plover%20SSAP.pdf
  The Atlantic coast Breeding Range spotlight action plan provides a goal that in 5 years the status of the Atlantic coast population has been maintained or improved. Three measures are identified to achieve that goal:

  1. Reduced or stabilized threat from effects of sea level rise.

     a. Develop a strategy to address this.

     b. Work with land managers to incorporate explicit measures to preserve resilience of habitat into at least one pilot management plan for an important breeding site.

  2. Increased abundance of the population, and for New York Field Office, recouping and maintaining the New York/New Jersey recovery until target of greater than 575 pairs reached only once.

     a. Continue vigorous implementation of recovery plan tasks 1.1 through 1.5.

     b. Work with U.S. Department of Agriculture (USDA) Animal Wildlife Services to develop targeted predator management plans where predation is a major factor limiting productivity.

  3. Demonstrating progress towards achieving recovery criterion 4 which is establishment of long term agreements for protection and management of habitat.

a. Complete at least one prototype agreement to ensure long term protection of plovers and their habitat, responding to listing factors A, C, D, and E, recovery task 1.62, and 5-year review number 3.

- Atlantic Coast Population website: http://www.fws.gov/northeast/pipingplover/

- Bird Conservation Plan for the New England/Mid Atlantic Coast Bird Conservation Region (BCR 30) (http://www.nabci-us.org/bcr30.htm)

Research needed:

- Develop a state-by-state wintering and migration habitat use atlas (Recovery Actions 2.12, 2.13, 2.16).

  (WHO: USFWS will work with Recovery lead Anne Hecht on proposal to be submitted to the LCC through FWINS) (cost TBD)

- Conduct studies to understand potential effects of wind turbine generators that may be located or proposed for the coast, nearshore, and within or between nesting or foraging habitats. Information needs include migration routes and altitude, flight patterns associated with breeding adults and post-fledged young of the year foraging at nearby sites that are not contiguous with nesting habitats, and avoidance rates under varying weather conditions.

  (WHO: USFWS will work with Recovery lead Anne Hecht on proposal to be submitted to the LCC through FWINS) (Cost: TBD)

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY 2010 - 2012

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range by:

A. Incorporating protection of breeding areas into land use plans and existing permitting processes (Recovery Action 1.341).

   1. Provide technical assistance on appropriate conservation measures (e.g. time-of-year restrictions) to avoid and minimize adverse effects relative to U.S. Army Corps of Engineers (USACE) and U.S. Coast Guard permit, planning, and operations decisions (LIFO). |FY12 $0 BP ESA PAPA,SPS Ongoing

Factors A, C, and D by identifying and securing reliable funding to support continuing management of threats from human disturbance and predation (Recovery Plan Tasks 1.1, 1.3, and 1.4).

Piping Plover (*Charadrius melodus*): Long Island Focal Area

A. Implement monitoring and management of piping plovers at select sites such as Sand City, Crab Meadow Beach, Breezy Point, West Hampton, Plum Island, Fishers Island, Centre Island, and Silver Point, between April 1 and September 1. Depending on availability and need, assist Long Island's east end towns with monitoring and management. This effort also includes cross-programmatic efforts with Long Island National Wildlife Refuge Complex (LINWRC) and USFWS-Law Enforcement (LE), coordination with cooperators, providing technical assistance, funding and supplies, and when available, outside funding from the USACE to hire a plover monitor for the Federal Fire Island Inlet Navigation Project Area (LIFO). |FY12 $0 MON ESA PAPA,SPS Ongoing

B. Survey Cedar Beach Mount Sinai and other key breeding sites (to be listed) within each sub-basin for feral cats. Coordinate with cooperators to assess predator issues at breeding sites and develop action plans as necessary.

   1. Assess feasibility of a plan regarding feral cats on Cedar Beach Mount Sinai and other breeding sites within the Town of Brookhaven. Continue to participate in national teleconferences to develop USFWS guidance on feral cats. On Long Island, obtain and gather information on feral cat colony locations; do outreach to local government to advise them about removal of colonies (LIFO). |FY12 $0 BP ESA PAPA Ongoing

C. Coordinate with USDA – Animal Wildlife Services on Long Island-wide predator management program, a subpart of the overall Northeast Corridor Plan.

   1. Provide input for Long Island.

   2. Complete any intraservice consultations on removal of predators in breeding habitat (LIFO). |FY12 $0 BP ESA PAPA,SPS Ongoing

D. Provide cooperators piping plover equipment such as signs, predator exclosures, fencing, and string for identified priority sites (as funding allows) (LIFO). |FY12 $10,000 DEL ESA PAPA,SPS Ongoing

E. Hold steward training sessions.

   1. Hold two steward training sessions for incoming stewards and land managers (LIFO). |FY12 $0 MON ESA PAPA,SPS Ongoing

   2. Work with USFWS-LE to assess need for special training for USFWS-LE agents from cooperating land managers (LIFO). |FY12 $0 MON ESA PAPA,SPS Ongoing

F. Conduct Long Island Colonial Waterbird and Piping Plover Surveys at Sand City, Centre Island, Tobay Marsh Islands, Silver Point, Crab Meadow Beach, Breezy Point, Fishers Island, and Plum Island. Assess piping plover use of mainland upland sand dredging

disposal sites located at Roe and Grove Avenue in Patchogue by conducting periodic surveys (LIFO). |FY12 $0 MON ESA PAPA,SPS Ongoing

G. Work with NYSDEC and National Park Service (NPS) to organize and implement annual End of Season cooperators meeting to assess season results and recognize stewards. |FY12 $0 MON ESA PAPA,SPS Ongoing

H. Continue to promote the restoration and maintenance of natural coastal formation processes in the New York-New Jersey recovery unit (specifically, Long Island) where threats from development and artificial shoreline stabilization are highest, and in the Southern recovery unit, where the plover's habitat requirements are the most stringent (recovery task 1.2). This action is also critical to reducing adverse effects of accelerating sea-level rise. Where possible, reestablish high quality intertidal forage habitats by promoting, with land use regulators, the natural formation of overwash fans and other like formations. Where possible, work with landowners to develop plans to reestablish high quality foraging habitats by either manufacturing sandflats, mudflats, or overwash fans, or allowing such formations to build naturally. Also, ephemeral pool creation adjacent to beach nesting habitat will be pursued in these plans.

I. On a case by case basis, assess impacts of USACE and local government projects on coastal processes through Section 7 consultation and Section 10 permit review (LIFO). |FY12 $0 BP ESA PAPA,SPS Ongoing

J. Meet with Fire Island National Seashore Natural Resource Management to review results of 2010, and plan for 2011, threatened and endangered species monitoring and protection efforts within the Seashore. |FY12 $0 BP ESA PAPA Ongoing

K. As follow up to existing Section 7 consultations with the NPS and Suffolk County Department of Parks, Recreation and Conservation, determine compliance with project commitments to undertake habitat restoration at Cupsogue County Park and Smith Point County Park (LIFO). |FY12 $0 MON ESA PAPA Ongoing

L. Work with New York State Office of Parks, Recreation and Historic Preservation (NYSOPRHP) on a conservation strategy to address long term conflicts between recreational uses of barrier beaches and listed species habitat protection and avoidance of adverse effects/take (all LIFO). |FY12 $0 BP ESA PAPA,SPS Ongoing

    1. Meet with NYSOPRHP to discuss loss of two chicks when ORV traffic impinged on natural movements of adults and hatched chicks in pre-fledged condition. |FY12 $0 BP ESA PAPA,SPS Ongoing

    2. Meet with Regional Office (RO) and other Habitat Conservation Plan (HCP) experts to draft a strategy for assisting the State in developing an HCP and Section 10 permit.

    3. Convene a workshop with NYSDEC and NYSOPRHP to explain HCP process and develop a timeline for the State to apply for a Section 6 HCP writing grant, if

interested; for developing the parts of the HCP and to show significant progress towards its completion before plover breeding season 2011. Key issues to iron out include: covered species, covered activities, covered lands, permit duration, and discuss impacts/effects, take and the impacts of the take. Set biological goals and objectives and development of a conservation strategy, including explicit measures for avoidance, minimization and mitigation; address monitoring and adaptive management measures. Fully discuss alternatives to take. |FY12 $0 BP ESA PAPA,SPS Ongoing

M. As needed, work with Valley Stream office of USFWS-LE to investigate alleged endangered species take incidents. Develop a work plan for a seasonal intern to undertake piping plover monitoring at Southampton and Huntington, New York, in support of USFWS-LE activities (contingent on funding) (LIFO).

N. As requested, undertake Section 7 consultation with the Federal Emergency Management Agency (FEMA) for emergency disaster declaration projects (LIFO). |FY12 $0 BP ESA PAPA Ongoing

O. Address oystercatcher predation pressure on plovers.

   1. Develop a scope of work to investigate the scope of the problem.

   2. Develop a research proposal to ascertain pressures causing this problem, including competition for breeding areas or for forage.

P. Continue to lead ESA efforts on review of General Services Administration's Draft Environmental Impact Statement regarding the proposed disposition of Plum Island Animal Research Lab (LIFO). |FY12 $0 BP ESA PAPA Ongoing

Address Factor E. Other natural or manmade factors affecting its continued existence:

Nothing planned this year.

Partners

NYSDEC Regions 1 and 2, New York State Parks, TNC, Audubon, Nassau and Suffolk Counties, Towns of Hempstead, Babylon, Islip, Brookhaven, Huntington, East Hampton, Southampton, Shelter Island, Southold, Riverhead, Oyster Bay, City of Long Beach, City of Glen Cove, Queens County, Kings County, Fire Island National Seashore.

OUTREACH

Participate in two outreach events to promote listed species conservation on Long Island.

Piping Plover (*Charadrius melodus*): Long Island Focal Area

MONITORING

Continue to review and track recovery progress.

Conduct Long Island Colonial Waterbird and Piping Plover Surveys at Sand City, Centre Island, Tobay Marsh Islands, Silver Point, West Hampton Dunes, Breezy Point, Fishers Island, and Plum Island.

Conduct weekly monitoring and management at Breezy Point, Sand City, and Plum Island. Monitor Cedar Beach Mount Sinai, Village of Westhampton Dunes, beaches within the Towns of Easthampton, Southampton, and Huntington, and Silver Point, as needed.
Supervise and assist volunteer piping plover monitors at Half Moon Beach, Crab Meadow Beach, and Prospect Point.

Secure funding for monitoring and management of listed species at Fire Island Navigation Project Area. Oversee subcontractor efforts.

Partners

New York State Natural Heritage Program, NYSDEC, The Nature Conservancy, Audubon Society

References

U.S. Fish and Wildlife Service. 1996 Recovery plan for the Atlantic coast piping plover (*Charadrius melodus*) Hadley, MA. http://ecos.fws.gov/docs/recovery_plan/960502.pdf

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U.S. Fish and Wildlife Service. 2009b. Draft Spotlight Species Action Plan for the Atlantic Coast Population of the Piping Plover (*Charadrius melodus*). Northeast Regional Office, U.S. Fish and Wildlife Service, Hadley, MA.
http://www.fws.gov/northeast/endangered/pdf/Piping%20plover%20SSAP.pdf

Red Knot (*Calidris canutus rufa*): Long Island Focal Area

Red Knot Species Action Plan

FOCAL AREA: LONG ISLAND

Other species benefitting:

sanderling, black-bellied plover, dunlin, ruddy turnstone, sandpiper spp.

BIOLOGICAL PLANNING

Introduction to species

Species information: The red knot (*Calidris canutus*) is a worldwide species with a total population of approximately 1.05 million (Wetlands International 2006, Minton unpublished data, this review). There are six subspecies of the red knot which together have a circumpolar arctic breeding distribution, though each breeds in a distinct area and winter separately. This species action plan focuses on the New World red knot subspecies *Calidris canutus rufa*.

Essentially, the plumage of all red knots is mainly chestnut-red or salmon-colored during the breeding season and white and gray for the remainder of the year. The differences between the subspecies are largely confined to breeding plumage and size. Pair bonds form soon after arrival on breeding grounds and remain intact until shortly after the eggs hatch (Niles et al. unpublished data) when the females leave their broods. Nests are cup-shaped depressions, often with well-defined rims, lined with dried leaves, grasses, and sometimes lichens. Red knots lay only one clutch per season and as far as is known, do not lay a replacement clutch if the first is lost. The usual clutch size is 4 eggs, though 3-egg clutches have been recorded. The incubation period lasts approximately 22 days from the last egg laid to the last egg hatched. Both sexes participate equally in egg incubation. Hatching occurs within the first half of July and is generally synchronized. Hatching within clutches is apparently quite synchronous, occurring within the same day. The fledgling period is estimated to be 18 days. Soon after the chicks hatch in mid-July, the females leave the breeding grounds and start moving south. Males look after the chicks until they fledge at about 25 days when they too abandon them and move south. Not long after, they are followed by the juveniles, which start to appear along the northeast coast of the U.S. in the second half of August. Throughout the flyway, the adults generally precede the juveniles as they move south from stopover to stopover.

Justification for species selection: The red knot is a candidate species for listing under the Endangered Species Act of 1973. It is found at shorebird migratory stopover sites on Long Island during the summer.

State contribution to overall species population: The numbers of red knots who use Long Island as a migratory stopover are based on limited casual observations of the species during the migration period.

Threats and threat assessment:

Red Knot (*Calidris canutus rufa*): Long Island Focal Area

1. **Reduction in foraging resources**

   The main identified threat to the rufa population is the reduced availability of horseshoe crab eggs in Delaware Bay, arising from elevated harvest of adult crabs for bait in the conch and eel fishing industries. Since 1990, there has been a substantial decline in the crab population. Although significant uncertainty regarding the extent of the decline of the horseshoe crab population remains, there is general agreement that horseshoe crab stocks have declined to a level where increased management of the fishery is necessary and appropriate. The decline in crabs has led to a decrease in the density of eggs available to shorebirds. Because of their delayed maturity, demographic models indicate that even if further exploitation of crabs ceases immediately, it will be some years before the horseshoe crab population recovers to its former level.

   The greatest risk of the declining availability of horseshoe crab eggs in Delaware Bay to red knots is that it jeopardizes their ability to achieve the mass required to reach the Arctic and attain good breeding condition.

   Research needed:

   - How many crab eggs are enough? Integration of horseshoe crab egg data and shorebird behavior into a model that can predict the numbers of eggs needed by shorebirds. From this an estimate of the density of eggs required to support present and future numbers of shorebirds can be calculated.

   - Modeling food availability to red knots in Delaware Bay will need bay-wide egg data and an understanding of the conditions under which the egg supply in the top 5 cm of sand (and, therefore, potentially available to knots) increases and decreases.

   - Studies that determine the level of harvest that will ensure enough eggs for migratory shorebirds are essential.

     (Who: U.S. Fish and Wildlife Service [USFWS] via species coordinator; Costs: unknown at this time)

2. **Decreased habitat availability from beach erosion and shoreline stabilization**

   Delaware Bay's sandy barrier beaches are dynamic features that respond in a generally predictable manner, migrating landward by storm overwash as the bayward shoreline is also retreating landward in the face of continued sea level rise (Phillips 1986a).

   Research needed:

   - Evaluate threat to species as a result of decreased habitat availability due to beach erosion and shoreline stabilization.

     (Who: USFWS via species coordinator; Costs: unknown at this time)

3. Curtailment of habitat use from disturbance by people and dogs

Human disturbance can have an adverse effect on shorebird foraging and this depends on the degree of disturbance and the availability of other suitable feeding areas. Disturbance compels birds to pay the energetic cost of flying to a new area; it may reduce the amount of time that the birds are able to feed, and can prevent them from feeding in the most preferred sites. Any overall reduction in energy intake as a result of these responses is the net impact of disturbance on energy budgets (Davidson and Rothwell 1993).

Research needed:

- Effects of disturbance mechanisms on red knot.

  (Who: USFWS via species coordinator: Costs: unknown at this time)

4. Competition from gulls

Gulls are both competitors for food and potential predators of shorebirds. They take advantage of abundant horseshoe crab eggs, particularly on that part of the New Jersey bayshore that lies close to their Atlantic coast breeding colonies.

Research needed:

- Effects of gull competition on foraging resources and harassment of red knot.

  (Who: USFWS via species coordinator: Costs: unknown at this time)

5. Risks associated with small population size

The threat to *rufa* may become further increased if the population drops below about 10,000 because Baker *et al*. (2005a) has shown that, due to their low genetic variability, the effective size of shorebird populations is much smaller than numbers censused (i.e., not all individuals contribute to the gene pool). As a result, census populations of 5,000 - 10,000 are likely to be especially vulnerable to the accumulation of harmful genetic mutations. Small populations are also at greater risk from the effects of stochastic events. This applies especially to those which, like the red knot, are highly dependent on a small number of sites.

Research needed:

- Modeling analysis of risks associated with small population size.

  (Who: USFWS via species coordinator: Costs: unknown at this time)

6. Weather-related threats to red knots

Cold and/or wet weather during the brief arctic summer can have a severely adverse effect on the breeding success of shorebirds (van de Kam et al. 2004). Global climate warming may lead to alterations in arctic weather patterns. These may be beneficial to shorebirds if they lead to warmer, longer breeding seasons, but this is by no means certain (Rehfisch and Crick 2003).

In the very long term, global warming may lead to large-scale habitat changes which will greatly exacerbate the vegetation responses to increased atmospheric carbon dioxide (Rehfisch and Crick 2003).

Research needed:

- Modeling analysis of risks associated with weather-related threats on red knot populations.

  (Who: USFWS via species coordinator: Costs: unknown at this time)

7. Inadequacies of the Federal and regional regulatory system

The existing regulatory system creates a number of problems for the conservation of red knots stopping over in Delaware Bay in that different agencies have jurisdiction over the protection of horseshoe crabs (and their eggs) on the one hand, and red knots on the other. The birds are under the legal jurisdiction of the USFWS, and the horseshoe crabs are under the legal jurisdiction of the Atlantic States Marine Fisheries Commission (ASMFC) which has the authority to set quotas for adoption by the states. The ASMFC is overseen by the National Marine Fisheries Service (NMFS) which has ultimate responsibility for the management and conservation of living marine resources.

Research needed:

- Analysis of most effective regulatory mechanisms to help recover red knots.

  (Who: USFWS via species coordinator: Costs: unknown at this time)

8. Inadequacies of regulatory systems in individual states

Without adequate Federal coordination, the attempts of individual states to conserve red knots have lacked consistency. This has led to substantial gaps in protection, especially when horseshoe crab fishermen have exploited differences in regulations among states.

Research needed:

- Analysis of most effective regulatory mechanisms to help recover red knots.

(Who: USFWS via species coordinator: Costs: unknown at this time)

9. Disease or predation

Potential predators of shorebirds, especially peregrines, red foxes (*Vulpes vulpes*), and feral cats (*Felis catus*), are possibly more of a threat to knots in Delaware Bay as sources of disturbance than as agents of mortality. An epizootic disease resulting in large-scale mortality of knots reported from the west coast of Florida in December 1973 and November 1974 was caused by a protozoan parasite, most likely an undescribed sporozoan species (Harrington 2001). Further reports on knot mortality in Florida in 1981 were due to *Plasmodium hermani* (Harrington 2001). In 1981 there was a report of an adventitious molt in red knots caused by a mallophagan parasite (Mallophaga: Menoponidae) in feather shafts (Harrington 2001). No systematic effort has yet been made to assess the parasite load of birds passing through Delaware Bay, but field workers have noticed ectoparasites on a substantial number of knots caught there (Minton and Niles unpublished information). This is a factor worthy of further investigation.

Research needed:

- Analysis of disease pathways and predation on red knots

  (Who: USFWS via species coordinator: Costs: unknown at this time)

Partners/potential funding:

Partners: National Park Service (NPS), New York State Department of Environmental Conservation (NYSDEC) Regions 1 and 2, New York State Parks, Nassau and Suffolk Counties, Long Island towns, Queens County, Kings County, New York City Audubon, local Audubon Chapters

CONSERVATION DESIGN

Strategies for addressing those threats

1. Reduction in foraging resources and decreased habitat availability from beach erosion and shoreline stabilization

a. Seek to minimize loss of horseshoe crab habitat by influencing regulatory agency decisions regarding shoreline modifications including bulkheading; and, “unnatural” erosion mitigation practices, dredging, and placement of fill along bay shorelines.

b. Target USFWS habitat restoration and enhancement projects to horseshoe crab habitat including adding enhancements to shoreline beach nourishment projects; promoting habitat restoration projects; and, provide technical assistance on restoration projects.

c. Facilitate habitat preservation through coordination with Federal, State, and local government agencies as well as private organizations such as land trusts.

d. Preserve, restore, and/or enhance shorelines known to support horseshoe crabs.

e. Seek to minimize loss of habitat function when habitat is degraded by adjacent land uses by influencing regulatory agency decisions.

2. Curtailment of habitat use from disturbance by people and dogs

a. Coordinate with land managers to evaluate land use measures to reduce disturbances from humans and dogs.

b. Develop outreach materials specific to this issue through the Beach Awareness and Habitat Campaign which is comprised of Federal, State, and local agencies and non-governmental organizations (NGO).

3. Competition from gulls

a. Collect data on gull absence/presence at horseshoe crab spawning sites.

4. Risks associated with small population size

Please go to the following document for the existing strategies:

Status of the red knot in the Western Hemisphere (Service 2007).

5. Weather-related threats to red knots

Please go to the following document for the existing strategies:

Status of the Red knot in the Western Hemisphere (Service 2007).

6. Inadequacies of the Federal and regional regulatory system

Please go to the following document for the existing strategies:

Status of the red knot in the Western Hemisphere (Service 2007).

7. Inadequacies of regulatory systems in individual states

Please go to the following document for the existing strategies:

Status of the Red knot in the Western Hemisphere (Service 2007).

8. Disease or predation

a. Record dead red knot specimens; identify sources of predation at key migratory stopover areas.

Partners/potential funding:

Partners

NPS, NYSDEC Regions 1 and 2, New York State Parks, Nassau and Suffolk Counties, Long Island towns, Queens County, Kings County, New York City Audubon, local Audubon Chapters.

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY 2010 – 2012

1. **Reduction in foraging resources and decreased habitat availability from beach erosion and shoreline stabilization**

   a. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding shoreline modifications, including bulkheading and "unnatural" erosion mitigation practices, dredging, and placement of fill along bay shorelines and wetlands.

      i. Developing fact sheets and best management practices (BMP) to minimize impacts to red knot from a suite of different construction activities.

      ii. Post these fact sheets/BMP on our website.

      iii. Writing substantive comments on proposed Federal agency actions with likely adverse impacts on red knot (Conservation Planning Assistance [CPA]).

   b. Target USFWS habitat restoration and enhancement projects for red knot, including adding enhancements to shoreline protection design projects; promoting habitat restoration projects; and, provide technical assistance on beach nourishment and restoration projects.

      i. Incorporate Fire Island to Montauk Point Restoration proposals into horseshoe crab habitat enhancement planning.

   c. Facilitate habitat preservation through coordination with Federal, State, and local government agencies as well as private organizations such as land trusts.

      i. Coordination with Peconic Land Trust and other organizations to protect important horseshoe crab spawning sites and red knot foraging areas.

   d. Preserve, restore, and/or enhance shorelines known to support horseshoe crabs and red knots.

i. Coordinate with Federal, State, and local agencies as well as NGOs on methods to preserve, restore, or enhance red knot habitat.

e. Seek to minimize loss of habitat function when habitat is degraded by adjacent land uses by influencing regulatory agency decisions.

i. Coordinate with Federal, State, and local regulatory and land use agencies on measures that could minimize impacts to horseshoe crab and red knot habitat, including the Plumb Beach Shoreline Protection Project (LIFO). |FY12 $0 BP ESA PAPA,SPS Ongoing

2. **Curtailment of habitat use from disturbance by people and dogs**

a. Coordinate with land managers to evaluate land use measures to reduce disturbances from humans and dogs.

b. Develop outreach materials specific to this issue through the Beach Awareness and Habitat Campaign which is comprised of Federal, State, and local agencies and NGOs.

3. **Competition from gulls**

a. Collect data on gull absence/presence at horseshoe crab spawning sites.

4. **Risks associated with Small population size**

Please go to these documents for the existing strategies:

Status of the Red knot in the Western Hemisphere (Service 2007).

5. **Weather-related threats to red knots**

Please go to the following document for the existing strategies:

Status of the Red knot in the Western Hemisphere (Service 2007).

6. **Inadequacies of the Federal and regional regulatory system**

Please go to the following document for the existing strategies:

Status of the Red knot in the Western Hemisphere (Service 2007).

7. **Inadequacies of regulatory systems in individual states**

Please go to the following document for the existing strategies:

Status of the Red knot in the Western Hemisphere (Service 2007).

8. **Disease or predation**

    a. Record dead red knot specimens; work to reduce feral cat and red fox populations near known migratory stopover areas.

Partners/potential funding:

Partners: NPS, NYSDEC Regions 1 and 2, New York State Parks, Nassau and Suffolk Counties, Long Island towns, Queens County, Kings County, New York City Audubon, local Audubon Chapters.

OUTREACH

Potential outreach needs:

- Landowner education
- Public outreach

Partners/potential funding:

Partners: NPS, NYSDEC Regions 1 and 2, New York State Parks, Nassau and Suffolk Counties, Long Island towns, Queens County, Kings County, New York City Audubon, local Audubon Chapters.

MONITORING

- Work with NYSDEC to monitor red knot at migratory stopover areas such as West Hampton Dunes, Southampton, and Jamaica Bay.

- Evaluate habitat restoration projects and resulting effects on red knot habitat use and abundance during migration.

- Seek funding and support for monitoring.

Partners/potential funding:

Partners: NPS, NYSDEC Regions 1 and 2, New York State Parks, Nassau and Suffolk Counties, Long Island towns, Queens County, Kings County, New York City Audubon, local Audubon Chapters.

Other Research needed as identified in USFWS (2007):

- How do birds from different wintering populations use Delaware Bay?

Red Knot (*Calidris canutus rufa*): Long Island Focal Area

- Why has there been a trend for northward migration to become later?
- About 20% of the red knots passing through Delaware Bay have isotope signatures not compatible with known molting areas – where do these birds molt?
- Why have there been declines in some wintering areas in southern South America and not others?
- Why have many southern South American wintering birds not passed through Delaware Bay in Spring?
- What is the extent of the roselaari and rufa wintering areas, do they both pass through Delaware Bay and where do they breed?
- Breeding productivity is a major unknown – monitoring it might help with understanding the impact of depleted food resources in Delaware Bay as well as allowing full demographic modeling.
- Virginia - Investigation of which prey red knots are targeting on the Virginia barrier islands, with specific attention paid to identifying the availability of prey on peat banks vs. on high energy beaches and the relative importance of each to migrating red knots.
- North Carolina - Research on impacts of beach stabilization and impacts of human disturbance.
- South Carolina - Develop a South Carolina Department of Natural Resources web site with information on the status, management, and natural history of red knots in South Carolina. Work with public and private land managers to protect areas identified as important red knot roost sites. Obtain travel money to participate in red knot working groups.
- Massachusetts - High priority needs for the State of Massachusetts include research and monitoring of human disturbance in shorebird habitats, particularly those disturbances associated with commercial and recreational fishing and public access to beaches.

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Roseate Tern (*Sterna dougallii dougallii*): Long Island Focal Area

Roseate Tern Species Action Plan

FOCAL AREA: LONG ISLAND

Other species benefitting:

common tern, least tern, red-throated loon, common eider, razorbill, scoter spp., long-tailed duck

BIOLOGICAL PLANNING

Introduction to species

Species information:

Justification for species selection: Federally-listed (endangered) State Status. New York field Office (NYFO) national or regional lead?

State contribution to overall species population: Federally-listed endangered species, New York sustains approximately 50% of the Atlantic Coast population. Roseate terns have been fairly stable for the past 5 years, though the number of breeding locations has declined in recent years, with Great Gull Island and Fort Tyler (Gardiners Point Island) as the only stable breeding locations in all of New York.

Threats and threat assessment:

Threats[14] (See 5-year review for full assessment):

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Long- and short-term shoreline erosion
B. Preclusion of overwash/early successional habitat
C. Shoreline development and stabilization
D. Sea level rise
E. Storm-induced flooding

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes: NA

Factor C. Disease or predation:

[14] Refers to 5 listing factors A-E in Section 4 of Endangered Species Act

Roseate Tern (*Sterna dougallii dougallii*): Long Island Focal Area

A. Mammalian and Avian Predators: Nest predation can be very high, particularly from fox, crow, and most recently, American oystercatchers. Predation of chicks by cat, gull, raccoon, fox, and crow limits productivity of successfully nesting birds.

Factor D. The inadequacy of existing regulatory mechanisms:

A. Recreational Activities

Factor E. Other natural or manmade factors affecting its continued existence:

A. Invasive vegetation
B. Wind energy projects
C. Sea level rise - As sea level continues to rise and erosion of historical breeding islands continues, suitable nesting sites of both Common and Roseate terns are likely to decrease, exposing both species to a higher likelihood of drastic population declines as the few remaining breeding locations contain a higher proportion of the entire population.

Recovery Goals:

Range-wide Recovery Goals/Objectives: To increase the nesting pairs (U.S. and Canada) to 5,000 breeding pairs at six large colonies. Secondarily, to have roseate terns distributed to at least 30 sites, and expand breeding range to historically occupied areas south of current range. (Roseate Tern Recovery Plan [1989] and First Update [1998]).

Conservation goal(s) for New York State:

Objective: Working with Roseate Tern Recovery Team, New York State Department of Environmental Conservation (NYSDEC), and Federal, State, and local cooperators contribute to recovery of the northeastern roseate tern population. On Long Island, achieve and maintain between 1,600 and 1,800 breeding pairs over the next 5 years, and explore potential for expanding the number of colonies in the Long Island Sound and South Shore Ocean and Bays focal areas.

Research/Actions needed:

Movement of bait fish – moving north are species changing or number declining and potential impact on the population.

Additional studies of roseate tern migratory movement along the Atlantic Coast.

(WHO – recovery team coordinator Michael Amaral has the lead)

Continuing to fund American Museum of Natural History (AMNH) Great Gull monitoring and management of common tern and roseate tern colony at Great Gull – largest colony in New York State, sustaining and providing 98% of New York population (Long Island Field Office [LIFO]).

Roseate Tern (*Sterna dougallii dougallii*): Long Island Focal Area

Participate in roseate tern recovery meeting in Rhode Island end of November (LIFO). |FY12 $10,000 BP ESA SPS Ongoing

Participate in roseate tern recovery meeting October 2011. |FY12 $0 BP ESA PAPA,SPS Ongoing

CONSERVATION DESIGN

Strategies for addressing those threats

Please go to these documents for the existing strategies:

- Recovery Plan
- Last 5-year review completed
    - Next 5-year review anticipated
- A number of goals and recommendations for this species have been identified by the NYSDEC in their Comprehensive Wildlife Conservation Strategy for the Lower Hudson – Long Island Basins focal area. (http://www.dec.ny.gov/docs/wildlife_pdf/lowerhudsontxt.pdf). Several of these are provided below:
- Roseate Tern Recovery Plan (1989) and First Update (1999)
- NYSDEC Long Island Colonial Waterbird and Piping Plover Survey Program (1998-1999)
- U.S. Fish and Wildlife Service (USFWS) Long Island Field Office Piping Plover Steward training and Law Enforcement Training Manuals
- West of Shinnecock Inlet Interim Storm Damage Protection Biological Opinion

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY 2010 -2012

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Meet with NYSDEC and other local public landowners to discuss potential restoration opportunities to develop new ideal nesting conditions on islands with less recreational use pressure, predators. Explore mechanisms such as use of dredge spoil management, input

B. Develop ideal nesting condition on barrier beaches.

   1. Provide technical assistance to Breezy Point Coop, and other sites as needed, for common, least, and roseate tern nesting habitat protection. (LIFO). |FY12 $0 BP ESA PAPA,SPS Ongoing

C. Seek management and restoration opportunities that aim to restore natural shorelines in the basin.

D. Support cooperative and coordinated interagency invasive species management and control. Also, control density and composition of vegetation at breeding sites to maintain suitability for nesting through planting of fresh spoil sites with desired species, and grading and/or spoil deposition at sites where vegetation has become too dense.

   1. Bay Islands (e.g. New Made Island, West Inlet) – essential to establish alternative populations as 98% of New York population is at Great Gull.

   2. Continue to support Town of Brookhaven project at New Made Island with installation and broadcasting breeding calls to attract roseate and common terns (LIFO). |FY12 $0 DEL ESA PAPA,SPS Ongoing

   3. In cooperation with the Town of Brookhaven, plan vegetation removal/maintenance at New Made Island. (LIFO). |FY12 $0 DEL ESA PAPA,SPS Ongoing

Factor B. Disease or predation:

A. Control predators by encouraging landowners to open property during legal hunting and trapping seasons, as well as allowing trapping within the breeding season if predation levels are excessive.

B. Address avian predators by ensuring proper disposal and pick up of garbage and litter to minimize likelihood that avian predators will be present.

   1. Monitor impacts from oystercatchers sharing nesting areas with roseate terns (e.g. New Made Island). Convene meeting or provide information via Fact Sheet to webserve of American oystercatcher habitat managers.

   2. If needed, assist in funding predator control on Great Gull Island (LIFO). |FY12 $0 DEL ESA PAPA,SPS Ongoing

Factor C. The inadequacy of existing regulatory mechanisms:

Roseate Tern (*Sterna dougallii dougallii*): Long Island Focal Area

A. Address impacts of inadequate management of recreational activities by expanding and coordinating seasonal protection of beach and island ground nesting birds and transient shorebirds, including the tree species of terns. This should include fencing of key nesting areas and enhanced stewardship of nesting beaches.

   1. Establish symbolic pre-fencing at East Inlet Island.

   2. Monitor recreational use of bay islands which may disturb roseate tern nesting (e.g. Goose Island Flat).

B. Continue to oversee coordination with private and public landowners regarding implementation of roseate tern recovery activities on Long Island, with special emphasis on Great Gull Island, Fort Tyler, Cartwright Shoals, New Made Island, West Island, East Inlet Island, Sexton Island, and Goose Island Flat.

Factor D. Other natural or manmade factors affecting its continued existence:

A. Invasive vegetation

OUTREACH

Educate the public on the impacts of domestic cats on birds and encourage landowners to keep their cats indoors.

MONITORING

Review and track recovery progress.

Saltmarsh Sharp-tailed Sparrow (*Ammodramus caudacutus*): Long Island Focal Area

Saltmarsh Sharp-tailed Sparrow Species Action Plan

FOCAL AREA: LONG ISLAND

Other species benefitting:

Clapper rail, other rail species, glossy ibis, marsh wren, seaside sparrows

BIOLOGICAL PLANNING

Introduction to species

Species information: The saltmarsh sharp-tailed sparrow is a secretive and highly localized species largely restricted as a breeding bird to wet meadows, edges of freshwater marshes, and saltmarshes in recently deglaciated regions of interior and Atlantic coastal North America (Greenlaw & Rising 1994). In the U.S., the saltmarsh sharp-tailed sparrow is limited in its breeding range from Maine south to the Delmarva Peninsula where its breeding habitat is typically restricted to saltmarshes. Its wintering range extends from New York to Florida. It is a ground nester whose breeding success is largely affected by the timing of nesting in relation to spring high tides and storms which would otherwise flood their nests. In New York, most nests are placed in medium-height cordgrass (*Spartina alterniflora*) growing just below mean high-tide level and in salt-meadow areas above mean high tide. During the breeding season its diet is almost exclusively animal matter (primarily adult and larval insects, spiders, and amphipods) supplemented by seeds of grasses, wild rice, and other herbaceous plants (Greenlaw & Rising 1994).

Justification for species selection: The saltmarsh sharp-tailed sparrow was chosen as a priority species because of its importance in the eastern U.S., as well as in New York. The saltmarsh sharp-tailed sparrow is listed as a Highest priority species in Bird Conservation Region (BCR) 30 (USFWS 2008). Due to this species' precarious population status, the National Audubon Society has included it on their species WatchList of "high conservation concern species." The species is also considered globally Vulnerable using IUCN Red List criteria (BirdLife International 2004). It is suggested that possibly half of the world's population of saltmarsh sharp-tailed sparrows occur in southern New England (Dettmers and Rosenberg 2000).

Coastal marsh and mature forested habitats are the highest priority habitats within the BCR due to development pressures, rate of loss, or lack of information on rate of loss and present spatial distribution (USFWS 2008). Saltmarsh sharp-tailed sparrows are at severe risk from climate change impacts such as sea level rise (http://www.stateofthebirds.org).

State contribution to overall species population: The saltmarsh sharp-tailed sparrow breeds along the northern and southern shores of Long Island. This concern is based on their limited range and specialized habitat use. Saltmarshes along the Atlantic Coast have suffered considerable habitat loss, fragmentation, and modification (Rozsa 1995, Zedler and Adam 2002), and the effects of these changes are exacerbated by reduced sparrow densities in smaller marshes

(Benoit and Askins 2002, Shriver et al. 2004). Continuing threats to these habitats include the spread of the invasive common reed (*Phragmites australis*), sea level rise, and coastal erosion (Zedler and Adam 2002). It is well documented that saltmarsh sharp-tailed sparrows breed primarily in high marsh habitats dominated by saltmeadow cordgrass (*Spartina patens*; Brawley et al. 1998, Benoit and Askins 1999, DiQuinzio et al. 2002, Shriver 2002, Shriver et al. 2004).

Threats and threat assessment: (from Atlantic Coast Joint Venture [ACJV] 2008)

1. **Loss of habitat and habitat function.** Loss, degradation, and fragmentation of existing habitats are the most pressing threat to saltmarsh sparrows in BCR 30. Populations of most priority species are limited by factors related to the quantity, distribution, connectivity, and quality of habitats (including patch size) available to them during the breeding and non-breeding seasons and during migration. When wetlands, forests, or fields are converted for use as human housing, industry, intensive agriculture, or forestry, they often lose most of their value as bird habitat (i.e., they become unavailable to the vast majority of bird species). Further, the activities, noise, pets, vehicles, buildings, roads, power lines, and other characteristics of anthropogenic land uses often disrupt and decrease the quality of any potential habitats remaining, including lands nearby or adjacent to human developments. The isolation and lack of connectivity of remaining habitat patches (fragmentation) lowers their value to many species.

   Research needed:

   - Conduct research on food availability and food habits.

   - Conduct research on niche separation between sympatric species.

2. **Marsh management.** Due to unknown effects of mosquito control, marsh burning, open marsh water management, ditch plugging, etc., the ditching of saltmarshes for the purposes of controlling mosquitoes in proximity to residential developments has resulted in hydrologic changes to marshes throughout much of the range of the saltmarsh sharp-tailed sparrow. Changes in marsh hydrology can result in changes to plant communities, formation of habitat types (such as erosion of mud flats), and tidal amplitudes. Chemical control of mosquito in marsh areas requires application of compounds often by aircraft may affect species' biology and behaviors.

   Research needed:

   - Research is needed to determine the impacts of mosquito control and pesticides on sparrow populations resulting from food limitation and food habits.

   - Research impacts of marsh management techniques on populations.

3. **Possible point and non-point sources of mercury deposition.** Saltmarsh sharp-tailed sparrows are considered bioindicators for the presence of mercury in saltmarshes. Recent

research has detected elevated mercury levels in the blood of passerine species such as the saltmarsh sharp-tailed sparrow. Pathways for mercury contamination include bioaccumulation and direct exposure with contaminated sources such as sediments.

Research needed:

- Research is needed to determine the extent of mercury contamination in saltmarsh sharp-tailed sparrow and other marsh bird populations through sampling of sparrow populations across its range.

4. **Climate change.** Seasonal climate changes could shift migration patterns of birds such as saltmarsh sharp-tailed sparrows and changes in food and habitat availability.

Research needed:

- Research is needed to evaluate effects of climate change on this species.

- Research techniques to increase productivity and survival.

Partners/potential funding:

New York State Department of Environmental Conservation (NYSDEC) Regions 1 and 2; New York State Parks; Nassau and Suffolk Counties; Towns of Hempstead, Babylon, Islip, Brookhaven, Huntington, East Hampton, Southampton, Shelter Island, Southold, Riverhead, and Oyster Bay; Cities of Long Beach and Glen Cove; Queens County, Kings County; New York City Audubon, Audubon Connecticut, Audubon New York, local Audubon Chapters; University of Connecticut; Parker River National Wildlife Refuge

Population goal(s) for New York State:

Population Goal for New York Field Office (NYFO)

A coordinated census program for this species has not been undertaken across its range which would currently allow for detailed population estimates to be made. However, some estimates for BCR 30 (ACJV 2008) place the standing population at around 250,000 birds with a future goal of 500,000 birds.

Research needed:

- In 2010, convene a teleconference with University of Maine to identify survey protocols for saltmarsh sharp-tailed sparrows that will be incorporated into a Long Island census of sparrow populations at the following sites: Gardiner County Park, Long Cove Fire Island National Seashore (FIIS), NYSDEC Fireplace Neck wetlands, The Nature Conservancy (TNC) Pine Neck Marsh and Wading River Marsh, Town of Hempstead Oceanside Marine Sanctuary and North Cinder Island, and New York

City Department of Parks wetlands near JFK Airport and Jamaica Bay (Long Island Field Office [LIFO]). |FY12 $0 BP CPA PAPA Completed

- Determine the feasibility of developing a monitoring network, similar to the Long Island Colonial Waterbird and Piping Plover survey program, that could undertake coordinated sampling for this and other species, by hold a meeting with the NYSDEC and other principal partners (LIFO). |FY12 $0 BP CPA PAPA Ongoing

- In 2011, initiate a status assessment for saltmarsh sharp-tailed sparrow. Coordinate one meeting of interested parties to discuss population objectives and sampling methodology for saltmarsh sharp-tailed sparrows on Long Island (LIFO). |FY12 $0 BP CPA PAPA Ongoing

- Build partnerships to determine the population objectives for each of the highest species of concern on Long Island within BCR 30. Additional species may be identified through this process that are on other watch lists or are State listed species. This is envisioned as a longer term initiative but critical to addressing bird conservation issues around Long Island for species using pelagic, forested, grassland, shoreline, and nearshore habitats.

  A. As time permits, participate in the annual two-day survey of U.S. Geological Survey (USGS) Breeding Bird Survey routes (Hauppauge and Huntington routes) (LIFO). |FY12 $0 MON CPA PAPA,SPS Ongoing

CONSERVATION DESIGN

Strategies for addressing those threats

1. **Loss of habitat and habitat function.**

   a. Create a habitat mapping and modeling working group for the BCR to develop specific questions and strategies for conservation/landscape design and select a subset of priority species (focal species) that best represent priority species and habitats. This group should examine habitat mapping and modeling efforts from the eastern United States to assess the best overall strategy for developing a “best-fit” conservation design for BCR 30.

   b. Fee or easement acquisition of priority high-quality habitats including nesting, migratory stopover, and wintering areas, and the upstream headwaters and adjacent buffer habitats throughout the watershed that are central to improving and maintaining water quality in coastal marshes.

   c. Develop decision support tools using habitat data layers and bird-habitat models to determine where conservation should be targeted to optimally achieve population

objectives for migratory birds. Make these tools useful and available at the BCR and state scales.

2. **Marsh management.**

   a. Restore hydrological conditions of saltmarshes supporting highest and high breeding and non-breeding priority species.

   b. Determine the affects of marsh management (mosquito control, marsh burning, open marsh water management, ditch plugging, Phragmites control, etc.) and choose management programs with the most benefit to estuarine emergent wetland species.

   c. Control invasive species.

   d. Create dredge spoil material islands/marshes.

3. **Possible point and non-point sources of mercury deposition.**

   a. Continue sampling efforts aimed at tracking blood mercury levels in saltmarsh sharp-tailed sparrows. Strategy will depend on results of research need noted above.

4. **Climate change.**

   a. Control erosion in coastal marshes.

   b. Develop a targeted monitoring program for marsh species following a standardized regional (or national) protocol for both breeding and non-breeding habitats.

   c. Develop probabilistic models to predict the capacity of regions to support bird populations at present and in the future. Compare this capacity with the population and habitat objectives determined by stepping down continental goals. Work with USGS, states, and others to develop models (possibly as part of a Science Support or Multistate grant).

Partners/potential funding:

NYSDEC Regions 1 and 2; New York State Parks; Nassau and Suffolk Counties; Towns of Hempstead, Babylon, Islip, Brookhaven, Huntington, East Hampton, Southampton, Shelter Island, Southold, Riverhead, and Oyster Bay; Cities of Long Beach and Glen Cove; Queens County, Kings County; New York City Audubon, Audubon Connecticut, Audubon New York, local Audubon Chapters; University of Connecticut; Parker River National Wildlife Refuge

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats FY 2010-2012

Saltmarsh Sharp-tailed Sparrow (*Ammodramus caudacutus*): Long Island Focal Area

1. **Loss of habitat and habitat function.**

    a. Assess the carrying capacity needed to accomplish many of the conservation actions identified for priority species.

    b. Identify and protect the most critical coastal marsh habitats and buffers for priority species, taking into consideration projected sea level rise within the BCR to reduce threats from habitat loss, coastal development, and sea level rise.

    c. Improve nesting and wintering habitat quality at multiple geographic scales. For example, at an individual site improve habitat quality by controlling water levels and vegetation, reducing erosion and runoff to the area, and conserving or improving nesting or roosting habitats or buffer habitats (e.g., their width and vegetative composition) adjacent to wetlands. At the larger scale, protect or improve water quality throughout the watershed and increase the number, size, and connectivity of habitat patches (nesting, roosting, stopover, wintering, etc.) in the landscape.

    d. Work with the northeast states, USGS, U.S. Fish and Wildlife Service (USFWS) and other partners to complete the compiling and mapping of basic information on the distribution of existing species, habitat, and managed lands in the BCR including the most recent National Land Cover Data (NLCD) set as well as the more detailed Ecological Systems land cover when available. Organize information by BCR and state. Utilize relationship with regional National Biological Information Infrastructure (NBII) node and NBII bird conservation node to make the information available to partners through a Web site.

2. **Marsh management.**

    a. Enhance/restore degraded wetlands and adjacent upland habitats (including buffers and marsh islands).

    b. Delivery will depend upon strategy determined from research above.

3. **Possible point and non-point sources of mercury deposition.**

    a. Delivery will depend upon strategy determined from research above.

4. **Climate change.**

Partners/potential funding:

NYSDEC Regions 1 and 2; New York State Parks; Nassau and Suffolk Counties; Towns of Hempstead, Babylon, Islip, Brookhaven, Huntington, East Hampton, Southampton, Shelter Island, Southold, Riverhead, and Oyster Bay; Cities of Long Beach and Glen Cove; Queens

County, Kings County; New York City Audubon, Audubon Connecticut, Audubon New York, local Audubon Chapters; University of Connecticut; Parker River National Wildlife Refuge

OUTREACH

Potential outreach needs:

- Landowner education
- Public outreach

Partners/potential funding:

NYSDEC Regions 1 and 2; New York State Parks; Nassau and Suffolk Counties; Towns of Hempstead, Babylon, Islip, Brookhaven, Huntington, East Hampton, Southampton, Shelter Island, Southold, Riverhead, and Oyster Bay; Cities of Long Beach and Glen Cove; Queens County, Kings County; New York City Audubon, Audubon Connecticut, Audubon New York, local Audubon Chapters; University of Connecticut; Parker River National Wildlife Refuge

MONITORING

Develop best management practices from results of monitoring to inform future saltmarsh sharp-tailed sparrow population restoration activities.

- Development of protocols to measure progress/success.
- Monitoring to measure progress/success.

References

Atlantic Coast Joint Venture. 2008. New England-Atlantic coast Bird Conservation Region (BCR) 30 Implementation Plan. Atlantic Coast Joint Venture, Laurel, Maryland. http://www.acjv.org/BCR_30/BCR30_June_23_2008_final.pdf.

Brown, S., C. Hickey, B. Harrington, and R. Gill, eds. 2001. United States Shorebird Conservation Plan. 2nd edition. May 2001. Manomet Center for Conservation Sciences, Manomet, Massachusetts.

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Saltmarsh Sharp-tailed Sparrow (*Ammodramus caudacutus*): Long Island Focal Area

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Kushlan, J.A., M.J. Steinkamp, K.C. Parsons, J. Capp, M. Acosta Cruz, M. Coulter, I. Davidson, L. Dickson, N. Edelson, R. Elliot, R. Michael Erwin, S. Hatch, S. Kress, R. Milko, S. Miller, K. Mills, R. Paul, R. Phillips, J.E. Saliva, B. Sydeman, J. Trapp, J. Wheeler, and K. Wohl. 2002. Waterbird Conservation for the Americas: The North American Waterbird Conservation Plan, Version 1. Waterbird Conservation for the Americas. Washington, DC, U.S.A.

Existing strategies for saltmarsh sharp-tailed sparrow restoration:

Please refer to the following document for existing strategies:

- Bird Conservation Plan for BCR 30 (Atlantic Coast Joint Venture 2008) http://www.acjv.org/BCR_30/BCR 30_June_23_2008_final.pdf.
- North American Waterbird Conservation Plan (Kushlan et al. 2002) http://www.waterbirdconservation.org/nawcp.html.
- U. S. Shorebird Conservation Plan (2001) http://www.fws.gov/shorebirdplan/USShorebird/PlanDocuments.htm.
- Peconic Bay Comprehensive Conservation and Management Plan http://www.peconicestuary.org/CCMP.html.
- South Shore Estuary Reserve Comprehensive Conservation and Management Plan http://www.estuary.cog.ny.us/background-pages/SSER_Imp_Status_Report.pdf.
- Long Island Sound Comprehensive Conservation and Management Plan http://www.longislandsoundstudy.net/mgmtplan.htmAds.
- Conservation Strategies for the Orient Point to Plum Island Important Bird Area http://ny.audubon.org/PDFs/OPPIConservationPlanFINAL.pdf.
- Comprehensive Restoration Plan for the Hudson-Raritan Estuary http://www.nan.usace.army.mil/harbor/crp/.
- NYS Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf.

Saltmarsh Sharp-tailed Sparrow (*Ammodramus caudacutus*): Long Island Focal Area

- Partners in Flight Landbird Conservation Plan (Rich et al. 2004) http://www.partnersinflight.org/cont_plan/default.htm.

Sandplain Gerardia (*Agalinis acuta*): Long Island Focal Area

Sandplain Gerardia Species Action Plan

FOCAL AREA: LONG ISLAND

Other species benefitting:

little/big bluestem, beardgrass, Indiangrass, panic grass, winter bentgrass, short-eared owl, meadowlark, American kestrel, white-tailed deer, eastern cottontail, prairie warbler, woodcock

BIOLOGICAL PLANNING

Introduction to species

Species information: Annual plant found in grassland sandplains, flowering and seed production in August-October. Overall plan population was thought to have declined from 49 historical records to 10 populations remaining today. However, in 2007 - 8, two scientists from the University of Maryland completed research that calls into question whether *acuta* is a viable species. From an abstract of a presentation at the 2008 International Congress for Conservation Biology: (2008) James Pettingill, and Maile Neel in: "Upon being listed as a federally endangered species in 1988, *Agalinis acuta* was assumed to represent a distinct species. However, a phylogeny of the genus including single accessions of *Agalinis tenella* and *A. acuta* suggested the two species may not be independently evolving lineages. To better understand the evolutionary relationships of these species, we created a more comprehensive phylogeny from 7 chloroplast DNA loci and the nuclear ITS locus (total aligned length = 11,820 nucleotides) assayed from multiple individuals of these two species and 27 other congeneric species. The resulting phylogeny indicated that there was no statistical support for *A. tenella* and being reciprocally monophyletic and that *Agalinis decemloba* was also indistinguishable. To further evaluate the relationships among *A. tenella*, *A. acuta*, and *A. decemloba*, we sampled 64 morphological characters from multiple individuals from multiple populations of each species. These data suggest high correct classification rates at both the population and species levels. Given the fact that reciprocal monophyly is not always to be expected between recently diverged species due to incomplete lineage sorting and the results of the morphological data, we advocate that *A. acuta* continued to be protected under the Endangered Species Act until more rapidly evolving loci can be assayed." This year James Pettingill completed his dissertation which explores these questions further in: (2010) Elucidating the Macro- and Micro-evolutionary Relationships of the Federally Listed Endangered Species *Agalinis acuta* (Orobanchaceae). University of Maryland.

Justification for species selection: Federally-listed endangered species.

State contribution to overall species population: Long Island has 4 of the 11 stable range-wide populations (nearly 40%).

Sandplain Gerardia (*Agalinis acuta*): Long Island Focal Area

Threats and threat assessment:

Threats[15] (See 5-year review for full assessment):

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Loss/degradation of habitat, suppression of fires/disturbance regimes, vegetative succession, and development.

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes: NA

Factor C. Disease or predation:

A. Herbivory may play a role.

Factor D. The inadequacy of existing regulatory mechanisms:

A. Certain recreational activities (e.g. off-road vehicles [ORV] and dirt bikes, for which enforcement of rules is inadequate).

Factor E. Other natural or manmade factors affecting its continued existence:

A. Encroachment of invasive vegetation.

Recovery Criteria: From recovery plan:

There are 20 stable, wild populations located throughout the species historic range to ensure against any unpredictable events that could lead to reproductive failure and subsequent population decline. In order to be deemed "stable," a population must maintain a five-year running geometric average population size of at least 100 individuals.

At least 15 of these populations are located on protected sites. Protection may be accomplished through: 1) ownership by a government agency or a private organization that considers maintenance of the *A. acuta* population to be the predominating management objective for the site; or 2) a deeded easement or covenant that effectively commits present and future landowners to implementing any management activities needed to perpetuate the population.

There must be proven technology for: 1) propagating the species in a cultivated setting; or 2) storing seed in a seedbank and successfully sowing them on a wild site.

[15] Refers to 5 listing factors A-E in Section 4 of Endangered Species Act

Sandplain Gerardia (*Agalinis acuta*): Long Island Focal Area

Recovery Goal for Focus Area:

Maintain 4-7 sites with stable populations of 100 or more plants; Develop propagation plan; Develop action plan for genetics determination.

Recovery Goals

Research/Actions needed:

- Meet with U.S. Fish and Wildlife Service (USFWS) personnel at USFWS Region 5 Biologist Conference (Feb. 2011) to agree upon a strategy to address *A. acuta* taxon now being *A. decemloba,* and the associated de-listing and possible re-listing. In coordination with USFWS Raleigh, North Carolina, Field Office, initiate efforts to determine *A. decemloba* range/distribution/abundance in southern states. Identify stakeholders and assign tasks (LIFO).

- Develop a range-wide plan to deal with non-governmental organizations (NGO) and others interested in habitat restoration, reintroduction, and habitat management. (WHO: LIFO has species lead; other involved offices in USFWS R-4 and R-5 to the south and New England Field Office [NEFO], Regional Office [RO]. Cost: TBD, seek potential listing funds for 2011).

CONSERVATION DESIGN

Strategies for addressing those threats

Please go to these documents for the existing strategies:

- Recovery Plan 1989
- Last 5-year review completed in draft, 2009

Significant new research casts doubt as to whether *acuta* is a unique species – see introductory paragraph. Coordinate with RO in 5-year review. |FY12 $0 DES ESA SPS Planned

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY 2010 - 2012

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Address habitat loss by considering habitat restoration according to a range-wide plan for the species.

Sandplain Gerardia (*Agalinis acuta*): Long Island Focal Area

1. Assist The Nature Conservancy (TNC) and Long Island National Wildlife Refuge Complex (LINWRC) in managing suitable habitat in Sayville and TNC properties (LIFO). |FY12 $0 DEL ESA SPS Ongoing

2. Identify other areas where habitat management is critical to maintain existing populations of *agalinis* while its status is reviewed.

B. Develop a protocol for seed harvesting and redistribution of seeds within "populations".

Factors B and C. The inadequacy of existing regulatory mechanisms and other natural or manmade factors affecting its continued existence:

A. Develop outreach materials to promote species conservation.

1. Work with LINWRC to develop temporary/traveling exhibit about *agalinis,* and;

2. Develop outreach materials addressing impacts of ORV activity on listed plant species.

OUTREACH

See above.

MONITORING

Work with partner agencies in *decemloba's* range and range of what we know of as *acuta* to assess success of habitat restoration projects.

Develop a successful monitoring protocol.

Seek funding to do evaluation of success of projects.

Seek data to determine if measures can be taken to preclude the need to list *decemloba.* Facilitate surveys completed in SE United States to assess abundance and distribution of *A. decemloba*. |FY12-FY13 $15,000 MON ESA SPS Planned

Partners

References

Pettengill, J. and Neel, M. 2008. "What Is The Taxonomic Status of the Federally Listed Endangered Species Agalinis Acuta (Orobanchaceae)?" Paper presented at the annual meeting of the International Congress for Conservation Biology, Convention Center, Chattanooga, TN, Jul. 10, 2008 <Not Available>. 2010-11-02 <http://www.allacademic.com/meta/p243624_index.html>Pettingill, James and M. Neely.

Sandplain Gerardia (*Agalinis acuta*): Long Island Focal Area

Pettingill, J. 2010. Elucidating the Macro- and Micro-evolutionary Relationships of the Federally Listed Endangered Species *Agalinis acuta* (Orobanchaceae). Dissertation. University of Maryland.

U.S. Fish and Wildlife Service. 1989, Sandplain gerardia (*Agalinis acuta*) Recovery Plan. Northeast Regional Office, Hadley, MA.

Seabeach Amaranth (*Amaranthus pumilis*): Long Island Focal Area

Seabeach Amaranth Species Action Plan

FOCAL AREA: LONG ISLAND; SOUTH SHORE BARRIER ISLANDS

Other species benefitting:

seabeach knotweed, dusty miller, sea rocket, sea spurge, least tern, common tern, black skimmer, piping plover, American oystercatcher

BIOLOGICAL PLANNING

Introduction to species

Species information: Annual plant found in barrier island beaches, germination in May-September, seed production in June-September. This species requires extensive areas of barrier islands and inlets, functioning in a relatively natural and dynamic manner. It often grows in the same areas selected for nesting by shorebirds such as plovers, terns, and skimmers. Seabeach amaranth appears to be intolerant of competition and does not occur on well-vegetated sites. The plant acts as a sand binder, with a single plant being able to create a dune up to 6 decimeters high, containing 2-3 cubic meters of sand (USFWS 1996). Seeds can withstand the conditions necessary to move among island conditions and it is likely that it has the ability to persist as seed banks in inlets and possibly offshore (USFWS 2007).

Justification for species selection: Federally-listed threatened species.

State contribution to overall species population: South Shore of Long Island provides for over 50% of the total range-wide population.

Threats and threat assessment:

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Destruction of suitable habitat is the most significant threat to this species.
B. Long and short term shoreline erosion; species could persist as long as other suitable habitat exists; alternative sites often developed, hard shoreline, or utilized for recreation.
C. Sea level rise.
D. Preclusion of overwash/early successional habitat development.
E. Storm-induced flooding.
F. Storm damage protection and dredging projects.
G. Certain recreational activities.

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes: NA

Seabeach Amaranth (*Amaranthus pumilis*): Long Island Focal Area

Factor C. Disease or predation: Herbivory

Factor D. The inadequacy of existing regulatory mechanisms:

A. Certain recreational activities poorly regulated after piping plover breeding season ends.

Factor E. Other natural or manmade factors affecting its continued existence:

A. Vegetative succession
B. Invasive species
C. Climate change may be causing increased flooding and erosion of habitat

Recovery Goals:

Range-wide Recovery Goals/Objectives: Seabeach amaranth will be considered for delisting when the species exists again in at least 6 of the states within its historic range [Delaware (DE), Massachusetts (MA), Maryland (MD), North Carolina (NC), New Jersey (NJ), New York (NY), Rhode Island (RI), South Carolina (SC), and Virginia (VA)], and when a minimum of 75 percent of the sites with suitable habitat within each state are occupied by amaranth populations for 10 consecutive years.

Recovery/Conservation Goal for Focus Area: 5,000-25,000 plants across south shore beaches

Research/Actions needed:

Quantifying the effects of beach nourishment projects on seabeach amaranth recruitment; (Who and cost: Recovery lead Dale Suiter; Cost: to be determined. Long Island Field Office/New York Field Office [LIFO/NYFO] to support academia who propose research on Long Island).

Quantifying the effects of hardened structures in seabeach amaranth habitat; (Who and cost: Recovery lead Dale Suiter; Cost: to be determined. LIFO/NYFO to support academia who propose research on Long Island).

Quantifying the effects of off-road vehicle (ORV) use and mechanical beach raking on seabeach amaranth germination, growth, and reproduction; (Who and cost: Recovery lead Dale Suiter; Cost: to be determined. LIFO/NYFO to support academia who propose research on Long Island).

Quantifying the effects of symbolic fencing on seabeach amaranth germination, growth, and reproduction; (Who and cost: Recovery lead Dale Suiter; Cost: to be determined. LIFO/NYFO to support academia who propose research on Long Island).

Determining the ecological requirements of seabeach amaranth, especially pertaining to the nutrients provided by birds, wrack, and other beach vegetation; (Who and cost: Recovery lead

Seabeach Amaranth (*Amaranthus pumilis*): Long Island Focal Area

Dale Suiter; Cost: to be determined. LIFO/NYFO to support academia who propose research on Long Island).

Determining the location of seed banks and seed dormancy; (Who and cost: Recovery lead Dale Suiter to determine. LIFO/NYFO to support academia who propose research on Long Island).

CONSERVATION DESIGN

Strategies for addressing those threats

Please go to these documents for the existing strategies:

- Recovery Plan 1996
- Last 5-year review completed 06/04/07
    - Next 5-year review anticipated in 2012

Research/Actions needed: See range-wide recovery goals/research needed. None proposed by NYFO/LIFO at present time.

CONSERVATION DELIVERY

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Address sea level rise and preclusion of overwash/early successional habitat development by influencing (via Endangered Species Act [ESA] and/or Fish and Wildlife Coordination Act [FWCA] consultations) Federal construction agency to construct lower dune profile to promote natural coastal processes. This includes Fire Island to Montauk Point (FIMP), Interim projects, Fire Island community projects, and Federal Emergency Management Agency (FEMA) funded storm mitigation.

B. Address storm-induced flooding; promote natural processes.

C. Address storm damage protection and dredging projects.

    1. Influencing Federal permitting and construction agencies by establishing dredged material disposal windows to minimize impacts to the plants.

D. Address certain recreational activities.

    1. Establish symbolic fencing; actively manage and protect habitat for plovers and seabeach amaranth at Breezy Point Co-op and Village of Westhampton Dunes, and provide recommendations to land managers regarding protection of amaranth along

the south shore of Long Island. Assist in installation of symbolic fencing as needed (LIFO). |FY12 $0 DEL ESA SPS Planned

2. Protect existing populations and essential habitat.

3. Determine and implement the management necessary for long-term reproduction, establishment, maintenance, and vigor.

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes: NA

Factor C. Disease or predation: Herbivory

Factor D. The inadequacy of existing regulatory mechanisms:

A. Certain recreational activities poorly regulated after piping plover breeding season ends

   1. Enforce laws protecting the species and/or its habitat.

Factor E. Other natural or manmade factors affecting its continued existence:

A. Vegetative succession: Address by promoting habitat restoration projects.

B. Invasive species: Address by promoting habitat restoration projects.

C. Climate change: Promote natural processes that create suitable habitat.

D. Climate change may be causing increased flooding and erosion of habitat.

E. Annually assess the success of the recovery efforts for the species.

OUTREACH

Develop materials to inform the public about the status of the species and the recovery plan objectives.

MONITORING

Review and track recovery progress. Conduct species surveys at Breezy Point, Westhampton Dunes. Assist in surveys throughout Long Island as needed (LIFO). |FY12 $0 MON ESA SPS Planned

Maintain Long Island-wide database on species abundance and convey to Dale Suiter, Wendy Walsh (LIFO). |FY12 $0 MON ESA SPS Planned

Seabeach Amaranth (*Amaranthus pumilis*): Long Island Focal Area

Partners

The Nature Conservancy; New York State Department of Environmental Conservation (NYSDEC); U.S. Army Corps of Engineers; National Park Service's Fire Island National Seashore and Gateway National Recreation Area; Suffolk County Department of Parks and Recreation; New York State Office of Parks, Recreation and Historic Preservation; New York State Natural Heritage Program; Breezy Point Cooperative; Town of Hempstead; New York City Urban Park Rangers; Town of Babylon; Town of Southampton; Town of Easthampton.

References

U.S. Fish and Wildlife Service. 1996. Recovery Plan for Seabeach Amaranth (*Amaranthus pumilus*). Southeast Region, Atlanta, GA.

U.S. Fish and Wildlife Service. 2007. Seabeach Amaranth (*Amaranthus pumilus*) 5-year review: Summary and Evaluation. Southeast Region, Ecological Services, Raleigh, NC.

Eastern Tiger Salamander *(Ambystoma tigrinum)*: Long Island Focal Area

Eastern Tiger Salamander Species Action Plan

FOCAL AREA: LONG ISLAND

Other species benefitting:

Pine barrens buck moth, spotted salamander, spotted turtle

BIOLOGICAL PLANNING

Introduction to species

Species information: From New York State Department of Environmental Conservation (NYSDEC) website at http://www.dec.ny.gov/animals/7143.html. The tiger salamander is one of the largest terrestrial salamanders in the United States. The biggest specimen recorded was 13 inches long. The average size ranges between 7 and 8 inches. It is stocky with sturdy limbs and a long tail. The body color is dark brown, almost black, and irregularly marked with yellow to olive colored blotches. The only other salamander with which it might be confused is the smaller spotted salamander (*Ambystoma maculatum*). The spotted salamander, however, has two rows of regular, yellow-to-orange spots running parallel down its back, compared to the irregularly distributed spots of the tiger salamander.

The tiger salamander inhabits sandy pine barren areas with temporary or permanent pools for breeding and is thus emblematic of the endangered habitat on the sand plains of eastern Long Island. The tiger salamander spends most of its life underground, as do other members of the group referred to as "mole salamanders." On Long Island, the tiger salamander emerges from its burrow in February or March to migrate at night, usually during rain, to the breeding ponds. After a brief courtship, which consists of the male pushing his nose against the female's body, eggs are laid in a mass and attached to twigs and weed stems under water. The female may deposit one or more egg masses containing 25-50 eggs per mass. Hatching occurs after approximately 4 weeks, and the larvae remain in the ponds until late July or early August. After this time, the larvae transform into air breathing sub-adults measuring between 4 and 5 inches, and leave the ponds at night during wet weather to begin their underground existence. It takes 4 to 5 years for the tiger salamanders to reach sexual maturity and they may live for 12-15 years. The tiger salamander eats invertebrates and small vertebrates.

Justification for species selection: Selected as a representative species of wooded freshwater wetland habitats. This species is a New York State endangered species whose range in the northeastern United States is limited to New York.

State contribution to overall species population: Species has been extirpated from the rest of New York; the nearest population is in southern New Jersey. More widespread across the central states but everywhere in decline. Breeding areas now limited to approximately 80 small ponds on Long Island.

Eastern Tiger Salamander *(Ambystoma tigrinum)*: Long Island Focal Area

Threats and threat assessment:

1. Loss of habitat has been responsible for the extirpation of this species from heavily developed western Long Island. Recent surveys have identified about 90 breeding ponds in New York, confined to eastern Nassau County and Suffolk County. Threat of development.

2. Suppression of fire has allowed for conversion of open, grassland and shrub scrub pine barren communities to thick pine-dominated thickets.

3. Habitat fragmentation has threatened the species as increased construction of roads and other land use patterns have also bisected the habitat, jeopardizing migrating adults.

4. Pesticides and other contaminants, including emerging contaminants, threaten the species on the densely populated island which is their last refuge in the State.

5. Disturbance at breeding ponds may include filling isolated breeding areas which are no longer protected by the Clean Water Act Section 404 (post Solid Waste Association of Northern Cook County [SWANCC] decision) nor large enough to be protected by the State freshwater wetlands act (must be >12.4 acres, unless otherwise identified to be unique resources).

6. Introduction of predatory fish into permanent pools and expansion of bullfrog populations threaten annual reproduction.

7. Recreational activities, especially off-road vehicles (ORV), further impact breeding sites and year round habitat.

Research needed:

- Investigation into the genetic makeup of this isolated population.
- Population viability analysis.
- Formulation of population goals.
- Identification of habitat restoration and creation methods and landscape scale requirements for long term sustainability of the population.
- Investigation of the potential for captive rearing and introduction into restored and protected habitat in its historic range.

Partners/potential funding:

NYSDEC, Suffolk County, State University of New York – Cortland (SUNY-Cortland)

Eastern Tiger Salamander *(Ambystoma tigrinum)*: Long Island Focal Area

Population goal(s) for New York State:

A stable to increasing population, with viable genetic variability, with permanent protection of key breeding habitat.

CONSERVATION DESIGN

Strategies for addressing those threats

1. Coordinate with NYSDEC on how to best assist them in tiger salamander recovery and identify U.S. Fish and Wildlife Service (USFWS) role in this effort.

2. Address loss of habitat including loss by suppression of fire by:

    a. Developing a coalition of interested scientists to address habitat loss.

    b. Influencing planning and regulatory agencies by providing information about rare amphibians and reptiles and their conservation needs.

3. Address habitat fragmentation by:

    a. Developing a green infrastructure study group, and

    b. Developing a green infrastructure plan for long term landscape scale conservation of rare amphibians and reptiles and associated plant communities.

4. Address pesticides and other contaminants, including emerging contaminants.

    a. Develop an outreach program to address pesticides and other contaminants, and explore alternatives which could be utilized in sensitive habitats.

    b. Investigate development of a On-/Off-Refuge research proposal to address impact of contaminants on this and/or other herpetile species and seek funding for such work. (Environmental Contaminants [EC] FY2011)

5. Address disturbance at breeding ponds by:

    a. Creating a program involving symbolic fencing of sensitive areas and buffers during critical times of the year.

    b. Developing an outreach program which is targeted at ORV users and other sources of disturbance.

c. Developing an outreach program targeted at community leaders within the critical habitat areas and potential restoration areas.

d. Developing a program with partners to do "salvage and rescue" operations when unprotected vernal pools and other small ephemeral wetlands are slated for destruction.

e. With partners, explore captive rearing of Long Island genetic strains of tiger salamanders, and reintroduction into the wild where sufficient long term protection of habitat is assured.

6. Address the introduction of predatory fish into permanent pools and the expansion of bullfrog populations, both of which threaten annual reproduction, by:

   a. Developing a program involving pet store owners and the Long Island Herpetological Society and others to discourage release of unwanted pets, including exotic herps.

7. Address uncontrolled recreational activities, especially ORVs by:

   a. Convene a workshop of land managers, similar to pre-season piping plover recreational activity management workshops, to develop recreational activity management for ephemeral pool and buffer area protection for tiger salamander breeding areas.
   b. Develop standard protocols for recreational activity management to minimize take.
   c. Develop training materials to distribute to land managers and their staff.

Partner organizations: See above

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY 2010 - 2012

1. Address loss of habitat by:

   a. Convening a workshop of herpetologists, academic researchers, local non-governmental organizations (NGO), to explore opportunities for habitat restoration in the Pine Barrens and in historic habitat where restoration of suitable blocks of habitat may be possible.

      i. Meet Natural Heritage Staff, American Museum of Natural History, and noted herpetologists (e.g. J. Gibbs, A. Breisch, P. Ducey) to develop an overall strategy.

      ii. Plan and convene the workshop on Long Island.

iii. Produce proceedings and a standing committee to address amphibian habitat issues on Long Island.

b. Influencing planning and regulatory agencies by providing information about rare amphibians and reptiles and their conservation needs.

2. Address habitat fragmentation by:

a. Developing a green infrastructure study group.

i. Through action item 1Ai, work with a subset of workshop participants to seek funding to develop a landscape scale green infrastructure plan for amphibian and reptile conservation on LI.

b. Developing a green infrastructure plan for long term landscape scale conservation of rare amphibians and reptiles and associated plant communities

i. With contractors and group of stakeholders, map out green infrastructure plan; utilize information from research studies regarding dispersal patterns once larvae hatch and juveniles move out around the landscape.

ii. With steering committee, develop a strategy to ensure that the green infrastructure plan is incorporated into county and local municipal land-use plans.

iii. Promote pilot projects involving an underground tunnel to facilitate juvenile dispersal across the landscape.

3. Address pesticides and other contaminants, including emerging contaminants.

a. Develop an outreach program to address pesticides and other contaminants, and explore alternatives which could be utilized in sensitive habitats.

i. Utilizing term employees and Student Career Experience Program (SCEP) or Student Temporary Employment Program (STEP) opportunities, research pesticide use, and other contaminants and their effects on vernal pool breeding amphibians.

ii. Develop minimum standards for buffers to protect amphibian breeding areas from contamination.

iii. Develop Fact Sheets to post on the website to convey this information to the public.

b. Implement a research proposal to address impact of contaminants on this and/or other herpetile species when such work is funded.

4. Address disturbance at breeding ponds by:

   a. Coordinate with NYSDEC and State Parks on feasibility/need of creating a program involving symbolic fencing of sensitive areas and buffers during critical times of the year.

      i. With State Parks, create a pilot program to assess whether this will help control encroachment on breeding areas.

   b. Developing an outreach program which is targeted at ORV users and other sources of disturbance.

   c. Developing an outreach program targeted at community leaders within the critical habitat areas and potential restoration areas.

   d. Developing a program with partners to do "salvage and rescue" operations when unprotected vernal pools and other small ephemeral wetlands are slated for destruction.

      i. Complete a memorandum with New York State Department of Transportation (NYSDOT) to ensure notification of resource agencies before destruction of amphibian breeding areas, to allow for salvage.

   e. With partners, explore captive rearing of Long Island genetic strains of tiger salamanders, and reintroduction into the wild where sufficient long term protection of habitat is assured.

5. Address the introduction of predatory fish into permanent pools and the expansion of bullfrog populations, threaten annual reproduction, by:

   a. Developing a program involving pet store owners and the Long Island Herpetological Society and others to discourage release of unwanted pets including exotic herps.

6. Address uncontrolled recreational activities, especially ORVs by:

   a. Convening a workshop of land managers, similar to pre-season piping plover recreational activity management workshops, to develop recreational activity. See above. Management for ephemeral pool and buffer area protection for tiger salamander breeding areas.

b. Developing standard protocols for recreational activity management to minimize take.

c. Developing training materials to distribute to land managers and their staff.

OUTREACH

Develop an urban herpetological initiative, towards conservation of this and other declining populations of species threatened by urbanization of Long Island, in part through classroom educational programs with partner agencies including TNC, American Museum of Natural History (AMNH), local herpetological societies, the New York State Natural Heritage Program, and others.

MONITORING

Coordinate with NYSDEC on need to supplement/expand/assist in their annual monitoring efforts.

Protocols for measuring the success of any on the ground habitat restoration or species reintroduction work will have to be developed.

Formation of a coalition of interested parties to carry out the success monitoring should be formed.

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Eastern Tiger Salamander *(Ambystoma tigrinum*): Long Island Focal Area

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Winter Flounder (*Pseudopleuronectes americanus)*: Long Island Focal Area

Winter Flounder Species Action Plan

FOCAL AREA: LONG ISLAND

Other species benefitting:

windowpane flounder, summer flounder, scup, black seabass

BIOLOGICAL PLANNING

Introduction to species

Species information: From Essential Fish Habitat Source Document: National Oceanic and Atmospheric Administration (NOAA) Tech. Memorandum National Marine Fisheries Service (NMFS)-NE-138 (U.S. Dept, of Commerce 1999). The winter flounder, *Pseudopleuronectes americanus*, a small-mouthed, right-eyed flounder is a valuable commercial and recreational species. It is distributed along the northwest Atlantic coast as far north as Labrador and as far south as North Carolina and Georgia. One of the more familiar fishes in the Gulf of Maine, winter flounder are common on Georges Bank and in shelf waters as far south as Chesapeake Bay, and are ubiquitous in inshore areas from Massachusetts to New Jersey.

The species is managed as three separate stocks - the Gulf of Maine, southern New England and the Middle Atlantic, and Georges Bank. However, there have been questions as to whether the population on Georges Bank, where fish tend to grow larger and have different meristic characteristics and movement patterns than those residing inshore, is in fact a separate species. It has been concluded that many of these differences could be attributed to temperature.

Except for the Georges Bank population, adult winter flounder migrate inshore in the fall and early winter and spawn in late winter and early spring throughout most of their range. In northern waters, spawning occurs somewhat later: April in Passamaquoddy Bay and May and June in Newfoundland. After spawning, adults typically leave inshore areas although some remain inshore year-round.

Winter flounder have been described as omnivorous or opportunistic feeders, consuming a wide variety of prey. Polychaetes and crustaceans (mostly amphipods) generally make up the bulk of the diet. They feed on bivalves, capelin eggs, and fish.

Adult winter flounder are preyed upon by a wide variety of predators including striped bass, bluefish, spiny dogfish, goosefish, oyster toadfish, and sea raven. Cormorants, blue herons, seals, and ospreys have also been cited as predators.

Winter flounder eggs are generally collected from very shallow waters (less than about 5 m), at water temperatures of 10 degrees C or less, and salinities ranging from 10 to 30 parts per thousand (ppt). These shallow water, nearshore, habitats are of critical importance because they are most likely to be impacted by human activities. The type of substrate where eggs are found

varies, having been reported as sand, muddy sand, mud, and gravel, although sand seems to be the most common.

Justification for species selection: Selected as a representative species of demersal (on or near the bottom) tidal water habitats. This is an important commercial and recreational fishery species. The species is recognized as an important species requiring management by the Atlantic States Marine Fisheries Commission in their management plan for winter flounder of 2005.

State contribution to overall species population: Commercial landings of winter flounder peaked in the 1980s throughout its range and have since declined (U.S. Dept. of Commerce, 1999). The New York State Department of Environmental Conservation (NYSDEC) recognized that winter flounder populations are overharvested and designated it as a species of greatest conservation need in their wildlife strategy plan (NYSDEC 2010).

In the southern New England-Middle Atlantic stock, biomass declined from 39,000 metric tons (mt) in 1981 to a record low of 8,500 mt in 1992. Contributions from strong year classes in 1992 and 1994 have rebuilt the stock biomass to 18,000 mt in 1996, but the stock remains overexploited (U.S. Dept. of Commerce, 1999). The southern New England-Middle Atlantic spawning stock biomass (which includes Long Island/New York) is only 9% of the target spawning stock biomass (ASMFC 2005).

Threats and threat assessment:

1. Nearshore water quality degradation;
2. Suspended sediments from dredging;
3. Entrainment/impingement from power plants and other activities;
4. Commercial and recreational overfishing; and,
5. Habitat alteration from channeling and bulkheading.

Research needed:

- Focus research on quantifying mortality associated with habitat loss and alteration, contamination by toxics, and power plant entrainment and impingement (U.S. Dept. of Commerce 1999). |FY? $0 BP EC,CPA ?,? Future
- Research studies should be designed to provide reliable estimates of anthropogenic mortality from sources other than fishing. Both mortality sources should then be incorporated into fisheries yield/recruit models to simultaneously evaluate these dual mortality factors (U.S. Dept. of Commerce 1999).

Winter Flounder (*Pseudopleuronectes americanus)*: Long Island Focal Area

- Examine the implications of stock mixing from data from the Great South Channel region (U.S. Dept. of Commerce 1999).

- Conduct studies to delineate all major substocks in terms of geographic spawning area and seasonal offshore movements (e.g. exposure to fishing pressure) (U.S. Dept. of Commerce 1999).

- Conduct studies to identify major predators (such as seals, cormorants, or striped bass) of winter flounder and quantify their potential impact on winter flounder stocks. Special emphasis may be warranted on local spawning populations of winter flounder (U.S. Dept. of Commerce 1999).

- Study use of oyster shell hash and reef structures by juvenile winter flounder (NYSDEC 2010).

- Identify and map habitats important to juvenile and spawning winter flounder (NYSDEC 2010).

Partners/potential funding:

NYSDEC, NMFS/NOAA, Atlantic States Marine Fisheries Commission (ASMFC)

Population goal(s) for New York State:

Increase population, with viable genetic variability. The southern New England-Middle Atlantic spawning stock biomass (which includes Long Island/New York) target is 42.7 million pounds (ASMFC 2005). Rebuild winter flounder stocks in sufficient abundance to support stable, productive commercial and recreational fisheries by 2015 (NYSDEC 2010).

CONSERVATION DESIGN

Strategies for addressing those threats

1. Address nearshore water quality degradation by:

    a. Supporting Federal, State, and local watershed management efforts.

    b. Promoting use of non-toxic materials for in-water structures.

2. Address suspended sediments from dredging by:

    a. Providing comments on Section 10/404 permit applications.

3. Address entrainment/impingement from power plants and other activities by:

a. Completing Fish and Wildlife Coordination Act (FWCA) consultations with Federal agencies.

4. Address commercial and recreational overfishing by:

   a. Supporting NYSDEC and ASMFC efforts in establishing and enforcing landing limits.

5. Address habitat alteration from channeling and bulkheading by:

   a. Providing comments on Section 10/404 permit applications.

Partner organizations: See above

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY 2010 - 2012

1. Address nearshore water quality degradation by:

   a. Supporting Federal, State, and local watershed management efforts. Review watershed management/local waterfront revitalization program plans, support efforts to improve nearshore water quality as such plans are proposed.

   b. Promoting use of non-toxic materials for in-water structures. When reviewing Section 10/404 permit applications, recommend use of non-toxic materials for in-water structures such as bulkheads, piers, pilings, and boat lifts. (Long Island Field Office [LIFO]). |FY12 $0 DEL CPA SPS Ongoing

   c. Coordinate Gowanus Canal Biological Technical Assistance Group (BTAG) activities to maximize potential for a remedy which protects wildlife, with U.S. Environmental Protection Agency (USEPA) (Environmental Contaminants [EC]). |FY11-FY13 $0 DEL EC ASR Ongoing

   d. Coordinate Newtown Creek BTAG activities to maximize potential for a remedy that protects wildlife with USEPA. |FY11-FY13 $0 DEL EC ASR Ongoing

2. Address suspended sediments from dredging by:

   a. Providing comments on Section 10/404 permit applications. When reviewing Section 10/404 permit applications, recommend time of year restrictions so that dredging activities, which increase suspended sediment concentrations, do not occur during winter flounder spawning (generally October- March, coordinate with NYSDEC to confirm) (LIFO). |FY12 $0 DEL CPA SPS Ongoing

3. Address entrainment/impingement from power plants and other activities by:

    a. Completing FWCA consultations with Federal agencies. Consult with U.S. Army Corps of Engineers (USACE)/Federal action agencies that authorize, fund, or undertake actions (power plants, tidal power projects) which could entrain/impinge winter flounder and provide recommendations/conservation measures to avoid/minimize or compensate for these impacts (LIFO). |FY12 $0 DEL CPA SPS Ongoing

4. Address commercial and recreational overfishing by:

    a. Supporting NYSDEC/NMFS/ASMFC efforts in establishing and enforcing landing limits.

5. Address habitat alteration from channeling and bulkheading by:

    a. Providing comments on Section 10/404 permit applications. When reviewing Section 10/404 permit applications, recommend conservation measures that avoid, minimize, or compensate for impacts associated with channeling and/or bulkheading of nearshore habitats (LIFO).

6. Coordinate with NYSDEC on mapping winter flounder habitat, development of management goals and objectives.

OUTREACH

Support NYSDEC, NMFS/NOAA, ASMFC in any outreach efforts they propose.

MONITORING

Support NYSDEC, NMFS/NOAA, ASMFC in any monitoring efforts they propose.

References

Atlantic States Marine Fisheries Commission. 2005. Amendment 1 to the Interstate Fisheries Management Plan for inshore stocks of Winter Flounder. Fishery Management Report No. 43. NOAA.

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Winter Flounder (*Pseudopleuronectes americanus)*: Long Island Focal Area

NMFS, Northeast Region, Northeast Fisheries Science Center, Woods Hole, MA. NOAA Technical Memorandum NMFS-NE-138.

LOWER HUDSON FOCAL AREA

The Lower Hudson Focal Area (LHFA) is located in southeastern New York and contains approximately 4,535 square miles or 8.3% of the state. The focal area is largely demarcated by the Lower Hudson River watershed, which extends from the Battery at the southern end of Manhattan to the Rensselaer-Columbia county line. A small portion of the Neversink River in the Delaware River watershed is also included in this focal area. The LHFA contains a wide variety of ecoregions including the glacially deepened Hudson River Valley, the Taconic Foothills and portions of the Taconic Mountains, the Ridge and Valley, and sections of the Pocono Highlands and Catskill Mountains. Local relief ranges from 25-300 feet in areas dominated by large rivers and lowlands up to 1000-2000 feet in mountainous areas. Overall elevation ranges are 0-4180 feet. This focal area is characterized by the tidally influenced Hudson River Valley as well as the complex terrain associated with a variety of mountainous regions and geological histories.

The Hudson River stretches from the Adirondack Mountains to the Battery in Manhattan and is one of the largest watersheds in the eastern United States. More than 8,000,000 people live within this corridor, and it has historically been and is currently one of the major transportation and commercial centers in the country. All of, or portions of, eleven counties are included within the LHFA boundary including Columbia, Greene, Duchess, Ulster, Sullivan, Orange, Putnam, Westchester, Rockland, Bronx, and New York. Approximately 3,500,000 people live within this focal area, concentrated primarily in the New York Metropolitan area and along the Hudson River, but with other concentrations across the focal area (i.e. Middletown). Land uses transition from heavily urbanized and residential to agriculture with increasing distance from major metropolitan areas to forest with increasing distance from the Hudson River Valley and increasing elevation.

This focal area was selected because it contains significant tidal wetland habitats and habitat complexes located along the Hudson River as wells as unique and varied upland habitats. There are currently five Federally-listed species (endangered [E], threatened [T], candidate [C]) and two identified species of concern within the focal area. The productive estuary area of the Hudson River is a regionally significant nursery and wintering habitat for a number of anadromous, estuarine, and marine fish species, including the American eel, and is a migratory and feeding area for birds, including the bald eagle, and fish that feed on the abundant fish and benthic invertebrate resources in this area. Forests, forested wetlands, and the variety of other habitats in the LHFA are also important habitats for Indiana bat (E), bog turtle (E), Blanding's turtle, small whorled pogonia orchid (T), and northern monkshood (T). Successional habitats are also present that are important for New England cottontail (C). Lastly, high quality streams in the Neversink River Valley support populations of dwarf wedgemussel (T).

The NYFO actively seeks to promote the above resources by addressing issues related to interactions with industry, transportation, hydropower, wind power, contaminants (PBCs and mercury), and development. Specific threats include habitat loss, land conversion, fish barriers, habitat succession, invasive species, decreased habitat complexity, degraded water quality, and

climate change. Current projects include the Hudson River Natural Resource Damage Assessment (NRDA), Federal and non-federal permit review for hydroelectric and wind power development and relicensing, endangered species consultation and recovery activities, and habitat restoration and invasive species control implemented by the Partners for Fish and Wildlife.

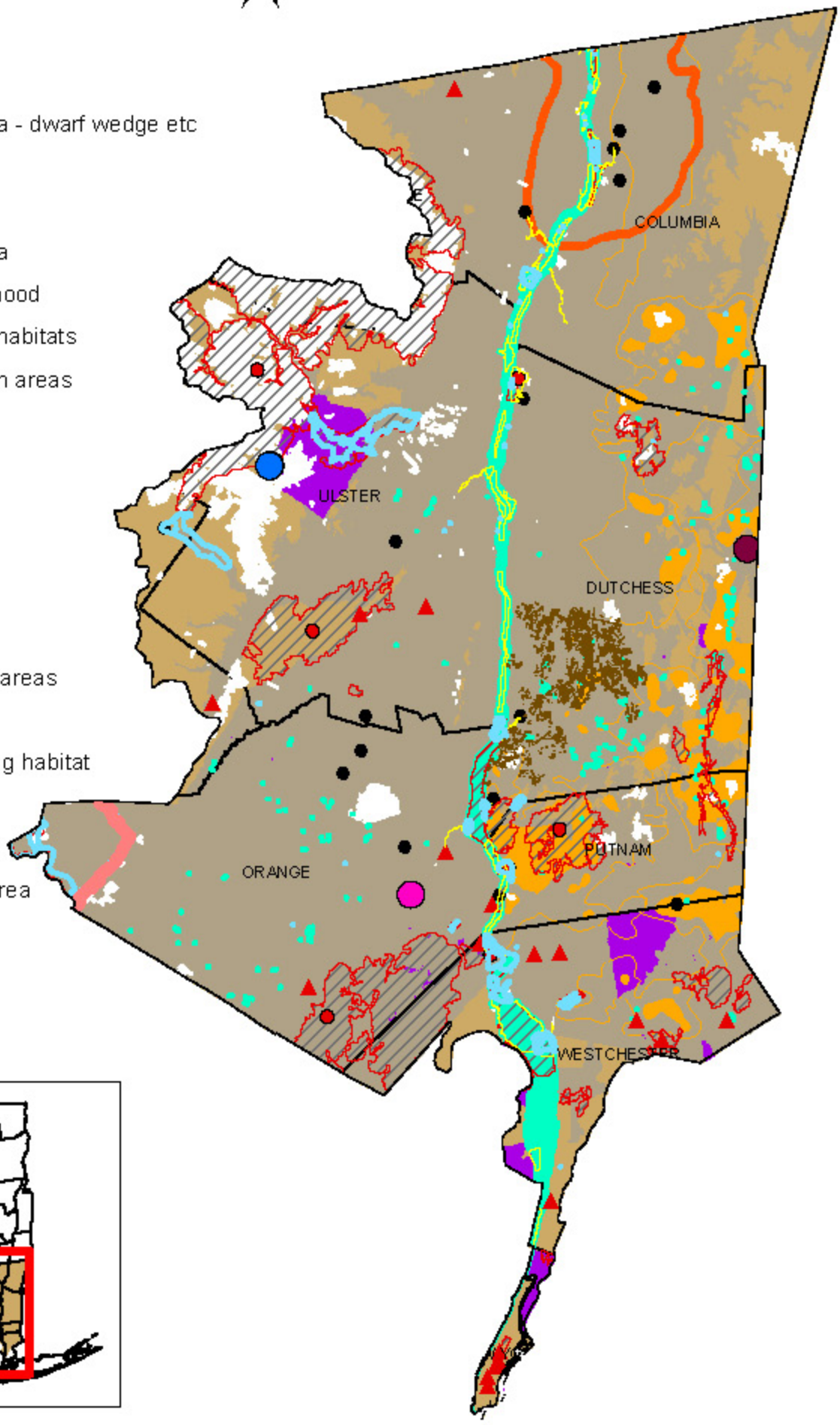
Lower Hudson Focal Area

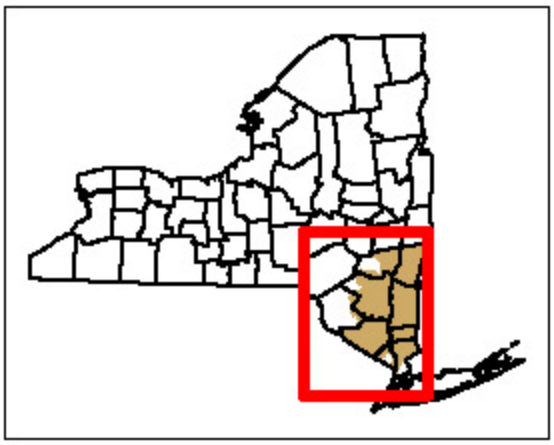
0 5 10 20 Miles

N

Legend

- Neversink mussel area - dwarf wedge etc
- Bald eagles 2010
- Dwarf wedge mussel
- Small whorled pogonia
- Northern Wild Monkshood
- Dept of State coastal habitats
- DEC Bird conservation areas
- Hawkwatch sites
- Important bird areas
- Hydro projects
- Endangered species
- Protected lands
- Karner habitat
- NEC expanded focus areas
- NEC focal areas
- Blandings turtle nesting habitat
- Bog turtle potential
- Indiana bat habitat
- Lower Hudson focal area





American Eel (*Anguilla rostrata*): Lower Hudson Focal Area

American Eel Species Action Plan

FOCAL AREA: LOWER HUDSON

Other species benefitting:

blueback herring, American shad, alewife, shortnose sturgeon, Atlantic sturgeon, striped bass

BIOLOGICAL PLANNING

Introduction to species

Species information: American eel is a semelparous, catadromous species that is a habitat generalist. Their range includes rivers and inland lakes accessible from the Atlantic Ocean. Eel mature in 8 – 30+ years in freshwater prior to migrating to spawn in the Sargasso Sea. All eel mortality in freshwater occurs prior to spawning, resulting in a cumulative impact.

Justification for species selection: American eel stocks range-wide have shown a dramatic decline in the last 20 years. American eel is a Federal trust species. The species underwent a status review by the U.S. Fish and Wildlife Service (USFWS), but was not designated as threatened or endangered. A recent petition was filed to list the species; this petition is currently under review. The Atlantic States Marine Fisheries Commission (ASMFC) developed an Interstate Fishery Management Plan for American eel in 2000, with addendums in 2006 and 2008.

State contribution to overall species population: The American eels found in the Lake Ontario/St. Lawrence River basin are exclusively female and represent the largest, most fecund individuals found in the spawning population. As such, it is generally agreed that these females represent a critical component of the spawning population. The Lower Hudson contributes a substantial proportion of the overall spawning population.

Threats and threat assessment:

1. **Barriers to riverine movement and upstream habitat access.**
2. **Hydro turbine mortality of outmigrating eel.**
3. **Overfishing.**
4. **Habitat degradation and alteration.**
5. **Contaminants.**
6. **Parasitism.**
7. **Climate change**; potential to affect ocean currents and dispersal of larval eel.

8. **Cumulative threats.**

   Research needed:

   - Conduct surveys to determine stock goals for Lower Hudson.

     (Who: Unknown; Cost: Unknown)

Population goal(s) for New York State:

The American eel is a panmictic species with a single population. The goal for the Lower Hudson River basin is to maintain the species as a viable, self-reproducing portion of the ecosystem.

CONSERVATION DESIGN

Strategies for addressing those threats

1. **Barriers to riverine movement and upstream habitat access.**

   a. Attend meetings to fully understand other organization/agencies' efforts towards American eel restoration and to assist in further advancing efforts.

   b. Provide technical assistance on stream restoration projects in the watershed, as requested; target USFWS habitat restoration projects to benefit American eel; preserve, restore, and/or enhance streams known to support American eel (Partners for Fish and Wildlife [PFW]) (staff time plus unknown dollars). |FY12 $0 DES PFW ? Ongoing

   c. Preserve high quality streams known to support American eel (Conservation Planning Assistance [CPA]) (staff time only).

2. **Hydro turbine mortality of outmigrating eels**.

   a. Minimize loss of habitat by influencing regulatory agency decisions regarding operation of hydroelectric power producing facilities (CPA) (staff time only). |FY12 $0 DES CPA SPP Ongoing

3. **Overfishing.**

4. **Habitat degradation and alteration.**

   a. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding operation of hydroelectric power producing facilities; and, "unnatural" erosion mitigation practices, agricultural practices that diminish stream and wetland values

for wildlife, and dredging and placement of fill in streams and wetlands (CPA) (staff time only). |FY12 $0 DES CPA SPP,TRS Ongoing

b. Seek to minimize loss of habitat value by influencing Federal Energy Regulatory Commission (FERC) minimum flow decisions (CPA) (staff time only). |FY12 $0 DES CPA SPP Ongoing

c. Address status assessment and listing proposal. (Endangered Species [ESA], CPA) (staff time only). |FY13 $0 DES CPA,ESA,EC SPP,RAN,ASR Future

5. **Contaminants** (including dams and impassable culverts).

   a. Use Hudson River Natural Resource Damage Assessment (NRDA) case to direct restoration activities. |FY11-FY12 $0 DES EC KJ Ongoing

   b. Determine if contaminants are a significant threat to eels. |FY11-FY13 $0 DES EC ASR Ongoing

   c. Seek to minimize loss of habitat, due to contamination, by influencing regulatory agency decisions related to State and Federal Superfund sites. |FY11-FY13 $0 DES EC ASR Ongoing

   d. Respond as appropriate to spills impacting fish and wildlife resources. |FY12-FY14 $0 DES EC ALS Planned

6. **Parasitism.**

7. **Climate change** (including dams and impassable culverts).

   a. Follow literature to determine if these are actions we need to pursue.

8. **Cumulative threats.**

   a. Address status assessment and listing proposal (ESA, CPA) (staff time only). |FY13 $0 DES CPA,ESA,EC SPP,RAN,ASR Future

Partner organizations:

Please refer to the following documents for existing strategies:

- ASMFC/National Oceanic and Atmospheric Administration (NOAA) – Interstate Fishery Management Plan for American Eel
- Coordinate efforts with other organizations/agencies

American Eel (*Anguilla rostrata*): Lower Hudson Focal Area

USFWS-Lower Great Lakes Fish and Wildlife Conservation Office, U.S. Geological Survey, New York State Department of Environmental Conservation, State University of New York – College of Environmental Science and Forestry.

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY 2010 – 2012

1. **Barriers to riverine movement and upstream habitat access.**

    a. Address barriers to riverine movement and upstream habitat access by barrier mitigation and habitat restoration/enhancement.

2. **Hydro turbine mortality of outmigrating eel**.

    a. Minimize loss of habitat by influencing regulatory agency decisions regarding operation of hydroelectric projects through FERC-related project reviews (CPA) (staff time only). |FY12 $0 DEL CPA SPP Ongoing

        i. Green Island (Done)

        ii. Normanskill. |FY12 $0 DEL CPA SPP Ongoing

        iii. Stuyvesant Falls. |FY12 $0 DEL CPA SPP Ongoing

3. **Overfishing.**

4. **Habitat degradation and alteration.**

    a. Review dredging projects for impacts to eels (CPA) (staff time only). |FY12 $0 DEL CPA TRS Ongoing

    b. Minimize loss of habitat by influencing regulatory agency decisions regarding operation of hydroelectric projects through FERC-related project reviews (CPA) (staff time only). |FY12 $0 DEL CPA SPP Ongoing

5. **Contaminants.**

    a. Manage assessment for FWS for the Hudson River NRDA; review results of fish toxicity pilot study and determine next steps; consider restoration projects that benefit American eel, if possible. (Environmental Contaminants [EC]). |FY12 $0 DEL EC KJ Planned

    b. Determine if contaminants are a significant threat to eels.

        i. Continue with the third year of the funded Off Refuge Laboratory Study, Reproductive Effects of Contaminants on Artificially Matured and Fertilized

American Eels (FY 2011-2012) (EC) (staff and analytical funding). |FY12-FY13 $0 DEL EC ASR Ongoing

c. Seek to minimize loss of habitat, due to contamination, by influencing regulatory agency decisions related to State and Federal Superfund sites.

i. Provide substantive Federal agency comments on proposed actions with likely adverse impacts to American eels and/or their habitat (FY 2011-2013) (EC, CPA) (staff time only). |FY11-FY13 $0 DEL EC,CPA ASR,TRS Ongoing

6. Parasitism.

a. No work identified at this time.

7. Climate change.

a. No work identified at this time.

8. Cumulative threats.

a. Address status assessment and listing proposal (ESA, CPA) (staff time only). |FY13 $0 DEL CPA,EC,ESA SPP,ASR,RAN Future

OUTREACH

Status assessment and listing proposal

MONITORING

- Development of protocols to measure progress/success
- Monitoring to measure progress/success
- Investigate potential barrier removals and available habitat both pre- and post-removal

References

Atlantic States Marine Fisheries Commission (ASMFC). 2000. Interstate Fishery Management Plan for American Eel. ASMFC - Fisheries Management Report No. 36 http://www.asmfc.org/speciesDocuments/eel/fmps/eelFMP.pdf.

Addendum I – Interstate Fishery Management Plan for American Eel, 2006. http://www.asmfc.org/speciesDocuments/eel/fmps/addendumI.pdf.

Addendum II – Interstate Fishery Management Plan for American Eel, 2008. http://www.asmfc.org/speciesDocuments/eel/fmps/addendum%20II_AmericanEel_FINAL.pdf.

Bald Eagle (*Haliaeetus leucocephalus*): Lower Hudson Focal Area

Bald Eagle Species Action Plan

FOCAL AREA: LOWER HUDSON

Other species benefitting:

turkey vultures, migrating raptors including golden eagle, sharp-shinned hawk, rough-legged hawk, red-tailed hawk, broad winged hawk, American kestrel, osprey

BIOLOGICAL PLANNING

Introduction to species:

Species information: Although newly delisted from the Federal endangered species list, the bald eagle still faces threats from human intervention in their migration routes and foraging and breeding areas. Despite their fierce image, bald eagles are actually quite timid and opportunistic. Since their primary prey is fish, bald eagles are sometimes called sea eagles, though they will take some mammals, waterfowl, seabirds, and carrion, especially during winter. The bald eagle is a long-lived bird, with a life span in the wild of more than 30 years. Bald eagles mate for life, returning to nest in the general area (within 250 miles) from which they fledged. Once a pair selects a nesting territory, they use it for the rest of their lives. During the 2009 winter survey, 79 total eagles (41 adults, 38 immatures) were seen along the lower Hudson River during the yearly aerial count; depending on availability of open water, eagles also overwinter near the NY city reservoirs just west of this focal area. During the evening roosting count within a 20-25 mile stretch of river between Fishkill and Croton Point, 257 eagles were counted in 2009. In 2009, State-wide, 173 breeding pairs were identified as successful and fledged 223 young. Also in 2009, 195 nesting territories were identified.

Justification for species selection: Once Federally delisted, the bald and golden eagle are still protected by the Bald and Golden Eagle Protection Act (BGEPA) which now requires authorization by the U.S. Fish and Wildlife Service (USFWS) for unavoidable take of nests and of eagles. The bald eagle is still State listed and a new permit program for authorization of unavoidable take is slowly being utilized. The BGEPA program calls for Ecological Services (ES) offices to assist with early coordination and consultation with potential permittees because of our long history of working with eagles through Section 7 and our program which are delivered to the public from field stations, including providing technical assistance on minimizing impacts of development and policy actions on wildlife. Several areas in New York will involve New York Field Office (NYFO) work with bald and golden eagle conservation – along the ridge just south of the shoreline of Lake Erie, along the shoreline of Lake Ontario and in the St. Lawrence River valley where eagle migration is documented every year by three raptor watch sites in New York and several in Canada, and in the lower Hudson River where eagles nest and roost on mid-river islands and may forage along the shoreline in the vicinity of rail lines.

Bald Eagle (*Haliaeetus leucocephalus*): Lower Hudson Focal Area

State contribution to overall species population: The New York State Department of Environmental Conservation (NYSDEC) does an annual bald eagle count which, for 2009 statewide was 241 adults and 160 immature birds. State biologists assume that the number of resident eagles is growing each year, but no attempt is made to differentiate between resident eagles and seasonal migrants in the annual count in January. The Lower Hudson River consistently supports the greatest number of wintering eagles in the State (in 2009, 79). According to the NYSDEC, the reason we have come to expect the greatest numbers of wintering eagles in this area is that during a "typical" (i.e., cold and iced-over) winter, the most open water is to be found here. In addition, and not insignificantly, five major power plants are also found in this zone that provide considerable amounts of forage for eagles in the form of entrained fish, making it a highly attractive wintering habitat for eagles. However, it should be noted that even well before any of these power-plants existed, large numbers of eagles were recorded in this same zone as far back as the late 1800s and early 1900s, indicating it has served as prime bald eagle wintering habitat for a long time. The bald eagle is still State-listed as threatened.

Threats and threats assessment:

1. Modification or destruction of habitat(s) including migratory corridors, winter roosting areas, and breeding areas. This includes human disturbances from logging, developments, poorly planned public use (boating, canoe/kayak trails, jet skis, ATVs).

2. Disease or predation, including lead ingestion, botulism, predation from other eagles, death by shotgun.

3. Inadequacy of existing regulatory protections. Endangered Species Act (ESA) and BGEPA protection is in the form of a permitting program that allows for "death by a thousand cuts" effects on bald eagles. Although take is prohibited without permits, it can be authorized with a permit; the success of various mitigation schemes to offset take is unknown.

4. Other man-made or natural factors including collisions with trains – in 2009, 10 (known) bald eagles were killed along the rail line along the Hudson River.

5. Ingestion of environmental contaminants, impacts to reproduction.

Research needed:

- Identification of essential breeding and wintering habitats to target locations for habitat management and protection. |FY12-FY14 $3,000 BP CPA SLD Planned

- Identification of movement patterns, migratory pathways and the locations where New York's wintering eagles breed to target locations for habitat protection and to inform the wind industry about specific areas to avoid. This needs to include the heights that eagles fly when riding thermals (in the vicinity of potential wind energy

development sites) for both activity associated with breeding and migratory movements. |FY11-FY14 $0 BP CPA SLD Ongoing

- Monitoring contaminant levels in eagles within New York. |FY? $0 BP EC ALS Future

- Continued pathology investigations to determine causes of mortality in bald eagles. |FY12-FY14 $0 BP CPA SLD Future

- Post-construction monitoring of developments that might affect eagles and their habitats and providing mitigation where needed. |FY13-FY14 $0 BP CPA SLD Future

Partners/potential funding:

NYSDEC, New York State Energy Research and Development Authority (NYSERDA), USFWS, State Wildlife Grants (SWG), wind energy developers

Population goal(s) for New York State:

Goal – productivity of 1.0/eagle pair.

Research needed: Identification of a population goal for the New York State breeding population. |FY12-FY14 $0 BP CPA SLD Future

CONSERVATION DESIGN

1. **Loss of habitat**

   a. Address modification or destruction of habitat(s) including winter roosting areas, and breeding areas through public education programs and website postings in conjunction with the NYSDEC bald eagle recovery program. Assist the NYSDEC in identifying movement patterns, migratory pathways, and locations where New York's wintering eagles breed. |FY12-FY13 $0 DES CPA SLD Ongoing

   b. Continue engagement in Federal Clean Water Act permitting program and State Environmental Quality Review Act (SEQRA) program for wind power and development projects proposed in eagle concentration areas and wind resource areas that coincide with breeding, foraging, and migratory routes. |FY12-FY14 $0 DES CPA SLD Ongoing

   c. Assist NYSDEC in identifying, managing, and protecting essential breeding and wintering habitats. |FY12-FY14 $0 DES CPA SLD Ongoing

Bald Eagle (*Haliaeetus leucocephalus*): Lower Hudson Focal Area

2. **Disease or predation, including lead ingestion, botulism, predation from other eagles, death by shotgun.**

    a. Through hunter education programs, address nest protection programs. |FY14 $0 DES CPA SLD Future

    b. Ensure continued monitoring of lead and other contaminant levels in eagle eggs and chicks. |FY? $0 DES EC,CPA ALS,SLD Future

    c. Develop a strategy for addressing high levels of contaminants, if found. |FY? $0 DES EC,CPA ALS,SLD Future

3. **Inadequacy of existing regulatory protections.**

    a. Address inadequacy of existing regulatory protections by providing information about the Federal BGEPA program as administered in New York by the NYFO and the Regional Office's Migratory Bird Program Office, and State protections under the State ESA. |FY12-FY13 $0 DES CPA SLD Ongoing

4. **Other man-made or natural factors.**

    a. Address other factors including collisions with trains – (in 2009, 10 known bald eagles were killed along the high speed rail line along the Hudson River) – by developing a programmatic permit for take by the rail companies associated with their operations along the Hudson River Corridor. Develop advanced conservation strategies and best management practices (BMP) for this industry and for the wind industry to avoid and minimize impacts to bald and golden eagles. |FY12-FY13 $0 DES CPA SLD Ongoing

    b. Address wind and rail related mortalities by improved intraoffice coordination on development of BMP and other strategies. |FY12-FY13 $0 DES CPA SLD Ongoing

5. **Ingestion of environmental contaminants, impacts to reproduction**.

    a. Determine if there are impacts to bald eagles from environmental contaminants within the watershed and if so, implement mitigative measures. |FY? $0 DES EC ALS Future

    b. Seek to minimize loss of habitat due to contamination by influencing regulatory agency decisions related to State and Federal Superfund sites. |FY11-FY13 $0 DES EC ASR Ongoing

    c. Investigate development of an On-/Off-Refuge proposal to address impact of contaminants on osprey and/or other avian species and seek funding for such work. |FY11 $0 DES EC KJ Completed

d. Evaluate USFWS Natural Resource Damage Assessment and Restoration (NRDAR) along the Lower Hudson River. |FY11-FY13 $0 DES EC KJ Ongoing

e. Respond as appropriate to spills impacting fish and wildlife resources. |FY12-FY14 $0 DES EC ALS Planned

Partner organizations:

Ripley Hawk Watch, Onondaga Audubon Society, Cornell Lab of Ornithology, NYSDEC, Riverkeeper, Haudenosaunee Confederacy.

CONSERVATION DELIVERY

1. **Loss/degradation of habitat.**

   a. Address modification or destruction of habitat(s) including winter roosting areas and breeding areas through public education programs, and website postings in conjunction with the NYSDEC bald eagle recovery program. Assist the NYSDEC in identifying movement patterns, migratory pathways, and locations where New York's wintering eagles breed.

      i. Along with links to biological information about bald eagles, develop materials for the website to clarify for the public the connections between what humans do by way of development, forest clearing, use of motor boats, jet skis, etc., in bald eagle nesting areas and nest abandonment, loss of productivity, etc. |FY12-FY13 $0 OUT IT,CPA AFL,SLD Ongoing

      ii. Continue engagement in Federal Clean Water Act permitting program and SEQRA program for wind power and development projects proposed in eagle concentration areas and wind resource areas that coincide with breeding and migratory routes (Conservation Planning Assistance [CPA]). |FY12-FY13 $0 DEL CPA ? Ongoing

      iii. Participate in regional workgroup and other agencies' sponsored workgroups developing guidance for wind power project siting. |FY12-FY13 $0 DEL CPA SLD Ongoing

      iv. Develop maps for internal use that map out a "green infrastructure" of migratory, roosting, and breeding areas for eagles in New York State to refer to when screening 404 and Federal projects reviews. |FY12-FY14 $0 DEL CPA SLD Future

v. Provide substantive comments to the regulatory agencies that provide BMP, mitigation recommendations for eagle conservation when in suitable habitat (CPA). |FY12-FY13 $0 DEL CPA SLD Ongoing

b. Assist NYSDEC in identifying, managing, and protecting essential breeding and wintering habitats through NYSDEC-ESA/BGEPA Program that will result in a net benefit to eagles. |FY12-FY14 $0 DEL CPA SLD Ongoing

i. Obtain, prepare, and/or distribute maps outlining key areas for conservation to coworkers who may be reviewing projects in bald eagle habitat. |FY12-FY14 $0 DEL IT AFL Future

ii. Assist coworkers in drafting language for comment letters on a wide variety of regulated activities if they occur in known bald eagle habitats. |FY12-FY13 $0 DEL CPA SLD Ongoing

iii. Develop/tweak national guidelines for land management agencies to ensure that their trail systems minimize impacts to bald and golden eagles in concentration areas. Prepare guidelines, and distribute to State Parks, State Forests, and National Forests interpretation staff. |FY12-FY13 $0 DEL CPA SLD Ongoing

2. Disease or predation, including lead ingestion, botulism, predation from other eagles, death by shotgun.

a. Through hunter education programs, address nest protection programs.

b. Ensure continued monitoring of lead and other contaminant levels in eagle eggs and chicks.

c. Develop a strategy for addressing high levels of contaminants if found.

3. Inadequacy of existing regulatory protections.

4. Other man-made or natural factors.

a. Address other factors including collisions with trains by developing a programmatic permit for take by the rail companies associated with their operations along the Hudson River Corridor.

i. Develop advanced conservation strategies and BMP for this industry and for the wind industry to avoid and minimize impacts to bald and golden eagles. |FY12-FY13 $0 DEL CPA SLD Ongoing

ii. Address wind- and rail-related mortalities by improved intraoffice coordination on development of BMP and other strategies. |FY11-FY132 $0 DEL CPA SLD Ongoing

iii. Send letter to rail companies reminding them of need to pursue authorization of incidental take. |FY11 $0 DEL CPA SLD Completed

iv. Meet with new Northern BGEPA coordinator to discuss an approach to compliance. |FY11-FY13 $0 DEL CPA SLD Ongoing

v. Meet with NYSDEC, Solicitor's Office-NE, Bald Eagle Coordinator, and Law Enforcement to strategize next steps, by mid-November 2010. |FY10 $0 DEL CPA SLD Completed

vi. By December 31, 2010, convene a multiparty meeting to discuss next steps with the rail companies and their attorneys. |FY10 $0 DEL CPA SLD Completed

vii. Work with the NYSDEC, industry, other field offices, Regional Office, and species experts to identify advanced conservation practices that will avoid and minimize take of eagles and other large raptors. |FY11 $0 DEL CPA SLD Completed

5. **Ingestion of environmental contaminants, impacts to reproduction**.

   a. Determine if there are impacts to bald eagles from environmental contaminants (EC) within the watershed and if so, implement mitigative measures.

   b. Evaluate USFWS NRDAR along the Lower Hudson River.

      i. Manage assessment for USFWS for the Hudson River Natural Resource Damage Assessment (NRDA); review bald eagle data and assess status of injury. |FY11-FY14 $0 DEL EC,CPA KJ,SLD Ongoing

   c. Seek to minimize loss of habitat, due to contamination, by influencing regulatory agency decisions related to State and Federal Superfund sites.

      i. Provide substantive Federal agency comments on proposed actions with likely adverse impact to bald eagles and/or their habitat. |FY11-FY13 $0 DEL EC ASR Ongoing

6. **Address disease or predation**, including lead ingestion, botulism, predation from other eagles, and death by shotgun, through hunter education programs, nest protection programs.

a. Investigate whether bald and golden eagle fact sheets could be provided at hunter training programs run by the NYSDEC. Develop fact sheets and distribute. |FY12-FY14 $0 DEL CPA SLD Ongoing

7. **Address inadequacy of existing regulatory protections** by providing information about the Federal BGEPA program as administered in New York by the NYFO and the Regional Office's Migratory Bird Program Office, and State protections under the State ESA.

   a. Provide a New York highlighted fact sheet on the website to outline process for protection of bald and golden eagles through the BGEPA permit processes. |FY12-FY14 $0 DEL CPA SLD Ongoing

   b. Identify three organizations with whom we could meet to further BGEPA education – builders, outfitters, etc. |FY13 $0 DEL CPA SLD Future

OUTREACH

See specific examples, above.

Continue to make bald eagle recovery traveling exhibit available for exhibition; keep copy blocks current. |FY12-FY13 $0 OUT CPA SLD Ongoing

Develop an accompanying workbook based on the one the BOCES students started. |FY12-FY13 $0 OUT CPA SLD Planned

MONITORING

Develop protocols to measure progress/success. |FY12-FY14 $0 MON CPA SLD Ongoing

Recommend monitoring to measure progress/success. |FY12-FY14 $0 MON CPA SLD Ongoing

Investigate options for State bald eagle program funding to continue to monitor nests, concentration areas, productivity, and contaminant levels in eagles. |FY12-FY13 $0 OUT CPA SLD Ongoing

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Bald Eagle (*Haliaeetus leucocephalus*): Lower Hudson Focal Area

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Blanding's Turtle (*Emydoidea blandingii*): Lower Hudson Focal Area

Blanding's Turtle Species Action Plan

FOCAL AREA: LOWER HUDSON

Other species benefitting:

(shrub swamps/marshes/fens/vernal pool habitat) New England cottontail, bog turtles, black duck, wood duck, American woodcock, golden-wing warbler, spotted salamanders

BIOLOGICAL PLANNING

Introduction to species

Species information: The Blanding's turtle is a long-lived, late-maturing species that inhabits a wide range of habitats throughout its range, including shrub swamps, marshes, vernal pools, bogs, ponds, lakes, wet prairies, forested wetlands, and low-gradient streams and rivers. Blanding's turtles main range extends disjunctly from southeastern Ontario, adjacent Quebec, and southern Nova Scotia, south into New England, and west through the Great Lakes to western Nebraska, Iowa, and extreme northeastern Missouri. Several disjunct populations occur in the Northeast (eastern New York, eastern Massachusetts, southern New Hampshire, southern Maine, and southern Nova Scotia). These eastern populations have been effectively isolated from the main range for several millennia, are genetically distinct, and may qualify for Federal listing as a Distinct Population Segment under the U.S. Endangered Species Act (ESA). Blanding's turtles mature between 14-21 years, and can attain ages greater than 75 years and still reproduce successfully.

In addition, Blanding's turtles use uplands for several parts of their life cycle for nesting, moving among wetlands, basking, aestivation, and possibly feeding. Most individuals move overland (over 3 km) among multiple wetlands throughout the season. In addition, females often move long distances to nesting sites. Habitat, therefore, must be considered in the context of its landscape setting.

Because Blanding's turtles have a generation time of nearly 40 years and population increases take place slowly, recoveries from declines may take many decades or centuries. Therefore, to be effective, conservation efforts must take place well in advance of severe declines.

Justification for species selection: Blanding's turtles are State-listed as either threatened or endangered in nine of 15 states where they occur, including three of the four states in the Northeast. In New York, the Blanding's turtle is State-listed as threatened. At the Federal level, the species in not currently listed under the U.S. Fish and Wildlife Service (USFWS) ESA; under the Canada Species at Risk Act, the species is considered threatened (endangered in Nova Scotia).

State contribution to overall species population: In New York, Blanding's turtles are known from the following counties: Dutchess, Saratoga, St. Lawrence, Jefferson, Niagara, and Erie.

Blanding's Turtle (*Emydoidea blandingii*): Lower Hudson Focal Area

Evidence suggests there are 3 evolutionary significant units (ESU) for Blanding's turtles across their range. Two of these units occur in New York – the St. Lawrence/western New York populations and those populations in the Hudson River basin. It is likely that there would be a minimum of two recovery units established in New York, if the species is Federally-listed. With two ESUs, it could be stated that New York's Blanding's turtle population is genetically more diverse than any other State.

Threats and threat assessment:

Threats[16] (see Status Assessment in references):

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Wetland loss, including vernal pools. Upland habitat loss (nesting habitat).

B. Fragmentation of habitat (connectivity of wetland and upland habitat).

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:

A. Collections for the pet trade will always remain a threat, but at this time it is not currently believed to be a major problem.

Factor C. Disease or predation:

A. At this time, no disease threats have been identified. Predation of adults is not a significant factor. Predation of nests, hatchlings, and juveniles is naturally high.

Factor D. The inadequacy of existing regulatory mechanisms:

A. Although State-listing affords species protection from direct take, protection provided to habitat is weak and variable. Upland habitat is rarely protected.

Factor E. Other natural or manmade factors affecting its continued existence:

A. Road mortality is a significant threat to adult turtles. Forestry (crushing of turtles, degradation of vernal pools), agriculture (nest disturbance, pollution), and water impoundment management (winter draw-downs may expose overwintering adults to freezing temperatures). Environmental contaminants (effects on reproductive success). Climate change (narrow latitudinal range of this species, combined with a long generation time may leave the species especially vulnerable to climate change impacts).

[16] Refers to 5 listing factors A-E in Section 4 of ESA.

Blanding's Turtle (*Emydoidea blandingii*): Lower Hudson Focal Area

Recovery Goals

Conservation goal(s) for New York State:
The New York State Department of Environmental Conservation (NYSDEC) is currently writing a Blanding's Turtle Recovery Plan. Although no population goals have been established for New York, the New York Field Office (NYFO) will continue to collaborate with partners to establish target population goals. Empirically determining the status and trends of Blanding's turtles is difficult; this is the result of sparse data and a long generation time for the species. In general, trends must be inferred based upon the species life history and condition/trends of habitat.

Research/Actions needed:

- Extensive surveys to assess known sites and identify new populations. |FY? $0 BP ESA ? Future

  (Who: NYSDEC, Hudsonia Ltd, New York Natural Heritage Program [NYNHP] State University of New York-Potsdam [SUNY-Potsdam], USFWS; Cost: unknown at this time)

- Conduct genetic analyses needed to address Distinct Population Segment issue before species can be considered for listing. |FY12 $0 BP ESA ? Ongoing

  (Who: NYSDEC, U.S. Geological Survey [USGS], Hudsonia Ltd, NYNHP, SUNY-Potsdam, USFWS; Cost: unknown at this time)

- Conduct study on road designs to reduce adult mortality (underpass or overpass designs, crossing signage). |FY? $0 BP ESA ? Future

  (Who: NYSDEC, USGS, University of Massachusetts (UMass), Federal Highway Administration [FHWA], New York State Department of Transportation [NYSDOT], Hudsonia Ltd., NYNHP, SUNY-Potsdam, USFWS; Cost: unknown at this time)

CONSERVATION DESIGN

Strategies for addressing those threats

Please go to these documents for the existing strategies:

- Status Assessment - 2007
- Nova Scotia Recovery Plan – 2003
- Quebec Recovery Plan – 2005

Blanding's Turtle (*Emydoidea blandingii*): Lower Hudson Focal Area

In addition, the NYSDEC is developing a Blanding's turtle recovery plan for New York State (A. Ross).

Research/Actions needed: Specific actions for the next 3 years addressing conservation design include the following:

A. Assist with development/review of New York State Recovery Plan. |FY12 $0 DES ESA ? Ongoing

   Recovery Plan is currently being drafted by NYSDEC.

B. Assist with development/review of Northeast Blanding's Turtle Conservation Initiative.

C. Determine potential role with New England Field Office (NEFO)/NYSDEC. |FY12 $0 DES ESA ? Ongoing

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats FY2010-2012

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Wetland loss, including vernal pools. Upland habitat loss (nesting habitat).

B. Fragmentation of habitat (connectivity of wetland and upland habitat).

   1. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding wetland impacts and modifications, uplands impacts associated with wetland impacts, road development, and agricultural practices that diminish wetland values.

      a. Draft standard language and compile materials to share with the public (Endangered Species [ESA]). |FY? $0 DEL ESA ? Future

      b. Provide substantive comments on proposed Federal agency actions with likely adverse impacts on Blanding's turtles (Conservation Planning Assistance [CPA]) and Environmental Contaminants [EC] Biological Technical Assistance Group to USEPA). |FY11-FY13 $0 DE CPA,EC TRS,SLD,ASR Ongoing

   2. Develop standard avoidance and minimization measures for development projects.

      a. Develop standard guidelines to minimize development impacts to the Blanding's turtle (ESA). |FY? $0 DEL ESA ? Future

b. Lead meetings to educate local government/townships of presence of the species and provide recommendations regarding development guidelines to reduce impacts. |FY? $0 DEL ESA ? Future

3. Target wetland mitigation projects, including vernal pool creation/restoration.

   a. Provide comments and recommendations on wetland mitigation projects in known range of the Blanding's turtles to ensure projects are beneficial to the species (CPA). |FY12 $0 DEL CPA TRS,SLD Ongoing

4. Work with NYSDOT and FHWA to reduce road mortality.

   a. Provide substantive comments on proposed Federal agency actions with likely adverse impacts on Blanding's turtles (CPA). |FY12 $0 DEL CPA TRS,SLD Ongoing

5. Work with partners to proactively protect the complexes of wetlands and uplands used by extant populations.

   a. Work to ensure information on known locations of Blanding's turtles is conveyed to land protection partners and land trusts to focus their efforts (ESA). |FY12 $0 DEL ESA ? Future

6. Participate in New York State Recovery Plan and Conservation Initiative meetings.

   a. Attend and provide input at NYSDEC Recovery Plan meetings as requested. Assist NYSDEC with development of best management plans (BMP), threats assessment, and mitigation strategies as requested. (ESA). |FY12 $0 DEL ESA ? Ongoing

   b. Provide USFWS support for 2011 multi-state State Wildlife Grant (SWG) Blanding's turtle proposal submission, with a priority given to the population genetics research, as requested (ESA). |FY12 $0 DEL ESA ? Ongoing

7. Assist with NYSDEC surveys.

   a. Coordinate with the NYSDEC and Hudsonia to determine survey schedule (ESA/NYFO). |FY12 $0 DEL ESA ? Ongoing

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:

A. Collections for the pet trade will always remain a threat, but at this time it is not currently believed to be a major problem.

Blanding's Turtle (*Emydoidea blandingii*): Lower Hudson Focal Area

1. No work identified at this time.

Factor C. Disease or predation:

A. At this time, no disease threats have been identified. Predation of adults is not a significant factor. Predation of nests, hatchlings, and juveniles is naturally high.

1. No work identified at this time.

Factor D. The inadequacy of existing regulatory mechanisms:

A. Although State-listing affords species protection from direct take, protection provided to habitat is weak and variable. Upland habitat is rarely protected.

1. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding wetland impacts and modifications, uplands impacts associated with wetland impacts, road development, and agricultural practices that diminish wetland values.

a. Provide substantive comments on proposed Federal agency actions with likely adverse impacts on Blanding's turtles (CPA). |FY12 $0 DEL CPA,ESA TRS,SLD,? Future

Factor E. Other natural or manmade factors affecting its continued existence:

A. Road mortality is a significant threat to adult turtles. Forestry (crushing of turtles, degradation of vernal pools), agriculture (nest disturbance, pollution), and water impoundment management (winter draw-downs may expose overwintering adults to freezing temperatures). Environmental contaminants (effects on reproductive success). Climate change (narrow latitudinal range of this species, combined with a long generation time may leave the species especially vulnerable to climate change impacts).

1. Continue to manage the Hudson River Natural Resource Damage Assessment (NRDA) case. |FY11-FY13 $0 DEL EC KJ Ongoing

a. Consider Blanding's turtle restoration projects in NRDAs. |FY11-FY13 $0 DEL EC KJ Ongoing

2. Identify potential effects to the Blanding's turtle from climate change. |FY? $0 DEL ESA ? Future

a. Work with National Weather Service to create models for determining climate change impacts to the Blanding's turtles.

Blanding's Turtle (*Emydoidea blandingii*): Lower Hudson Focal Area

OUTREACH

Develop education and outreach tools – on land protection needs and conservation restriction options for landowners, on turtles crossing roads, on turtles as pets, on life history strategy, and on nesting turtles. |FY? $0 OUT ESA ? Future

MONITORING

- Work with partners to review and track recovery progress. |FY? $0 MON ESA ? Future
- Establish benchmarks for success based on New York State Blanding's Turtle Recovery Plan (pending). |FY? $0 MON ESA ? Future

Partners

NYSDEC, NYSDOT, FHWA, USGS, NYNHP, USFWS/NEFO, Hudsonia Ltd., Wilton Wildlife Preserve and Park, The Nature Conservancy (TNC), UMass, SUNY-Potsdam, land trusts, adjacent States

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Bog Turtle (*Clemmys [=Glyptemys] muhlenbergii*): Lower Hudson Focal Area

Bog Turtle Species Action Plan

FOCAL AREA: LOWER HUDSON

BIOLOGICAL PLANNING

Other species benefitting:

spotted turtle, fen plant communities, Indiana bat, New England cottontail

Introduction to species

Species information: Bog turtles often hibernate communally with other bog turtles and with spotted turtles. The bog turtle emerges from hibernation which is often spent in an abandoned muskrat lodge or other burrow, by mid-April when both the air and water temperatures exceed 50ºF. Sexual maturity may be reached between 8-11 years old. Mating occurs in the spring (primarily) or fall, and may be focused in or near the hibernaculum (winter shelter). In early to mid-June, a clutch of two to four eggs is laid in a nest (tussocks). The eggs hatch around mid-September and the adults enter hibernation in late October. Bog turtles live for 30 years or more in wetland (fen) communities and may use adjacent upland areas. Although generally very secretive, the bog turtle can be seen basking in the open, especially in the early spring just after emerging from hibernation. It is an opportunistic feeder, although it prefers invertebrates such as slugs, worms, and insects. Seeds, plant leaves, and carrion are also included in its diet.

Justification for species selection: The bog turtle was Federally-listed as threatened in 1997 and listed as endangered by the State of New York. The bog turtle is a U.S. Fish and Wildlife Service (USFWS) Spotlight Species and Region 5 of the USFWS has a new bog turtle initiative.

State contribution to overall species population: There are 2 Recovery Units (RU) in New York, the Prairie Peninsula/Lake Plain RU (New York has all known extant sites) and the Hudson Housatonic RU (HHRU).

Threats and threat assessment:

Threats[17] (See 5-year review for full assessment):

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Residential and commercial development continues to be a leading cause of habitat loss and degradation. Most direct effects to bog turtles and their habitat are now avoided. Indirect effects to wetlands remain.

[17] Refers to 5 listing factors A-E in Section 4 of Endangered Species Act

Bog Turtle (*Clemmys [=Glyptemys] muhlenbergii*): Lower Hudson Focal Area

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:

A. Collection is an ongoing threat.

Factor C. Disease or predation:

A. New concerns about potential disease issues in New York and Massachusetts.

B. Predation is a threat at certain sites.

Factor D. The inadequacy of existing regulatory mechanisms:

A. Continues to pose a threat.

Factor E. Other natural or manmade factors affecting its continued existence:

A. Beaver use of sites, weather events (flooding, drought).

B. Climate change may or may not be a threat to the species.

C. Invasive species.

Recovery Goals

Range-wide Recovery Goals/Objectives: Protect and maintain the northern population of this species and its habitat, enabling the eventual delisting of the species.

Conservation goal(s) for New York State: Long-range protection is secured for at least 40 viable populations in HHRU, including at least 10 populations in each of the following recovery subunits: the Wallkill River, the Hudson River, and the Housatonic River.

Research/Actions needed:

A. Coordinate with Pennsylvania Field Office (PAFO), New Jersey Field Office (NJFO), New England Field Office (NEFO), and partners on updating goals for New York for HHRU subunit. |FY12 $0 BP ESA NR Planned

    1. Hold and participate in annual meeting with partners within the HHRU. |FY12 $? BP ESA NR,RAN Planned

B. Conduct surveys to locate additional populations of bog turtles (Recovery Action 3.4).

    1. Recommend surveys during project reviews annually. |FY12 $0 BP ESA RAN,SLD,NR Ongoing

2. Conduct proactive surveys to locate additional populations.

    a. Complete grant agreement (contingent on funding) for proactive surveys to locate additional populations. |FY12 $20,000 BP ESA NR,RAN Planned

    b. Review Tesauro final report from FY11. |FY12 $0 BP ESA NR,RAN Planned

C. Monitor status of and threats to extant populations (Recovery Actions 3.5 and 6.1).

1. Monitoring of potential new disease (see Conservation Delivery).

2. Conduct bog turtle surveys at extant sites.

    a. Develop a schedule and assign monitors to adopt a site. |FY12 $0 BP ESA RAN,SLD,NR Planned

D. Develop a strategy for evaluating bog turtle populations and managing those populations (where necessary) (Recovery Action 7.1).

1. Meet with State University of New York-College of Environmental Science and Forestry (SUNY-ESF) to learn more about population estimates. |FY11 $0 BP ESA RAN,SLD,NR Completed

2. Work with Kevin Shoemaker (Stony Brook University) to develop a protocol for assessing viability of sites. |FY12 $0 DEL ESA RAN,SLD,NR Planned

CONSERVATION DESIGN

Strategies for addressing those threats

Please go to these documents for the existing strategies:

- Recovery Plan completed 2001 (Service 2001)
- 5-year review drafted 2008 (Service 2008)
- 5-year review 2012
    - Provide technical assistance on 5-year review as requested. |FY12 $0 DES ESA RAN,SLD,NR Planned
- Spotlight Species Action Plan 2009 (Service 2009)
- National Fish and Wildlife Foundation (NFWF) Business Plan (NFWF 2009)

Bog Turtle (*Clemmys [=Glyptemys] muhlenbergii*): Lower Hudson Focal Area

Research or Actions needed: Specific actions for the next 3 years addressing conservation design include the following:

A. Participate in Bog Turtle Initiative. |FY12 $0 DES ESA RAN,SLD,NR Ongoing

   1. Participate on monthly regional conference calls. |FY12 $0 DES ESA SLD,NR Ongoing

   2. Host and attend periodic HHRU conference calls. |FY12 $0 DES ESA NR,RAN Ongoing

   3. Attend March 10, 2010, meeting in Pennsylvania. |FY10 $0 DES ESA RAN,SLD Completed

   4. Assist Alison Whitlock in planning November 2011 regional workshop. |FY11-FY12 $0 DES ESA NR Complete

   5. Attend November 2011 regional workshop. |FY12 $1,100 DES ESA SLD,NR Complete

   6. Attend 2012 regional workshop (location and date TBD). |FY12 $1,000? DES ESA SLD,NR Planned

B. In each recovery unit, identify and prioritize sites for appropriate conservation efforts (Recovery Action 2.1).

   1. Initiate HHRU recovery implementation team.

      a. Hold initial call/meeting to reinvigorate Hudson/Housatonic team and discuss drafting subunit plans (first call is done, periodic calls are addressed). |FY11-FY12 $0 DES ESA NR Completed

   2. Complete 1-3 year implementation plan for Hudson, Housatonic, and Wallkill recovery subunits. |FY11-FY12 $0 DES ESA NR Ongoing

   3. Develop site-specific management plans for each priority site. |FY13 $0 DES ESA NR Future

C. Conduct research/studies to understand and identify the degree to which land-use activities alter bog turtle habitat (Recovery Action 6.2).

   1. Conduct research to help understand indirect effects such as hydrological changes from residential and commercial development.

a. Coordinate with Alison Whitlock regarding development of a funding request for U.S Geological Survey (USGS) Science Support Partnership (SSP) to help understand hydrological changes in bog turtle sites from residential and commercial development. |FY13 $0 DES ESA RAN,SLD,NR Future

D. Assist with structured decision making process to assess feasibility of doing captive propagation within the northern portion of the bog turtle range. |FY12 $? DEL ESA NR Planned

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats FY2010-2012

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Protect bog turtle sites through purchase and conservation easements (Recovery Action 2.3).

1. Provide technical assistance to partners that may be able to protect sites (Recovery Land Acquisition grant, New York State Department of Environmental Conservation [(NYSDEC] Environmental Protection Fund [EPF], The Nature Conservancy [TNC], or land trusts).

a. Coordinate with land trusts.

i. Hold landowner protection meetings in HHRU to engage individual land trusts in bog turtle conservation. |FY13 $? DEL ESA NR,RAN Future

ii. Assist land trusts in HHRU with land parcel selection. |FY13-FY14 $0 DEL ESA NR Future

iii. Provide technical assistance to partners in HHRU regarding land acquisition funding. |FY13-FY14 $0 DEL ESA NR Future

b. Coordinate with the NYSDEC.

i. Assist the NYSDEC with applying for land acquisition funding. |FY13-FY14 $0 DEL ESA NR Future

2. Provide technical assistance to Natural Resources Conservation Service (NRCS) on Wetlands Reserve Program (WRP) HHRU projects.

a. Meet with NRCS annually on status of projects and plans within HHRU. |FY11-FY13 $0 DEL ESA NR Ongoing

3. Coordinate with the U.S. Army Corps of Engineers regarding bog turtle conservation.

    a. Target Section 404 mitigation projects within HHRU. |FY11-FY13 $0 DEL ESA,CPA RAN,SLD,NR,TRS Ongoing

    b. Engage the U.S. Army Corps of Engineers with development of the HHRU subunit plans. |FY11-FY13 $0 DEL ESA NR Ongoing

B. Improve the effectiveness of regulatory reviews in protecting bog turtles and their habitats, specifically to address agencies working at cross purposes when permitting activities in wetlands (Recovery Action 1.2) and avoid and minimize direct and indirect adverse effects to bog turtles and their habitat (Recovery Action 1.3).

1. Develop standardized avoidance, minimization, and compensation measures (AMM).

    a. Pipelines.

        i. Utilize materials on pipelines (AMM's, best management practices [BMP]) from NiSource Habitat Conservation Plan [HCP] to develop pipeline fact sheet. |FY11-FY12 $0 DEL ESA RAN Ongoing

        ii. Post BMP on website. |FY12 $0 DEL ESA,IT NR,AFL Planned

    b. Marcellus shale drilling.

        i. Assess potential threat of Marcellus shale drilling. Potentially develop a conservation framework to address drilling activities. Coordinate with PAFO on this action. |FY12 $0 DEL ESA,CPA NR,TRS Planned

    c. Residential/Commercial Development.

        i. Develop standardized exposure/response table and narratives to explain threats associated with residential/commercial development. |FY13 $0 DEL ESA,CPA NR,TRS Future

C. Coordinate with New York State Department of Transportation (NYSDOT) to address potential problems with culverts/crossings at sites.

1. Attend site visit to look at problematic culverts. Partners for Fish and Wildlife [PFW], Jason Tesauro, NYSDOT. |FY12 $? DEL ESA,CPA,PFW NR Planned

2. Coordinate with TNC (Michelle Brown) regarding their list of priority culverts to see if any could be placed for bog turtle conservation. |FY12 $0 DEL ESA,CPA,PFW SLD,NR Planned

Bog Turtle (*Clemmys [=Glyptemys] muhlenbergii*): Lower Hudson Focal Area

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:

A. Coordinate with Law Enforcement and TNC to identify and monitor any potential collection. |FY12 $? DEL ESA NR Planned

Factor C. Disease or predation:

A. Assist with health assessment with Wildlife Conservation Society (WCS).

   1. Fund project jointly with NEFO and NYFO (total $10,000). |FY10 $5,107 DEL ESA RAN Completed

   2. Assist with field collection of samples in coordination with NEFO. |FY11 $0 DEL ESA SLD,RAN,JW Completed

   3. Provide grant oversight. |FY11-FY12 $0 DEL ESA RAN Ongoing

Factor D. The inadequacy of existing regulatory mechanisms: No work planned in next 2-3 years.

Factor E. Other natural or manmade factors affecting its continued existence: Control invasive species, especially *Phragmites australis,* monotypic stands of *Typha* spp., and *Lytrum salicaria (*purple loosestrife*).*

A. Manage, restore, and maintain bog turtle habitat, as appropriate (Recovery Action 6.4) and control succession and invasive exotic plants (Recovery Action 6.3.1).

   1. Continue habitat restoration projects in focused areas.

      a. Meet with HHRU implementation team members to determine how USFWS can best assist with habitat restoration projects in HHRU. |FY11-FY13 $0 DEL ESA NR,RAN Ongoing

      b. Provide technical assistance annually to NRCS (e.g., review site plans, ensure consistency with NRCS BO) as requested. |FY11-FY13 $0 DEL ESA NR Ongoing

      c. Assist with habitat restoration projects (e.g., NRCS or PFW) in HHRU (e.g., fence installation, woody vegetation removal). |FY11-FY12 $? DEL ESA,PFW NR Ongoing

      d. Fund Jason Tesauro to continue landowner outreach, surveys, development of site plans, and monitoring. |FY10 $22,000 DEL ESA RAN Completed

e. Provide grant oversight for "d" above. |FY12 $0 DEL ESA RAN Planned

f. Fund Jason Tesauro for habitat restoration at three bog turtle sites in Dutchess County with technical assistance from PFW. |FY11-FY12 $23,600 DEL ESA,PFW RAN,GD Ongoing

g. Provide grant oversight for "f" above. |FY12 $0 DEL PFW GD Ongoing

h. Explore an NRCS or coastal/partners cost-share position to work on both bog turtles and New England cottontail in the HHRU. |FY12 $? DEL ESA,PFW RAN,NR Planned

OUTREACH

Current ideas include:

- Update website with BMPs. |FY11-FY12 $? DEL ESA,IT NR,AFL Planned
- Target nature centers located in the recovery units and research the need for educational opportunities. |FY13 $? OUT ESA SLD,NR Future
- Design outreach exhibit to inform the public on bog turtle life history, threats (including Climate Change), avoidance, minimization, and conservation measures. |FY14 $? OUT ESA SLD,NR Future

MONITORING

- Review and track recovery progress in HHRU annually. |FY12 $0 MON ESA NR Ongoing
- Provide annual Recovery Data Call (RDC) information to Alison Whitlock as requested. |FY12 $0 MON ESA SLD,NR Planned
- Coordinate with Jason Tesauro, NRCS, and SUNY-Purchase to monitor vegetation and turtle response at restoration projects in the HHRU. |FY12 $0 MON ESA NR Planned
- Coordinate with NYSDEC and partners to draft a rotational schedule (e.g., every 5 or 10 years) for blitz surveys at known bog turtle locations in the HHRU. |FY12 $0 MON ESA NR Planned

Partners

NYSDEC, New York Natural Heritage Program (NYNHP), ED, NRCS, TNC, NYSDOT, U.S. Army Corps of Engineers (USACE), Columbia County Land Trust, Dutchess County Land Conservancy

Bog Turtle (*Clemmys [=Glyptemys] muhlenbergii*): Lower Hudson Focal Area

References

U.S. Fish and Wildlife Service. 2001. Bog Turtle (*Clemmys muhlenbergii*) Northern Population Recovery Plan. Hadley, Massachusetts. 103 pp.

U.S. Fish and Wildlife Service. 2008. Draft Bog Turtle Northern Population 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service, State College, Pennsylvania

U.S. Fish and Wildlife Service. 2009. Draft Spotlight Species Action Plan.

Dwarf Wedgemussel (*Alasmidonta heterodon*): Lower Hudson Focal Area

Dwarf Wedgemussel Species Action Plan

FOCAL AREA: LOWER HUDSON HOUSATONIC

Other species benefitting:

Bottom-dwelling fish host species; tessellated darter and mottled sculpin and other mussels

BIOLOGICAL PLANNING

Introduction to species

Species information: The dwarf wedgemussel (DWM) is a Federally-listed endangered species and a New York State-listed endangered species. This mussel is sexually dimorphic; however, the dimorphism is very subtle and routine determination of sex in DWM is difficult. DWM live embedded in the fine sediment that has accumulated between cobbles in slow to moderate current and relatively shallow water (40 cm) in small cool water rivers and similar habitat in larger rivers in New York (New York National Heritage Program [NYNHP]).

Fish hosts for DWM are small, bottom-dwelling fish, such as the tessellated darter and the mottled sculpin. The darter and sculpin glocidial host fish species are generally pollutant sensitive taxa and a healthy fish assemblage is critical to viable mussel populations. The glochidium receives little nutrition from the fish, but uses it for dispersal. After several weeks, the glochidium detaches itself from the unharmed fish and drops to the river bottom. It is then a juvenile mussel.

Many mussels have life spans that range upwards of 20, 30, or even 100 years. The DWM appears to only live about 10 years. Adults must, therefore, be constantly replaced to maintain a viable population.

Justification for species selection: The DVM is State- and Federally-listed as endangered. This mussel was once found at 70 locations in 15 major Atlantic Coast drainages. DWM is discontinuously distributed along Atlantic seaboard drainages from New Hampshire to North Carolina (New Hampshire [NH], Vermont [VT], Connecticut [CT], New York [NY], New Jersey [NJ], Pennsylvania [PA], Massachusetts [MA], Maryland [MD], Virginia [VA], and North Carolina [NC]). Numbers have declined drastically; most populations that remain number in the 100s.

State contribution to overall species population: Historically known from about 70 locations in 15 major drainages, it was listed as a Federally endangered species in the United States in 1990. When the Federal recovery plan was published three years later, the dwarf wedgemussel was known to exist in only 20 of 70 locations where it had originally been known to occur. Most of the populations were thought to be small and declining. Since the Federal recovery plan was published in 1993, surveyors have found nearly 40 new populations in locations where the

species had been presumed extirpated or in rivers where the species had never been found (Nedeau 2005).

Threats and threats assessment:

Threats[18] (See 5-year review for full assessment):

Factor A. Destruction, modification, or curtailment of its habitat or range:

A. Direct impacts from impoundments and linear crossings (pipelines).

B. Indirect impacts from water quality including agriculture, pollution (industrial, agricultural, and domestic), and excess sediment.

C. Review water quality standards for contaminants (copper, ammonia).

Factor B. Disease or predation

A. Some site-specific impacts to small populations are possible (i.e., muskrats)

Factor C. Other natural or manmade factors affecting its continued existence:

A. Competition with exotic bivalves, both the Asian clam (*Corbicula fluminea*) and zebra mussel (*Dreissena polymorpha*), could pose a threat because they are expected to eventually invade all of New York's watersheds, although neither has yet invaded the upper Delaware system (Strayer and Ralley 1991).

B. Flooding has been a severe problem in the Delaware River drainage.

C. Climate Change: The Neversink River water levels are expected to rise due to an increase in precipitation (rain more so than snow), which would increase volume, velocity, and temperature of the water. Stream morphology, dimension, pattern, and profile may change river dynamics. Habitat loss and mortality would be expected if changes were severe.

Recovery Goals

Range-wide Recovery Goals/Objectives:

Maintain and restore viable populations of DWM to a significant portion of its historical range in order to remove the species from the Federal list of endangered and threatened species. In order to reclassify the DWM as threatened from endangered, this criterion must be met:

[18] Refers to 5 listing factors A-E in Section 4 of Endangered Species Act

Dwarf Wedgemussel (*Alasmidonta heterodon*): Lower Hudson Focal Area

- The following populations of the DWM must be shown to be viable (a population containing a sufficient number of reproducing adults to maintain genetic variability, and annual recruitment is adequate to maintain a stable population): Mainstem Connecticut River (NH/VT), Ashuelot River (NH), Neversink River (NY), Upper Tar River (NC), Little River (NC), Swift Creek (NC), Turkey Creek (NC), and six other rivers/creeks representative of the species' range.

This criterion has been partially met.

Viable populations have been found in the mainstem Connecticut River and Ashuelot River. In order to remove the DWM from the Federal list, the following additional criteria must be met:

- At least 10 of the rivers/creeks in Criterion 1 must support a widely dispersed viable population so that a single catastrophic event in a given river will be unlikely to result in the total loss of that river's population.

- The rivers in Criterion 2 should be distributed throughout the species' current range with at least two in New England (NH, VT, MA, CT), one in New York, and four south of Pennsylvania.

- All populations referred to in Criteria 1 through 3 must be protected from present and foreseeable anthropogenic and natural threats that could interfere with their survival.

These criteria have not been met, and in some cases have become irrelevant, see 2007 5-year review.

Conservation goal(s) for New York State:

The Neversink River population has apparently declined by 75% since it was first located in 1990 when it dropped from an estimated 80,000 individuals to 50,000 in 1991, then to 20,000 in 1994. It is not known if the population still numbers in the tens of thousands since the last survey over a decade ago. Since these population estimates are based on the direct capture of only a small number of individuals and standardized monitoring methods have only recently been adopted for Unionids, the estimates may not be accurate, nor directly comparable. The short-term trend for the Delaware River (meta) population is not known at this time because the sites have not been monitored since they were first located by U.S. Geological Survey (USGS) researchers in 2000 (NYNHP).

Neversink is an important river for the conservation of DWM (see criterion 1).

Research/Actions needed:

- Confirmation of host fish(es) in the Delaware and the Neversink Rivers, diet, age, and growth, and mortality factors.

Dwarf Wedgemussel (*Alasmidonta heterodon*): Lower Hudson Focal Area

- Details about habitat requirements (current speed, water depth, substrate grain size, substrate stability, water temperature, and water quality factors) also need work.
- Define viable population.
- Additional presence/absence surveys are needed to find new sites.
- Genetic work.
- Identify barrier removal opportunities.

CONSERVATION DESIGN

Strategies for addressing those threats

Please go to these documents for existing strategies:

- Federal recovery plan 1993
- 5-year review completed 2007

Note that the 5-year review recommended a revision of the recovery plan.

Assist the New England Field Office (NEFO) with revision when initiated.

Research/Actions needed:

- Conduct life history studies and identify ecological requirements of the species (U.S. Fish and Wildlife Service [USFWS] 1993).
- Preserve DWM populations and occupied sites (USFWS 1993). Locate and prioritize stream reach with known locations for long-term protection.
- Reduce alterations to the natural flow caused by the upstream Neversink Reservoir Dam (NYNHP). Work with Delaware River Basin Commission (DRBC) on water level regulation (Pennsylvania Field Office [PAFO] lead).
- Evaluate outcome of this management strategy on the mussel populations (NYNHP).
- Reintroductions may be needed to bring low-density populations back up to viable levels and re-establish populations extirpated from certain rivers (USFWS 1993).
- Monitor population levels and habitat conditions (USFWS 1993).
- Assist with development of measures for NiSource Habitat Conservation Plan [HCP]. |FY10-FY11 $0 DES ESA RAN,SLD Ongoing
- Develop conservation framework with PAFO including standard conservation measures, for bridge projects. |FY11 $0 DES ESA SLD Completed

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats FY2010-2012

Recommendations for specific recovery actions from 5-year review:

Dwarf Wedgemussel (*Alasmidonta heterodon*): Lower Hudson Focal Area

1. Identify high priority populations needed for the recovery of the species (if recovery plan revision does not proceed quickly).

2. Develop habitat protection strategies for high priority populations.

    a. Coordinate with The Nature Conservancy (TNC), New York State Department of Environmental Conservation (NYSDEC), and USGS to determine options for Neversink population.

3. Encourage and support publication of gray literature in peer-reviewed journals.

4. Develop accurate fact sheets for the DWM (outreach).

5. Assist with development of measures for NiSource HCP. |FY10-FY11 $0 DEL ESA RAN,SLD Ongoing

6. Develop conservation framework, including standard conservation measures, for bridge projects. |FY11 $0 DES ESA SLD Completed

7. Programmatic consultations with Federal Highway Administration (FHWA)/U.S. Army Corps of Engineers (USACE) (2011). (ESA)

    a. Programmatic assessment of impacts to mussels from crossings (pipeline, bridges, culverts). Develop matrices and conservation measures.

8. Obtain final USGS East Branch Delaware River Report. |FY11 $0 DEL ESA RAN Ongoing

In addition, surveys are needed in the Webatuck drainage (Dutchess County)

- Request funding for surveys. |FY10 $0 DEL ESA RAN Completed
- Complete grant agreement. |FY10 $0 DEL ESA RAN Completed
- Grant oversight. |FY10 $0 DEL ESA RAN Completed
- Review final report. |FY10 $0 DEL ESA RAN Completed
- Geographic Information System (GIS) mapping of potential habitat (New York Field Office [NYFO]. |FY10 $0 DEL ESA RAN Completed
- Evaluate impacts to Neversink and Delaware from water regulation and gas drilling. |FY12-FY14 $0 DEL ESA SLD Future

OUTREACH

Design and construct a mussel/aquatic invertebrate exhibit to add to the Outreach Strategic Plan.

Attend events at nature centers/festivals to educate the public on the importance of mussel species in New York.

Dwarf Wedgemussel (*Alasmidonta heterodon*): Lower Hudson Focal Area

Develop fact sheet on DWM and other mussels, salamanders, and other aquatics (2012).

MONITORING

Recommendations for specific recovery actions from 5-year review:

1. Complete population genetic analyses, determine correct taxonomic nomenclature. |FY13-FY15 $10,000 DEL ESA SLD Future

2. Complete ongoing state-wide population surveys in North Carolina and Virginia, assess population status in these states.

3. Resurvey Neversink and Delaware Rivers to assess impacts from severe flooding in 2005 and 2006 and establish new baselines for future comparison.

    - *Delaware surveys ongoing - funded USGS in 2009*
    - Request funding for additional surveys (USGS). |FY12 $5,000 DEL ESA RAN,SLD Planned

Partners

USGS, TNC, NYSDEC, NYNHP

References

NYNHP. DWM website *http://acris.nynhp.org/guide.php?id=8375&part=1*
Dwarf wedgemussel Recovery Plan. 1993. *http://www.fws.gov/northeast/nyfo/es/dwm.pdf*
Dwarf wedgemussel 5 yr review. 2007.
http://www.fws.gov/newengland/pdfs/DwarfWedgemussel_5yrreveiw.pdf

Indiana Bat (*Myotis sodalis*): Lower Hudson Focal Area

Indiana Bat Species Action Plan

FOCAL AREA: LOWER HUDSON RIVER

Other species benefitting:

eastern small-footed, little brown, tri-colored, northern, big brown, bog turtle

BIOLOGICAL PLANNING

Introduction to species

Species information: The Indiana bat (Ibat) typically hibernates in caves/mines in the winter and roosts under bark or in tree crevices in the spring, summer, and fall. Suitable potential summer roosting habitat is characterized by trees (dead, dying, or alive) or snags with exfoliating or defoliating bark, or containing cracks or crevices that could potentially be used by Indiana bats as a roost. The minimum diameter of roost trees observed to date is 2.5 inches for males and 4.3 inches for females. However, maternity colonies generally use trees greater than or equal to 9 inches d.b.h. Overall, roost tree structure appears to be more important to Indiana bats than a particular tree species or habitat type. Females appear to be more habitat specific than males presumably because of the warmer temperature requirements associated with gestation and rearing of young. As a result, they are generally found at lower elevations than males may be found. Roosts are warmed by direct exposure to solar radiation, thus trees exposed to extended periods of direct sunlight are preferred over those in shaded areas. However, shaded roosts may be preferred in very hot conditions. As larger trees afford a greater thermal mass for heat retention, they appear to be preferred over smaller trees. Additional information on potentially suitable summer habitat can be found on our website at http://www.fws.gov/northeast/nyfo/es/IndianaBatapr07.pdf.

Streams associated with floodplain forests, and impounded water bodies (ponds, wetlands, reservoirs, etc.) where abundant supplies of flying insects are likely found provide preferred foraging habitat for Indiana bats, some of which may fly up to 2-5 miles from upland roosts on a regular basis. Indiana bats also forage within the canopy of upland forests, over clearings with early successional vegetation (*e.g.,* old fields), along the borders of croplands, along wooded fencerows, and over farm ponds in pastures (Service 2007). While Indiana bats appear to forage in a wide variety of habitats, they seem to tend to stay fairly close to tree cover.

Justification for species selection: The Indiana bat is Federally- and New York State-listed as endangered. The NYFO has the R5 species lead.

State contribution to overall species population: New York used to have ~11% of wintering Ibats rangewide before White-nose syndrome (WNS). New York still has the largest number of wintering (and likely summering) Indiana bats in the region. There are draft recovery units and NY is part of the northeast recovery unit.

Indiana Bat (*Myotis sodalis*): Lower Hudson Focal Area

Threats and threat assessment:

Threats[19] (See 5-year review for full assessment):

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range: *See the Plan for in-depth discussion (Service 2007, page 71).*

A. Destruction and degradation of the bat's winter hibernacula (i.e., caves and mines) and summer habitat (i.e., forests) has been identified as a long-standing and ongoing threat to the species.

B. Winter – potential to impact hibernacula with gas drilling, filling, etc.

C. Spring/summer (maternity colony roosts, travel corridors, foraging habitat) – residential and commercial development

D. Fall (swarming) – same pressures as spring/summer habitat

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes: *See the Plan for in-depth discussion (USFWS 2007, page 80).*

A. Human disturbance of hibernating bats was originally identified as one of the primary threats to the species and still remains a threat at several important hibernacula in the bat's range. The primary forms of human disturbance to hibernating bats result from cave commercialization (cave tours and other commercial uses of caves), recreational caving, vandalism, and research-related activities.

Factor C. Disease or predation:

A. WNS is most significant threat in New York. Predation is also a threat.

Factor D. The inadequacy of existing regulatory mechanisms: *See the Plan for in-depth discussion (USFWS 2007, page 90).*

A. Generally, existing regulatory mechanisms are more effective at protecting Indiana bat hibernacula than summer habitat. Hibernacula are discrete and easily identified on the landscape, whereas summer habitat is more diffuse.

Factor E. Other natural or manmade factors affecting its continued existence: *See the Plan for in-depth discussion (USFWS 2007, page 91).*

A. Several natural factors have threatened the existence of local bat populations including flooding and freezing events at winter hibernacula. These natural events typically are not wide-spread, but rather associated with specific flood/freeze-prone sites.

[19] Refers to 5 listing factors A-E in Section 4 of Endangered Species Act

Indiana Bat (*Myotis sodalis*): Lower Hudson Focal Area

B. Anthropogenic factors that may affect the continued existence of Indiana bats include numerous environmental contaminants (e.g., organophosphate and carbamate insecticides, oil spills, and PCBs), collisions with man-made objects (e.g., poorly constructed cave gates, vehicles, aircraft, communication towers, and wind turbines) and climate change.

Recovery Goals

Range-wide Recovery Goals/Objectives: Intermediate- reclassification, Long-term- delisting

Conservation goal(s) for New York State: The Plan does not have specific criteria for New York. However, NY has several P1 and P2 hibernacula and there are criteria for protecting 80% of P1 hibernacula in each Recovery Unit. In general, protection of wintering populations, summer populations, and areas for safe migration between those areas are needed.

Research/Actions needed:

A. Reduce current threats at known hibernacula (Recovery Action 1.1.1) (primarily WNS-related actions- not included in recovery plan- WNS will eventually have a separate plan).

B. WNS-related research is needed to better understand the threat.

   1. Assist with requests for proposals (RFPs) as requested. |FY11-FY12 $0 BP ESA NR,RAN Ongoing
   2. Review proposals if requested to be on review team. |FY11-FY12 $0 BP ESA RAN,NR Ongoing
   3. Provide grant oversight for FY08 and FY09 projects. |FY11-FY12 $0 BP ESA RAN,NR Ongoing
   4. Assist with WNS-related research field work as requested. |FY11-FY12 $0 BP ESA RAN,NR Ongoing

C. Develop models of Indiana bat population dynamics as tools to assess progress towards recovery in different geographic areas, to determine sensitivities of various life history attributes contributing to population growth rates, and to evaluate the impact of catastrophic losses at key hibernacula on time to recovery (Recovery Action 3.1.6).

   1. Assist with Indiana bat demographic modeling structured decision making (SDM) effort until completion.

      a. Respond to data requests from U.S. Geological Survey (USGS) and Region 3 (R3). |FY11 $0 BP ESA RAN Completed
      b. Participate in calls during demographic model Beta testing. |FY11-FY12 $0 BP ESA RAN Ongoing
      c. Attend workshop to test demographic model. |FY12 $0 BP ESA RAN Planned
      d. Assist with roll-out of demographic model. |FY12 $0 BP ESA RAN Planned

e. Provide technical assistance to Field Offices (FOs) with use of demographic model. |FY12-FY13 $0 BP ESA RAN Planned

D. Conduct research on the potential impacts of environmental contaminants on Indiana bats (Recovery Action 3.4).

1. Environmental Contaminants (EC) WNS research - send all samples out for analysis. |FY11 $0 BP EC ALS Completed
2. Environmental Contaminants (EC) WNS research - review and interpret contaminants results. |FY12 $0 BP EC ALS Planned

CONSERVATION DESIGN

Strategies for addressing those threats

Please go to these documents for the existing strategies:

- Draft Recovery Plan 2007 (Service 2007)
- Last 5-year review completed 2009 (Service 2009)

Research/Actions needed: Specific actions for the next 3 years addressing conservation design include the following:

A. Assist R3 with finalizing Recovery Plan as requested. |FY12 $0 DES ESA RAN Planned

B. Assist with National WNS Response (not included in recovery plan- WNS will eventually have a separate plan)

1. Support development of WNS National Plan.

a. Provide technical assistance during USFWS and/or public review periods of WNS National Plan. |FY11 $0 DES ESA RAN,NR Completed
b. Participate in Communications Group. |FY11-FY13 $0 DES ESA NR Ongoing
c. Participate in Conservation and Recovery Working Group. |FY11-FY13 $0 DES ESA RAN,NR Ongoing
i. Develop Conservation and Recovery Implementation Plan. |FY11-FY12 $0 DES ESA RAN,NR Ongoing

2. Attend annual WNS Symposium. |FY11-FY13 $? DES ESA RAN,NR Ongoing

3. WNS-related research is needed to develop conservation strategies to respond to WNS.

a. Assist with captive bat management SDM effort. |FY11-FY12 $0 DES ESA RAN,NR Ongoing

C. Standardized approaches to evaluating wind projects and developing conservation measures are needed.

   1. Participate in multi-region project to develop Indiana bat/wind guidance. |FY10-FY11 $0 DES ESA RAN Completed

   2. Participate in team to update multi-region Indiana bat/wind guidance over time. |FY12-FY13 $0 DES ESA RAN Planned

   3. Coordinate first Regions 3, 4, and 5 threatened and endangered species wind call - February 3, 2010. |FY10 $0 DES ESA RAN Completed

   4. Participate in Region 5 Indiana bat wind guidance development. |FY11-FY13 $0 DES ESA RAN Ongoing

D. Develop guidance and template for how to complete a hibernacula management plan (Recovery Action 1.1.1.2.1)

   1. Assist R3 with development of guidance on how to complete hibernacula management plan. |FY13 $0 DES ESA RAN Future

E. Develop standardized protocols for conducting telemetry (Recovery Action 2.7.2.1)

   1. Participate in multi-region team to develop radio telemetry guidance. |FY11-FY12 $0 DES ESA RAN Ongoing

F. Develop standardized protocols for use of bat detection systems to survey for Indiana bats (Recovery Action 2.7.2.6)

   1. Assist with funding automation of acoustic survey data analysis

      a. Participate in Regional WNS funding discussions and promote funding of acoustic automation system. |FY10 $0 DES ESA RAN Completed
      b. Assist with USACE Phase 1 grant agreement for acoustic automation system. |FY10 $0 DES ESA RAN Completed

   2. Determine whether netting guidelines should be revised to include acoustic detectors

      a. Participate in multi-region Indiana bat/Wind Initiative survey protocol workgroup. |FY10 $0 DES ESA RAN Completed
      b. Participate in multi-region team to revise Indiana bat survey protocols. |FY11-FY12 $0 DES ESA RAN Ongoing
      c. Present revised draft Indiana bat survey protocols at Northeast Bat Working Group meeting. |FY12 $500 DES ESA RAN Planned

G. Determine land management practices that will increase or maintain suitability of habitat for maternity colonies of Indiana bats, and the impacts of habitat perturbations on persistence of maternity colonies (Recovery Action 3.3.9)

   1. Fund or otherwise coordinate wind project research

H. Regional coordination role

   1. Participate in R5 planning team to develop standardized roles/responsibilities for species leads as requested. |FY11 $0 DES ESA RAN Completed

   2. Act as Regional POC for Indiana bat issues and conduct the following activities.

      a. Provide updates to FOs on literature, information from other regions. |FY10-FY13 $0 DES ESA RAN Ongoing
      b. Provide technical assistance to FOs on Indiana bat formal consultations/Habitat Conservation Plans (HCPs). |FY10-FY13 $0 DES ESA RAN Ongoing
      c. Provide R5 comments on national issues (e.g., survey protocol updates). |FY10-FY13 $0 DES ESA RAN Ongoing
      d. Provide R5 Indiana bat end-of-year reporting info to R3. |FY10-FY13 $0 DES ESA RAN Ongoing
      e. Maintain understanding of current literature. |FY10-FY13 $0 DES ESA RAN Ongoing
      f. Participate in or provide technical assistance for WNS-related projects as needed. |FY10-FY13 $0 DES ESA RAN Ongoing
      g. Coordinate Regional review of Indiana bat permit conditions. |FY10-FY13 $0 DES ESA RAN Ongoing

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats FY 2010 - 2012

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Encourage activities that enhance or improve summer habitat on private lands (Recovery Action 2.1.3).

B. Conserve and manage Indiana bats and their habitat on Federal lands (Recovery Action 2.2).

C. Encourage habitat protection through acquisition/easements.

   1. Provide technical assistance to NYSDEC for Recovery Land Acquisition grants. |FY11-FY13 $0 DEL ESA RAN Ongoing

2. Provide technical assistance to NRCS for potential easements.

D. Minimize adverse impacts to Ibat during project reviews (Recovery Action 2.6).

1. Ensure implementation of conservation measures of existing BOs through follow up with Federal agency/project sponsor.

   a. Review annual BO reports for Adams Fairacre Farms. |FY11-FY13 $0 DEL ESA RAN Ongoing

2. Habitat protection through informal and formal consultations and HCPs.

   a. Assist with development of Indiana bat conservations measures for NiSource HCP. |FY10-FY12 $0 DEL ESA RAN Ongoing
   b. In coordination with the R5 IPaC Team, develop conservation framework, including standard conservation measures for residential and commercial projects. |FY11-FY13 $0 DEL ESA RAN Ongoing
   c. Develop conservation framework, including standard conservation measures, for wind energy development projects (see Ibat Wind Guidance). |FY11-FY13 $0 DEL ESA RAN Ongoing

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:

Factor C. Disease or predation: Need to determine what conservation measures will be available for WNS-response.

Factor D. The inadequacy of existing regulatory mechanisms: No work planned for FY11-FY13.

Factor E. Other natural or manmade factors affecting its continued existence: Wind project work being addressed through consultations/HCPs (see above).

OUTREACH

A. Develop and implement outreach activities to enhance specific recovery tasks for the Indiana bat, including development of guidelines, best management practices, land acquisition/easements efforts, landowner incentives programs, Endangered Species landowner programs, research activities, and Federal review activities. Employ appropriate communications goals and messages as outlined in comprehensive Indiana bat outreach plan. (Recovery Action 4.1)

B. Seek opportunities to raise awareness of the Indiana bat's special characteristics; foster a sense of appreciation for the bat, its habitat, and the unique life history of bats in general. (Recovery Action 4.2.3)

1. Current Indiana bat/WNS display

a. Rotate Indiana bat/WNS exhibit at nature centers. |FY10-FY11 $0 OUT ESA ALL Completed
b. Update Indiana bat/WNS exhibit at least once/year. |FY10-FY13 $0 OUT ESA ALL Ongoing

2. New bat and WNS exhibit

a. Provide technical assistance to the U.S. Forest Service (USFS) in development of a new display. |FY10-FY11 $0 OUT ESA ALL Completed
b. Provide technical assistance to RO to finalize display text and formatting. |FY12 $0 OUT ESA SLD Planned

3. New Indiana bat cave exhibit

a. Develop new cave display. |FY13 $? OUT ESA SLD Future

4. Attend meetings/workshops

C. Use USFWS websites as a repository of information about the Indiana bat. This information should be organized so that it is easily located and accessible and specific to key audiences (i.e., educators, planners, industry representatives, consultants) (Recovery Action 4.2.5)

1. Update NYFO Indiana bat fact sheet and web materials. |FY10-FY13 $0 OUT ESA,IT RAN,AFL Ongoing

D. Assist with Freedom of Information Act (FOIA) responses as needed

1. Assist with WNS FOIA request. |FY11 $0 OUT ESA NR Complete

MONITORING

Survey winter populations of Ibats at known hibernacula (monitor status of sites/impacts of WNS) (Recovery Action 1.3.1)

A. Survey winter populations of Ibats at known hibernacula (monitor status of sites/impacts of WNS) (Recovery Action 1.3.1)\

1. Assist NYSDEC with 2010 hibernacula surveys at Barton Hill, Graphite, and Williams Complex. |FY10 $0 MON ESA RAN,NR Completed
2. Assist NYSDEC with 2012 hibernacula surveys as needed. |FY12 $0 MON ESA RAN,NR Planned

B. Review and track recovery progress. |FY10-FY13 $0 MON ESA RAN Ongoing

Indiana Bat (*Myotis sodalis*): Lower Hudson Focal Area

Partners

NYSDEC, R3, R4, R5 FOs, NYSDOT, FHWA, USGS, Hudsonia, TNC

References

U.S. Fish and Wildlife Service (USFWS). 2007. Indiana Bat (*Myotis sodalis*) Draft Recovery Plan: First Revision. U.S. Fish and Wildlife Service, Fort Snelling, MN. 622 pp. (This document has been peer-reviewed and is available at http://www.fws.gov/midwest/Endangered/mammals/inba/index.html).

U.S. Fish and Wildlife Service. 2009. Indiana Bat 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service, Bloomington, IN.

New England Cottontail (*Sylvilagus transitionalis*): Lower Hudson Focal Area

New England Cottontail Species Action Plan

FOCAL AREA: LOWER HUDSON

BIOLOGICAL PLANNING

Other species benefitting:
American woodcock, golden-winged warbler, blue-winged warbler, brown thrasher, common nighthawk, ruffed grouse, whip-poor-will

Introduction to species

Species information: The New England cottontail (NEC) is New England's only native cottontail rabbit. The NEC populations historically occurred throughout the New England states and eastern New York and have declined dramatically in recent decades due to habitat loss and fragmentation resulting from land use change; habitat loss continues within its currently limited range. The NEC is a Species of Greatest Conservation Need (SGCN) in all seven states in its range, and a Candidate Species for Federal listing under the Endangered Species Act (ESA). The NEC requires thicket habitat and is frequently associated with shrublands and early successional forests. Studies show that the NEC's mortality rate is twice as high on patches smaller than 6 acres than it is on patches over 12 acres. On small patches, the habitat may provide insufficient food to support the cottontails throughout the winter. In these conditions, NECs either starve or risk predation in search of food outside the safety of dense cover. Habitat blocks of at least 25 acres in size (ideally much larger) and close to additional patches of habitat are necessary for the species to survive (Arbuthnot 2008).

Justification for species selection: The NEC is a Federal candidate (since 2006) for listing and is a New York State Species of Concern. It is also a U.S. Fish and Wildlife Service (USFWS) Spotlight Species. There is a 2007 Memorandum of Understanding among the Natural Resources Conservation Service (NRCS), USFWS, and Association of Fish and Wildlife Agencies to strengthen cooperation to conserve at-risk species and prevent their need for future listing under the ESA. Among the highest priorities in the New York Comprehensive Wildlife Conservation Strategy in 2009 is a Private Landowner Management Program for shrubland species, including NEC. There is a National Fish and Wildlife Foundation Keystone Initiative for the NEC.

State contribution to overall species population: Currently unclear. Working with New England Field Office (NEFO) and State partners to determine how many populations/acres we should target in New York.

Threats and threat assessment:

Threats[20]:

[20] Refers to 5 listing factors A-E in Section 4 of Endangered Species Act

New England Cottontail (*Sylvilagus transitionalis*): Lower Hudson Focal Area

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Habitat succession

B. Residential and commercial development

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:

A. Limited hunting

Factor C. Disease or predation:

A. Numerous diseases affect cottontail rabbits, but no information to suggest this is a significant threat.

B. Predation is a significant threat, particularly because current patches are insufficient to provide adequate cover and food. Common predators include coyotes, red foxes, bobcats, fishers, domestic cats, and owls.

Factor D. The inadequacy of existing regulatory mechanisms:

A. Ongoing threat.

Factor E. Other natural or manmade factors affecting its continued existence:

A. Invasive species.

B. Eastern cottontail competition.

C. White-tailed deer competition.

D. Weather.

E. Road-kill.

Conservation Goals

Range-wide Conservation Goals/Objectives: The 2009 Spotlight Species Action Plan goal is to reduce listing priority number from 2 to 8 by 2012. The ultimate goal of the USFWS is to preclude the need to list the NEC.

Conservation goal(s) for New York State: Long-term habitat and population goals have been development for New York through a predictive modeling project completed by the Wildlife

New England Cottontail (*Sylvilagus transitionalis*): Lower Hudson Focal Area

Management Institute (WMI). Draft habitat and populations goals for 7 focal areas are identified for New York and are listed below. The NRCS goal for New York is 40 acres entered into the Wildlife Habitat Incentive Program (WHIP).

Focal Areas -

Central Dutchess County: To establish 1,000-6,000 acres of habitat*/population size of 500.

Harlem-Housatonic: To establish 4,000-24,000 acres of habitat*/population size of 2,000.

Northern Columbia County: No habitat or population goals are identified for this focal area to date. No surveys have been done to see if NEC are present, but may be planned for the future as adequate habitat is likely present.

Rensselaer County: No habitat or population goals are identified for this focal area to date. NEC have been documented in this county, but records are at least 30 years old. Surveys may be planned for the future, but initial conservation efforts are going to focus on counties with NEC currently present.

Southern Columbia County: To establish 1,000-6,000 acres of habitat*/population size of 500.

Western Putnam County: To establish 3,000-6,000 acres of habitat*/population size of 1,500.

Westchester County: To establish 1,000-6,000 acres of habitat*/population size of 500.

*Indicate that NEC habitat may already be captured in the acreage goal identified in the form of protected natural or management habitat or on private lands where no management may be needed for many years.

Research/Actions needed:

1. Assist NEFO and WMI with developing range-wide Conservation Strategy. |FY10-FY12 $0 BP ESA NR,RAN Ongoing

    a. Participate in Steering Committee. |FY10-FY12 $0 BP ESA NR,RAN Ongoing

2. Assist the New York State Department of Environmental Conservation (NYSDEC) with developing New York conservation goals using predictive modeling from the State Wildlife Grant Program (SWG) projects as starting point. |FY11 $0 BP ESA NR,RAN Completed

    a. Conduct additional surveys to better understand current range of NEC in New York.

    b. Assist NYSDEC with pellet collection. |FY11-FY12 $0 BP ESA NR,RAN Ongoing

c. Assist the NYSDEC with vegetation surveys. |FY11-FY12 $0 BP ESA NR,RAN Ongoing

d. Assist NYSDEC with pellet analysis by funding the University of New Hampshire (UNH) to do DNA mitochondrial sequencing. |FY11 $11,500 BP ESA NR Complete

   i. UNH grant oversight for project duration. |FY11-FY12 $0 BP ESA NR Ongoing

3. Scientific research in New York:

   a. Evaluate the interrelationships between New England cottontail and Eastern cottontail, especially with regard to year-round and seasonal habitat selection, habitat use, home range and dispersal, population density, survivorship, and population dynamics. The State University of New York College of Environmental Science and Forestry (SUNY-ESF) will be addressing this question in FY12-FY16.

   b. Complete a diet analysis for both New England and Eastern cottontail including the nutritive values of various non-native species and native shrub species present at occupied sites and consumed by the rabbits. Dominant species at occupied sites include multiflora rose, Japanese and common barberry, autumn and Russian olive, Japanese and tartarian honeysuckle, oriental bittersweet, common buckthorn, alder, *Rubus*, and various species of dogwood and *Viburnum*. SUNY-ESF will be addressing this question in FY12-FY15.

   c. Evaluate the occurrence of New England cottontail and Eastern cottontail with respect to landscape characteristics, including factors such as patch size, land use surrounding occupied and unoccupied patches, and connectedness of patches. It is believed that SUNY-ESF will be partially addressing this question, but a larger study needs to be done.

   d. Evaluate the impact of rabbit hunting on New England cottontail on sites where they co-occur with Eastern cottontail. The NYSDEC is attempting to address this by collecting heads directly from hunters, but a larger study needs to be done.

CONSERVATION DESIGN

Strategies for addressing those threats

Please go to these documents for the existing strategies:

- Spotlight Species Action Plan completed in 2009 (Service 2009)
- Landowners Guide to Habitat Management (Arbuthnot 2008)

Research/Actions needed: Specific actions for the next 3 years addressing conservation design include the following:

New England Cottontail (*Sylvilagus transitionalis*): Lower Hudson Focal Area

A. Participate in multi-state SWG project and NEC USFWS Initiative.

1. Range-wide efforts.

   a. Participate in monthly USFWS calls. |FY10-FY12 $0 DES ESA NR,RAN Ongoing

   b. Participate in steering committee calls/meetings. |FY10-FY12 $0 DES ESA NR,RAN Ongoing

   c. Participate in technical committee calls/meetings. |FY10-FY12 $0 DES ESA NR,RAN Ongoing

   d. Assist with development of range-wide conservation strategy. |FY10-FY12 $0 DES ESA NR,RAN Ongoing

   e. Participate in established working groups (i.e., BMP and Research and Monitoring working groups). |FY11-FY12 $0 DES ESA NR,RAN Ongoing

   f. Review products from SWG grant. |FY10-FY12 $0 DES ESA NR,RAN Ongoing

2. New York efforts.

   a. Attend New York NEC initiative kick-off meeting October 2009. |FY10 $0 DES ESA NR,RAN Completed

   b. Host New York NEC meeting June 2011 to continue focal area conservation efforts. |FY11 $0 DES ESA NR,RAN Completed

   c. Assist with development/review of focus area maps. |FY10-FY11 $0 DES ESA NR,RAN Completed

   d. Hold joint New York bog turtle/NEC initiative meeting June 2010. |FY10 $0 DES ESA RAN Completed

   e. Develop population and habitat goals for New York populations (see biological planning above). |FY11 $0 DES ESA RAN,NR Completed

   f. Work with the NYSDEC and NRCS to overlay northeastern vegetation classifications, abiotic factors model, wetlands, state lands, bog turtle occurrences, etc., to better prioritize conservation areas for NEC. |FY12 $0 DES ESA RAN,NR Planned

g. Develop business plans for each of the focal areas to prioritize and implement work planned. |FY12 $0 DES ESA RAN,NR Planned

h. Work with PFW to identify areas where habitat restoration/enhancement can be done. |FY12 $0 DES ESA RAN,NR Planned

i. Discuss with the NYSDEC the feasibility of trap and transfer of NEC to populate areas with adequate habitat. |FY? $0 DES ESA RAN,NR Future

B. Participate in NRCS NEC Restoration Initiative (FY2011 and potentially beyond).

1. Participate in initial conference calls. |FY11 $0 DES ESA,PFW RAN,NR,CS Completed

2. Assist NRCS with ranking criteria for FY11 WHIP. |FY11 $0 DES ESA,PFW RAN,NR,CS Completed

3. Discuss with NRCS about possibly adding NEC to the Wetlands Reserve Program to allow for additional habitat restoration work. |FY12 $0 DES ESA RAN,NR Planned

4. Assist NRCS with signing up landowners for FY11 WHIP.

a. Co-host landowner meeting in Millbrook, New York, March 2, 2011. The meeting will focus on signing up landowners for WHIP, if possible, and to develop landowner outreach strategy to sign additional properties into the program to meet the NRCS FY11 acreage goal. |FY11 $0 DES ESA RAN,NR Completed

i. Fund Kelly Perkings at the Natural Heritage Program (NHP) to draft 3 management plans for landowners who enter into WHIP. Currently, no landowners are signed up. |FY11 $10,000 DES ESA RAN Completed

ii. Grant oversight of the NHP project. |FY11-FY12 $0 DES ESA RAN Ongoing

b. Co-host second landowner outreach meeting (date and location to be determined). |FY12 $0 DES ESA RAN,NR Planned

i. Pre-meeting logistics. |FY12 $0 DES ESA RAN,NR Planned

- Develop meeting goals, objectives, and agenda. Goals will be the same as for the Millbrook meeting. |FY12 $0 DES ESA RAN,NR Planned
- Develop invite list and send out invitations. |FY12 $0 DES ESA RAN,NR Planned

ii. Post-meeting

- Send notes and action items. |FY12 $0 DES ESA RAN,NR Planned
- Fund possibly the NHP to draft management plans for landowners entered into WHIP. |FY13? $10,000? DES ESA RAN,NR Future

5. Provide technical assistance to NRCS for development of outreach products as needed (example – Maine Field Office brochure). |FY12? $0 DES ESA RAN,NR Planned

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY 2010 - 2012

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Work with New York NEC Team to protect/manage habitat

   1. Determine whether there is overlap with current NRCS easements for bog turtle. |FY12 $0 DEL ESA RAN,NR Planned

   2. Conduct restoration activities in Wetlands Reserve Program (WRP) wetland buffers, as needed, using our equipment for creation of brush pile, hydro-axe, and plantings. |FY12-FY13? $0 DEL ESA,PFW RAN,NR,CS Planned

B. Participate in NRCS NEC Initiative (FY11 and potentially beyond) as noted above. |FY12 $0 DEL ESA,PFW RAN,NR,CS Ongoing

C. If State is interested, consider a Candidate Conservation Agreement with Assurances (CCAA) for New York based on New Hampshire's and Maine's.

   1. Participate on conference calls with NEFO, RO, and the Washington Office to further discuss this option. |FY11-FY12 $0 DEL ESA RAN,NR Ongoing

D. Develop programmatic conference opinion for NEC habitat restoration. |FY12? $0 DEL ESA RAN,NR Planned

E. Develop National Fish and Wildlife Foundation (NFWF) Business Plan for New York. |FY12? $0 DEL ESA RAN,NR Planned

F. Work with PFW to implement habitat restoration/enhancement projects. |FY12 $0 DEL ESA RAN,NR Planned

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:

New England Cottontail (*Sylvilagus transitionalis*): Lower Hudson Focal Area

No work planned in the next 2-3 years.

Factor C. Disease or predation:

No work planned in the next 2-3 years.

Factor D. The inadequacy of existing regulatory mechanisms:

No work planned in the next 2-3 years.

Factor E. Other natural or manmade factors affecting its continued existence: Expansion of habitat for NEC will help alleviate pressures from eastern cottontail and address invasive species (see actions under Factor A).

OUTREACH

- Develop outreach strategy to sign up landowners into NRCS or USFWS programs.
    - Co-host landowner outreach meeting with NRCS (see Conservation Design).
- Develop overall outreach strategy to increase awareness of the species in New York.
    - Provide general information to non-profit organizations, hunters, nature centers. |FY12? $0 OUT ESA RAN,NR Planned
    - Update website with NEC information and ongoing projects. |FY11-FY13 $0 OUT ESA,IT RAN,NR,AFL Ongoing
    - "Brake for bunnies" bumper stickers. |FY13? $? OUT ESA RAN,NR Future

MONITORING

Review and track recovery progress annually.

- Utilize the WMI Habitat Accomplishment Database to track progress on conservation efforts range-wide over time. |FY12? $0 MON ESA RAN,NR Planned

Partners

NYSDEC, New York State Natural Heritage Program (NYSNHP), The Nature Conservancy (TNC), NRCS, Columbia County Land Trust, NFWF

References

Arbuthnot, M. 2008. A Landowner's Guide to New England Cottontail Habitat Management. Environmental Defense Fund. 37 pp.

New England Cottontail (*Sylvilagus transitionalis*): Lower Hudson Focal Area

U.S. Fish and Wildlife Service. 2008. Candidate Notice of Review.

U.S. Fish and Wildlife Service. 2009. New England Cottontail Spotlight Species Action Plan.

U.S. Fish and Wildlife Service, Concord, New Hampshire, and Hadley, Massachusetts.

Northern Wild Monkshood (*Aconitum noveboracense*): Lower Hudson Focal Area

Northern Wild Monkshood Species Action Plan

FOCAL AREA: LOWER HUDSON HOUSATONIC

Other species benefitting:

Deciduous forest species: Canada mayflower, white snakeroot, wood nettle; wetland species: willow herb, fowl manna grass, small enchanter's nightshade; and ferns: bulbet fern, fragile fern, and lady fern.

BIOLOGICAL PLANNING

Introduction to species

Species information: The Northern monkshood is a glacial relict species that is typically found on shaded to partially shaded cliffs, algific talus slopes, or on cool, streamside sites. These areas have cool soil conditions, cold air drainage, or cold groundwater flowage out of nearby bedrock. In New York, this species is found in semi-shaded seepage springs at high elevation headwaters, in stream-side crevices downstream, and found on shale or conglomerate sandstone. The Recovery Plan states that one site is at 3,800 feet elevation, but has low population density. Year round soil temperatures may be as cold as 6°C (although most are in the range of 11° to 18°C, and the local distribution of this species in a particular habitat is often closely associated with areas where ground water or subterranean air is emanating. Such a condition also contributes to a local microclimate with a consistently high relative humidity. Adult plants do survive (bloom and set seed), but do not reproduce every year, suggesting that a cold soil environment may be essential to dormancy-breaking requirements of the difficult-to-germinate seeds. Northern monkshood is a perennial and reproduces from both seed and small tubers. The flowers bloom between June and September and are pollinated when bumblebees pry open the blossom to collect nectar and pollen.

Northern monkshood is a highly poisonous plant if consumed and may have medicinal benefits due to these poisonous alkaloid properties.

Justification for species selection: Northern monkshood has been Federally-listed as threatened since 1978 and is State-listed as threatened. Although Region 3 has overall species lead, New York Field Office (NYFO) is Region 5 lead. First described as a species in 1886 from a site in Chenango County where it was historically present. Currently, within Region 5, this species only occurs in New York. New York is only one of 4 states with northern monkshood. Adult plants may be long-lived as suggested by Dixon and May (1990) who had evidence that some large plants in New York were at least 40 years old. One can infer that long-lived plants have high reproductive output over the years, and, therefore, need protection to ensure continued reproductive success.

State contribution to overall species population: Northern monkshood is only found in Delaware, Sullivan, and Ulster Counties within the Catskill Mountain range.

Northern Wild Monkshood (*Aconitum noveboracense*): Lower Hudson Focal Area

Threats and threat assessment:

Threats[21] (See Recovery Plan):

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Dams and Reservoirs – Possible inundation due to dam construction and resulting reservoir, and the occurrence of reservoirs downstream from monkshood habitat, curtails seed dispersal via flowing water.
B. Road Construction and Maintenance – Excessive use of deicing agents in winter and herbicides in summer, placement of riprap to stabilize roadbed, road shoulder work, and actual road construction.
C. Powerline Construction and Maintenance – the main treat is from in-place corridors that further degrade habitat from maintenance activities, especially herbicide drift from aerially dispersed weed retardants, and by physically clearing habitat.
D. Logging – populations can be impacted when shade trees are removed allowing increased light onto monkshood plants.
E. Grazing – browsing by animals, specifically white-tailed deer, causes a weakening of the plants by loss of their photosynthetic organs, loss of reproductive potential when flowers or fruits are consumed, and trampling of plants, especially when grazing animals are at high density and the site is used as a pathway, resting place, or wallow.
F. Development – two types:

    1. Foot trail development – potential for redirection or widening of paths could threatened plants in area.

    2. Residential and urban development – most known monkshood populations are in rural locations, but some patches may be in urban/residential locations. The former Chenango County sighting is now a developed area and presumably lead to its extirpation. Development increases human presence. Higher land costs, taxes, and complex ownership patterns make preservation more difficult to accomplish in suburban and urban environments.

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:

A. Scientific Overcollecting and Overvisitation – caused by peaked scientific curiosity, many people visiting a site results in habitat degradation, and overcollecting resulting in population depletion.

[21] Refers to 5 listing factors A-E in Section 4 of Endangered Species Act

Northern Wild Monkshood (*Aconitum noveboracense*): Lower Hudson Focal Area

Factor C. Disease or predation:

A. Pathogens – seed capsules covered by fungus (Dixon and Cook 1990)
B. Deer herbivory – see Factor A: Grazing
C. Slug and caterpillar herbivory

Factor D. The inadequacy of existing regulatory mechanisms:

NA

Factor E. Other natural or manmade factors affecting its continued existence:

A. Flooding
B. Droughts
C. Cliff failure – may result in total loss of a population.
D. Invasive species – garlic mustard (*Alliaria petiolata*) encroachment (Mabry *et al.* 2009).
E. Specific habitat requirements – this species is naturally limited in existence due to the need for moist, cold soil conditions of cliffs, talus slopes, and streamside habitats. On or near cliffs, plants are restricted to a narrow band at the base, on ledges, and in scattered soil pockets normally on the lower portions of an outcrop where it is mostly damp, cool, and protected from prolonged periods of direct sunlight. Where northern monkshood is found, it may be distributed densely, especially in areas where there is active cold air or water seepage. The small number of cliff habitats possessing the right combination of exposure, and cold, root-zone microclimate, together with the particular requirements necessary for seed germination, appear to be the factors largely responsible for the limited distribution of the plant.
F. Pollinator decline – bumblebees are the most common pollinator of northern monkshood and their populations have been in decline (Kuchenreuther 1996; Mabry *et al.* 2009).
G. Climate change – increase in temperatures may change the microclimate necessary for northern monkshood survival. Higher temperatures may reduce cold air drainage of slopes and below-ground ice that is needed to maintain moist, cold soils (Mabry *et al.* 2009).

Recovery Goals:

Range-wide Recovery Goals/Objectives:
Delist the species by providing security for all known Northern monkshood locations against damage or destruction of the existing habitats.

To search for new Northern monkshood sites through surveys of all poorly known regions within its known range.

To continue research into the controlled propagation of the species.

Conservation goal(s) for New York State: No goals outlined for the next 3 years.

Northern Wild Monkshood (*Aconitum noveboracense*): Lower Hudson Focal Area

Research/Actions needed:

Initiate Northern monkshood population monitoring effort in each state, with the goal of an early warning system to indicate population declines, threats, and land use or ownership changes (Recovery Action 15); search remote, high elevation sites in and around Catskill Mountains and, reinvestigate the old Chenango County location(s) (Recovery Action 213).

- 2007 survey was completed by Sam Adams which included looking for additional sites
- Surveys should be done at least every 5 years

CONSERVATION DESIGN

Strategies for addressing those threats

Please go to these documents for the existing strategies:

- Recovery Plan 1983
- 5-year review initiated
  - Provide technical assistance on 5-year review as requested by Region 3. John Wiley reviewed draft in 2011. |FY12 $0 DES ESA RAN,JW Planned

Research/Actions needed: Specific actions for the next 3 years addressing conservation design include the following:

Conduct propagation research (Recovery Action 12)

- Complete controlled propagation plan with Olive Natural Heritage Society. |FY13 $? DES ESA RAN,NR Future

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY 2010 - 2012

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Consult with NYSDOT with the goal of marking the road segment for an Ulster County population against damaging activities like applying excessive quantities of road salt (Recovery Action 1134). |FY13 $? DEL ESA RAN,NR Future

B. Consult with NYSDEC trail maintenance staff with the goal of placing trail marker guides in the vicinity of the Sullivan County population closely skirted by a State foot trail (Recovery Action 1135 and 252). |FY13 $? DEL ESA RAN,NR Future

C. Pursue acquisition of properties that are found to be available (Recovery Action 22). |FY13? $? DEL ESA RAN,NR Future

Factor B. Other natural or manmade factors affecting its continued existence:

No work planned in next 2-3 years.

OUTREACH

Nothing currently identified for next 2-3 years.

MONITORING

Review and track recovery progress every five years. |FY12 $0 MON ESA RAN,NR Planned

Provide information to USFWS Region 3 for annual Recovery Data Call. |FY12 $0 MON ESA RAN,NR Planned

Partners

NYSNHP, NYSDEC, Olive Natural Heritage Society

References

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U.S. Fish and Wildlife Service. 1998.

Small Whorled Pogonia (*Isotria medeoloides)*: Lower Hudson Focal Area

Small Whorled Pogonia Species Action Plan

FOCAL AREA: LOWER HUDSON

Other species benefitting:

blue sedge, black-edge sedge, Reznicek's sedge, timber rattlesnake, cerulean warbler, Virginia snakeroot, worm-eating warbler, blunt mountain mint

BIOLOGICAL PLANNING

Introduction to species

Species information: Small whorled pogonia (SWP) is a small herbaceous orchid found throughout the eastern United States in deciduous and mixed forests. In May 2010 the New York Natural Heritage Program (NYNHP), funded via Section 6 of the Endangered Species Act, rediscovered SWP in New York within the recently created Schunnemunk Mountain State Park.

The SWP commonly occurs in moist, acidic soils overlying a fragipan on level to moderately sloping terrain near steeper slopes. Populations are frequently associated with dead wood and are often found in relatively open understories, although they can be found within stands of dense ferns. As an orchid, SWP produces minute seeds that require a mycorrhizal associate in order to provide the nutrients necessary to germinate and grow. The habitat requirements and identity of the fungal associate are not yet known. Individual plants are known to remain dormant for 3-4 years, and this effect appears to be related to light levels, as anecdotal and empirical evidence indicates canopy breaks promote population numbers (Brumback et al. 2011).

The SWP is distinctive with its whorls of five to six glabrous leaves at the terminus of a smooth, green stem. Although few plants flower each year, SWP can produce a terminal one to two yellow-flowered inflorescence in the early summer. This species is predominately self-pollinating and has a relatively low genetic diversity across its range. Confusion can arise when comparing this species to either *I. verticillata* or *Medeola virginiana*. The former can be ruled out as it has a purple, not green, stem, and the latter can be ruled out because of the densely white-haired and wiry stem.

Justification for species selection: The SWP is a Federally-listed threatened species (listed endangered 1982, reclassified threatened 1994), as well as a New York State-listed endangered species. As of 2007 there were 150 known and ~90 historical sites in 22 eastern states and Canada. Although this species is relatively wide spread, populations are generally small in size and isolated. The majority of sites range from 1-20 stems, although there are exceptional ones in New Hampshire > 100 stems.

Small Whorled Pogonia (*Isotria medeoloides)*: Lower Hudson Focal Area

The SWP habitat is fairly nonspecific, upland forests, and the widespread and sporadic nature of individual populations can create ambiguity as to when and where to expect SWP across the landscape. A majority of the historical sites within the species' range were lost because of habitat destruction associated with development. Although listing does not protect the species on private lands when there is no Federal nexus (permitting, funding, or ownership), it has allowed for the recognition and protection of this species on Federal lands and regulatory oversight in conjunction with Federally-funded and/or permitted projects.

Herbivory is a considerable threat to SWP as it is considered highly palatable forage for deer, rabbit, and slugs. Herbivore populations have rebounded dramatically in the last 100 years, often to unsustainable levels, especially in areas with limited hunting pressure. In particular, deer populations can place undue browsing pressure on SWP and prevent successful growth and reproductive efforts.

The techniques necessary to understand and promote SWP recovery are only beginning to be adequately determined and threats to this species still exist. Nearly all increases in population numbers since listing have been due to the location of additional, established populations through intensive surveys. There are few records of new populations establishing or an existing population greatly expanding since listing; therefore, losses of individuals of this species due to habitat conversion appear to be generally irreversible. Continued action is required to attempt to mitigate and correct this trend.

State contribution to overall species population: The SWP has a patchy distribution from Georgia to Maine, but had been found in nearly all eastern states excepting New York until its rediscovery. New York populations serve to connect the New England and southern states across the species' range. The New York population consisted of five stems during 2010-2011 which is typical of the majority of SWP populations outside of New Hampshire and Maine.

Threats and threat assessment:

Threats (See 5-year review for full assessment):

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Habitat loss to development and physical destruction is the primary threat to this species via conversion of forested land and construction of infrastructure. The New York population was found on State park property, so this threat is minimal. However, care must be taken, as this recently established State park is developed for recreational use, so that any new infrastructure (e.g., trails) does not impact SWP.

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes: NA.

Factor C. Disease or predation:

A. Fungal diseases have been identified in the past (Ware 1999), but were not observed in the New York population.

B. Herbivory by deer, rabbits, and slugs is a common threat for woodland herbs, especially in areas with restricted hunting, such as State parks.

Factor D. The inadequacy of existing regulatory mechanisms: Populations found primarily on private lands occur in North Carolina, Virginia, New Jersey, Connecticut, New Hampshire, and Maine, as well as the outlying states. Residential or commercial development of these populations often does not require Federal permits or consultation under Section 7 of the Endangered Species Act (ESA). Although the SWP is State-listed as endangered in every state within its range, state listing rarely, if ever, provides regulatory protection, albeit project review for state-listed species may be required. Recommendations provided by state agencies to avoid or minimize adverse effects are generally not mandatory. The SWP is listed as endangered under the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and the Species at Risk Act (SARA, Section 37); however this designation does not afford regulatory protection. The SARA only requires the preparation of recovery strategies for listed species (McConnell 2006).

Populations occurring on Federal lands (the majority of which occur in North Carolina, South Carolina, Georgia, and Tennessee) may benefit from section 7(a)(1) of the ESA and may require consultation under section 7(a)(2) if the Federal agency proposes an action that may affect the species.

Factor E. Other natural or manmade factors affecting its continued existence:

A. Canopy closure may negatively affect SWP as it has been shown to prefer sites with a semi-open canopy (Brumback et al. 2011).

B. Limited illegal collection is known to occur. Additionally, trampling and/or handling by researchers can damage plants and/or encourage herbivory.

Recovery Goals

Range-wide Recovery Goals/Objectives: Maintain 61 populations in each of three population centers, 75% of which should be viable populations (currently considered a geometric mean of >20 stems over a 3-year period, although this metric is being reevaluated) in order to delist the species.

Conservation goal(s) for New York State: Increase knowledge of the distribution and abundance of SWP in New York and promote viability in known populations in order to contribute to the required viable population level needed to delist the species.

Small Whorled Pogonia (*Isotria medeoloides)*: Lower Hudson Focal Area

Research/Actions needed[22]**:** As this population is newly discovered, initial actions will focus primarily on biological planning research activities in order to understand the habitat, dynamics, and viability of this population as well as locate additional populations. Specifically the following:

- Assist with surveys of the known population in order to determine population size and reproductive effort over 3 years and assess population viability (FY 2011 – FY 2012, New York Field Office [NYFO] Student Temporary Employment Program [STEP] transitioning to New York State Office of Parks, Recreation and Historic Preservation [NYSOPRHP] and NYSNHP, Cost: $0), Recovery Task 3.2. (Endangered Species [ESA]).

- Measure habitat parameters at the known population according to the methods outlined in the Five-Year Review, Appendix 1, Recovery Task 4.21 (ESA). |FY12 $0 BP ESA JW Planned

- Coordinate with NYNHP to survey for additional populations according to the methods outlined in the Five-Year Review, Appendix 2, Recovery Action 4.1 (ESA). |FY11-FY13 $10,000 BP ESA JW Ongoing

    - Apply for Showing Success grant for surveys [not funded]. |FY11 $0 BP ESA JW Completed

    - Obtain funding for surveys in additional areas within Schunnemunk Mountain State Park, Sterling Forest State Park, West Point Military Reservation, and at locations with soil series identical to the known population in Orange County, New York. |FY11 $11,812 BP ESA RAN,JW Completed

    - Build a predictive GIS-based habitat model for New York State in order to refine survey efforts across the State (sensu Sperduto and Congalton 1996), Recovery Action 4.23. |FY12 $0 BP ESA JW Planned

    - Obtain funding for surveys in areas identified in the habitat model. |FY13 $20,000 BP ESA JW,RAN Future

- Participate in the SWP Recovery Plan Update Meeting in Concord, New Hampshire, February 7, 2012. |FY12 $0 BP ESA JW,RAN? Planned

- Review and provide data and comments for the Five-Year Review. |FY13 $0 BP ESA JW Future

[22] Note that actions listed in orange are planned for Fiscal Year (FY) 2011.

Small Whorled Pogonia (*Isotria medeoloides)*: Lower Hudson Focal Area

CONSERVATION DESIGN

Strategies for addressing those threats

Please go to these documents for the existing strategies:

- Recovery Plan, First Revision (U.S. Fish and Wildlife Service 1992) http://ecos.fws.gov/docs/recovery_plan/921113b.pdf.

- 5-Year Review (U.S. Fish and Wildlife Service 2008) http://ecos.fws.gov/docs/five_year_review/doc2002.pdf.

    - Next 5-year review anticipated in 2013

Research/Actions needed: Specific actions for the next 3 years addressing conservation design include the following:

- Evaluate the results of the publication currently in review regarding canopy manipulation for application to New York SWP population, Recovery Action 2.11 (ESA). |FY11 $0 DES ESA JW Completed

- Coordinate with stakeholders with regard to determining and implementing a canopy manipulation treatment if habitat parameters indicate increased canopy openness will benefit the population. |FY13 $0 DES ESA JW Future

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY 2010 – 2013

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Limit possible habitat and physical destruction.

    1. Coordinate with NYSOPRHP with regard to the location of recreation developments near SWP, Recovery Action 1.31. |FY11-FY13 $0 DEL ESA JW Ongoing

Factor B. Disease or predation:

A. Limit herbivory.

    1. Construct exclosure fencing around the known population and adjacent suitable habitat. Funded via NYSOPRHP and Section 6 Recovery Funds, Recovery Action 2.13. |FY11 $1,000, DEL ESA JW Complete

Factor C. Other natural or manmade factors affecting its continued existence:

Small Whorled Pogonia (*Isotria medeoloides)*: Lower Hudson Focal Area

A. Manage canopy openness.

   1. Coordinate the implementation of any canopy manipulation protocols developed among stakeholders, if they are needed, Recovery Action 2.11. |FY14 $10,000 DEL ESA JW Future

B. Prevent illegal collection.

   1. Best accomplished through limited dissemination of population locations.

C. Limit researcher impacts.

   1. Participate in the New York State SWP working group with species partners in order to coordinate efforts and resources, Recovery Action 1.31. |FY11-FY13 $0 DEL ESA JW Ongoing

   2. Ensure all researchers are familiar with the "Minimizing impacts" section of the Five-Year Review, Appendix 2, Recovery Action 2.12. |FY11-FY13 $0 DEL ESA JW Ongoing

OUTREACH

- Construct SWP web page for the NYFO site, linking to New England Field Office (NEFO) as needed, Recovery Action 7.1. |FY13 $0 OUT ESA JW Future

MONITORING

A. Coordinate with NYSOPRHP and NYNHP to survey the known population in order to determine population size and viability over 3 years, Recovery Action 3.2. |FY10-FY12 $3,000 MON ESA JW Ongoing

B. Review and track recovery progress. |FY10-FY13 $0 MON ESA JW Ongoing

C. Participate in the annual Regional Data Collection. |FY10-FY13 $0 MON ESA JW Ongoing

Partners

NYSOPRHP, NYNHP

References

Sperduto, M. and R. Congalton. 1996. Predicting rare orchid (Small whorled Pogonia) habitat using GIS. Photogrammetric Engineering and Remote Sensing 62:1269-1279.

Small Whorled Pogonia (*Isotria medeoloides)*: Lower Hudson Focal Area

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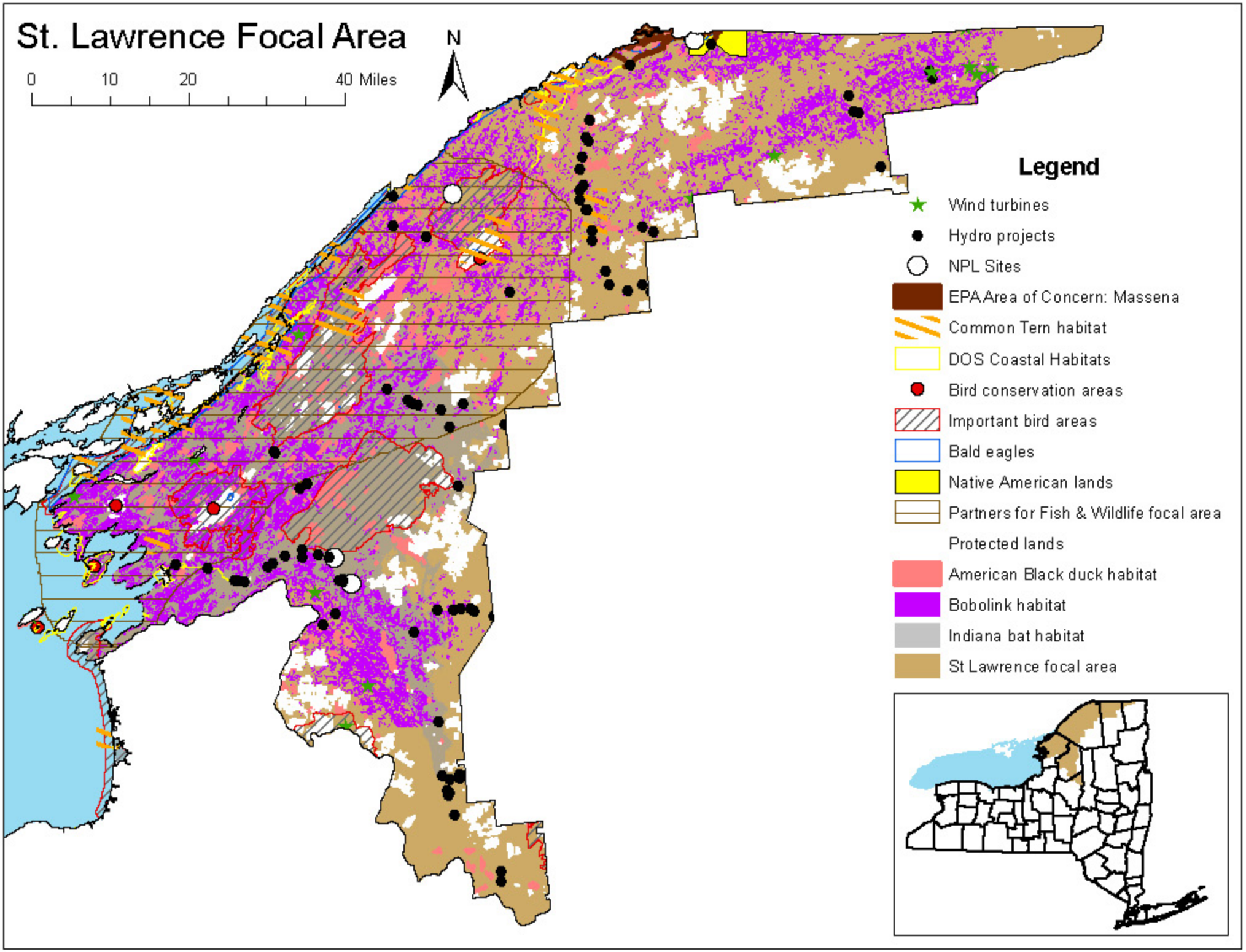
ST. LAWRENCE FOCAL AREA

The St. Lawrence Focal Area (SLFA) is located in the northern-most portion of New York and contains approximately 4,667 square miles or 8.6% of the state. The focal area is largely demarcated by the St. Lawrence River drainage basin, although portions of the upper Black River drainage, including the northeastern portion of Tug Hill, are also included. The focal area does not include portions of these drainages lying within the Blue Line of the Adirondack Park as these areas are closely monitored and managed by the State of New York. The SLFA contains the level glacial lake and marine plains and scattered low ridges of the St. Lawrence Lowlands with a local relief of 45-100 feet and the more elevated, rolling, and southerly regions of the Upper St. Lawrence Valley with a local relief of 95-500 feet. Overall elevation ranges are 180-600 feet and 480-1480 feet, respectively. This focal area is characterized by its vast level to undulating terrain, extensive island archipelago in the Thousand Islands region, unique alvar habitats, and large wilderness-fed rivers, including the Black, Oswegatchie, Grasse, Raquette, St. Regis, Salmon, and Trout Rivers.

The St. Lawrence River is the outlet for the entire Great Lakes Basin and serves as a major waterborne transportation corridor. Additionally, over 4,000 MW of hydropower are produced on the mainstem and thousands more on tributaries. All of, or portions of, six New York counties are included within the SLFA boundary including Oneida, Lewis, Jefferson, St. Lawrence, Franklin, and Clinton counties. Approximately 250,000 people live within this focal area, concentrated primarily in the municipalities of Watertown, Ogdensburg, Canton, Potsdam, Massena, and Malone. Land use in the lowlands is predominately highly productive grassland agriculture with some areas of urbanization and industrialization in the larger cities and along the St. Lawrence River. These land uses transition to predominately forested lands with lesser amounts of agriculture in the less populated southern upland areas.

This focal area was selected because it contains important riverine and grassland habitats that support locally, nationally, and internationally significant fish and wildlife resources. There are currently one Federally-listed species (endangered [E]) and ten identified species of concern within the focal area. Although there are few, large public landholdings of significance within this focal area, the cooler climate and poor drainage of this region result in an extensive agricultural grassland with a late-season harvest that promotes breeding of grassland bird species (i.e., 16% of global bobolink population). The SLFA is located within Bird Conservation Region 13 (Lower Great Lakes/St. Lawrence Plain) and Partners in Flight Physiographic Area 18 (Saint Lawrence Plain). The extensive island systems of the Thousand Islands Region also support colonies of common tern. Additional successional, forest edge, and forested wetland habitats support populations of woodcock, golden-winged warbler, black duck, and bald eagle. In total, the SLFA has the highest production of waterfowl in the northeast. Forests, forested wetlands, and the variety of other habitats in the SLFA are also important habitats for Indiana bat (E) and the State-listed Blanding's turtle (T). The large rivers consisting of the St. Lawrence and its major tributaries support remnant populations of the once widespread lake sturgeon, northern pike, and American eel populations.

The NYFO actively seeks to promote the above resources by addressing issues related to interactions with industry, transportation, navigation, water-level regulations, hydropower, wind power, contaminants (PBCs and mercury), and development. Specific threats include habitat loss (principally), fish barriers, hydrologic changes, habitat succession, invasive species, decreased habitat complexity, changes in agricultural practices, shoreline hardening, degraded water quality, and climate change. Current projects include the Fish Enhancement, Mitigation, and Research Fund (FEMRF), St. Lawrence Environment Natural Resource Damage Assessment and Restoration (NRDAR), Federal and non-federal permit review for hydroelectric and wind power development and relicensing, endangered species consultation and recovery activities, and habitat restoration and invasive species control implemented by the Partners for Fish and Wildlife.


St. Lawrence Focal Area
N
0
10
20
40 Miles
Legend
Wind turbines
Hydro projects
NPL Sites
EPA Area of Concern: Massena
Common Tern habitat
DOS Coastal Habitats
Bird conservation areas
Important bird areas
Bald eagles
Native American lands
Partners for Fish & Wildlife focal area
Protected lands
American Black duck habitat
Bobolink habitat
Indiana bat habitat
St Lawrence focal area

American Black Duck (*Anas rubripes*): St. Lawrence Focal Area

American Black Duck Species Action Plan

FOCAL AREA: ST. LAWRENCE

Other species benefitting:

American bittern, bald eagle, king rail, least bittern, waterfowl (canvasback, common goldeneye, Greater and lesser scaup, long-tailed duck)

BIOLOGICAL PLANNING

Introduction to species

Species information: The American black duck (black duck) was once a common breeder in the U.S. portion of Bird Conservation Region (BCR) 13 (the Lower Great Lakes/St. Lawrence Plain), but densities have dramatically declined over the years with the conversion and subsequent destruction of forested wetlands. Black ducks breed in a variety of North American wetlands, including freshwater wetlands created by beaver (*Castor canadensis*); brooks lined by speckled alder (*Alnus incana*); lakes, ponds, and bogs throughout mixed hardwood and boreal forests; and, salt marshes. Migrants eat seeds, foliage, and tubers of aquatic plants, seeds and fruits of terrestrial species, and a variety of invertebrates, agricultural grains, and occasionally fish and amphibians.

Justification for species selection: The black duck was chosen as a priority species because of its importance in the northeast as well as in New York. The black duck is a New York State Species of Greatest Conservation Need and is also rated High-High in the Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain BCR 13 (USFWS 2007). The high continental concern and precipitous decline in the northeast make freshwater wetlands and their relationship to local agriculture a key conservation concern. (Dettmers and Rosenberg 2003).

The Lower Great Lakes Plain population is estimated at 200 pairs in freshwater wetland habitat, with populations declining at approximately 15% per year (Dettmers and Rosenberg 2003).

State contribution to overall species population: Range extends across New York in freshwater habitat.

Threats and threat assessment:

1. **Loss of habitat and habitat function**. Loss of sufficient quality/quantity habitat within the basin due to water level alternations, draining, dredging, filling, pollution (including combined sewer overflows [CSO]), acid rain, agricultural practices, siltation, and invasive species).

Research needed:

- Need to characterize habitat loss.
- Analyze existing areas of wetland habitat and recently altered wetland landscapes to determine potential breeding areas.
- Develop GIS tools to determine how much high value habitat remains and how much is needed and where.
- Characterize loss in habitat function (i.e. determine the cause).
- Investigate wetland management alternatives that provide a variety of habitat conditions suitable to the needs of black ducks.

2. **Invasive species.** Invasive species, such as *Lythrum salicaria or Phragmites australis,* have impacts on wetland habitat, potentially adversely affecting black ducks.

Research needed:

- Complete population modeling and habitat suitability indices to quantify invasive species' impacts on black duck productivity.
- Assess the extent and nature of infestation by invasives (Natural Heritage, The Nature Conservancy [TNC], and other data gathering institution).
- Evaluate effects of invasive plants.
- Develop GIS tools to determine how much habitat remains free of invasives.
- Need to characterize habitat loss due to invasives (i.e. what is causing it).

3. **Hybridization with mallards.** Hybridization between mallards and black ducks has been linked as one cause of the decline of the black duck (Ankney et al. 1987).

Research needed:

- Assess the extent of hybridization within New York (Natural Heritage, TNC, and other data gathering institution).

4. **Climate change.** Most existing climate change models predict less runoff and, therefore, lower water levels in the region.

Research Needed:

- Assess changes in habitat community structure.

- Determine climate change impacts on prey base during breeding season.

5. **Public Use** (recreational disturbances).

6. **Environmental contaminants.** Assess the effects of contaminants on black ducks, especially at Areas of Concern (AOC) and Confined Disposal Facilities that are used by black ducks. |FY? $0 BP EC ? Future

7. **Changes in prey base** during breeding season.

Population goal(s) for New York State:

No New York-specific objectives have been articulated in the Joint Venture plans due to lack of reliable population estimates for most of the species in this habitat suite; numerical population and habitat-area objectives have not been determined (Dettmers and Rosenberg 2003).

Research needed:

- To determine the population management goal for New York, work with the Division of Migratory Birds and local partners (Audubon, Cornell, etc.) to determine appropriate goal for St. Lawrence Valley in New York.

CONSERVATION DESIGN

Strategies for addressing those threats

1. **Loss of habitat.**

   a. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding wetland draining, agricultural practices that diminish wetland values for wildlife, and dredging and placement of fill in wetlands with a focus on coastal wetlands.
   b. Target U.S. Fish and Wildlife Service (USFWS) habitat restoration and enhancement projects to benefit black ducks.
   c. Participate in the New York Wetlands Forum to coordinate wetland restoration/protection activities that would benefit black ducks.
   d. Consider black duck habitat restoration when developing St. Lawrence Natural Resource Damage Assessment and Restoration (NRDAR) case (Environmental Contaminants [EC]). |FY11-FY13 $0 DES EC ALS Ongoing
   e. Facilitate habitat preservation through coordination with land trusts.
   f. Preserve, restore, and/or enhance freshwater wetlands in Atlantic Coast Joint Venture (ACJV) and North American Waterfowl Management Plan (NAWMP) in breeding areas and migratory corridors.
   g. Protecting all remaining habitat. Use GIS or develop new tools to help identify and target, especially the wetlands that have the highest potential to produce black ducks.

h. If possible, use NRDAR funds to accomplish black duck habitat restoration and protection. |FY11-FY13 $0 DES EC ALS Ongoing

2. **Loss of habitat function** (values diminished).

   a. Seek to minimize loss of habitat function when habitat is degraded by adjacent land uses by influencing regulatory agency decisions.
   b. Seek to minimize loss of habitat value by influencing International Joint Commission (IJC) decisions on river water level management.
   c. Invasive species.
   d. Seek to minimize success of invasives colonization in habitat along St. Lawrence River by influencing IJC decisions on river water level management.
   e. Utilize Fish Enhancement, Mitigation, and Research Fund (FEMRF) GIS mapping products or use FEMRF protocol to assess additional areas to determine most suitable locations for placement of water control structures to provide more natural water regime.
   f. See also northern pike species action plan. Actions to restore northern pike habitat will benefit the black duck. Use amphibious excavator to create openings in *Typha* monocultural stands. Do GIS reconnaissance to determine most suitable locations.

3. **Invasive Species**

   a. Work with partners to identify sites where invasive species control would benefit black duck.

      i. Design water control structure to allow management of water levels to control and/or manage invasive species.

4. **Environmental Contaminants**

   a. As part of the GLRI, evaluate emerging contaminants at the Rochester embayment AOC (potentially 2010-2014). |FY11-FY13 $0 DES EC DG,ASR Ongoing
   b. Seek to minimize loss of habitat due to contamination by influencing regulatory agency decisions related to State and Federal Superfund sites. |FY11-FY13 $0 DES EC ASR Ongoing
   c. Respond as appropriate to spills impacting fish and wildlife resources. |FY12-FY14 $0 DES EC ALS Planned

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY 2010 - 2012

1. **Loss of habitat.**

American Black Duck (*Anas rubripes*): St. Lawrence Focal Area

a. Influence regulatory agency decisions regarding wetland draining, agricultural practices that diminish wetland values for wildlife, and dredging and placement of fill in wetlands by:

   i. Developing fact sheets and best management practices (BMP) to minimize impacts to black ducks.

   ii. Posting these fact sheets/BMP on our website.

   iii. Providing substantive comments on proposed Federal agency actions with likely adverse impacts on black ducks.

b. Deliver habitat restoration and enhancement projects by:

   i. Developing a poster for the New York State Wetlands Forum (NYSWF) that targets black duck conservation.

   ii. Restore – 60 acres of wetland habitat to benefit black ducks in the St. Lawrence Valley; see priority sites as per FEMRF strategic plan, GLRI priority. (FEMRF and Partners for Fish and Wildlife [PFW]). |FY11 $0 DEL PFW CS,GD,ER Completed

   iii. Restore – 60 acres of grassland habitat to benefit black ducks in the St. Lawrence Valley; see priority sites as per FEMRF strategic plan, GLRI priority. (FEMRF and PFW). |FY11 $0 DEL PFW,FMF CS,GD,ER Completed

   iv. Facilitate habitat preservation of marsh habitat adjacent to tributary streams through coordination with the Thousand Island Land Trust (TILT) and other non-governmental organizations (NGO).

   v. Working with partners and fellow trustee agencies, identify habitat that could be restored using NRDAR funds associated with the St. Lawrence case. |FY11-FY13 $0 DEL EC ALS Ongoing

c. Influence regulatory agency decisions regarding siting, construction, and operation of wind turbines proposed for the St. Lawrence Valley watershed by:

   i. Developing fact sheets and BMP to minimize impacts to black ducks and other waterfowl (PFW).

   ii. Posting these fact sheets/BMP on our website (IT).

   iii. Providing substantive comments on proposed wind farms, including the Cape Vincent, Hounsfield, Hamlin, Hammond, Lake Erie, and Lake Ontario Wind Farm proposals to both Federal, State, and local agencies with regulatory

influence over wind power project siting and operation (Conservation Planning Assistance [CPA]). |FY11-FY13 $0 DEL CPA ? Ongoing

iv. Coordinate with Region 3 relative to potential impacts from offshore wind projects (determine if offshore wind projects could have a negative impact to waterfowl (CPA). |FY11-FY13 $0 DEL CPA ? Ongoing

2. **Loss of habitat function** (values diminished).

   a. Influence regulatory agency decisions regarding wetland draining, agricultural practices that diminish wetland values for wildlife, dredging, and placement of fill in wetlands by:

      i. Developing fact sheets and BMP to minimize impacts to black ducks (CPA, PFW).

      ii. Posting these fact sheets/BMP on our website (IT).

      iii. Providing substantive comments on proposed Federal agency actions with likely adverse impacts on black ducks (CPA). |FY11-FY13 $0 DEL CPA ? Ongoing

   b. Influence other agencies and the IJC regarding decisions on lake and river water level management by providing substantive comments on proposed water level regulation protocol (CPA). |FY11-FY13 $0 DEL CPA ? Ongoing

3. **Invasive species.**

   a. To mitigate adverse impacts of monotypic cattail stands on wetland habitat, fabricate, and place a water control structure/fish ladder to provide more natural water regime in tributaries to the St. Lawrence.

   b. See northern pike species action plan. Actions to benefit the northern pike will also benefit black ducks. Use amphibious excavator to create openings in monotypic *Typha* stands through a stretch of river/marsh, according to overall habitat restoration plans for the area.

4. **Environmental contaminants.**

   a. As part of the GLRI, evaluate emerging contaminants at the Rochester Embayment AOC and evaluate the "Fish Tumors" Beneficial Use Impairment for the Niagara River AOC (potentially 2010-2013).

      i. Conduct pilot study on emerging contaminants in soil, water, and fish of Rochester embayment to determine potential impacts to fish and wildlife Trust resources and their supporting habitats (initiated in September 2010) (2011-2013) (EC). |FY11-FY13 $0 DEL EC DG,ASR Ongoing

ii. Coordinate with USEPA and AOC Remedial Action Committees on future directions with objective of improving and restoring habitat for Trust resources (dependent on USEPA funding 2011-2013) (EC). |FY11-FY13 $0 DEL EC DG,ASR Ongoing

b. Seek to minimize loss of habitat due to contamination by influencing regulatory agency decisions related to State and Federal Superfund Sites.

i. Provide substantive Federal agency comments on proposed actions with likely adverse impacts to black ducks and/or their habitat (2011-2013). |FY11-FY13 $0 DEL EC ASR Ongoing

Partners/potential funding:

Haudenosaunee Confederacy, FEMRF, U.S. Geological Survey (USGS), Natural Resources Conservation Service (NRCS), NYSDEC, County Soil and Water Conservation District (SWCD), TNC, Ducks Unlimited (DU), Audubon New York, Cornell Lab of Ornithology, New York State Department of Transportation (NYSDOT), New York Power Authority (NYPA), State University of New York – College of Environmental Science and Forestry (SUNY-ESF), Clarkson University, St. Lawrence University

OUTREACH

- Landowner education
- Public involvement

Create Outdoor Classroom wetland projects in the St Lawrence watershed

MONITORING

- Develop protocols to measure success of all conservation delivery activities.
- Work with Partners to identify leads for accomplishing monitoring activities.
- Develop BMP from results of monitoring to inform future black duck population restoration activities.

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American Black Duck (*Anas rubripes*): St. Lawrence Focal Area

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North American Waterfowl Management Plan: UMR/GL Region Joint Venture Implementation Plan (1998) http://www.fws.gov/midwest/NAWMP/documents/WaterfowlManagementPlan.pdf.
North American Waterfowl Management Plan: Atlantic Coast Joint Venture Implementation Plan (2005) http://www.acjv.org/wip/acjv_wip_main.pdf.

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Zimpfer, N.L., Rhodes, W.E., Silverman, E.D., Zimmerman, G.S., and M.D. Kone. 2009. Trends in Duck Breeding Populations, 1955-2009. USFWS, Laurel, MD http://www.fws.gov/migratorybirds/NewReportsPublications/PopulationStatus/Trends/Trend%20Report%202009.pdf.

Existing strategies for American black duck restoration:

Please refer to the following document for existing strategies:

- Partners in Flight Landbird Conservation Plan: Physiographic Area 18: St. Lawrence Plain (Rosenberg 2000). (http://www.blm.gov/wildlife/plan/pl_18_10.pdf).

- NYS Comprehensive Wildlife Conservation Strategy (NYSDEC 2005). (http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf).

- Bird Conservation Plan for the Lower Great Lakes/ St. Lawrence Plain Bird Conservation Region (USFWS 2007). (http://www.acjv.org/BCR_13/BCR13_Final_Plan_July07.pdf).

American Black Duck (*Anas rubripes*): St. Lawrence Focal Area

- North American Waterfowl Management Plan: Strategic Guidance (2004). http://www.fws.gov/birdhabitat/NAWMP/files/NAWMP2004.pdf.

- North American Waterfowl Management Plan: Implementation Framework (2004). http://www.fws.gov/birdhabitat/NAWMP/files/ImplementationFramework.pdf.

- North American Waterfowl Management Plan: UMR/GL Region Joint Venture Implementation Plan (1998). http://www.fws.gov/midwest/NAWMP/documents/WaterfowlManagementPlan.pdf.

- North American Waterfowl Management Plan: Atlantic Coast Joint Venture Implementation Plan (2005). http://www.acjv.org/wip/acjv_wip_main.pdf.

- North American Waterfowl Management Plan: Atlantic Coast Joint Venture Strategic Plan Update (2009). http://www.acjv.org/documents/ACJV_StrategicPlan_2009update_final.pdf.

American Eel (*Anguilla rostrata*): St. Lawrence Focal Area

American Eel Species Action Plan

FOCAL AREA: ST. LAWRENCE

Other species benefitting:

tributary spawning species, redhorse species, white suckers, walleye

BIOLOGICAL PLANNING

Introduction to species

Species information: American eel (*Anguilla rostrata*) is a semelparous, catadromous species that is a habitat generalist. Their range includes rivers and inland lakes accessible from the Atlantic Ocean. Eel mature in 8 – 30+ years in freshwater prior to migrating to spawn in the Sargasso Sea. About 40% of spawning females at the Sargasso Sea originate in the Lake Ontario/St. Lawrence River Basin. All eel mortality in freshwater occurs prior to spawning resulting in a cumulative impact.

Justification for species selection: American eel stocks in the Lake Ontario/St. Lawrence River Basin have been reduced by 99% in the last 20 years. American eel is a Federal trust species and has been identified as a priority species under the New York Field Office - Fish Enhancement, Mitigation, and Research Fund (FEMRF). The species underwent a status review by the U.S. Fish and Wildlife Service (USFWS), but was not designated as threatened or endangered. A recent petition was filed to list the species; this petition is currently under review. American eel is listed as threatened in the Province of Ontario. The Atlantic States Marine Fisheries Commission (ASMFC) developed an Interstate Fishery Management Plan for American eel in 2000, with addendums in 2006 and 2008.

State contribution to overall species population: The American eels found in the Lake Ontario/St. Lawrence River basin are exclusively female and represent the largest, most fecund individuals found in the spawning population. As such, it is generally agreed that these females represent a critical component of the spawning population.

Threats and threat assessment:

1. **Barriers to riverine movement and upstream habitat access.**

2. **Hydro turbine mortality of outmigrating eel.**

   Research needed:

   - Investigate means to safely trap and transport eels around the St. Lawrence River hydro projects at Moses-Saunders and Beauharnois Dams.

     (Who: FEMRF, Ontario Power Generation, Hydro Quebec; Cost: Millions)

- Investigate stocking as a means to temporarily improve recruitment to the Lake Ontario/St. Lawrence River basin.

  (Who: Currently being done by Ontario Power Generation and Hydro Quebec)

3. **Overfishing.**

4. **Habitat degradation and alteration.**

5. **Contaminants.**

6. **Parasitism.**

7. **Climate change**; potential to affect ocean currents and dispersal of larval eel.

8. **Cumulative threats.**

Population goal(s) for New York State:

The American eel is a panmictic species with a single population. However, we can create a goal for the Lake Ontario/St. Lawrence stock of American eel. This goal would be to restore upstream passage numbers at the Moses-Saunders Power Dam to historic levels (1980s) of over one million per year and to maintain the American eel as a self-sustaining component of the St. Lawrence River fish community by reducing all sources of mortality at both the yellow and silver life stages.

CONSERVATION DESIGN

Strategies for addressing those threats

1. **Barriers to riverine movement and upstream habitat access.**

   a. Identify and prioritize streams for eel passage in the St. Lawrence River basin, removing barriers to fish migration in high priority tributaries as identified through the FEMRF strategic plan (Partners for Fish and Wildlife [PFW], CPA and FEMRF) (staff time plus variable FEMRF funding). |FY12 $0 DES PFW,CPA SS Ongoing

   b. Attend meetings to fully understand other organization/agencies' efforts towards American eel restoration and to assist in further advancing efforts; draft plan has been completed to address downstream passage in the St. Lawrence; approximate costs have been estimated (Conservation Planning Assistance [CPA], FEMRF) (staff time only). |FY12 $0 DES CPA SPP,SS Ongoing

c. Coordinate with developing Great Lakes Landscape Conservation Cooperatives (LCC) and Great Lakes Fish Habitat Partnership (CPA, FEMRF, PFW) (staff time only). |FY12 $0 DES CPA SS Ongoing

d. Provide technical assistance on stream restoration projects in the watershed, as requested (PFW) (staff time only). |FY12 $0 DES PFW ? Ongoing

2. Hydro turbine mortality of outmigrating eels.

a. Lead International Eel Passage Group (IEPG) meetings and present approaches to address turbine mortality through trap/transport alternatives in efforts to foster international support (CPA) (staff time only). |FY12 $0 DES CPA SPP Ongoing

b. Minimize loss of habitat by influencing regulatory agency decisions regarding operation of hydroelectric power producing facilities (CPA) (staff time only). |FY12 $0 DES CPA SPP Ongoing

c. Via FEMRF funding, continue research determined necessary by the USFWS to support upstream and downstream passage of eel at the St. Lawrence-FDR Power Project (FEMRF) (unknown dollars from FEMRF). |FY12 $0 DES CPA SPP,SS Ongoing

d. Hold at least two Fisheries Advisory Council (FAC) meetings annually to discuss FEMRF proposals (FEMRF, CPA) (staff time only). |FY12 $0 DES CPA SS Ongoing

e. Hold at least two FEMRF Eel Study Group (ESG) meetings annually to further efforts towards proposed approach to address turbine mortality. The ESG will review FEMRF eel project proposals (CPA, FEMRF) (staff time only). |FY12 $0 DES CPA SPP,SS Ongoing

3. Overfishing.

a. Attend annual IEPG to address overfishing issues. (CPA, FEMRF) (staff time only). |FY12 $0 DES CPA SPP,SS Ongoing

4. Habitat degradation and alteration.

a. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding operation of hydroelectric power producing facilities; and, “unnatural” erosion mitigation practices, agricultural practices that diminish stream and wetland values for wildlife, and dredging and placement of fill in streams and wetlands. (CPA) (staff time only). |FY12 $0 DES CPA SPP,TRS Ongoing

b. Facilitate habitat preservation through coordination with land trusts (Thousand Islands Land Trust [TILT]). (FEMRF) (staff time only). |FY12 $0 DES CPA SS Ongoing

c. Manage the St. Lawrence River NRDA case; consider restoration projects that benefit American eel, if possible. |FY12 $0 DES EC ALS Ongoing

d. Seek to minimize loss of habitat value by influencing Federal Energy Regulatory Commission (FERC) minimum flow decisions (CPA) (staff time only). |FY12 $0 DES CPA SPP Ongoing

e. Address status assessment and listing proposal. (Endangered Species [ESA], CPA) (staff time only). |FY13 $0 DES CPA,EC,ESA SPP,SS,RAN,ASR Future

5. **Contaminants** (including dams and impassable culverts).

   a. Determine if contaminants are a significant threat to the eels in the St. Lawrence River basin. |FY12-FY13 $0 DES EC ASR Ongoing

   b. Use NRDA case, Grasse River/ALCOA/GM to direct restoration activities. |FY12 $0 DES EC ALS Ongoing

   c. Seek to minimize loss of habitat due to contamination by influencing regulatory agency decisions related to State and Federal Superfund sites. |FY11-FY13 $0 DES EC ASR Ongoing

   d. As part of the GLRI, evaluate opportunities for the St. Lawrence River AOC (potentially 2010 2013). |FY11-FY13 $0 DES EC DG,ASR Ongoing

   e. Respond as appropriate to spills impacting fish and wildlife resources. |FY12-FY14 $0 DES EC ALS Planned

6. **Parasitism.**

   a. Fund studies through FEMRF to determine if this is a significant threat.

7. **Climate change** (including dams and impassable culverts).

   a. Follow literature to determine if these are actions we need to pursue.

8. **Cumulative threats.**

   a. Address status assessment and listing proposal. (ESA, CPA) (staff time only). |FY13 $0 DES, CPA,EC,ESA SPP,SS,RAN,ASR Future

Partner organizations

Please refer to the following document for existing strategies:

American Eel (*Anguilla rostrata*): St. Lawrence Focal Area

- Great Lakes Fishery Commission – Fish Community Objectives for the St. Lawrence River[1]
- ASMFC/National Oceanic and Atmospheric Administration (NOAA) – Interstate Fishery Management Plan for American Eel[2]
- Ontario Power Generation Action Plan for the Recovery of the American Eel in Lake Ontario/Upper St. Lawrence River 2006 to 2011[3] (Unpublished)
- Hydro Quebec - American Eel Action Plan (Unpublished)
- New York Power Authority – Review of Technologies for Guiding, Capturing, Holding, Transporting, and Monitoring Outmigrating Eels (Unpublished)
- USFWS-FEMRF-ESG – Approach to address turbine mortality (Unpublished)
- Coordinate efforts with other organizations/agencies

USFWS-Lower Great Lakes Fish and Wildlife Conservation Office, U.S. Geological Survey, New York State Department of Environmental Conservation, Department of Fisheries and Oceans, Ontario Ministry of Natural Resources, ministère des Ressources Naturelles et de la Faune Quebec (MRNFQ), St. Regis Mohawk Tribe, New York Power Authority, State University of New York – College of Environmental Science and Forestry, Ontario Power Generation, Hydro Quebec.

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY 2010 – 2012

1. **Barriers to riverine movement and upstream habitat access.**

    a. Identify and prioritize streams for eel passage in St. Lawrence River basin, removing barriers to fish migration in high priority tributaries as identified through the FEMRF strategic plan (PFW; FEMRF (variable FEMRF) funding, CPA). |FY12 $0 DEL PFW,CPA SS Ongoing

        i. Evaluate at least three tributaries per year for fish barriers and develop plans for barrier mitigation to be submitted to the FAC (FEMRF, PFW) (variable FEMRF funding). For FY2011 tributaries are: Barretts, Mullett, Brandy. |FY12 $0 DEL PFW,CPA SS Ongoing

        ii. Look at fish barrier mitigation on Oswegatchie River through relicensing process at two locations (FEMRF) (staff time only). |FY12 $0 DEL CPA SPP Ongoing

        iii. Investigate opportunity to reopen FERC license at Ogdensburg to require upstream and downstream fish passage (FEMRF) (staff time only). |FY12 $0 DEL CPA SPP Ongoing

2. **Hydro turbine mortality of outmigrating eel.**

    a. Lead IEPG (CPA) (staff time only). |FY12 $0 DEL CPA SPP Ongoing

i. Develop and seek funding for an approach to address turbine mortality through trap/transport alternatives (CPA, FEMRF) (staff time plus unknown FEMRF dollars). |FY12 $0 DEL CPA SPP,SS Ongoing

b. Minimize mortality on the Oswegatchie River through the FERC licensing process. |FY12 $0 DEL CPA SPP Ongoing

i. Provide fish protection and downstream passage at two developments of the Oswegatchie River Project (CPA) (staff time only). |FY12 $0 DEL CPA SPP Ongoing

ii. Investigate opportunities to reopen the license at Ogdensburg to provide fish protection and downstream passage (CPA) (staff time only). |FY12 $0 DEL CPA SPP Ongoing

c. Minimize mortality on the St. Regis River through the FERC licensing process. |FY12 $0 DEL CPA SPP Ongoing

i. Investigate decommissioning/dam removal during Hogansburg relicensing (CPA) (staff time only). |FY12 $0 DEL CPA SPP Ongoing

ii. Investigate fish protection and passage alternatives at Hogansburg (CPA) (staff time only). |FY12 $0 DEL CPA SPP Ongoing

d. Minimize loss of habitat by influencing regulatory agency decisions regarding operation of hydroelectric projects through FERC-related project reviews (CPA) (staff time only). |FY12 $0 DEL CPA SPP Ongoing

i. Lower Raquette River [DONE]

ii. Massena-Grasse [DONE]

3. Overfishing.

a. Work with MRNFQ through IEPG (CPA) (staff time only). |FY12 $0 DEL CPA SPP Ongoing

4. Habitat degradation and alteration.

a. Review dredging projects for impacts to eels (CPA) (staff time only). |FY12 $0 DEL CPA TRS Ongoing

5. Contaminants.

a. Determine if contaminants are a significant threat to the eels in the St. Lawrence River basin.

i. Continue with the third year of the funded Off Refuge laboratory study, Reproductive Effects of Contaminants on Artificially Matured and Fertilized American eels (staff and analytical funding) (EC). |FY12-FY13 $0 DEL EC ASR Ongoing

b. Use NRDA case, Grasse River/ALCOA/GM to direct restoration activities.

i. Manage the St. Lawrence River NRDA case. |FY12 $0 DEL EC ALS Ongoing

ii. Consider restoration projects that benefit American eel, if possible (staff time only) (EC). |FY12 $0 DEL EC ALS Ongoing

c. Seek to minimize loss of habitat due to contamination by influencing regulatory agency decisions related to State and Federal Superfund sites.

i. Provide substantive Federal agency comments on proposed actions with likely adverse impacts to American eels and/or their habitat (2011-2013) (EC). |FY11-FY13 $0 DEL EC ASR Ongoing

d. As part of the GLRI, evaluate opportunities for the St. Lawrence River AOC (potentially 2010-2013).

i. Coordinate with USEPA and St. Lawrence AOC Remedial Action Committee on future directions with objective of improving and restoring habitat for Trust resources (dependent on USEPA funding: 2011-2013) (EC). |FY11-FY13 $0 DEL EC DG,ASR Ongoing

6. Parasitism.

a. No work identified at this time.

7. Climate change.

a. No work identified at this time.

8. Cumulative threats.

a. Address status assessment and listing proposal (ESA, CPA) (staff time only). |FY13 $0 DEL ESA,EC,CPA RAN,ASR,SS,SPP Future

OUTREACH

International Eel Working Group

Work with Great Lakes Fishery Commission

American Eel (*Anguilla rostrata*): St. Lawrence Focal Area

Status assessment and listing proposal

MONITORING

- Development of protocols to measure progress/success
- Monitoring to measure progress/success
- Investigate potential barrier removals and available habitat both pre- and post-removal
- Investigate stocking as a means to temporarily improve recruitment to Lake Ontario/St. Lawrence River Basin (being done by Ontario Power Generation and Hydro Quebec).

References

[1]LaPan, S.R., A. Mathers, T.J. Stewart, R.E. Lange, S.D. Orsatti. 2002. Fish-Community objectives for the St. Lawrence River. Great Lakes Fish. Comm. Spec. Pub. 2002 http://www.glfc.org/lakecom/loc/slrfco.pdf

[2]Atlantic States Marine Fisheries Commission (ASMFC). 2000. Interstate Fishery Management Plan for American Eel. ASMFC - Fisheries Management Report No. 36
http://www.asmfc.org/speciesDocuments/eel/fmps/eelFMP.pdf
Addendum I – Interstate Fishery Management Plan for American Eel, 2006.
http://www.asmfc.org/speciesDocuments/eel/fmps/addendumI.pdf
Addendum II – Interstate Fishery Management Plan for American Eel, 2008.
http://www.asmfc.org/speciesDocuments/eel/fmps/addendum%20II_AmericanEel_FINAL.pdf

[3]Ontario Power Generation Action Plan for the Recovery of the American Eel in Lake Ontario/Upper St. Lawrence River 2006 to 2011. Unpublished. Link to press release brief
http://www.opg.com/news/releases/FS-OPG%20Action%20Plan%20For%20The%20Recovery%20Of%20The%20American%20Eel%20.pdf

American Woodcock (*Scolopax minor)*: St. Lawrence Focal Area
American Woodcock Species Action Plan

FOCAL AREA: ST. LAWRENCE

Other species benefitting:

American black duck, mallard, Canada warbler, willow flycatcher, wood duck (scrub-shrub wetlands); brown thrasher, field sparrow, golden-winged warbler, blue-winged warbler, northern oriole, northern flicker, prairie warbler, ruffed grouse, red-headed woodpecker, song sparrow (shrub/early successional habitat); wood turtle

BIOLOGICAL PLANNING

Introduction to species

Species information: This shorebird species, also known as timber doodle, is a popular game bird. It is a migratory species, nesting in young forests and old fields; courtship displays and nesting span a 6 month period beginning in mid-winter in the south and extending into June in the north (Keppie & Whiting 1994). Across its northern range, woodcock appear to be the earliest migrant species to breed. It is strongly associated with both upland and wetland habitat types in BCR13. Woodcock are most abundant where available habitats include a mix of fields or openings, forests of different ages, and feeding habitat with moist soils and high shrub cover.

Justification for species selection: Since woodcock surveys began in 1966, it is estimated that woodcock numbers have declined 1% annually within their geographic range. Land-use changes such as wetland drainage and land conversion from early succession to mature forest are likely causes of population declines. However, hunter harvest may contribute, as roughly two million birds are shot annually. As a result, national and international bird conservation organizations consider the American woodcock a species of continental concern, and protecting the woodcock is a high priority in its habitat ranges. The American woodcock was chosen as a priority species because of its importance in the eastern U.S. as well as in New York. It is ranked "High" (H) on the BCR 13 list of "Priority Bird Species in Bird Conservation Regions partially or wholly within the Atlantic Coast Joint Venture". It is ranked as highly imperiled in the Northern Atlantic Regional Shorebird Plan, and is identified as a "Bird in Trouble" in the Eastern Forest in the North American Bird Conservation Initiative's 2009 report, "The State of the Birds, United States of America."

The population estimate for this species for the U.S. and Canada is 5,000,000, with no estimate available of the population in BCR 13 (Rich et al. 2004).

There has been a loss of over 829,000 singing male woodcock since the early 1970s (Kelley et al. 2008). According to Breeding Bird Survey data during the period from 1966-2002 (NYSDEC 2005), in New York, the American woodcock has exhibited a precipitous decline of 64% over this time period.

American Woodcock (*Scolopax minor)*: St. Lawrence Focal Area

State contribution to overall species population: Woodcock are managed on the basis of two regions or populations, Eastern and Central (Cooper 2008), with New York in the eastern population. Singing-ground survey data for the eastern region for 1998-2008 indicate no significant trend in the population (Cooper 2008); however, in New York the species has declined. Annual spring surveys of their breeding grounds show that woodcock numbers in the eastern flyway and in New York have been falling by about 2 percent since the 1960s - a loss of over 55 percent in the last 40 years. The New York State Department of Environmental Conservation (NYSDEC) manages for early successional species on several Wildlife Management Areas (WMA) or Bird Conservation Areas (BCA).

The woodcock's range extends across New York in upland and wetland habitats. Relatively high concentrations of woodcock can found in WMA and BCA in the eastern Adirondacks, Lower Hudson, St. Lawrence Valley, and Central and Western New York.

Threats and threat assessment:

1. **Loss of habitat and habitat function**. The woodcock's decline is attributed to loss of upland and wetland habitat due to development, succession, and forest maturation. In addition, the reduction in forestry practices, especially in riparian areas (critical for breeding and migrating), contributes to loss of woodcock. In BCR 13 there has been a net loss of 2.3 million acres (0.9 M hectares [ha]) of early-successional habitats since the 1970s, resulting in declines in bird species such as American woodcock that utilize this habitat type. Loss of sufficient quality/quantity habitat within the focal areas and the function the habitat provides has adversely affected this species. As the rate of change from farmland into young growth forests increases, there is a decrease in quantity and quality of habitat for this species (NAS 2009).

2. **Decline in food supply** (i.e. earthworms) from changes in soil pH due to acid deposition (NAS 2009).

   Research needed:

   - Per McAuley et al. 2005, specific research is needed to evaluate if low recruitment observed on northeast sites is caused by contaminants, habitat fragmentation, or habitat degradation (such as decline in food supply).

3. **Contaminants**. Lead contamination that is either ingested as shot or ingested through contaminated earthworms after being spread through the food chain adversely affects this species (NAS 2009).

   Research needed:

   - Determine extent of lead contamination in current and potential habitat areas by conducting a literature review and if necessary, conducting limited soil sampling. |FY? $0 BP EC ? Future

- Determine impacts of other contaminants on American woodcock by conducting a literature review. |FY? $0 BP EC ? Future

4. **Climate change.** Early successional habitat sequesters more carbon than mature forest. Climate change effects could include decreased water levels in rivers and lakes, changes in seasonal climate that could shift migration patterns of birds such as woodcock, and changes in food availability. Additional research would be needed to determine impacts due to climate change.

   Research needed:

   - Research is needed to determine the effects of climate change on this species.

Population goal(s) for New York State:

In New York, based on singing-ground surveys, there is a deficit of 72,249 males that would be needed to restore the population to 1970s levels. Of this, in BCR 13, there is a deficit of 51,804 males that would be needed to restore the population to 1970s levels. To restore woodcock densities in BCR 13 to those observed during the early 1970s, a total of nearly 3.6 million acres (1.4 million ha) of new woodcock habitat needs to be created. In BCR 13, the vast majority of timberland is under private ownership. Therefore, State and Federal resource agencies will need to enlist the help of individual and commercial private forestland owners in order to achieve habitat-management goals. This is a tremendous amount of acreage to manage and will require a monumental undertaking and cooperation from a diverse group of parties, as well as considerable monetary investment (Kelley et al. 2008).

Management Objectives for the Population:

- Halt population declines by 2012 as measured by Singing Ground Surveys

- Have positive population growth by 2022

  Note: Woodcock are banded from late spring through early fall. Birds are weighed, sexed, aged, and their bills are measured, and then each bird is banded. The U.S. Geological Survey (USGS) maintains a toll-free number so that banded birds that are recovered can be reported. Band return data are used to estimate population sizes and determine migration routes.

Overall Goal:

To halt the decline of woodcock populations and to return them to densities which provide adequate opportunity for utilization of the woodcock resource.

American Woodcock (*Scolopax minor)*: St. Lawrence Focal Area

Management Objectives for Habitat for This Species:

- Halt decline of early successional habitat by 2012 (includes creation of 4.7 million acres of new habitat per year)

- To increase early successional habitat by 2022

CONSERVATION DESIGN

Strategies for addressing the threats

In 2001, Federal and State wildlife agencies, along with non-governmental organizations (NGO) including the Wildlife Management Institute (WMI), the Association of Fish and Wildlife Agencies, and the Ruffed Grouse Society (RGS), formed the Woodcock Task Force. Since then, using funding from the National Fish and Wildlife Foundation which is administered by the WMI, biologists and land managers have developed a Woodcock Conservation Plan.

1. **Loss of habitat and habitat function.**

    a. Influence regulatory agency decisions regarding proposed development, agricultural practices, etc., that result in loss of habitat and habitat functions for this species.

    b. Target U.S. Fish and Wildlife Service (USFWS) habitat creation, restoration, and enhancement projects to benefit woodcock.

        i. Use Natural Resource Damage Assessment and Restoration (NRDAR) funds to accomplish habitat restoration and protection using guidance found in Woodcock Conservation Plan.

        ii. Work with land trusts to target woodcock conservation.

        iii. In creating woodcock habitat, consider the management recommendation of the National Audubon Society (NAS) 2009 (appended to the end of this document). Facilitate habitat preservation through coordination with land trusts (Partners for Fish and Wildlife [PFW]).

        iv. Use geospatial tools to:

            - Analyze existing areas of habitat to determine potential breeding areas;

            - Analyze breeding bird survey data to focus efforts; and,

            - Create map for possible woodcock sites of concern.

2. **Decline in food supply.**

    a. Strategy will depend upon results of research need noted above.

3. **Contamination.**

    a. Use Natural Resource Damage Assessment and Restoration (NRDAR) funds to accomplish habitat restoration and protection using guidance found in Woodcock Conservation Plan. |FY? $0 DES EC ? Future

    b. Evaluation USFWS NRDAR along the St. Lawrence. |FY12-FY13 $0 DES EC ALS,ASR Planned

    c. Seek to minimize loss of habitat due to contamination by influencing regulatory agency decisions related to State and Federal Superfund sites. |FY12-FY13 $0 DES EC ASR Planned

    d. Strategy will depend upon results of research need noted above.

4. **Climate change.**

    a. Strategy will depend upon results of research need noted above.

Partners/potential funding:

RGS, WMI, USGS, Natural Resources Conservation Service (NRCS), NYSDEC, County Soil and Water Conservation Districts (SWCD), The Nature Conservancy (TNC), Audubon New York, Cornell Lab of Ornithology, New York State Department of Transportation (NYSDOT), New York Power Authority (NYPA), Thousand Islands Land Trust (TILT), and universities.

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY 2010 – 2012

1. **Loss of habitat and habitat function.**

    a. Provide substantive Federal agency comments on proposed Federal agency actions with likely adverse impacts to woodcock and/or their habitat.

    b. Prioritize permit review in early successional habitat types or areas that have the potential for restoration.

    c. Develop Fact Sheets with best management practices (BMP) to minimize impacts to woodcock, and use these to influence landowners regarding habitat needs of this

species. In developing BMPs, consider the management recommendation of the NAS 2009 (appended to the end of this document).

d. Post on New York Field Office (NYFO) web site Fact Sheets with BMP to minimize impacts to woodcock and/or their habitat.

e. Provide technical assistance to NRCS for the Wetlands Reserve Program (WRP) for the restoration and conservation of habitat that would also be suitable for woodcock. |FY12-FY13 $0 DEL PFW EJR Ongoing

f. Work with partners (RGS, NYSDEC, National Wildlife Refuges, NGO's, etc.) to enhance/create early successional habitat within the Focal Area.

   i. Restore 100 acres of early successional habitat within the St. Lawrence, Upper Susquehanna, Upper Hudson, and Great Lakes Focal Areas. |FY12-FY13 $20,000 DEL PFW EJR Planned

   ii. Coordinate logistics for use of R5 NWR Hydro-Ax. |FY12-FY13 $0 DEL PFW EJR Ongoing

2. Decline in food supply.

a. Delivery will depend upon strategy determined from research noted above.

3. Contamination.

a. Manage St. Lawrence NRDAR case. |FY11-FY13 $0 DEL EC ALS Ongoing

   i. Consider woodcock habitat restoration and preservation during St. Lawrence NRDAR case restoration planning. |FY11-FY13 $0 DEL EC ALS Ongoing

b. Seek to minimize loss of habitat due to contamination by influencing regulatory agency decisions related to State and Federal Superfund sites along the St. Lawrence. |FY12-FY13 $0 DEL EC ASR Planned

c. Delivery will depend upon strategy determined from research noted above.

4. Climate change.

a. Delivery will depend upon strategy determined from research noted above.

Partners/potential funding:

To implement the Woodcock Conservation Plan, Woodcock Habitat Regional Initiatives have been set up: Northern Forest Initiative, Appalachian Mountains Initiative, and Upper Great Lakes Initiative. These initiatives are partnerships of agencies and organizations in geographic

areas within the woodcock's range. None of these encompass the Upper Hudson River Focal Area or the St. Lawrence Focal Area.

Partners in the Woodcock Conservation Plan include: Connecticut Woodcock Council, Minnesota Woodcock, Woodcock Limited of Pennsylvania, Golden-Winged Warbler Working Group, RGS, and WMI. Other potential partners include: USGS, NRCS, NYSDEC, County SWCD, TNC, Audubon New York, Cornell Lab of Ornithology, NYSDOT, NYPA, TILT, universities.

OUTREACH

Landowner education during site visits when potential habitat projects are present (on-going) (PFW).

Public involvement and education regarding the need for protection and restoration of shrubland and early successional habitat for woodcock and similar species. This could be addressed through the development of a new traveling exhibit.

The NYFO could develop an educational workbook devoted to early successional species. The NYFO could develop Fact Sheets aimed at some of the groups listed below (landowners, public).

Put Landowners Guide to Woodcock Management up on NYFO web site (FY2011) (IT).

Woodcock Conservation Plan notes the following: "Outreach will play a critical role in the northeast as woodcock and the entire early successional bird suite is more threatened, due to more widespread and greater declines in populations, than any other species suite (grassland suite is in similar predicament). This is contrary to the misconception that forest interior species are in most decline and most threatened. Managers, environmentalists and the public need to be educated that shrubland and early succession habitats are important to birds and need to be protected or managed for. These habitats provide critical diversity to the area. A program to develop demonstration sites throughout the various states and provinces would be beneficial in helping to educate the public and would provide habitat guidance to those interested in managing for woodcock and other early successional birds."

Potential Outreach Partners:

Audubon New York, Cornell Lab of Ornithology, NYSDEC, NWR, NRCS, RGS, Private Landowners, NYPA, and NGO.

MONITORING

- Develop protocols to measure success of all conservation delivery activities.
- Work with Partners to identify leads for accomplishing monitoring activities.

American Woodcock (*Scolopax minor)*: St. Lawrence Focal Area

- Develop best management practices from results of monitoring to inform future American woodcock population restoration activities.

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NYS Ruffed Grouse Hunting Log to identify core woodcock habitat http://www.dec.ny.gov/animals/56849.html.

NYSDEC FAQs on Grouse Hunting and Management (with map) http://www.dec.ny.gov/outdoor/48393.html.

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American Woodcock (*Scolopax minor)*: St. Lawrence Focal Area

Sepik, G.F., R.B. Owen, and M.W. Coulter. 1981. A Landowner's Guide to Woodcock Management in the Northeast. Moosehorn National Wildlife Refuge. U.S. Fish and Wildlife Service. 25 pp.

Thogmartin, W.E., J.R. Sauer and M.G. Knutson. 2007. Modeling and Mapping Abundance of American Woodcock Across the Midwestern and Northeastern United States. The Journal of Wildlife Management. 71(2): 376-382.

Existing strategies for American woodcock restoration:

Please refer to the following documents for existing strategies:

- Bird Conservation Plan for BCR13 (Atlantic Coast Joint Venture 2007) http://www.acjv.org/bcr13_plan.htm.

- American Woodcock Conservation Plan (Kelley et al. 2008) http://www.timberdoodle.org/sites/default/files/woodcockPlan_0.pdf.

- Partners in Flight Landbird Conservation Plan (Rich et al. 2004) http://www.partnersinflight.org/cont_plan/default.htm.

- NYS Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf.

- Woodcock Management Recommendations (NAS 2009): Create or maintain the various types of habitat required for feeding, display, roosting, and nesting. Habitat types need to be in close proximity (e.g., within 1/2 mile).

- Maintain at least 0.5 acres of open habitat for singing displays through plowing, mowing, or prescribed burns. Suggestion of one patch per 20-25 acres. The goal is for fields to appear "patchy," rather than uniform in structure. Moderate use of livestock grazing can also accomplish this. Mow every 2-4 years.

- Encourage native trees and shrubs.

- Maintain larger areas, 3-5 acres, of open habitat for nighttime roosts. Suggestion of one patch per 100 acres. Plant shrubs in open fields and around the perimeter of cultivated fields to provide roosting and escape cover.

- Maintain young, dense forest of at least 5 acres for nesting and feeding.

- Maintain grassy areas near water sources for feeding and display grounds.

Bald Eagle (*Haliaeetus leucocephalus*): St. Lawrence Focal Area
Bald Eagle Species Action Plan

FOCAL AREA: ST. LAWRENCE

Other species benefitting:

turkey vultures, migrating raptors including golden eagle, sharp-shinned hawk, rough-legged hawk, red-tailed hawk, broad winged hawk, American kestrel, osprey

BIOLOGICAL PLANNING

Introduction to species

Species information: Although newly delisted from the Federal endangered species list, the bald eagle still faces threats from human intervention in their migration routes and foraging and breeding areas. Despite their fierce image, bald eagles are actually quite timid and opportunistic. Since their primary prey is fish, bald eagles are sometimes called sea eagles, though they will take some mammals, waterfowl, seabirds, and carrion, especially during winter. The bald eagle is a long-lived bird, with a life span in the wild of more than 30 years. Bald eagles mate for life, returning to nest in the general area (within 250 miles) from which they fledged. Once a pair selects a nesting territory, they use it for the rest of their lives. The St. Lawrence River valley is important for wintering bald eagles, with over 100 individuals being counted there in January 2010. This represents approximately 25 percent of all bald eagles wintering in the State.

Justification for species selection: Once Federally delisted, the bald and golden eagle are still protected by the Bald and Golden Eagle Protection Act (BGEPA) which now requires authorization by the U.S. Fish and Wildlife Service (USFWS) for unavoidable take of nests and of eagles. The bald eagle is still State listed and a new permit program for authorization of unavoidable take is slowly being utilized. The BGEPA program calls for Ecological Services (ES) offices to assist with early coordination and consultation with potential permittees because of our long history of working with eagles through Section 7 and our program which are delivered to the public from field stations, including providing technical assistance on minimizing impacts of development and policy actions on wildlife. Several areas in New York will involve New York Field Office (NYFO) work with bald and golden eagle conservation – along the ridge just south of the shoreline of Lake Erie, along the shoreline of Lake Ontario and the St. Lawrence River valley where eagle migration is documented every year by three raptor watch sites in New York and several in Canada, and in the lower Hudson River where eagles nest and roost on mid-river islands and may forage along the shoreline in the vicinity of rail lines.

State contribution to overall species population: The New York State Department of Environmental Conservation (NYSDEC) conducts an annual bald eagle count which, for 2009 statewide was 241 adults and 160 immature birds. State biologists assume that the number of resident eagles is growing each year, but no attempt is made to differentiate between resident eagles and seasonal migrants in the annual count in January. The bald eagle is still State listed as threatened.

Bald Eagle (*Haliaeetus leucocephalus*): St. Lawrence Focal Area

Threats and threats assessment:

1. Modification or destruction of habitat including migratory corridors, winter roosting areas, and breeding areas. This includes human disturbances from logging, developments, poorly planned public use (boating, canoe/kayak trails, jet skis, ATVs).

2. Disease or predation, including lead ingestion, botulism, predation from other eagles, death by shotgun.

3. Inadequacy of existing regulatory protections. Endangered Species Act (ESA) and BGEPA protection is in the form of a permitting program that allows for "death by a thousand cuts" effects on bald eagles. Although take is prohibited without permits, it can be authorized with a permit; the success of various mitigation schemes to offset take is unknown.

4. Other man-made or natural factors including collisions with trains – in 2009, 10 (known) bald eagles were killed along the rail line along the Hudson River.

5. Ingestion of environmental contaminants, impacts to reproduction.

   Research needed**:**

   - Identification of essential breeding and wintering habitats to target locations for habitat management and protection.

   - Identification of movement patterns, migratory pathways and the locations where New York's wintering eagles breed to target locations for habitat protection and to inform the wind industry about specific areas to avoid. This needs to include the heights at which eagles fly when riding thermals (in the vicinity of potential wind energy development sites) for both activity associated with breeding and migratory movements. |FY11-FY14 $0 BP CPA SLD Ongoing

   - Monitoring contaminant levels in eagles in New York. |FY? $0 BP EC ALS Future

   - Continued pathology investigations to determine causes of mortality in bald eagles.

   - Post-construction monitoring of developments that might affect eagles and their habitats and providing mitigation where needed. |FY13-FY14 $0 BP CPA SLD Future

Partners/potential funding:

NYSDEC, New York State Energy Research and Development Authority (NYSERDA), USFWS, State Wildlife Grants (SWG), wind energy developers

Bald Eagle (*Haliaeetus leucocephalus*): St. Lawrence Focal Area

Population goal(s) for New York State:

Goal – productivity of 1.0/eagle pair.

Research needed: Identification of a population goal for the New York State breeding population.

CONSERVATION DESIGN

1. **Loss of habitat.**

    a. Address modification or destruction of habitat(s) including winter roosting areas and breeding areas through public education programs and website postings in conjunction with the NYSDEC bald eagle recovery program. Assist the NYSDEC in identifying movement patterns, migratory pathways, and locations where New York's wintering eagles breed. |FY12-FY13 $0 DES CPA SLD Ongoing

    b. Continue engagement in Federal Clean Water Act permitting program and State Environmental Quality Review Act (SEQRA) program for wind power and development projects proposed in eagle concentration areas and wind resource areas that coincide with breeding and migratory routes. |FY12-FY13 $0 DES CPA SLD Ongoing

    c. Assist NYSDEC in identifying, managing, and protecting essential breeding and wintering habitats. |FY12-FY13 $0 DES CPA SLD Ongoing

2. **Disease or predation, including lead ingestion, botulism, predation from other eagles, death by shotgun.**

    a. Through hunter education programs, address nest protection programs. |FY14 $0 DES CPA ? Future

    b. Ensure continued monitoring of lead and other contaminant levels in eagle eggs and chicks. |FY? $? DES EC,CPA ALS,SLD Future

    c. Develop a strategy for addressing high levels of contaminants, if found. |FY? $0 DES EC,CPA ALS,SLD Future

3. **Inadequacy of existing regulatory protections.**

    a. Address inadequacy of existing regulatory protections by providing information about the Federal BGEPA program as administered in New York by the NYFO and the Regional Office's Migratory Bird Program Office, and State protections under the State ESA. |FY12-FY13 $0 DES CPA SLD Ongoing

4. **Other man-made or natural factors.**

    a. Develop advanced conservation strategies and best management practices (BMP) for this industry and for the wind industry to avoid and minimize impacts to bald and golden eagles. |FY12-FY13 $0 DES CPA SLD Ongoing

    b. Address wind related mortalities by improved intraoffice coordination on development of BMP and other strategies. |FY12-FY13 $0 DES CPA SLD Ongoing

5. **Ingestion of environmental contaminants, impacts to reproduction**.

    a. Determine if there are impacts to bald eagles from environmental contaminants within the watershed and if so, implement mitigative measures. |FY? $0 DES EC ALS Future

    b. Seek to minimize loss of habitat due to contamination by influencing regulatory agency decisions related to State and Federal Superfund sites. |FY11-FY14 $0 DES EC ASR Ongoing

    c. Investigate development of an On-/Off-Refuge proposal to address impact of contaminants on osprey and/or other avian species and seek funding for such work. |FY11 $0 DES EC KJ Completed

    d. Evaluate USFWS Natural Resource Damage Assessments (NRDA) along the Great Lakes. |FY11-FY13 $0 DES EC ASR,ALS Ongoing

    e. As part of the GLRI, evaluate emerging contaminants at the Rochester Embayment Area of Concern (AOC) and potential other opportunities within the St. Lawrence AOC. |FY11-FY13 $0 DES EC DG,ASR Ongoing

    f. Respond as appropriate to spills impacting fish and wildlife resources. |FY12-FY14 $0 DES EC ALS Planned

Partner organizations:

Onondaga Audubon Society, Rice Creek Field Station, Cornell Lab of Ornithology, Ripley Hawk Watch, NYSDEC, Haudenosaunee Confederacy.

CONSERVATION DELIVERY

1. **Loss/degradation of habitat.**

    a. Address modification or destruction of habitat(s) including winter roosting areas and breeding areas through public education programs and website postings in conjunction with the NYSDEC bald eagle recovery program. Assist the NYSDEC in

identifying movement patterns, migratory pathways, and locations where New York's wintering eagles breed.

i. Along with links to biological information about bald eagles, develop materials for the website to clarify for the public the connections between what humans do by way of development, forest clearing, use of motor boats, jet skis, etc., in bald eagle nesting areas and nest abandonment, loss of productivity, etc. |FY12-FY14 $0 DEL CPA SLD Future

ii. Continue engagement in Federal Clean Water Act permitting program and SEQRA program for wind power and development projects proposed in eagle concentration areas and wind resource areas that coincide with breeding and migratory routes. |FY12-FY14 $0 DEL CPA SLD Ongoing

iii. Participate in regional workgroup and other agencies' sponsored workgroups developing guidance for wind power project siting. |FY12-FY13 $0 DEL CPA SLD Ongoing

iv. Develop maps for internal use that map out a "green infrastructure" of migratory, roosting, and breeding areas for eagles in New York State to refer to when screening 404 and Federal projects reviews. |FY12-FY14 $0 DEL CPA ? Ongoing

v. Provide substantive comments to the regulatory agencies that provide BMP, mitigation recommendations for eagle conservation when in suitable habitat. |FY12-FY14 $0 DEL CPA SLD Ongoing

b. Assist NYSDEC in identifying, managing, and protecting essential breeding and wintering habitats through NYSDEC-ESA/BGEPA Program that will result in a net benefit to eagles. |FY12-FY14 $0 DEL CPA SLD Ongoing

i. Obtain, prepare, and/or distribute maps outlining key areas for conservation to coworkers who may be reviewing projects in bald eagle habitat. |FY12-FY13 $0 DEL CPA SLD Future

ii. Assist coworkers in drafting language for comment letters on a wide variety of regulated activities if they occur in known bald eagle habitats. |FY12-FY13 $0 DEL CPA SLD Ongoing

iii. Develop/tweak national guidelines for land management agencies to ensure that their trail systems minimize impacts to bald and golden eagles in concentration areas. Prepare guidelines, and distribute to State Parks, State Forests, and National Forests interpretation staff.

2. **Disease or predation, including lead ingestion, botulism, predation from other eagles, death by shotgun.**

a. Through hunter education programs, address nest protection programs.

b. Ensure continued monitoring of lead and other contaminant levels in eagle eggs and chicks.

c. Develop a strategy for addressing high levels of contaminants if found.

3. Inadequacy of existing regulatory protections.

a. Address inadequacy of existing regulatory protections by providing information about the Federal BGEPA program as administered in New York by the NYFO and the Regional Office's Migratory Bird Program Office, and State protections under the State ESA. |FY12-FY13 $0 DEL CPA SLD Ongoing

4. Other man-made or natural factors.

a. Address other factors.

i. Develop advanced conservation strategies and BMP for this industry and for the wind industry to avoid and minimize impacts to bald and golden eagles. |FY12-FY13 $0 DEL CPA SLD Ongoing

ii. Address wind-related mortalities by improved intraoffice coordination on development of BMP and other strategies. |FY12-FY13 $0 DEL CPA SLD Ongoing

iii. Meet with new Northern BGEPA coordinator to discuss an approach to compliance. |FY12-FY14 $0 DEL CPA SLD Ongoing

iv. Work with the NYSDEC, industry, other field offices, Regional Office, and species experts to identify advanced conservation practices that will avoid and minimize take of eagles and other large raptors. |FY12-FY14 $0 DEL CPA SLD Ongoing

5. Ingestion of environmental contaminants, impacts to reproduction.

a. Determine if there are impacts to bald eagles from environmental contaminants within the watershed and if so, implement mitigative measures.

b. Seek to minimize loss of habitat due to contamination by influencing regulatory agency decisions related to State and Federal Superfund sites.

i. Provide substantive Federal agency comments on proposed actions with likely adverse impact to bald eagles and/or their habitat (EC) (2010-2013). |FY11-FY13 $0 DEL EC ASR Ongoing

c. Evaluate USFWS NRDA along the Great Lakes.

   i. Continue to manage St. Lawrence NRDAR case. |FY11-FY13 $0 DEL EC ALS Ongoing

   ii. Consider bald eagle habitat restoration projects during St. Lawrence NRDA River restoration planning. |FY11-FY13 $0 DEL EC ALS Ongoing

d. As part of the GLRI, evaluate emerging contaminants at the Rochester Embayment AOC and potential other opportunities within the St. Lawrence AOC.

   i. Conduct study on emerging contaminants in soil, water, and fish of Rochester Embayment AOC to determine potential impacts to fish and wildlife Trust resources and their supporting habitats, with potential for including the St. Lawrence AOC in subsequent years. |FY11-FY13 $0 DEL EC DG,ASR Ongoing

   ii. Coordinate with USEPA and AOC Remedial Action Committees on future directions with objective of improving and restoring habitat for Trust resources (dependent on USEPA funding: FY 2011-FY2013). |FY11-FY13 $0 DEL EC DG,ASR Ongoing

6. **Address disease or predation**, including lead ingestion, botulism, predation from other eagles, and death by shotgun, through hunter education programs, nest protection programs.

   a. Investigate whether bald and golden eagle fact sheets could be provided at hunter training programs run by the NYSDEC. Develop fact sheets and distribute. |FY12-FY14 $0 DEL CPA SLD Ongoing

7. **Address inadequacy of existing regulatory protections** by providing information about the Federal BGEPA program as administered in New York by the NYFO and the Regional Office's Migratory Bird Program Office, and State protections under the State ESA.

   a. Provide a New York highlighted fact sheet on the website to outline process for protection of bald and golden eagles through the BGEPA permit processes. |FY12-FY14 $0 DEL CPA SLD Ongoing

   b. Identify three organizations with whom we could meet to further BGEPA education – builders, outfitters, etc. Participate in the New York/Canada Bald Eagle Task Force to update knowledge of eagles found along the international border. |FY13 $0 DES CPA SLD Future

Bald Eagle (*Haliaeetus leucocephalus*): St. Lawrence Focal Area

OUTREACH

See specific examples above.

Continue to make bald eagle recovery traveling exhibit available for exhibition; keep copy blocks current (CPA). |FY12-FY13 $0 OUT CPA SLD Planned

Develop an accompanying workbook based on the one the BOCES students started. |FY13 $0 OUT CPA SLD Ongoing

MONITORING

Development of protocols to measure progress/success. |FY12-FY14 $0 MON CPA SLD Ongoing

Monitoring to measure progress/success. |FY12-FY14 $0 MON CPA SLD Ongoing

Investigate options for State bald eagle program funding to continue to monitor nests, concentration areas, productivity, and contaminant levels in eagles (CPA). |FY12-FY13 $0 MON CPA SLD Ongoing

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NYSDEC New York State Eagle Report 2009
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Blanding's Turtle (*Emydoidea blandingii*): St. Lawrence Focal Area
Blanding's Turtle Species Action Plan

FOCAL AREA: ST. LAWRENCE

Other species benefitting:

(shrub, swamps/marshes) black duck, wood duck, woodcock, golden-winged warbler, northern pike

BIOLOGICAL PLANNING

Introduction to species

Species information: The Blanding's turtle is a long-lived, late-maturing species that inhabits a wide range of habitats throughout its range, including shrub swamps, marshes, vernal pools, bogs, ponds, lakes, wet prairies, forested wetlands, and low-gradient streams and rivers. Blanding's turtles main range extends disjunctly from southeastern Ontario, adjacent Quebec, and southern Nova Scotia, south into New England, and west through the Great Lakes to western Nebraska, Iowa, and extreme northeastern Missouri. Several disjunct populations occur in the Northeast (eastern New York, eastern Massachusetts, southern New Hampshire, southern Maine, and southern Nova Scotia). These eastern populations have been effectively isolated from the main range for several millennia, are genetically distinct, and may qualify for Federal listing as a Distinct Population Segment under the U.S. Endangered Species Act (ESA). Blanding's turtles mature between 14-21 years and can attain ages greater than 75 years and still reproduce successfully.

In addition, Blanding's turtles use uplands for several parts of their life cycle for nesting, moving among wetlands, basking, aestivation, and possibly feeding. Most individuals move overland (over 3 km) among multiple wetlands throughout the season. In addition, females often move long distances to nesting sites. Habitat, therefore, must be considered in the context of its landscape setting.

Because Blanding's turtles have a generation time of nearly 40 years and population increases take place slowly, recoveries from declines may take many decades or centuries. Therefore, to be effective, conservation efforts must take place well in advance of severe declines.

Justification for species selection: Blanding's turtles are State-listed as either threatened or endangered in 9 of 15 states where they occur, including three of the four states in the Northeast. In New York, the Blanding's turtle is State-listed as threatened. At the Federal level, the species is not currently listed under the U.S. Fish and Wildlife Service (USFWS) ESA; under the Canada Species at Risk Act, the species is considered threatened (endangered in Nova Scotia).

State contribution to overall species population: In New York, Blanding's turtles are known from the following counties: Dutchess, Saratoga, St. Lawrence, Jefferson, Niagara, and Erie. Evidence suggests there are 3 evolutionary significant units (ESU) for Blanding's turtles across their range. Two of these units occur in New York – the St. Lawrence/western New York populations and those populations in the Hudson River basin. It is likely that there would be a

minimum of two recovery units established in New York if the species is Federally-listed. With two ESUs, it could be stated that New York's Blanding's turtle population is genetically more diverse than any other State.

Threats and threat assessment:

Threats[23] (see Status Assessment in references):

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Wetland loss, including vernal pools. Upland habitat loss (nesting habitat).

B. Fragmentation of habitat (connectivity of wetland and upland habitat).

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:

A. Collections for the pet trade will always remain a threat, but at this time it is not currently believed to be a major problem.

Factor C. Disease or predation:

A. At this time, no disease threats have been identified. Predation of adults is not a significant factor. Predation of nests, hatchlings, and juveniles is naturally high.

Factor D. The inadequacy of existing regulatory mechanisms:

A. Although State-listing affords species protection from direct take, protection provided to habitat is weak and variable. Upland habitat is rarely protected.

Factor E. Other natural or manmade factors affecting its continued existence:

A. Road mortality is a significant threat to adult turtles. Forestry (crushing of turtles, degradation of vernal pools), agriculture (nest disturbance, pollution), and water impoundment management (winter draw-downs may expose overwintering adults to freezing temperatures). Environmental contaminants (effects on reproductive success). Climate change (narrow latitudinal range of this species, combined with a long generation time may leave the species especially vulnerable to climate change impacts).

Recovery Goals

Conservation goal(s) for New York State:

The New York State Department of Environmental Conservation (NYSDEC) is currently writing a Blanding's Turtle Recovery Plan. Although no population goals have been established for

[23] Refers to 5 listing factors A-E in Section 4 of the ESA.

Blanding's Turtle (*Emydoidea blandingii*): St. Lawrence Focal Area

New York, the New York Field Office (NYFO) will continue to collaborate with partners to establish target population goals. Empirically determining the status and trends of Blanding's turtles is difficult as a result of sparse data and a long generation time for the species. In general, trends must be inferred based on the species life history and condition/trends of habitat.

Research:

- Extensive surveys to assess known sites and identify new populations. |FY? $0 BP ESA ? Future

- Conduct genetic analyses needed to address Distinct Population Segment issue before species can be considered for listing. |FY12 $0 BP ESA ? Ongoing

- Conduct study on road designs to reduce adult mortality (underpass or overpass designs, crossing signage). |FY? $0 BP ESA ? Future

CONSERVATION DESIGN

Strategies for addressing those threats

Please go to these documents for the existing strategies:

- Status Assessment - 2007
- Nova Scotia Recovery Plan – 2003
- Quebec Recovery Plan – 2005

In addition, the NYSDEC is developing a Blanding's turtle recovery plan for New York State (A. Ross).

Research/Actions needed: Specific actions for the next 3 years addressing conservation design include the following:

A. Assist with development/review of New York State Recovery Plan. |FY12 $0 DES ESA ? Ongoing

   Recovery Plan is currently being drafted by NYSDEC.

B. Assist with development/review of Northeast Blanding's Turtle Conservation Initiative.

C. Determine potential role with New England Field Office (NEFO)/NYSDEC. |FY12 $0 DES ESA ? Ongoing

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats FY2010-2012.

Blanding's Turtle (*Emydoidea blandingii*): St. Lawrence Focal Area

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Wetland loss, including vernal pools. Upland habitat loss (nesting habitat). Fragmentation of habitat (connectivity of wetland and upland habitat)

1. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding wetland impacts and modifications, uplands impacts associated with wetland impacts, road development, and agricultural practices that diminish wetland values.

    a. Draft standard language and compile materials to share with the public (ESA). |FY? $0 DEL ESA ? Future

    b. Provide substantive comments on proposed Federal agency actions with likely adverse impacts on Blanding's turtles (Conservation Planning Assistance [CPA]). |FY12 $0 DEL CPA TRS,SLD Ongoing

2. Develop standard avoidance and minimization measures for development projects.

    a. Develop standard guidelines to minimize development impacts to the Blanding's turtle. |FY? $0 DEL ESA ? Future

    b. Lead meetings to educate local government/townships of presence of the species and provide recommendations regarding development guidelines to reduce impacts. |FY? $0 DEL ESA ? Future

3. Target wetland mitigation projects, including vernal pool creation/restoration.

    a. Provide comments and recommendations on wetland mitigation projects in known range of the Blanding's turtles to ensure projects are beneficial to the species (CPA). |FY12 $0 DEL CPA TRS,SLD Ongoing

4. Work with NYSDOT and FHWA to reduce road mortality.

    a. Provide substantive comments on proposed Federal agency actions with likely adverse impacts on Blanding's turtles (USFWS-NYFO, CPA). |FY12 $0 DEL CPA TRS,SLD Ongoing

5. Work with partners to proactively protect the complexes of wetlands and uplands used by extant populations.

    a. Work to ensure information on known locations of Blanding's turtles is conveyed to land protection partners and land trusts to focus their efforts (ESA). |FY? $0 DEL ESA ? Future

b. Consider Blanding's turtle restoration projects in settlement negotiations regarding St. Lawrence NRDA. |FY11-FY13 $0 DEL EC ALS Ongoing

i. Acquire property for Blanding's turtle using St. Lawrence NRDA restoration funds. |FY12 $0 DEL EC ALS Ongoing

ii. Conduct restoration for Blanding's turtle using St. Lawrence NRDA restoration funds. |FY13-FY14 $0 DEL EC ALS Future

c. Work with the New York Power Authority (NYPA) to monitor success of the installed nesting berm project (required as condition of hydropower relicensing) (CPA). |FY12 $0 DEL CPA SPP,SS Planned

6. Participate in New York State Recovery Plan and Conservation Initiative meetings.

a. Attend and provide input at NYSDEC Recovery Plan meetings as requested. Assist the NYSDEC with development of best management practices (BMP), threats assessment, and mitigation strategies as requested (ESA). |FY12 $0 DEL ESA ? Ongoing

b. Provide Service support for 2011 multi-state SWG Blanding's turtle proposal submission, with a priority given to population genetics research (ESA). |FY12 $0 DEL ESA ? Ongoing

7. Assist with NYSDEC surveys.

a. Coordinate with the NYSDEC and Glen Johnson (SUNY-Potsdam) to determine survey schedule (ESA). |FY12 $0 DEL ESA ? Ongoing

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:

A. Collections for the pet trade will always remain a threat, but at this time it is not currently believed to be a major problem.

1. No work identified at this time.

Factor C. Disease or predation:

A. At this time, no disease threats have been identified. Predation of adults is not a significant factor. Predation of nests, hatchlings, and juveniles is naturally high.

1. No work identified at this time.

Factor D. The inadequacy of existing regulatory mechanisms:

Blanding's Turtle (*Emydoidea blandingii*): St. Lawrence Focal Area

A. Although State-listing affords species protection from direct take, protection provided to habitat is weak and variable. Upland habitat is rarely protected.

   1. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding wetland impacts and modifications, uplands impacts associated with wetland impacts, road development, and agricultural practices that diminish wetland values.

      a. Provide substantive comments on proposed Federal agency actions with likely adverse impacts on Blanding's turtles (CPA). |FY12 $0 DEL CPA,ESA TRS,SLD,? Ongoing

Factor E. Other natural or manmade factors affecting its continued existence:

A. Road mortality is a significant threat to adult turtles. Forestry (crushing of turtles, degradation of vernal pools), agriculture (nest disturbance, pollution), and water impoundment management (winter draw-downs may expose overwintering adults to freezing temperatures). Environmental contaminants (effects on reproductive success). Climate change (narrow latitudinal range of this species, combined with a long generation time may leave the species especially vulnerable to climate change impacts).

   1. Identify potential effects to the Blanding's turtle from climate change. |FY? $0 DEL ESA ? Future

      a. Work with National Weather Service to create models for determining climate change impacts to the Blanding's turtles.

OUTREACH

Develop education and outreach tools – on land protection needs and conservation restriction options for landowners, on turtles crossing roads, on turtles as pets, on life history strategy, and on nesting turtles. |FY? $0 OUT ESA ? Future

MONITORING

- Work with partners to review and track recovery progress. |FY? $0 MON ESA ? Future

- Establish benchmarks for success based on NYS Blanding's turtle Recovery Plan (pending). |FY? $0 MON ESA ? Future

Partners

NYSDEC, NYSDOT, FHWA, USGS, NYNHP, USFWS (NEFO), Hudsonia Ltd., Wilton Wildlife Preserve and Park, The Nature Conservancy (TNC), UMass, SUNY-Potsdam, land trusts, adjacent States

Blanding's Turtle (*Emydoidea blandingii*): St. Lawrence Focal Area

References

Status Assessment for the Blanding's Turtle (Emydoidea blandingii). 2007. B.W. Compton, Department of Natural Resources Conservation, University of Massachusetts.

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Congdon, J.D. et al. 2008. *Emydoidea blandingii* (Holbrook 1838) – Blanding's Turtle. Conservation Biology of Freshwater Turtles and Tortoises, Chelonian Research Monographs, No. 5, pp 015.1-015.12. http://www.iucn-tftsg.org/cbftt/.

Bobolink (*Dolichonyx oryzivorus*): St. Lawrence Focal Area

Bobolink Species Action Plan

FOCAL AREA: ST. LAWRENCE

Other species benefitting:

northern harrier, rough-legged hawk, red-tailed hawk, American kestrel, loggerhead shrike, upland sandpiper, short-eared owl, Henslow's sparrow, grasshopper sparrow, vesper sparrow, horned lark, blue-winged teal

BIOLOGICAL PLANNING

Introduction to species

Species information: Bobolinks are neotropical migrants, traveling to South America each autumn and making a round-trip of approximately 12,500 mi. Bobolink habitat consists of open grasslands and hay fields. During migration and in winter, they use freshwater marshes, grasslands, and rice and sorghum fields. This ground nester looks for open grasslands and hay fields during the summer and builds a nest consisting of dead grass with a central lining of fine grass or sedges. Habitat patch size generally assumed to be a minimum 10 acres, and can be well-managed by late season mowing. The nest may have a canopy of dead grass hanging over top. Clutch size ranges from 1-7 eggs that hatch in 11-13 days. Food consists primarily of seeds and insects. The bobolink is one of the few songbirds that undergo two complete molts each year, completely changing its feathers on both the breeding and wintering grounds. The bobolink is polygynous (Martin and Gavin 1995).

The bobolink is protected under Migratory Bird Treaty Act and listed as a Species of Greatest Conservation Need (SGCN) in New York State.

Justification for species selection: The bobolink was chosen as a priority species because of its importance in this geographic area. It has a higher density (19%) in the St. Lawrence Focal area than anywhere else in its range. The bobolink is a grassland bird species targeted by the New York Grassland Bird Conservation Plan. It has been identified as a New York State SGCN in New York (March 2003).

The population estimate for this species for the U.S. and Canada is 11,000,000 with 2,159,750 in Bird Conservation Region (BCR) 13 (Atlantic Coast Joint Venture [ACJV] 2007).

State contribution to overall species population: An estimated 17% of the world's bobolink population breeds in the St. Lawrence Valley New York State Department of Environmental Conservation (NYSDEC) (NYSDEC 2005). The bobolink's population trend is stable overall since 1966, but has shown 2-3% decline since 1980. It breeds throughout New York with the exception of the Adirondacks.

Bobolink (*Dolichonyx oryzivorus*): St. Lawrence Focal Area

Threats and threat assessment:

1. **Habitat loss and fragmentation**, including farm abandonment, lack of prescribed fire, and haying/mowing practices that adversely affect this species (In New York, primary disturbance to nesting is hay-cropping; 100% of nests with eggs and young nestlings affected by mowing were abandoned or destroyed).

   Research needed:

   - There is a need to develop methods and data for modeling distributions and abundance of grassland land cover across the landscape. |FY? $0 BP ? ? Future

   - Research is needed to assess impacts of management on productivity of grassland birds, to amplify existing information on grassland bird abundances associated with management.

   - Research is needed to determine potential benefits of native grass species as grassland habitat in contrast with demonstrated benefit of non-native cool season grasses.

2. **Collision with wind energy projects.**

   Research needed:

   - Research is needed to assess and reduce/mitigate risks from collisions.

3. **Predation.**

   Research needed:

   - In South America, on wintering grounds, shooting and trapping is a probable factor as where species is considered a pest of agricultural crops and where males are sold in local pet trade. Needs further study.

4. **Climate change.** Changes in habitat community structure or prey base may affect this species.

   Research needed:

   - Research is needed to determine the effects of climate change on this species.

Partners/potential funding:

Ducks Unlimited (DU), land trusts, and non-governmental organizations (NGO), refuges, U.S. Geological Survey (USGS), New York State Department of Transportation (NYSDOT),

Bobolink (*Dolichonyx oryzivorus*): St. Lawrence Focal Area

Natural Resources Conservation Service (NRCS), NYSDEC, The Nature Conservancy (TNC), Cornell Laboratory of Ornithology, Audubon New York, universities

Population goal(s) for New York State:

680,000 pairs of bobolinks. Per Rosenberg 2000, objective is to provide 775,000 ha of suitable grassland habitat to support the entire habitat-species suite (e.g. 680,000 pairs of bobolinks), with 100,000 ha maintained in large enough patches to support 7,600 pairs of upland sandpipers, and 2,000 ha intensively managed to support 1,000 pairs of Henslow's sparrows in New York and Ontario.

CONSERVATION DESIGN

Strategies for addressing those threats

1. **Habitat loss and fragmentation**, including farm abandonment, lack of prescribed fire, and haying/mowing practices that adversely affect this species.

    a. Influence regulatory agency decisions regarding proposed development, agricultural practices, etc., that result in loss of habitat and habitat functions for this species.

        i. Seek to minimize loss of habitat due to contamination by influencing regulatory agency decisions related to State and Federal Superfund sites. |FY11-FY13 $0 DES EC ASR Ongoing

    b. Prioritize permit review in grassland habitat (CPA). |FY12-FY13 $0 DES CPA ? Planned

    c. Develop fact sheets with best management practices (BMP) to minimize impacts to bobolink and use these to influence landowners regarding habitat needs of this species, including providing guidance regarding haying and mowing practices. In developing BMP consider the management recommendation of the National Audubon Society (NAS) 2009 (appended to the end of this document).

    d. Target U.S. Fish and Wildlife Service (USFWS) habitat restoration and enhancement projects to benefit bobolink through creation of new habitat.

        i. If possible, use Natural Resources Damage Assessment and Restoration (NRDAR) funds to accomplish habitat restoration and protection. In creating bobolink habitat, consider the management recommendation of the NAS 2009 (appended to the end of this document). |FY? $0 DES EC ALS Future

        ii. Facilitate habitat preservation through coordination with land trusts.

    e. Other strategies may result from research needs noted above.

i. Use geospatial tools to focus efforts: Audubon New York is involved in bobolink conservation and may have data layers we can use; check studies by Cornell – in vicinity of Madison County NRCS has shape files for priority areas for Conservation Reserve Program (CRP) and Wildlife Habitat Incentives Program (WHIP) (Information Technology [IT]).

ii. Analyze existing areas of habitat to determine potential breeding areas – unlike woodcock, species does not have its own strategic plan; analyze breeding bird survey data to focus efforts (Conservation Planning Assistance [CPA], Partners for Fish and Wildlife [PFW], IT).

iii. Create map for possible bobolink sites of concern (IT).

2. **Wind energy projects.**

   a. Strategy will depend upon results of research need noted above.

3. **Predation.**

   a. Strategy will depend upon results of research need noted above.

4. **Climate change.**

   a. Strategy will depend upon results of research need noted above.

Partners/potential funding:

DU, land trusts, NGO, refuges, USGS, NYSDOT, NRCS, NYSDEC, TNC, Cornell Laboratory of Ornithology, Audubon New York, universities

CONSERVATION DELIVERY

On- the-ground actions using strategies to address threats FY2010-2012

A. **Habitat loss and fragmentation.**

   1. Provide substantive Federal agency comments on proposed Federal agency actions with likely adverse impacts to bobolink and/or their habitat.

      a. Seek to minimize loss of habitat due to contamination by influencing regulatory agency decisions related to State and Federal Superfund sites by providing substantive Federal agency comments on proposed actions with likely adverse impacts to bobolinks and/or their habitat (2011-2013). |FY11-FY13 $0 DEL EC ASR Ongoing

2. Post on New York Field Office (NYFO) web site fact sheets with BMP to minimize impacts to bobolink and/or their habitat.

3. Restore 50 acres of early successional grassland habitat to benefit bobolink and other birds with similar habitat needs at project site patch size of ≥10 acres (PFW). |FY12-FY13 $10,000 DEL PFW CS Ongoing

4. Manage St. Lawrence NRDAR case. |FY11-FY13 $0 DEL EC ALS Ongoing

    a. Consider bobolink restoration projects in settlement negotiations regarding St. Lawrence NRDA. |FY11-FY12 $0 DEL EC ALS Ongoing
    b. Consider bobolink restoration projects during restoration planning related to the St. Lawrence NRDA. |FY11-FY13 $0 DEL EC ALS Ongoing

B. **Collision with wind energy projects.**

1. Delivery will depend upon strategy determined from research noted above.

C. **Predation.**

1. Delivery will depend upon strategy determined from research noted above.

D. **Climate change.**

1. Delivery will depend upon strategy determined from research noted above.

Partners/potential funding:

DU, land trusts, NGO, refuges, USGS, NYSDOT, NRCS, NYSDEC, TNC, Cornell Laboratory of Ornithology, Audubon New York, universities

OUTREACH

Potential outreach needs:

- PFW Landowner Handouts
- NYFO Outreach (traveling exhibits)
- Local newspaper/TV
- DU *Flyways* articles
- Other Federal and State agency referrals/coordination
- Working with NGO (land trusts, TNC)

Bobolink (*Dolichonyx oryzivorus*): St. Lawrence Focal Area

Partners/potential funding:

DU, land trusts, NGO, refuges, USGS, NYSDOT, NRCS, NYSDEC, TNC, Cornell Laboratory of Ornithology, Audubon New York, universities

MONITORING

Develop protocols to measure progress/success of all conservation delivery activities.

Work with partners to identify leads for accomplishing monitoring activities.

Develop best management practices from results of monitoring to inform future bobolink population restoration activities.

References

Atlantic Coast Joint Venture. 2007. Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Region (BCR 13). Atlantic Coast Joint Venture, U.S. Fish and Wildlife Service, Sunderland, Massachusetts.

Martin, S.G. and T.A. Gavin. 1995. Bobolink (*Dolichonyx oryzivorus*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/176.

Morgan, M. and M. Burger. 2008. A Plan for Conserving Grassland Birds in New York: Final Report to the New York State Department of Environmental Conservation under contract #C005137. Audubon New York, Ithaca, New York. 8 May 2008.

National Audubon Society. 2009. Bobolink: Guidance for Conservation. Audubon New York, Ithaca, New York. Accessed 4 March 2010. (http://ny.audubon.org/PDFs/HRVC_Bobolink.pdf).

NYSDEC. 2005. Comprehensive Wildlife Conservation Strategy: A Strategy for Conserving New York's Fish and Wildlife Resources, Final Submission Draft, September 2005. (http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf).

Rosenberg. K.V. 2000. Partners in Flight Landbird Conservation Plan: Physiographic Area 18: St. Lawrence River Plain. Version 1.0. Draft. 10 August 2000. (http://www.partnersinflight.org/bcps/plan/pl_18_10.pdf).

USFWS. 2007. Final Draft Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Area (BCR 13). January, 2007. (http://www.acjv.org/BCR_13/BCR13_Final_Plan_July07.pdf).
Existing strategies for bobolink restoration:

Please refer to the following documents for exiting strategies:

Bobolink (*Dolichonyx oryzivorus*): St. Lawrence Focal Area

1. Partners in Flight Landbird Conservation Plan: Physiographic Area 18: St. Lawrence Plain (Rosenberg 2000) http://www.blm.gov/wildlife/plan/pl_18_10.pdf.

2. "A Plan for Conserving Grassland Birds in New York," Final Report to NYSDEC (Morgan and Burger 2008). http://ny.audubon.org/PDFs/ConservationPlan-GrasslandBirds-NY.pdf.

3. Partners in Flight North American Landbird Conservation Plan http://www.partnersinflight.org/cont_plan/.

4. NYS Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf.

5. Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Region (USFWS 2007) http://www.acjv.org/BCR_13/BCR13_Final_Plan_July07.pdf.

Bobolink Management Recommendations (NAS 2009):

- Create large habitat patches (greater than 20 acres) and minimize woody edges whenever possible. Suitable habitat includes grasslands of moderate height (8-12") and density, with adequate litter.

- Protect nesting habitat from disturbance during the breeding season (early May to August 1) by postponing haying, burning, and moderate or heavy grazing.

- Perform management activities in early spring, several weeks prior to the arrival of adults on the breeding grounds, or in the late summer or fall after the breeding season.

- Use a rotating management schedule on several nearby grassland fragments to provide a variety of habitat conditions. Adjacent patches of similar habitat provide refuge for fledglings to escape from mowed areas and for late-nesting females.

- Create or maintain patches of relatively sparse, grass-dominated vegetation resembling old hayfields (more than 8 years since planted).

- Encourage scattered forbs, such as clover, for nest-site cover and also for seeds and host plants for various invertebrates, which are critical for feeding rapidly growing nestlings.

- Mow or burn patches every 2-3 years to prevent development of woody vegetation.

- Avoid disturbance of suitable habitat (e.g., mowing) during the breeding season, May 1 to August 1.

Common Tern (*Sterna hirundo*): St. Lawrence Focal Area

Common Tern Species Action Plan

FOCAL AREA: ST. LAWRENCE

Other species benefitting:

Waterbirds and Diving Waterfowl - Bonaparte's gull, little gull, canvasback, common goldeneye, greater scaup, lesser scaup, long-tailed duck

BIOLOGICAL PLANNING

Introduction to species

Species information: The common tern is a colonial breeder, breeding in wetland-open water habitats throughout the Great Lakes and along the northern Atlantic Coast. The common tern is an opportunistic forager taking small (3-15 cm) forage fish, crustaceans, and insects within 50 cm of the water's surface. They nest on islands, marshes, and lake and ocean beaches. Common terns prefer nest sites with sand, gravel, shell, or cobble substrates with scattered vegetation, or other protected areas where chicks can shelter. The North American common tern population is migratory, wintering mainly in South America or western Central America.

A recent review (Morris *et al*. 2010) of Great Lakes (and the St. Lawrence River) common tern survey data from 1976-2000 indicates long-term declines in nest numbers and colony sites. Band recovery data indicate that the Great Lakes common tern population is endemic with little immigration from the east coast population or elsewhere (Haymes and Blokpoel 1978; Blokpoel and Courtney 1982, as cited within Morris *et al*. 2010). The authors (Morris *et al.* 2010) suggest that specific policy development and management action is urgently needed to stabilize numbers of common terns on the Great Lakes.

Justification for species selection: The common tern is a New York State (NYS) Threatened Species and a NYS Species of Greatest Conservation Need. In the Great Lakes focal area, common tern is also rated as High in the Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Region (BCR) (BCR 13, Atlantic Coast Joint Venture [ACJV] 2007). The overall trend in Great Lakes common tern nest numbers between 1976 and 2000 was negative (−19.1%) and represents a net decrease of 2,140 nests and 18 active nesting sites (Morris *et al.* 2010).

State contribution to overall species population: ACJV (2007) notes an estimated common tern population for BCR 13 of greater than 6,484 pairs. The Thousand Islands area of the St. Lawrence River contains at least 28 colonies (~totaling 700 pairs) of common terns (New York State Department of Environmental Conservation [NYSDEC] 2005). An additional 400 pairs are located on Lake Oneida islands in New York (NYSDEC 2005). Common terns also breed along the northern and western shores of Lake Erie (including Buffalo Harbor), the U.S. waters of the Niagara River, and Lake Ontario (Morris *et al.* 2010).

Research needed: Increase knowledge/understanding of common tern in New York.

Common Tern (*Sterna hirundo*): St. Lawrence Focal Area

- Great Lakes Colonial Waterbird Surveys conducted every 10 years – determine NY status: survey should be occurring soon (2011-2015). |FY11 $0 BP CPA TRS Completed

- Great Lakes Colonial Waterbird Survey conducted 2011 - obtain and review the 2011 data. |FY12-FY13 $0 BP CPA,EC TRS,ASR Planned

- Recommended monitoring: survey of known nest colonies every five years-determine NY status: survey should be occurring soon (2012-2013?). |FY12 $0 BP CPA TRS Planned

- Data on waterbird abundance, distribution, chronology, population trends, and factors affecting them (habitat availability and management). |FY? $0 BP ? ? Future

- Chronology and peaks of waterbird movements, temporal composition of migrants, and factors affecting turnover rates at stopover sites. |FY? $0 BP ? ? Future

- Distribution, abundance, conditions, and ownership of wetlands and other important waterbird habitats, how they are affected by climatic patterns and human activities, and where there is potential to restore and enhance additional waterbird habitat. |FY? $0 BP ? ? Future

- Analyze existing areas of breeding habitat and recently altered shoreline to determine potential breeding areas (FY 2012). |FY12 $0 BP CPA,EC TRS,ASR Planned

Threats and threats assessment:

1. **Competition and Predation** of nesting and foraging habitat.

   Research needed:

   - Research involving habitat availability, relationships with gulls (specifically, ring-billed gulls), double-crested cormorants, and other competitors and food requirements are key areas that need further study (Hyde 1997). |FY? $0 BP ? ? Future

   - Waterbird nutritional requirements/food preferences. |FY? $0 BP ? ? Future

2. **Loss of habitat** due to island/shoreline development, water level management of the Great Lakes, and vegetation succession.

   Research needed: Assess how human disturbance affects waterbird foraging and breeding and ways to reduce these impacts.

   - Post-construction monitoring at Peace Bridge related to habitat displacement of the structure. |FY? $0 BP CPA TRS Future

- Pre- and post-construction monitoring for on- and off-shore wind projects. |FY? $0 BP CPA TRS Future

- Survey to identify potential areas of overlap for nuclear development and common tern habitat. |FY? $0 BP ? ? Future

- Review Great Lakes water level data and impacts to existing habitat. |FY? $0 BP ? ? Future

3. **Fragmentation of habitat** due to the location of wind power projects, pipelines, and transmission lines along migration corridors and stop over habitat.

   Research needed:

   - Assess how human disturbance affects waterbird foraging and breeding and ways to reduce these impacts. |FY? $0 BP ? ? Future

4. **Climate change;** changes in habitat community structure and changes in prey base during breeding season.

   Research needed:

   - Determine changes in species distribution and population sizes due to climate change (especially the impacts of flooding and rising water levels on existing habitat). |FY? $0 BP ? ? Future

5. **Environmental contaminants.**

   Research needed:

   - Assess the effects of contaminants on waterbirds, especially at Great Lakes Areas of Concern (AOCs) and Confined Disposal Facilities that are used by foraging birds. |FY? $? BP EC ? Future

Partners/potential funding:

Haudenosaunee Confederacy, USGS, Natural Resources Conservation Service (NRCS), NYSDEC, County Soil and Water Conservation Districts (SWCD), The Nature Conservancy (TNC), Ducks Unlimited (DU), Audubon NY, Cornell Lab of Ornithology, New York State Department of Transportation (NYSDOT), utilities, Buffalo Niagara Riverkeeper, Niagara Greenway Committee, USEPA through GLRI, and other Great Lakes funding sources.

***Population goal(s) for New York State*:**

Increase to 2,500 pairs (ACJV 2007). The State Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) indicated a need to develop a long-term plan that established population

objectives for beach and island ground-nesting birds (common tern) and recommended appropriate management options. Currently, NYSDEC recommends protecting existing common tern habitat and creating new habitat to expand nesting opportunities (NYSDEC 2005).

CONSERVATION DESIGN

Strategies for addressing those threats

Objectives: Increase local populations, through the protection, preservation, and/or restoration of common tern nesting and foraging habitat along the Great Lakes shoreline.

1. **Competition and Predation** of nesting and foraging habitat.

    a. Target USFWS habitat enhancement to benefit this species including gull deterrents, predator control, and nesting habitat improvement projects. |FY? $0 DES ? ? Future

    b. Other strategies may result from research need noted above.

2. **Loss of habitat** due to island/shoreline development, water level management of the Great Lakes, and vegetation succession.

    a. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding new development, water level management, and vegetation management in breeding and foraging areas. |FY11-FY13 $0 DEL CPA,IT SPP,TRS,AFL Ongoing

    b. Target USFWS habitat restoration and enhancement projects to benefit common terns, including habitat acquisition and preservation, predator control, nesting habitat improvement projects (including artificial nesting platforms). |FY? $0 DES ? ? Future

    c. Other strategies may result from research need noted above.

3. **Fragmentation of habitat** due to the location of wind power projects, pipelines, and transmission lines along migration corridors and stop over habitat.

    a. Seek to minimize fragmentation of habitat by influencing regulatory agency decisions regarding new development, water level management, and vegetation management in breeding, foraging, and migration areas. |FY11-FY13 $0 DEL CPA SPP,TRS Ongoing

    b. Other strategies may result from research need noted above.

4. **Changes in habitat community structure and changes in prey base during breeding season due to climate change.**

    a. Identify potential future habitat areas above current water levels and protect or restore the habitat for common terns. |FY? $0 DES ? ? Future

b. Other strategies may result from research need noted above.

5. **Environmental contaminants.**

   a. Evaluate USFWS Natural Resource Damage Assessments along the St. Lawrence River. |FY11-FY13 $0 DES EC ALS Ongoing

   b. As part of the GLRI, evaluate emerging contaminants at the Rochester Embayment AOC (potentially 2010-2014). |FY11-FY13 $0 DES EC DG,ASR Ongoing

   c. Seek to minimize loss of habitat due to contamination by influencing regulatory agency decisions related to State and Federal Superfund sites. |FY11-FY13 $0 DES EC ASR Ongoing

   d. Respond as appropriate to spills impacting fish and wildlife resources. |FY12-FY14 $0 DES EC ALS Planned

   e. Other strategies may result from research need noted above.

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY 2011-2013

1. **Competition and Predation of nesting and foraging habitat.**

   a. Target USFWS habitat enhancement to benefit this species including gull deterrents, predator control, and nesting habitat improvement projects.

      i. No work identified at this time.

   b. Other actions may result from research need noted above.

2. **Loss of habitat** due to island/shoreline development, water level management of the Great Lakes and St Lawrence River, and vegetation succession.

   a. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding new development, water level management, and vegetation management in breeding and foraging areas.

      i. Create map or shapefile of existing and potential common tern breeding and foraging areas for all NYFO programs (2011-2012) (IT). |FY11 $0 DEL IT AFL Completed

ii. Provide substantive Federal agency comments on proposed development/actions with likely adverse impacts to common terns and/or their habitat (2011-2013) (CPA). |FY11-FY13 $0 DEL CPA SPP,TRS Ongoing

iii. Provide substantive Federal agency comments on the New York Power Authority (NYPA) Common Tern Habitat Improvement Project (2011-2013) (CPA). |FY11-FY13 $0 DEL CPA SPP,SS Ongoing

b. Target USFWS habitat restoration and enhancement projects to benefit common terns, including habitat acquisition and preservation, predator control, and nesting habitat improvement projects (including artificial nesting platforms).

c. Other actions may result from research need noted above.

3. **Fragmentation of habitat** due to the location of wind power projects, pipelines, and transmission lines along migration corridors and stop over habitat.

a. Seek to minimize fragmentation of habitat by influencing regulatory agency decisions regarding new development, water level management, and vegetation management in common tern breeding, foraging, and migration areas.

i. Provide substantive Federal agency comments on proposed development/actions with likely adverse impacts to common terns and/or their habitat (2011-2013) (CPA). |FY11-FY13 $0 DEL CPA SPP,TRS Ongoing

b. Other actions may result from research need noted above.

4. **Changes in habitat community structure and changes in prey base during breeding season due to climate change.**

a. Identify potential future habitat areas above current water levels and protect or restore the habitat for common terns.

i. No work identified at this time.

b. Other actions may result from research need noted above.

5. **Environmental contaminants**

a. Evaluate and prioritize USFWS Natural Resource Damage Assessments along the St. Lawrence River.

i. Manage St. Lawrence River Environment case (2011-2013). |FY11-FY13 $0 DEL EC ALS Ongoing

ii. Consider restoration projects that benefit common tern (EC). |FY11-FY13 $0 DEL EC ALS Ongoing

b. As part of the GLRI, evaluate emerging contaminants at the Rochester Embayment AOC and evaluate the "Fish Tumors" Beneficial Use Impairment for the Niagara River AOC (potentially 2010-2013).

i. Conduct pilot study on emerging contaminants in soil, water, and fish of Rochester embayment to determine potential impacts to fish and wildlife Trust resources and their supporting habitats (initiated in September 2010) (2011-2013). |FY11-FY13 $0 DEL EC DG,ASR Ongoing

ii. Coordinate with USEPA and AOC Remedial Action Committees on future directions with objective of improving and restoring habitat for Trust resources (dependent on USEPA funding: 2011-2013) (EC). |FY11-FY13 $0 DEL EC DG,ASR Ongoing

c. Seek to minimize loss of habitat due to contamination by influencing regulatory agency decisions related to State and Federal Superfund sites.

i. Provide substantive Federal agency comments on proposed actions with likely adverse impacts to common terns and/or their habitat (2011-2013) (EC). |FY11-FY13 $0 DEL EC ASR Ongoing

d. Other actions may result from research need noted above.

OUTREACH

- Update/distribute existing NYSDEC fact sheet to educate and encourage landowners to control predators that represent significant threats to the viability of species-at-risk such as common tern. http://www.dec.ny.gov/animals/7100.html. |FY? $0 OUT ? ? Future

MONITORING

- Development of protocols to measure progress/success for any common tern habitat enhancement and/or restoration projects developed and constructed. |FY? $0 MON ? ? Future

- Seek funding and support for monitoring. |FY? $0 MON ? ? Future

Partners

USEPA, USGS, NRCS, NYSDEC, County SWCD, TNC, DU, Audubon NY, Cornell Lab of Ornithology, NYSDOT, utilities, Buffalo Niagara Riverkeeper, Niagara Greenway Committee, and Haudenosaunee Confederacy.

Common Tern (*Sterna hirundo*): St. Lawrence Focal Area

References

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Golden-winged Warbler (*Vermivora chrysoptera*): St. Lawrence Focal Area
Golden-winged Warbler Species Action Plan

FOCAL AREA: ST. LAWRENCE

Other species benefitting:

American woodcock, blue-winged warbler, brown thrasher, field sparrow, willow flycatcher, Canada warbler, yellow-breasted chat

BIOLOGICAL PLANNING

Introduction to species

Species information: The golden-winged warbler (GWWA) is an imperiled neotropical migrant. In New York, the majority of its territories are in shrubby fields produced by secondary succession following farmland abandonment. It is insectivorous, eating moths and their pupae, winged insects, caterpillars, and spiders, while foraging generally in the upper half of small trees and shrubs. Nest sites are often located along the shaded edge of a forest-field (Confer 1992).

Justification for species selection: The GWWA is declining precipitously in the northeastern U.S. (7.6% per year in U.S. Fish and Wildlife Service [USFWS], Region 5), while increasing in the northern and northwestern portions of its range where farmland abandonment and clear cutting is common. The decline may be due, in part, to a loss of shrubland habitat. In addition, this decline correlates with the range expansion of the blue-winged warbler into the range of the GWWA. The northward expansion and resultant zone of overlap has led not only to increased competition, but also to widespread interbreeding between the golden-winged and blue-winged warblers. Because of this wide-spread hybridization, populations of pure GWWA may soon disappear after the arrival of the blue-winged warblers (Cornell Lab of Ornithology). Petition for listing received in 2010.

The GWWA was chosen as a priority species because of its importance in the northeast. It is a New York State (NYS) Species of Special Concern, a NYS Species of Greatest Conservation Need, and is rated High-High in Bird Conservation Region (BCR) 13. Golden-winged warblers require patches of herbs, shrubs, and scattered trees adjacent to forest edge secondary succession, and may use marshes and bogs with forest edge, moderate size sites 10-15 hectare (ha).

Global Population estimated at 210,000 individuals

BCR 13 population estimated at 10,000 individuals, only 5,000 in New York

Populations declining at approximately 7.5 % per year in Region 5

State contribution to overall species population: Range extends across New York; however, population declines in southeast New York have been observed. Slight population expansion believed in Lake Ontario plain and northern New York. Breeding Bird Atlas results for 2000 to

Golden-winged Warbler (*Vermivora chrysoptera*): St. Lawrence Focal Area

2005 showed a significant population decline across the State with the only remaining stronghold in the St. Lawrence Valley of northwestern New York.

General:

- Participate on monthly calls and periodic meetings for the Tug Hill GWWA working group. |FY11-FY12 $0 DES ESA NR Ongoing

Threats and threat assessment:

Research needed:

1. **Loss of sufficient quantity/quality of habitat**, largely as a result of habitat succession. Maintaining shrub and early successional habitats is a high priority in the Lower Great Lakes Plain. (Dettmers and Rosenberg 2003).

    - Research is needed to determine the range of suitable habitats and identify present breeding sites for GWWA in the St. Lawrence region. Tom Langen (Clarkson University) is currently doing some banding work in this focal area.

    - Research is needed to compare early-succession habitats resulting from natural disturbances vs. forestry practices for this high-priority species.

    - Research is needed to study the impacts of human development on early succession species.

    - Research is needed to determine the effects between American woodcock management and GWWA population expansion.

2. **Hybridization with blue-winged warbler**.

    - Research is needed to determine habitat-management options (e.g. succession stage, water regime) that will discourage blue-winged warblers and favor GWWA.

    - Research is needed to determine the difference in climate and elevation between GWWA and blue-winged warbler.

3. **Interference or exploitation by blue-winged warbler**.

4. **Nest parasitism by brown-headed cowbirds**.

5. **Livestock overgrazing.**

6. **Mowing and herbicide** treatment of woody areas (highway power line right-of-ways [ROW]), especially during the breeding season.

7. **Climate change**: Climate change may be pushing species northward and to higher elevations (GWWA Working Group identified this threat).

    - Research is needed to evaluate effects of climate change/temperature gradient for both blue-winged warblers and GWWA.

8. **Reduction in timber harvesting** in some areas.

9. **Loss of winter habitat.**

Partners/potential funding

Haudenosaunee Confederacy, U.S. Geological Survey (USGS), Natural Resources Conservation Service (NRCS), New York State Department of Environmental Conservation (NYSDEC), County Soil and Water Conservation Districts (SWCD), The Nature Conservancy (TNC), Audubon New York, Cornell Lab of Ornithology, Ithaca College, Wilson Ornithological Association, New York State Department of Transportation (NYSDOT), utilities, Partners in Flight (PIF), Clarkson University.

***Population goal(s) for New York State*:** 8,500 pairs

As outlined in the Partners in Flight Landbird Conservation Plan by Robertson & Rosenberg 2003, their objective is to provide roughly 260,000 ha of disturbed or shrub habitat to support the habitat-species guild, of which 18,000 ha should be suitable to support 8,500 pairs of GWWA.

Roughly 40,000 ha of shrub habitat are required to maintain the entire habitat-species suite (e.g., 60,600 pairs of field sparrow); of this, 12,000 ha should be maintained in a condition suitable to support 3,000 pairs of GWWA (Dettmers & Rosenberg 2003).

CONSERVATION DESIGN

Strategies for addressing those threats

1. **Loss of sufficient quantity/quality of habitat.**

    a. Influence regulatory agency decisions regarding projects that will result in loss of habitat and habitat functions for this species.

        i. Adopt existing fact sheets and BMP to minimize impacts to GWWA habitat. |FY13? $0 DES ESA NR Future

        ii. Post these fact sheets/BMP on website. |FY13? $0 DES ESA,IT NR,AFL Future

        iii. Write substantive comments on proposed Federal agency actions with likely adverse impacts to GWWA habitat. |FY12-FY13 $0 DES ESA,CPA NR,SLD Planned

b. Participate in the GWWA Atlas project - survey dates for New York are May 10 to June 15. (http://www.birds.cornell.edu/gowap/protocol.html). Send notification to office for those who may want to participate. |FY12? $0 DES ESA,CPA? NR Planned

c. Participate in early successional habitat meeting May 2011 hosted by Cornell University to discuss ways to conserve and maintain this habitat type and to prioritize species that utilize this habitat. |FY11 $0 DES ESA,PFW NR,CS,ER Complete

d. Review wind energy projects within the watershed to minimize impacts to this species. |FY12 $0 DES ESA,CPA NR,TRS,SLD Planned

e. Initiate discussions regarding a thorough inventory of potential grassland and early successional habitats to determine the most important sites to work on. This action has been worked on by others. Coordination with the GWWA Tug Hill working group is necessary to get updated site locations. |FY12? $0 DES ESA,PFW? NR,CS Planned

f. Create map or shapefile for possible GWWA sites for all New York Field Office (NYFO) programs. Contact Cornell University as they likely have this information. |FY12? $0 DES ESA NR Planned

g. Discuss the potential use of prescribed burning practices 5-7 year rotation to maintain GWWA habitat over time. |FY? $0 DES ESA,PFW? NR Future

2. **Hybridization with blue-winged warbler.**

   a. No strategy planned for the next 2-3 years.

3. **Interference or exploitation** by blue-winged warbler.

   a. No strategy planned for the next 2-3 years.

4. **Nest parasitism** by brown-headed cowbirds.

   a. No strategy planned for the next 2-3 years.

5. **Livestock overgrazing.**

   a. Discuss with PFW the potential to work with landowners to prevent livestock from entering breeding territories by fencing or some other method. |FY? $? DES ESA,PFW NR,CS Future

6. **Mowing and herbicide treatment** of woody areas (breeding season).

a. Recommend during project reviews to not mow or treat areas likely to support GWWA during breeding season, including ROW, along roadways, and utility ROW. |FY12 $0 DES ESA,CPA NR,SLD Planned

7. **Climate change.**

   a. Research is needed to determine future impacts related to climate change. Consult with Cornell University. |FY? $0 DES ESA NR Future

8. **Reduction in timber harvesting** in some areas.

   a. No strategy planned for the next 2-3 years.

9. **Loss of winter habitat.**

   a. No strategy planned for the next 2-3 years.

Partners/potential funding

Haudenosaunee Confederacy, USGS, NRCS, NYSDEC, County SWCDs, TNC, Audubon New York, Cornell Lab of Ornithology, Ithaca College, Wilson Ornithological Association, NYSDOT, utilities, PIF.

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats FY 2010 - 2012

1. **Loss of sufficient quantity/quality of habitat.**

   a. Work with NRCS to provide technical assistance on GWWA Initiative to restore habitat utilizing the Wildlife Habitat Incentives Program (WHIP). |FY? $0 DEL ESA,PFW? NR,CS? Future

   b. Participate in GWWA landowner meetings that are lead by Audubon New York and NRCS. These meetings focus on general GWWA biology and information on NRCS programs. Attend August 25, 2011, meeting. |FY11 $0 DEL ESA NR Completed

   c. Participate in future GWWA landowner meetings (dates and times are to be determined). |FY12? $0 DEL ESA NR Planned

   d. Promote PFW program at the landowner meetings. |FY12? $0 DEL ESA,PFW NR,CS Planned

   e. Evaluate restoration options during Natural Resource Damage Assessment and Restoration (NRDAR) (St. Lawrence Environment NRDA case) that account for scrub-shrub and GWWA habitat. |FY? $0 DEL ESA,EC NR,ALS? Future

f. Become a member of the Northeast PIF Working Group. |FY11 $0 DEL CPA SLD Completed

g. Become a member of the Tug Hill GWWA Working Group. |FY11 $0 DEL ESA NR Completed

2. **Hybridization** with blue-winged warbler.

   a. No strategies planned for the next 2-3 years.

3. **Interference or exploitation** by blue-winged warbler.

   a. No strategies planned for the next 2-3 years.

4. **Nest parasitism** by brown-headed cowbirds.

   a. No strategies planned for the next 2-3 years.

5. **Livestock overgrazing.**

   a. No strategies planned for the next 2-3 years.

6. **Mowing and herbicide treatment** of woody areas (highway power line ROW), especially during the breeding season.

   a. No strategies planned for the next 2-3 years.

7. **Climate change.**

   a. No strategies planned for the next 2-3 years.

8. **Reduction in timber harvesting** in some areas.

   a. No strategies planned for the next 2-3 years.

9. **Loss of winter habitat.**

   a. No strategies planned for the next 2-3 years.

Partners/potential funding:

Haudenosaunee Confederacy, USGS, NRCS, NYSDEC, County SWCDs, TNC, Audubon New York, Cornell Lab of Ornithology, Ithaca College, Wilson Ornithological Association, NYSDOT, utilities, PIF.

Golden-winged Warbler (*Vermivora chrysoptera*): St. Lawrence Focal Area

OUTREACH

1. Provide landowners with information regarding GWWA habitat requirements for consideration when managing their properties. |FY13? $0 DEL PFW CS Future

2. Educate landowners through attendance at the Audubon New York meetings (see Conservation Delivery).

MONITORING

- No on-the-ground projects are being planned in the next 2-3 years; therefore, there is no planned monitoring program in place.

References

Confer, John L. 1992. Golden-winged Warbler (*Vermivora chrysoptera*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/020.

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Robertson, Bruce and Kenneth V. Rosenberg. 2003. Partners In Flight Landbird Conservation Plan: Physiographic Area 24: Allegheny Plateau. Version 1.1: August 2003 (http://www.partnersinflight.org/bcps/plan/pl_24_10.pdf).

Existing strategies for GWWA restoration:

Please refer to the following document for existing strategies:

- NYSDEC Recovery Plan – Sterling Forest Bird Conservation Area (Orange Co.), John Thatcher BCA (Albany Co.), Letchworth Park (Livingston Co.). http://www.dec.ny.gov/animals/27024.html.

- Golden-winged Warbler Status Assessment and Conservation Plan http://web.utk.edu/~buehler/GWWAA/status.htm.

- The Nature Conservancy Species Management Abstract http://www.nbii.gov/portal/community/Communities/Ecological_Topics/Bird_Conservation/USFWS_Focal_Species/Golden-winged_Warbler/Distribution_&_Abundance/.

Golden-winged Warbler (*Vermivora chrysoptera*): St. Lawrence Focal Area

- Partners in Flight Bird Conservation Plan, Allegheny Plateau
  http://www.partnersinflight.org/bcps/plan/pl_24_10.pdf.

- Golden-winged Warbler Atlas Project
  http://www.birds.cornell.edu/gowap/why.html.

- Golden-winged Warbler Conservation Initiative.

- Partners in Flight Landbird Conservation Plan: Physiographic Area 15: Lower Great Lakes Plain (Dettmers and Rosenberg 2003).
  http://www.partnersinflight.org/bcps/plan/pl_18_10.pdf.

- New York State Comprehensive Wildlife Conservation Strategy (NYSDEC 2005).
  http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf.

- Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Region 13 (Atlantic Coast Joint Venture 2007).
  http://www.acjv.org/BCR_13/BCR13_Final_Plan_July07.pdf.

- Partners in Flight Landbird Conservation Plan (Rich et al. 2004).
  http://www.partnersinflight.org/cont_plan/default.htm.

- A Plan for Conserving Grassland Birds in New York," Final Report to NYSDEC (Morgan & Burger 2008).
  http://ny.audubon.org/PDFs/ConservationPlan-GrasslandBirds-NY.pdf.

Indiana Bat (*Myotis sodalis*): St. Lawrence Focal Area

Indiana Bat Species Action Plan

FOCAL AREA: ST. LAWRENCE

Other species benefitting:

eastern small-footed, little brown, tri-colored, northern, big brown

BIOLOGICAL PLANNING

Introduction to species

Species information: The Indiana bat typically hibernates in caves/mines in the winter and roosts under bark or in tree crevices in the spring, summer, and fall. Suitable potential summer roosting habitat is characterized by trees (dead, dying, or alive) or snags with exfoliating or defoliating bark, or containing cracks or crevices that could potentially be used by Indiana bats as a roost. The minimum diameter of roost trees observed to date is 2.5 inches for males and 4.3 inches for females. However, maternity colonies generally use trees greater than or equal to 9 inches d.b.h (diameter at breast height). Overall, roost tree structure appears to be more important to Indiana bats than a particular tree species or habitat type. Females appear to be more habitat specific than males presumably because of the warmer temperature requirements associated with gestation and rearing of young. As a result, they are generally found at lower elevations than males may be found. Roosts are warmed by direct exposure to solar radiation, thus trees exposed to extended periods of direct sunlight are preferred over those in shaded areas. However, shaded roosts may be preferred in very hot conditions. As larger trees afford a greater thermal mass for heat retention, they appear to be preferred over smaller trees. Additional information on potentially suitable summer habitat can be found on our website at http://www.fws.gov/northeast/nyfo/es/IndianaBatapr07.pdf.

Streams associated with floodplain forests and impounded water bodies (ponds, wetlands, reservoirs, etc.) where abundant supplies of flying insects are likely found provide preferred foraging habitat for Indiana bats, some of which may fly up to 2-5 miles from upland roosts on a regular basis. Indiana bats also forage within the canopy of upland forests, over clearings with early successional vegetation (*e.g.,* old fields), along the borders of croplands, along wooded fencerows, and over farm ponds in pastures (U.S. Fish and Wildlife Service [USFWS] 2007). While Indiana bats appear to forage in a wide variety of habitats, they seem to tend to stay fairly close to tree cover.

Justification for species selection: The Indiana bat is Federally- and New York State-listed as endangered. The New York Field Office (NYFO) has the Region 5 species lead.

State contribution to overall species population: New York used to have ~11% of wintering Indiana bats rangewide before White-nose syndrome (WNS). However, for now New York still has the largest number of wintering (and likely summering) Indiana bats in the region. The

Indiana Bat (*Myotis sodalis*): St. Lawrence Focal Area

USFWS has proposed recovery units in the draft recovery plan (Plan) (USFWS 2007) and New York is part of the Northeast Recovery Unit.

Threats and threat assessment:

Threats[24] (See 5-year review for full assessment):

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range: *See the Plan for in-depth discussion (USFWS 2007, page 71).*

A. Destruction and degradation of the bat's winter hibernacula (i.e., caves and mines) and summer habitat (i.e., forests) have been identified as long-standing and ongoing threats to the species.
B. Winter – potential to impact hibernacula with gas drilling, filling, etc.
C. Spring/summer (maternity colony roosts, travel corridors, foraging habitat) – residential and commercial development
D. Fall (swarming) – same pressures as spring/summer habitat

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes: *See the Plan for in-depth discussion (USFWS 2007, page 80).*

A. Human disturbance of hibernating bats was originally identified as one of the primary threats to the species and still remains a threat at several important hibernacula in the bat's range. The primary forms of human disturbance to hibernating bats result from cave commercialization (cave tours and other commercial uses of caves), recreational caving, vandalism, and research-related activities.

Factor C. Disease or predation: WNS is most significant threat in New York. Predation is also a threat.

Factor D. The inadequacy of existing regulatory mechanisms: *See the Plan for in-depth discussion (USFWS 2007, page 90).*

A. Generally, existing regulatory mechanisms are more effective at protecting Indiana bat hibernacula than summer habitat. Hibernacula are discrete and easily identified on the landscape, whereas summer habitat is more diffuse.

Factor E. Other natural or man-made factors affecting its continued existence: *See the Plan for in-depth discussion (USFWS 2007, page 91).*

A. Several natural factors have threatened the existence of local bat populations including flooding and freezing events at winter hibernacula. These natural events typically are not wide-spread, but rather associated with specific flood/freeze-prone sites.

[24] Refers to 5 listing factors A-E in Section 4 of Endangered Species Act

Indiana Bat (*Myotis sodalis*): St. Lawrence Focal Area

B. Anthropogenic factors that may affect the continued existence of Indiana bats include numerous environmental contaminants (e.g., organophosphate and carbamate insecticides, oil spills, and polychlorinated biphenyls [PCBs]), collisions with man-made objects (e.g., poorly constructed cave gates, vehicles, aircraft, communication towers, and wind turbines) and climate change.

Recovery Goals

Range-wide Recovery Goals/Objectives: Intermediate - reclassification, Long-term - delisting

Conservation goal(s) for New York State: The Plan does not have specific criteria for New York. However, New York has several P1 and P2 hibernacula and there are criteria for protecting 80% of P1 hibernacula in each Recovery Unit.

Research/Actions needed:

A. Reduce current threats at known hibernacula (Recovery Action 1.1.1) (primarily WNS-related actions – not included in recovery plan – WNS will eventually have a separate plan).

B. WNS-related research is needed to better understand the threat.

   1. Assist with requests for proposals (RFPs) as requested. |FY11-FY12 $0 BP ESA NR,RAN Ongoing
   2. Review proposals if requested to be on review team. |FY11-FY12 $0 BP ESA RAN,NR Ongoing
   3. Provide grant oversight for FY08 and FY09 projects. |FY11-FY12 $0 BP ESA RAN,NR Ongoing
   4. Assist with WNS-related research field work as requested. |FY11-FY12 $0 BP ESA RAN,NR Ongoing

C. Develop models of Indiana bat population dynamics as tools to assess progress towards recovery in different geographic areas, to determine sensitivities of various life history attributes contributing to population growth rates, and to evaluate the impact of catastrophic losses at key hibernacula on time to recovery (Recovery Action 3.1.6)

   1. Assist with Indiana bat demographic modeling shared decision-making (SDM) effort until completion (ESA).

      a. Respond to data requests from U.S. Geological Survey (USGS) and Region 3 (R3). |FY11 $0 BP ESA RAN Completed
      b. Participate in calls during demographic model Beta testing. |FY11-FY12 $0 BP ESA RAN Ongoing
      c. Attend workshop to test demographic model. |FY12 $0 BP ESA RAN Planned
      d. Assist with roll-out of demographic model. |FY12 $0 BP ESA RAN Planned

e. Provide technical assistance to Field Offices (FOs) with use of demographic model. |FY12-FY13 $0 BP ESA RAN Planned

D. Conduct research on the potential impacts of environmental contaminants on Indiana bats (Recovery Action 3.4)

1. Environmental Contaminants (EC) WNS research - send all samples out for analysis. |FY11 $0 BP EC ALS Completed
2. Environmental Contaminants (EC) WNS research - review and interpret contaminants results. |FY12 $0 BP EC ALS Planned

CONSERVATION DESIGN

Strategies for addressing those threats

Please go to these documents for the existing strategies:

- Draft Recovery Plan 2007 (USFWS 2007)
- Last 5-year review completed 2009 (USFWS 2009)

Research or Actions needed: Specific actions for the next 3 years addressing conservation design include the following:

A. Assist Region 3 with finalizing Recovery Plan as requested. |FY12 $0 DES ESA RAN Planned

B. Assist with National WNS Response (not included in recovery plan - WNS will eventually have a separate plan).

1. Support development of WNS National Plan

a. Provide technical assistance during USFWS and/or public review periods of WNS National Plan. |FY11 $0 DES ESA RAN,NR Completed
b. Participate in Communications Group. |FY11-FY13 $0 DES ESA NR Ongoing
c. Participate in Conservation and Recovery Working Group. |FY11-FY13 $0 DES ESA RAN,NR Ongoing

i. Develop Conservation and Recovery Implementation Plan. |FY11-FY12 $0 DES ESA RAN,NR Ongoing

2. Attend annual WNS Symposium. |FY11-FY13 $? DES ESA RAN,NR Ongoing

3. WNS-related research is needed to develop conservation strategies to respond to WNS.

a. Assist with WNS captive bat management structured decision making process. |FY11-FY12 $0 DES ESA RAN,NR Ongoing

C. Standardized approaches to evaluating wind projects and developing conservation measures are needed.

1. Participate in multi-region project to develop Indiana bat/wind guidance. |FY10-FY11 $0 DES ESA RAN Completed
2. Participate in team to update multi-region Indiana bat/wind guidance over time. |FY12-FY13 $0 DES ESA RAN Planned
3. Coordinate first R3, Regions 4 and 5 (R4, R5) threatened and endangered species wind call - 2/3/10). |FY10 $0 DES ESA RAN Completed
4. Participate in R5 Indiana bat wind guidance development. |FY11-FY13 $0 DES ESA RAN Ongoing

D. Develop guidance and template for how to complete a hibernacula management plan (Recovery Action 1.1.1.2.1)

1. Assist R3 with development of guidance for how to complete hibernacula management plan. |FY13 $0 DES ESA RAN Future

E. Develop standardized protocols for conducting telemetry (Recovery Action 2.7.2.1).

1. Participate in multi-region team to develop radio telemetry guidance. |FY11-FY12 $0 DES ESA RAN Ongoing

F. Develop standardized protocols for use of bat detection systems to survey for Indiana bats (Recovery Action 2.7.2.6)

1. Assist with funding automation of acoustic survey data analysis.

   a. Participate in Regional WNS funding discussions and promote funding of acoustic automation system. |FY10 $0 DES ESA RAN Completed
   b. Assist with USACE Phase 1 grant agreement for acoustic automation system. |FY10 $0 DES ESA RAN Completed

2. Determine whether netting guidelines should be revised to include acoustic detectors.

   a. Participate in multi-region Indiana bat/Wind Initiative survey protocol workgroup. |FY10 $0 DES ESA RAN Completed
   b. Participate in multi-region team to revise Indiana bat survey protocols. |FY11-FY12 $0 DES ESA RAN Ongoing
   c. Present revised draft Indiana bat survey protocols at Northeast Bat Working Group meeting. |FY12 $500 DES ESA RAN Planned

3. Assist New York State Department of Environmental Conservation (NYSDEC) with acoustic transect project.

    a. Conduct 1 acoustic transect route 2-3 nights. |FY10 $0 DES ESA RAN,NR Completed
    b. Conduct 1 acoustic transect route 2-3 nights if requested (not requested in FY11; ESA to coordinate). |FY12 $0 DES ESA RAN Planned

G. Determine land management practices that will increase or maintain suitability of habitat for maternity colonies of Indiana bats, and the impacts of habitat perturbations on persistence of maternity colonies (Recovery Action 3.3.9)

    1. Fund or otherwise coordinate wind project research

H. Regional coordination role

    1. Participate in R5 planning team to develop standardized roles/responsibilities for species leads as requested. |FY11 $0 DES ESA RAN Completed

    2. Act as Regional POC for Indiana bat issues and conduct the following activities.

        a. Provide updates to FOs on Indiana bat literature, information from other regions. |FY10-FY13 $0 DES ESA RAN Ongoing
        b. Provide technical assistance to FOs on Indiana bat formal consultations/Habitat Conservation Plans (HCPs). |FY10-FY13 $0 DES ESA RAN Ongoing
        c. Provide R5 comments on national issues (e.g., survey protocol updates). |FY10-FY13 $0 DES ESA RAN Ongoing
        d. Provide R5 Indiana bat end-of-year reporting info to R3. |FY10-FY13 $0 DES ESA RAN Ongoing
        e. Maintain understanding of current Indiana bat literature. |FY10-FY13 $0 DES ESA RAN Ongoing
        f. Participate in or provide technical assistance for WNS-related projects as needed. |FY10-FY13 $0 DES ESA RAN Ongoing
        g. Coordinate Regional review of Indiana bat permit conditions. |FY10-FY13 $0 DES ESA RAN Ongoing

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats FY 2010 - 2012

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Encourage activities that enhance or improve summer habitat on private lands (Recovery Action 2.1.3)

Indiana Bat (*Myotis sodalis*): St. Lawrence Focal Area

1. Army Compatible Use Buffer (ACUB) program has been initiated at Fort Drum. This is a great opportunity to target lands for protection that meet Town, Army, and conservation goals. Partners include Army, Ducks Unlimited (DU), Ontario Bays Initiative (OBI), NYSDEC

    a. Participate in ACUB meetings/calls to target Indiana bat lands. |FY10-FY13 $0 DEL ESA RAN Ongoing
    b. Provide technical assistance to Fort Drum with ACUB easement language. |FY11-FY13 $0 DEL ESA RAN Ongoing
    c. Complete consultation(s) on ACUB program. |FY11-FY13 $0 DEL ESA RAN Ongoing

B. Conserve and manage Indiana bats and their habitat on Federal lands (Recovery Action 2.2)

1. Fort Drum

    a. Ensure implementation of conservation measures of 2009-2011 Fort Drum Biological Opinion (BO) (also see Action 2.6)
    b. Participate in Fort Drum semi-annual Natural Resources Branch Meetings. |FY11-FY13 $0 DEL ESA RAN Ongoing
    c. Recognize the Army for assisting with recovery actions

        i. Nominate Fort Drum for Military Partnership Award - January 2010 [not awarded]. |FY10 $0 DEL ESA RAN Completed
        ii. Send Fort Drum recognition letter to Army. |FY11 $0 DEL ESA RAN Completed

    d. Assist Fort Drum with WNS research/monitoring

        i. Assist Fort Drum with capture and processing of bats at condo 1-3 nights. |FY10-FY11 $0 DEL ESA RAN,NR Completed

C. Encourage habitat protection through acquisition/easements

1. Provide technical assistance to NYSDEC for Recovery Land Acquisition grants. |FY11-FY13 $0 DEL ESA RAN Ongoing

2. Provide technical assistance to the Natural Resources Conservation Service (NRCS) for potential easements.

D. Minimize adverse impacts to Indiana bat during project reviews (Recovery Action 2.6)

1. Ensure implementation of conservation measures of existing BOs through follow up with Federal agency/project sponsor

a. Review annual reports for Fort Drum. |FY11-FY13 $0 DEL ESA RAN Ongoing
b. Review annual reports for Fort Drum Connector. |FY11-FY13 $0 DEL ESA RAN Ongoing

2. Habitat protection through informal and formal consultations and HCPs (NYFO ESA).

a. In coordination with R5 IPAC Team, develop conservation framework, including standard conservation measures, for residential and commercial projects. |FY11-FY13 $0 DEL ESA RAN Ongoing
b. Develop conservation framework, including standard conservation measures, for wind energy development projects (see Ibat Wind Guidance). |FY11-FY13 $0 DEL ESA RAN Ongoing
c. Complete St. Lawrence Wind consultation. |FY12 $0 DEL ESA RAN Ongoing
d. Complete consultation for 2012-2014 Fort Drum activities. |FY12 $0 DEL ESA RAN Planned

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes: No work planned for FY 2011.

Factor C. Disease or predation: Need to determine what conservation measures will be available for WNS-response.

Factor D. The inadequacy of existing regulatory mechanisms: No work planned for FY2011-FY2013.

Factor E. Other natural or man-made factors affecting its continued existence: Wind project work being addressed through consultations/HCPs (see above)

OUTREACH

A. Develop and implement outreach activities to enhance specific recovery tasks for the Indiana bat including development of guidelines, best management practices (BMP), land acquisition/easements efforts, landowner incentives programs, Endangered Species landowner programs, research activities, and Federal review activities. Employ appropriate communications goals and messages as outlined in comprehensive Indiana bat outreach plan. (Recovery Action 4.1)

B. Seek opportunities to raise awareness of the Indiana bat's special characteristics; foster a sense of appreciation for the bat, its habitat, and the unique life history of bats in general. (Recovery Action 4.2.3)

1. Current Indiana bat/WNS display

a. Rotate Indiana bat/WNS exhibit at nature centers. |FY10-FY11 $0 OUT ESA SLD Completed

b. Update Indiana bat/WNS exhibit at least once/year. (FY10-FY13 $0 OUT ESA RAN Ongoing

2. New bat and WNS exhibit

a. Provide technical assistance to the U.S. Forest Service (USFS) in the development of a new display. |FY10-FY11 $0 OUT ESA SLD Completed
b. Provide technical assistance to RO to finalize display text and formatting. |FY12 $0 OUT ESA SLD Planned

3. New Indiana bat cave exhibit

a. Develop new cave exhibit. |FY13 $? OUT ESA SLD Future

4. Attend meetings/workshops

a. Present information on bats at the Ithaca Sciencenter. |FY12 $0 OUT ESA RAN Completed
b. Present information on bats at Rice Creek. |FY12 $0 OUT ESA NR Completed

C. Use USFWS websites as a repository of information about the Indiana bat. This information should be organized so that it is easily located and accessible and specific to key audiences (i.e., educators, planners, industry representatives, consultants) (Recovery Action 4.2.5)

1. Update NYFO Indiana bat fact sheet and web materials. |FY10-FY13 $0 OUT ESA,IT RAN,AFL Completed

D. Assist with Freedom of Information Act (FOIA) responses as needed

1. Assist with WNS FOIA request. |FY11 $0 OUT ESA NR Completed

MONITORING

A. Survey winter populations of Indiana bats at known hibernacula (monitor status of sites/impacts of WNS) (Recovery Action 1.3.1)

1. Assist NYSDEC with 2010 hibernacula surveys at Glen Park. |FY10 $0 MON ESA RAN Completed
2. Assist NYSDEC with “Indiana bat on year” winter 2010-2011 surveys. |FY11 $0 MON ESA RAN Completed
3. Assist NYSDEC with 2012 hibernacula surveys at Glen Park. |FY12 $0 MON ESA RAN Planned

B. Review and track recovery progress. |FY10-FY13 $0 MON ESA RAN Ongoing

Indiana Bat (*Myotis sodalis*): St. Lawrence Focal Area

Partners

Partners - NYSDEC, R3, R4, R5 FOs, Montezuma National Wildlife Refuge (NWR), U.S. Army, USFS, New York State Department of Transportation (NYSDOT), Federal Highway Administration (FHWA), OBI, DU, USGS

References

U.S. Fish and Wildlife Service. 2007. Indiana Bat (*Myotis sodalis*) Draft Recovery Plan: First Revision. U.S. Fish and Wildlife Service, Fort Snelling, MN. 622 pp. (This document has been peer-reviewed and is available at http://www.fws.gov/midwest/Endangered/mammals/inba/index.html).

U.S. Fish and Wildlife Service. 2009. Indiana Bat 5-Year Review: Summary and Evaluation.

U.S. Fish and Wildlife Service, Bloomington, IN.

Lake Sturgeon (*Acipenser fulvescens*): St. Lawrence Focal Area

Lake Sturgeon Species Action Plan

FOCAL AREA: ST. LAWRENCE

Other species benefitting:

American eel, walleye, redhorse/white suckers, mooneye

BIOLOGICAL PLANNING

Introduction to species

Species information: Lake sturgeon is a long-lived, late-maturing species that inhabits large river and lake systems primarily in the Mississippi River, Hudson Bay, and Great Lakes basins. Lake sturgeon are the only sturgeon species endemic to the Great Lakes basin and are the largest freshwater fish indigenous to that system. Lake sturgeon can be considered a nearshore, warm water species with water temperature and depth preferences of low 50s to mid-60ºF and 15-30 feet, respectively. Lake sturgeon are benthivores, feeding on small invertebrates such as insect larvae, crayfish, snails, clams, and leeches. Life history characteristics of lake sturgeon are unique with respect to other fishes. Females mature between 14 and 33 years, males between 8 and 12 years. Spawning occurs only once every 2-7 years for males and 4-9 years for females. As a consequence of interrupted spawning cycles, only 10-20% of adult lake sturgeon within a population spawns during a given season. Spawning occurs on clean, gravel shoals and stream rapids from April to June in preferred water temperatures of 55-60ºF. The typical life-span of lake sturgeon is 55 years for males and 80-150 years for females.

Justification for species selection: In the past, sturgeon have comprised an important biological component of the Great Lakes fish community. By the early 1900s many populations of lake sturgeon throughout their range had been greatly reduced or extirpated as a result of overfishing, habitat loss, the construction of dams, and reduced water quality. Within the Great Lakes basin, the lake sturgeon population is estimated to be at 1% of historic abundance levels. Lake sturgeon are listed as either threatened or endangered by 19 of the 20 states within its original range in the United States. In New York State and the Province of Ontario, lake sturgeon are listed as a threatened species. In addition, the lake sturgeon is a Federal trust species and has been identified as a priority species under the New York Field Office (NYFO) - Fish Enhancement, Mitigation, and Research Fund (FEMRF).

State contribution to overall species population: Currently there are remnant populations of lake sturgeon occurring in Upper Niagara River/Lake Erie, Lower Niagara River, St. Lawrence River (middle corridor), St. Lawrence River (lower corridor), and the Grasse River. Among these remnant populations we see varying population trends, ranging from populations that are recovering to populations that remain very low, but apparently stable. Within the State, the populations maintaining themselves today are recognized as being in five geographic units, contrasted to more than 12 units historically. The New York State Department of Environmental Conservation (NYSDEC) Lake Sturgeon Recovery Plan states the goal of maintaining these

5 units and restoring populations in three other units. The NYSDEC has stocked 6 waterbodies in efforts to establish populations in three other units.

Research needed:

- Conduct surveys to determine current population levels and presence/absence. |FY? $0 BP FMF SS Future

  (Who: NYSDEC, U.S. Geological Survey [USGS], Ontario Ministry of Natural Resources [OMNR], and U.S. Fish and Wildlife Service [USFWS] (Lower Great Lakes Fish and Wildlife Conservation Office [LGLFWCO/NYFO]) to assist with lake sturgeon surveys to determine presence/absence and population densities, coupled with habitat investigation and evaluation of stocking initiatives; Cost: NYFO staff time)

- Assist with the completion of a New York State Lake Sturgeon Management Plan. |FY? $0 BP FMF SS Future

  (Who: USFWS [NYFO], NYSDEC, USGS, and Cornell University to assist with completion of New York State Lake Sturgeon Management Plan to address recovery, habitat restoration strategies and population goals; Cost: NYFO staff time)

Threats and threat assessment:

1. **Loss of Spawning Habitat.**

   Research needed:

   - Conduct surveys to determine quantity and quality of known spawning habitat. |FY? $0 BP FMF SS Future

   - Identify and prioritize areas for habitat restoration and enhancement. |FY? $0 BP FMF SS Future

2. **Barriers to Migration** (including dams and impassable culverts).

   Research needed:

   - Identify barriers having an influence on lake sturgeon spawning migration and prioritize barrier removal. |FY? $0 BP FMF SS Future

   - Conduct surveys to determine available sturgeon spawning habitat above existing barriers, in regards to both quantity and quality of habitat present. |FY? $0 BP FMF SS Future

3. **Contaminants.**

   Research needed:

   - Investigate the effects of contaminants on the survival and reproductive success of lake sturgeon, specifically the effects from polychlorinated biphenyls (PCBs), mirex, dioxin, mercury, and emerging contaminants. |FY? $0 BP EC,FMF ASR,ALS,SS Future

4. **Invasive Species (and associated disease transmission).**

   Research needed:

   - Determine the effects invasive species have on lake sturgeon populations, including the disease transmission pathway and effects of type-E botulism. |FY? $0 BP FMF SS Future

5. **Climate change; changes in riverine discharge regimes.**

   Research needed:

   - Identification of climate change related impacts to lake sturgeon. |FY? $0 BP FMF SS Future

Partners/potential funding

USFWS (LGLFWCO), USGS, OMNR, St. Regis Mohawk Tribe, NYSDEC, New York Power Authority (NYPA), Cornell University, State University of New York-College of Environmental Science and Forestry (SUNY-ESF).

Population goal(s) for New York State:

Currently, several agencies have published three population goals for lake sturgeon in the Lake Ontario/St. Lawrence River basin and these goals vary. The NYSDEC Lake Sturgeon Recovery Plan states the goals are to increase the number of naturally reproducing sturgeon populations in New York to 8 (up from 5) and the removal of the species from State-listing. The Great Lakes Fishery Commission stated goals are the rehabilitation of lake sturgeon populations including the expansion of sturgeon populations into favorable habitats and to enhance sturgeon spawning habitat. Their metric for success is based on a catch per unit effort (CPUE) of 0.1 sturgeon/net/night; CPUE rates observed from 2000 to 2007 ranged from 0 to 0.06 sturgeon/net/night. The OMNR, in a draft Lake Sturgeon Rehabilitation Plan, state goals as conserve and/or rehabilitate the existing self-sustaining lake sturgeon spawning populations with a minimum target of at least 750 sexually mature sturgeon in each system. This number was selected because it represents the minimum number thought to be present in remnant Great Lakes populations that are considered to be either stable or increasing in abundance. Although

population goals have not been established for New York, the NYFO will continue to collaborate with partners to establish target population goals for the Lake Ontario/St. Lawrence River basin.

CONSERVATION DESIGN

Strategies for addressing those threats

1. **Loss of spawning habitat**.

    a. Seek to minimize loss of spawning habitat by influencing regulatory agency decisions regarding locating/operating hydroelectric power generating facilities, stream alterations/fill, dredging, and poor agricultural practices. |FY12 $0 DES CPA SPP,TRS,SLD Ongoing

    b. Target habitat restoration and enhancement projects to benefit lake sturgeon including spawning substrate additions and enhancements (Partners for Fish and Wildlife [PFW] and NYPA). |FY? $0 DES FMF,PFW SS,CS Future

    c. Facilitate habitat preservation in riverine systems with confirmed lake sturgeon spawning through coordination with land trusts or non-governmental organizations. |FY? $0 DES FMF SS Future

    d. Promote habitat restoration projects that control sediment entering riverine environments and reduce quality of spawning habitat. |FY? $0 DES FMF,PFW SS,CS Future

    e. Conduct surveys to determine current population levels and presence/absence. |FY12 $0 DES FMF SS Ongoing

    f. Facilitate reintroduction of lake sturgeon to their known former range. |FY12 $0 DES FMF SS Ongoing

2. **Barriers to migration** (including dams and impassable culverts).

    a. Seek to minimize loss of spawning habitat by influencing regulatory agency decisions regarding locating/operating hydroelectric power generating facilities, stream alterations/fill, dredging, and poor agricultural practices. |FY12 $0 DES CPA SPP,TRS,SLD Ongoing

    b. Work with partners to identify, prioritize, and remove sturgeon barriers. |FY12 $0 DES FMF,PFW SS,CS Ongoing

    c. Work with partners to investigate and implement methods of reintroduction of sturgeon to restored riverine systems. |FY? $0 DES FMF SS Future

3. **Contaminants.**

    a. Investigate the effects of contaminants on the survival and reproductive success of lake sturgeon, specifically PCBs, mirex, dioxin, mercury, and emerging contaminants. |FY? $0 DES EC,FMF ASR,ALS,SS Future

    b. As part of GLRI, evaluate emerging contaminants at the Rochester Embayment AOC and other AOC opportunities (potential 2010-2013). |FY11-FY13 $0 DES EC DG,ASR Ongoing

    c. Continue to manage St. Lawrence River NRDAR case. |FY11-FY13 $0 DES EC ALS Ongoing

    d. Seek to minimize loss of habitat due to contamination by influencing regulatory agency decisions related to State and Federal Superfund sites. |FY11-FY13 $0 DES EC ASR Ongoing

    e. Respond as appropriate to spills impacting fish and wildlife resources. |FY12-FY14 $0 DES EC ALS Planned

4. **Invasive Species (and associated disease transmission).**

    a. Determine the effects invasive species have on lake sturgeon populations, including the disease transmission pathway and effects of type-E botulism. |FY? $0 DES FMF SS Future

5. **Climate change; changes in riverine discharge regimes.**

    a. Identify potential effects to lake sturgeon spawning habitat and water quality. |FY? $0 DES FMF SS Future

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY2012-2015

1. **Loss of spawning habitat and habitat function.**

    a. Seek to minimize loss of spawning habitat by influencing regulatory agency decisions regarding locating/operating hydroelectric power generating facilities, stream alterations/fill, dredging, and poor agricultural practices.

        i. Provide substantive comments on proposed Federal agency actions with likely adverse impacts on lake sturgeon (Conservation Planning Assistance [CPA]). |FY12 $0 DEL CPA TRS,SLD Ongoing

b. Target habitat restoration and enhancement projects to benefit lake sturgeon including spawning substrate additions and enhancements (PFW and NYPA).

   i. Work with NYPA to locate and place up to two spawning substrate beds below the St. Lawrence Power Project (NYPA-Habitat Improvement Project funding) (CPA/FEMRF). |FY12 $0 DEL CPA,FMF SPP,SS Ongoing

   ii. Work with NYFO-PFW and NYSDEC to identify locations to place spawning substrate beds in tributaries to the St. Lawrence River (FEMRF funding) (FEMRF, PFW). |FY12 $0 DEL FMF,PFW SS,CS Ongoing

   iii. Manage St. Lawrence Environment NRDA case and consider lake sturgeon restoration projects in settlement negotiations regarding that case (EC). |FY12-FY13 $0 DEL EC ALS Ongoing

c. Facilitate habitat preservation in riverine systems with confirmed lake sturgeon spawning through coordination with land trusts or non-governmental organizations.

   i. Work towards developing a NYFO FEMRF Geographic Information Systems (GIS) Decision Support Tool to focus preservation efforts. Kick-off meeting scheduled for January 26/27 (NYFO FEMRF funding) (FEMRF) [Kick-off meeting completed FY11]. |FY12 $0 DEL FMF SS Ongoing

   ii. Work with Thousands Islands Land Trust (TILT) and Save the River towards identifying parcels to preserve (NYFO FEMRF funding). |FY12 $0 DEL FMF SS Ongoing

d. Promote habitat restoration projects that also control sediment entering riverine environments.

   i. Work with USDA-NRCS to focus their programmatic efforts to reduce sediment input and agricultural run-off (USDA-NRCS funding). |FY12 $0 DEL FMF,PFW SS,CS Ongoing

e. Conduct surveys to determine current population levels and presence/absence.

   i. Assist NYSDEC and USGS with surveys to determine current population levels of lake sturgeon and determine presence/absence of the species (FEMRF). |FY12 $0 DEL FMF SS Planned

f. Facilitate reintroduction of lake sturgeon to their known former range.

   i. Facilitate the writing of a New York State Lake sturgeon management plan (FEMRF funding) (NYSDEC, USGS, FEMRF). [FY11 - NYSDEC will write]. |FY? $0 DEL FMF SS Future

ii. Assist the NYSDEC on annual lake sturgeon gamete collection for sturgeon propagation. NYFO-FEMRF to provide equipment, assistance with Investigational New Animal Drugs (INAD) permits, and field assistance. (FEMRF funding) (FEMRF). |FY12 $0 DEL FMF SS Planned

iii. Assist the NYSDEC with 5-year population assessments through providing field assistance and PIT tagging supplies (FEMRF funding, $10K) (FEMRF). |FY12 $0 DEL FMF SS Planned

2. **Barriers to migration** (including dams and impassable culverts).

a. Seek to minimize loss of spawning habitat by influencing regulatory agency decisions regarding locating/operating hydroelectric power generating facilities, stream alterations/fill, dredging, and poor agricultural practices.

i. Provide substantive comments on proposed Federal agency actions with likely adverse impacts on lake sturgeon (CPA). |FY12 $0 DEL CPA TRS,SLD Ongoing

ii. In addition, provide passage recommendations related to the relicensing of hydroelectric power generating facilities on tributaries to the St. Lawrence River, specifically the Oswegatchie River (Eel Weir Dam and Heuvelton Dam) (CPA). |FY12 $0 DEL CPA SPP Ongoing

b. Work with partners to prioritize, identify, and remove sturgeon barriers.

i. Work towards developing FEMRF GIS Decision Support Tool to prioritize tributaries for restoration activities (FEMRF funding) (FEMRF). |FY12 $0 DEL FMF SS Ongoing

ii. NYFO FEMRF to conduct multi-year barrier assessments on 3 tributaries of the St. Lawrence River per year and make recommendations for removal (USFWS Fish Barrier Assessment and Mitigation Project; FEMRF funding, $162K) (FEMRF). |FY12 $0 DEL FMF SS Planned

iii. NYFO PFW to remove up to 3 additional fish barriers per year (FEMRF/PFW). For FY2011: work on Sucker Brook (FEMRF funding) (PFW) - FY11 Completed. |FY12 $0 DEL FMF,PFW SS,CS Ongoing

c. Work with partners to investigate and implement methods of reintroduction of sturgeon to restored riverine systems.

i. Investigate egg stocking, streamside hatchery systems, and stocking to determine most cost-effective and ecologically sound method to reintroduce lake sturgeon to their known former range (NYSDEC, FEMRF). |FY12 $0 DEL FMF SS Ongoing

Lake Sturgeon (*Acipenser fulvescens*): St. Lawrence Focal Area

3. **Environmental Contaminants.**

   a. Investigate the effects of contaminants on the survival and reproductive success of lake sturgeon, specifically polychlorinated biphenyls (PCBs), mirex, dioxin, mercury, and emerging contaminants.

      i. Facilitate the investigation of the effects of contaminants on the survival and reproductive success of lake sturgeon (FEMRF, NRDAR, GLRI funding). |FY? $0 DEL EC,FMF ASR,ALS,SS Future

   b. As part of GLRI, evaluate emerging contaminants at the Rochester Embayment AOC and other AOC opportunities (potentially 2010-2013).

      i. Conduct study on emerging contaminants in soil, water, and fish of Rochester Embayment AOC to determine potential impacts to fish and wildlife Trust resources and their supporting habitats, with potential for including the St. Lawrence AOC in subsequent years (FY2010-2013). |FY11-FY13 $0 DEL EC DG,ASR Ongoing

      ii. Coordinate with USEPA and AOC Remedial Action Committees on future directions with objective of improving and restoring habitat for Trust resources dependent on USEPA funding FY2011-2013) (EC). |FY11-FY13 $0 DEL EC DG,ASR Ongoing

   c. Continue to manage St. Lawrence River NRDAR case.

      i. Consider lake sturgeon restoration projects during St. Lawrence River NRDA restoration planning (EC, FEMRF). |FY11-FY13 $0 DEL EC,FMF ALS,SS Ongoing

   d. Seek to minimize loss of habitat due to contamination by influencing regulatory agency decisions related to State and Federal Superfund sites.

      i. Provide substantive Federal agency comments on proposed actions with likely adverse impacts to lake sturgeon and/or their habitat. |FY11-FY13 $0 DEL EC ASR Ongoing

4. **Invasive Species (and associated disease transmission).**

   a. Determine the effects invasive species have on lake sturgeon populations, including the disease transmission pathway and effects of type-E botulism. |FY? $0 DEL FMF SS Future

      i. No work identified at this time.

Lake Sturgeon (*Acipenser fulvescens*): St. Lawrence Focal Area

5. **Climate change; changes in riverine discharge regimes.**

    a. Identify potential effects to lake sturgeon spawning habitat and water quality resulting from climate change and related changes in riverine discharge. |FY? $0 DEL FMF SS Future

OUTREACH

Host NYS Lake Surgeon Working Group meeting (FEMRF). |FY11 $0 OUT FMF SS Completed

Update the FEMRF webpage with "ongoing projects" on our website. |FY12 $0 OUT FMF SS Ongoing

Assist NYSDEC with lake sturgeon placard placement and fishermen education. |FY? $0 OUT FMF SS Future

MONITORING

- Work with partners to monitor lake sturgeon habitat restoration and enhancement projects, including spawning substrate additions and use of habitat post-removal of barriers. |FY? $0 MON FMF SS Future

- Monitor status and contribution to the population of stocked eggs/sturgeon as part of reintroduction strategy. |FY? $0 MON FMF SS Future

- Establish benchmarks for success based on New York State Lake Sturgeon Management Plan (pending). |FY? $0 MON FMF SS Future

Partners

USFWS (LGLFWCO), USGS, OMNR, St. Regis Mohawk Tribe, NYSDEC, NYPA, Cornell University, SUNY-ESF

References

Bouton, D. 1994. A Recovery Plan for Lake Sturgeon (*Acipenser fulvescens*), NYSDEC publication.

Carlson, D. 2000. A Recovery Plan for the Lake Sturgeon in New York State, NYSDEC publication, updated.

LaPan, S.R., A. Mathers, T.J. Stewart, R.E. Lange, S.D. Orsatti. 2002. Fish-Community Objectives for the St. Lawrence River. Great Lakes Fish. Comm. Spec. Pub. 2002 http://www.glfc.org/lakecom/loc/slrfco.

Lake Sturgeon (*Acipenser fulvescens*): St. Lawrence Focal Area

Farrell, J.M., R. Colesante, D. Dittman, J. Johnson. 2009. Lake Sturgeon Population Enhancement as a Strategy for Improvement of Ecosystem Function and Controlling Invasive Species. Final Report. Submitted to the USFWS in fulfillment of a FEMRF award.

Northern Pike (*Esox lucius*): St. Lawrence Focal Area
St. Lawrence Focal Area

Northern Pike Species Action Plan

FOCAL AREA: ST. LAWRENCE

Other species benefitting:

muskellunge, pugnose shiner, waterfowl/waterbirds

BIOLOGICAL PLANNING

Introduction to species

Species information: Northern pike are ambush predators found in freshwater throughout the northern hemisphere. Females mature between 3-4 years, males between 2-3 years. Spawning takes place late March to early April, eggs are broadcast over submergent aquatic vegetation or seasonally flooded terrestrial vegetation.

Justification for species selection: Northern pike populations in the St. Lawrence River/Lake Ontario Basin have declined dramatically. Water level regulation related to the St. Lawrence Seaway (Seaway) and St. Lawrence Power Project has resulted in stabilized water levels with reduced spring flooding (both volume and duration). This condition has also potentially facilitated the expansion of invasive cattail resulting in dense, monotypic stands that afford little habitat value for the species. Northern pike are considered an inter-jurisdictional species and have been listed as a priority species by both the New York State Department of Environmental Conservation (NYSDEC) and the Ontario Ministry of Natural Resources (OMNR). Consequently, the New York Field Office (NYFO) has listed the species as a priority under the Fish Enhancement, Mitigation, and Research Fund (FEMRF) and with partners, is currently implementing a habitat conservation strategy for the species.

State contribution to overall species population: Northern pike are found in freshwater throughout the northern hemisphere, including Russia, Europe, and North America. It has also been introduced to lakes in Morocco and is even found in the brackish water of the Baltic Sea.

Within North America, there are northern pike populations in North Dakota, South Dakota, Minnesota, Michigan, Montana, Maryland, West Virginia, Wisconsin, Indiana, Connecticut, Massachusetts, Vermont, Iowa, northern New Mexico, Arizona, Illinois, New York, New Jersey, Idaho, and northern New England; most of Canada, particularly Alberta, Saskatchewan, Manitoba, Ontario, and Québec (northern pike are rare in British Columbia and east coast provinces), Alaska; and the Ohio Valley, the upper Mississippi River and its tributaries, the Great Lakes Basin and surrounding states, Missouri, Kansas, Nebraska, Colorado, and parts of Oklahoma. They are also stocked in, or have been introduced to, some western lakes and reservoirs for angling purposes, although this practice often threatens other species of fish such as bass, trout, and salmon causing government agencies to exterminate the northern pike by poisoning the lakes.

Northern Pike (*Esox lucius*): St. Lawrence Focal Area
St. Lawrence Focal Area

Threats and threat assessment:

1. **Water level regulation** associated with the Seaway and hydropower development.

2. **Habitat loss -** stabilized water levels that have allowed invasive cattail to form dense, monotypic stands of little habitat value and timed to prevent overwintering of muskrats which may naturally control density of cattails.

   Research needed:

   - Surveys to establish baseline population levels and to set goals for restoration of population. |FY? $0 BP FMF SS Future

3. **Habitat loss –** barriers (culverts) preventing access to suitable spawning/nursery areas and cutting off flow to parts of marshes.

   Research needed:

   - Surveys to determine available spawning habitat (quality/quantity). |FY? $0 BP FMF SS Future

   - Discern population movement of northern pike along the river; if discreet populations exist, should be reflected in translocation/stocking program if implemented. |FY? $0 BP FMF SS Future

4. **Land use practices/stream bank erosion –** increases nutrient/sediment input reducing suitable SAV (replaced with lower quality SAV, invasive species, filamentous algae) and reducing water quality in embayments.

   Research needed:

   - Genetics work to determine if discreet populations exist in different areas of the river. |FY? $0 BP FMF SS Future

5. **Invasive species.**

   Research needed:

   - Investigate impacts associated with invasive species and contaminants, currently limited information available. |FY? $0 BP FMF SS Future

6. **Contaminants.**

   Research needed:

   - Fish health studies needed to determine:

     - Cause of skewed ratio of males/females. |FY? $0 BP EC ? Future

- Decreased sperm production in males. |FY? $0 BP EC ? Future

- Contaminants - Assess the effects of contaminants on northern pike, especially at Great Lakes Areas of Concern (AOCs) and Confined Disposal Facilities. |FY? $0 BP EC ? Future

  (Who: NYSDEC, NYFO, U.S. Environmental Protection Agency [USEPA] through the Great Lakes Restoration Initiative [GLRI]; Cost: NYFO staff time)

- Determine impacts related to invasive species and contaminants. |FY? $0 BP EC ? Future

7. **Climate change -** potential to affect spawning habitat and egg/fry survival. |FY? $0 BP FMF SS Future

Partners/potential funding

NYSDEC, OMNR, U.S. Department of Agriculture – Natural Resources Conservation Service (USDA-NRCS), State University of New York – College of Environmental Science and Forestry (SUNY-ESF), New York Sea Grant (NYSG), Ducks Unlimited (DU), Save The River (STR), Thousand Island Land Trust (TILT)

CONSERVATION DESIGN

Strategies for addressing those threats

1. **Address water level regulation effects associated with Seaway and hydropower development.**

   a. Attend/participate on the Lake Ontario-St. Lawrence River Study Working Group to work towards a revised water regulation plan (CPA/FEMRF). |FY12 $0 DES CPA,FMF SPP,SS Ongoing

   b. Seek to influence regulatory agencies by providing substantive comments on agency actions (e.g., U.S. Army Corps of Engineers [USACE] 404 permits, Federal Energy Regulatory Commission [FERC] relicensing, and license compliance work) (CPA). |FY12 $0 DES CPA,FMF SPP,SS Ongoing

   c. Provide substantive comments on the following projects with the conservation of northern pike and their recovery as one of our foci (CPA/FEMRF). |FY12 $0 DES CPA SPP Ongoing

      i. Massena Electric Department (proposed hydropower). |FY11 $0 DES CPA SPP Completed

      ii. Eel Weir Dam (hydropower relicensing – provide substantive comments). |FY12 $0 DES CPA SPP Ongoing

iii. Heuvelton Dam (hydropower relicensing – provide substantive comments). |FY12 $0 DES CPA SPP Ongoing

2. **Address habitat loss due to stabilized water levels that have allowed invasive cattail to form dense, monotypic stands with little habitat value.**

   a. Continue efforts with partners to effect positive habitat change. |FY12 $0 DES FMF,PFW SS,CS Ongoing

      i. FEMRF activities –

         - Implement all phases of the Fish Habitat Conservation Strategy (PFW). |FY? $0 DES FMF SS Future

         - Continue FEMRF efforts towards pursuing and funding sound proposals that would contribute to northern pike recovery (FEMRF, PFW). |FY12 $0 DES FMF,PFW SS,CS Ongoing

         - Work with FEMRF funded contractors to determine marshes with highest potential (FEMRF, PFW). |FY12 $0 DES FMF,PFW SS,CS Ongoing

         - Promote/plan/fund marsh evaluations/public outreach (FEMRF). |FY12 $0 DES FMF SS Ongoing

      ii. Coordinate efforts with other organizations/agencies to address habitat loss due to stabilized water levels (FEMRF). |FY12 $0 DES FMF SS Ongoing

      iii. Work with partners to identify tools; evaluate whether tools are having desired results.

      iv. Participate in Great Lakes Landscape Conservation Cooperatives (LCC) and Great Lakes Fish Habitat Partnership (FEMRF). |FY12 $0 DES FMF SS Ongoing

      v. Attend meetings with other organization/agencies to gain insight into their efforts towards northern pike habitat restoration (e.g., American Fisheries Society [AFS]) (FEMRF). |FY12 $0 DES FMF SS Ongoing

3. **Address habitat loss due to stream barriers that prevents access to suitable spawning/nursery areas and prevents adaptation to climate change and warmer water temperatures.**

   a. Continue Fish Barrier Assessment & Mitigation project (FEMRF). |FY12 $0 DES FMF SS Planned

   b. Initiate Stream Habitat Survey/Fish Response project proposal; working in conjunction with Fish Barrier Assessment & Mitigation project (FEMRF). |FY12 $0 DES FMF SS Planned

4. **Address poor land use practices that degrade water quality and fish habitat (i.e. increased nutrient/sediment input, reduced suitable submergent aquatic vegetation, invasive species, and filamentous algae).**

    a. Work in conjunction with the NRCS and the local Soil and Water Conservation District to provide technical assistance on agricultural best management practices (BMPs), including cattle exclusion fencing and stream bank restoration in the watershed (FEMRF/PFW). |FY12 $0 DES FMF,PFW SS,CS Ongoing

    b. Seek to influence regulatory agencies by providing substantive comments on agency actions (e.g., NRCS State Technical Committee) (CPA). |FY12 $0 DES CPA TRS,SLD Ongoing

5. **Invasive Species.**

    a. Investigate impacts associated with invasive species and contaminants; currently limited information available. |FY? $0 BP FMF SS Future

6. **Contaminants.**

    a. Evaluate U.S. Fish and Wildlife Service (USFWS) Natural Resource Damage Assessments (NRDA) along the Great Lakes. |FY11-FY13 $0 DES EC ASR,ALS Ongoing

    b. As part of the Great Lakes Restoration Initiative (GLRI), evaluate emerging contaminants at the Rochester Embayment AOC and other AOC opportunities (potentially FY 2010 – 2014). |FY11-FY13 $0 DES EC DG,ASR Ongoing

    c. Seek to minimize loss of habitat, due to contamination, by influencing regulatory agency decisions related to State and Federal Superfund sites. |FY11-FY13 $0 DES EC ASR Ongoing

    d. Respond as appropriate to spills impacting fish and wildlife resources. |FY12-FY14 $0 DES EC ALS Planned

    e. Other strategies may result from research need noted above.

7. **Climate Change.**

    a. Potential to affect spawning habitat and egg/fry survival. |FY? $0 BP FMF SS Future

Partner organizations:

NYSDEC, OMNR, USDA-NRCS, SUNY-ESF, NYSG, DU, STR, TILT

Northern Pike (*Esox lucius*): St. Lawrence Focal Area
St. Lawrence Focal Area

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY 2010 - 2012

1. **Address water level regulation effects associated with Seaway and hydropower development**.

    a. Attend/participate on the Lake Ontario-St. Lawrence River Study Working Group to work towards a revised water regulation plan (CPA/FEMRF). |FY12 $0 DEL CPA,FMF SPP,SS Ongoing

2. **Address habitat loss due to stabilized water levels which have allowed invasive cattail to form dense, monotypic stands with little habitat value.**

    a. Continue efforts with partners to effect positive habitat change (FEMRF, SUNY-ESF, DU, TILT). |FY12 $0 DEL FMF,PFW SS,CS Ongoing

        i. Complete Blind Bay project (PFW).

            - Construct four culverts across two causeways in Blind Bay – FY 2011 ($50,000). |FY11 $0 DEL FMF,PFW SS,CS Completed

            - Using amphibious excavator, construct sinuous channels through dense cattail marsh to enhance water quality and flow and provide access to northern pike spawning/nursery habitat (Blind Bay) (FEMRF/PFW). |FY12 $0 DEL FMF,PFW SS,CS Planned

            - Create oxbow-like sections of the new channels to encourage carex/juncus species diversity. See "monitoring" for monitoring component (Blind Bay). |FY12 $0 DEL FMF,PFW SS,CS Planned

        ii. Continue work in French Creek marsh to open up mono-typical stand of typha to increased flow/provide access to the marsh by northern pike. For FY2011: 2,320 feet (PFW/FEMRF). |FY11 $0 DEL FMF,PFW SS,CS Completed

        iii. Continue work on Grindstone Island projects (FEMRF/PFW).

            - Club Island – re-open channels connecting Flynn Bay with St. Lawrence River. |FY11 $0 DEL FMF,PFW SS,CS Completed

            - Delaney Bay marsh – re-open historic channels through dense cattail marsh to enhance water quality and flow and provide access to northern pike spawning/nursery habitat (PFW). |FY11 $0 DEL FMF,PFW SS,CS Completed

        iv. Begin work in Chippewa Bay marshes to open up mono-typical stand of typha to increase flow/provide access to the marsh by northern pike (FEMRF/PFW). |FY12 $0 DEL FMF,PFW SS,CS Planned

v. Continue to identify restoration sites for future restorations (FEMRF/PFW). |FY12 $0 DEL FMF,PFW SS,CS Ongoing

3. **Address habitat loss due to stream barriers which: prevent access to suitable spawning/nursery areas and prevents adaptation to climate change and warmer water temperatures.**

   a. Continue Fish Barrier Assessment & Mitigation project. FY 2011 – 2013 ($167,000) (PFW). FY2011 work on three stream systems: Barretts, Mullett, Brandy [Completed – FY11). FY 2012 work on minimum of three additional stream systems to be named (FEMRF/PFW). |FY12 $0 DEL FMF,PFW SS,CS Planned

      i. Mitigate significant barriers that have been identified (FEMRF/PFW). |FY12 $0 DEL FMF,PFW SS,CS Planned

      ii. Work to obtain funding for Stream Habitat Survey/Fish Response project. |FY12 $0 DEL FMF SS Planned

4. **Address poor land use practices which degrade water quality and fish habitat (i.e. increased nutrient/sediment input, reduced suitable submergent aquatic vegetation, invasive species, and filamentous algae).**

   a. Work in conjunction with the NRCS and the local Soil and Water Conservation District to provide technical assistance on agricultural best management practices (BMPs), including cattle exclusion fencing and stream bank restoration in the watershed (FEMRF/PFW). |FY12 $0 DEL FMF,PFW SS,CS Ongoing

   b. Seek to influence regulatory agencies by providing substantive comments on agency actions (e.g., NRCS State Technical Committee) (CPA). |FY12 $0 DEL CPA TRS,SLD Ongoing

5. **Invasive Species.**

   a. Investigate impacts associated with invasive species and contaminants; currently limited information available. |FY? $0 DEL FMF SS Future

6. **Contaminants.**

   a. Evaluate and prioritize USFWS NRDAs along the Great Lakes.

      i. Manage St. Lawrence NRDA River case. |FY11-FY13 $0 DEL EC ALS Ongoing

      ii. Consider northern pike restoration projects in settlement negotiations regarding the case (FY2010-2013) (EC). |FY11-FY13 $0 DEL EC ALS Ongoing

   b. As part of the GLRI, evaluate emerging contaminants at the Rochester Embayment AOC and other AOC opportunities (potentially 2010 – 2013).

i. Conduct pilot study on emerging contaminants in soil, water, and fish of Rochester embayment AOC to determine potential impacts to fish and wildlife Trust resources and their supporting habitats, with potential for including the St. Lawrence AOC in subsequent years (FY 2010-2013) (EC). |FY11-FY13 $0 DEL EC DG,ASR Ongoing

ii. Coordinate with USEPA and AOC Remedial Action Committees on future directions with objective of improving and restoring habitat for Trust resources (dependent on USEPA funding: FY 2011-2013) (EC). |FY11-FY13 $0 DEL EC DG,ASR Ongoing

c. Seek to minimize loss of habitat due to contamination by influencing regulatory agency decisions related to State and Federal Superfund sites.

i. Provide substantive Federal agency comments on proposed actions with likely adverse impacts to northern pike and/or their habitat, including impacts due to contaminants (FY 2010-2013) (CPA). |FY12 $0 DEL EC,CPA ALS,TRS,SLD Ongoing

d. Other actions may result from research need noted above.

7. Climate Change.

a. Potential to affect spawning habitat and egg/fry survival. |FY? $0 BP FMF SS Future

OUTREACH

Partner agency NYSG – Fish Habitat Fact Sheet Series (FEMRF funded product as part of Fish Habitat Conservation Strategy). |FY11 $0 DEL FMF SS Completed

Assist landowners in identifying suitable habitat on their properties, threats to those habitats, and references for technical assistance in implementing habitat improvement projects (FEMRF, PFW). |FY12 $0 DEL FMF,PFW SS,CS Ongoing

Media news release – work with Regional Office to establish media news release and fact sheet detailing projects and information for interested landowners and general public (FEMRF/PFW). |FY12 $0 DEL FMF,PFW SS,CS Ongoing

Establish storylines and information on Regional and NYFO webpage, detailing projects and information for interested landowners and general public (FEMRF/PFW). |FY12 $0 DEL FMF,PFW SS,CS Ongoing

MONITORING

Done by partner agency SUNY-ESF (see below)

Northern Pike (*Esox lucius*): St. Lawrence Focal Area
St. Lawrence Focal Area

Monitor fish barrier removal effectiveness at Little Sucker Brook (PFW). |FY11 $0 DEL FMF SS Completed

- Habitat restoration projects must be evaluated using consistent protocols for measuring "success", including determining contribution to changes in population numbers. |FY12 $0 DEL FMF SS Ongoing

- Projects need to be monitored to ensure that invasive species do not colonize newly restored habitat. |FY12 $0 DEL FMF SS Ongoing

- Projects need to be monitored to evaluate effectiveness with respect to longevity of reestablishment of diverse native vegetation. |FY12 $0 DEL FMF SS Ongoing

- Coordinate with SUNY-ESF who is conducting monitoring studies on stream/marsh restoration projects. |FY12 $0 DEL FMF SS Ongoing

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UPPER HUDSON FOCAL AREA

The Upper Hudson Focal Area (UHFA) is located in central-eastern New York and contains approximately 2,941 square miles or 5.4% of the state. The focal area is largely demarcated by the drainage area tributary to the Hudson River above the Rensselaer-Columbia county line, excluding the Mohawk River Basin. The southern portion of Lake Champlain and its immediate tributaries are also included. The UHFA contains the former glacial Lake Albany where, in a widened, irregular Hudson River Valley, is present with a local relief of 25-200 feet. Additionally, the focal area contains the Taconic Foothills and portions of the Taconic Mountains with a local relief of 50-600 feet. Overall elevation ranges are 0-700 feet in the Hudson River Valley and 500-1500 feet in the Taconic Region. This focal area is characterized by the presence of the non-tidal portion of the Hudson River, formerly extensive areas of glacially-derived sand plains now represented by the Albany Pine Bush, and generally complex, varied topography where the Mohawk and Hudson River valleys separate the Adirondack, Catskill, and Taconic Mountains.

The Hudson River stretches from the Adirondack Mountains to the Battery in Manhattan and is one of the largest watersheds in the eastern United States. More than 8,000,000 people live within this corridor, and it has historically been and is currently one of the major transportation and commercial centers in the country. All of, or portions of, seven New York counties are included within the UHFA boundary including Albany, Rensselaer, Schenectady, Saratoga, Washington, Warren, and Essex counties. Approximately 800,000 people live within this focal area, concentrated primarily in the Capital District cities of Albany, Schenectady, and Troy as well as in Saratoga Springs and Glens Falls. Land uses are predominately urban and industrial near the major population centers with associated suburban areas transitioning to agricultural corn and hay production for the dairy industry in the Hudson River Valley. Forest predominates in the surrounding mountains.

This focal area was selected because it contains significant habitats for trust resource and endangered species. There are currently three Federally-listed species (endangered [E], candidate [C]) and five identified species of concern within the focal area. As part of Bird Conservation Region 13 (Lower Great Lakes/St. Lawrence Plain) and Partners in Flight Physiographic Area 17 (Northern Ridge and Valley), this focal area supports significant habitat for waterfowl and waterbirds, including American black duck. In BCR 13, there has been a net loss of 2.3 million acres of early-successional habitats since the 1970s, resulting in declines in bird species dependent upon this habitat type. The UHFA still retains agricultural lands important to these birds, such as American woodcock and field sparrow. New England cottontail (C) also depends upon these early-successional habitats. The Upper Hudson River focal area includes sand plains from glacial Lake Albany that provide habitat for the Karner blue butterfly (E). Forests, forested wetlands, and the variety of other habitats in the UHFA are also important habitats for Indiana bat (E) and the State-listed Blanding's turtle (T). Over 7,000 miles of streams also support remnant populations of once widespread brook trout populations.

The New York Field Office actively seeks to promote the above resources by addressing issues related to interactions with industry, transportation, hydropower, wind power, contaminants (PBCs and mercury), and development. Specific threats include habitat loss, land conversion, fish barriers, habitat succession, invasive species, decreased habitat complexity, degraded water quality, and climate change. Current projects include the Hudson River Natural Resource Damage Assessment (NRDA), Federal and non-federal permit review for hydroelectric and wind power development and relicensing, endangered species consultation and recovery activities, and habitat restoration and invasive species control implemented by the Partners for Fish and Wildlife.

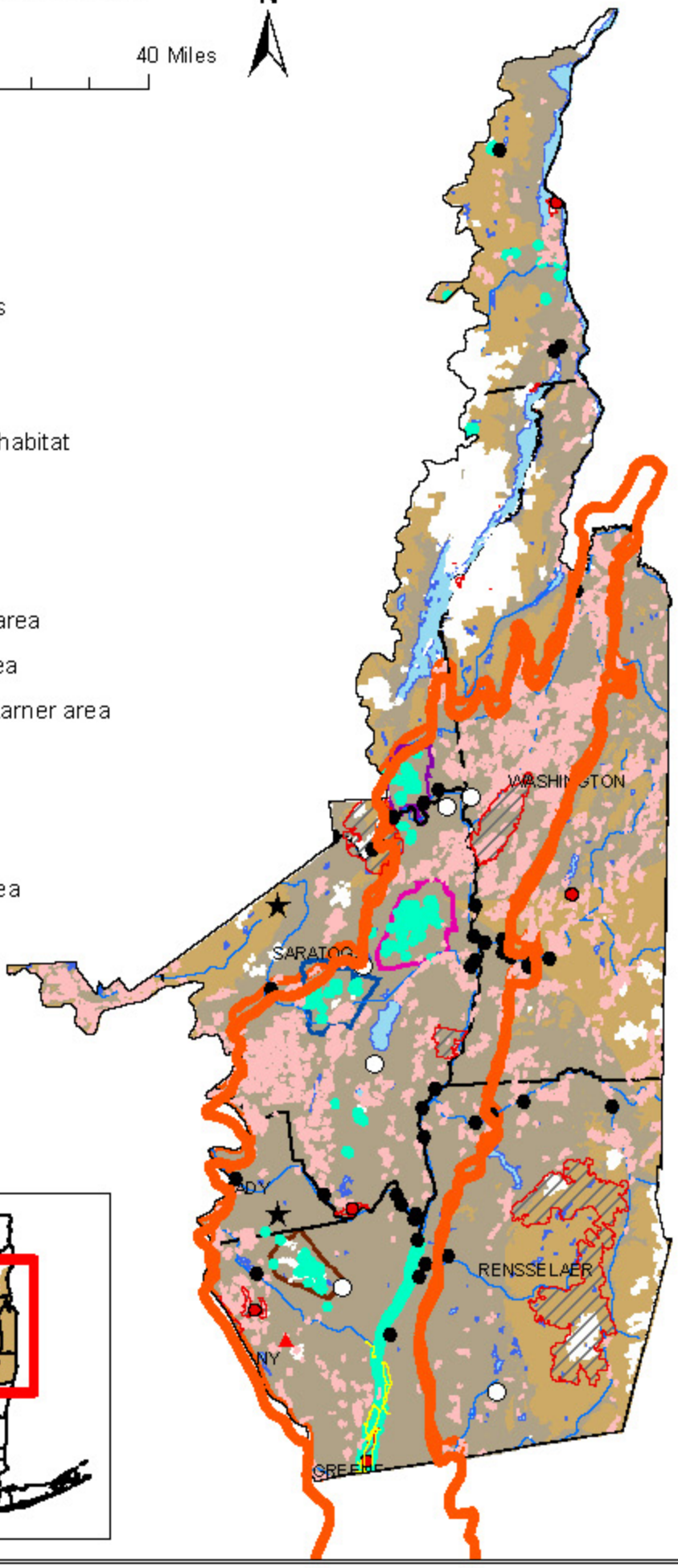
Upper Hudson Focal Area

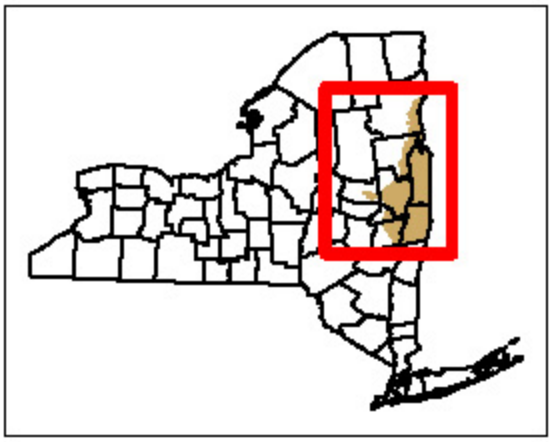
0 10 20 40 Miles

N

Legend

- NPL Sites
- Wind turbines
- Hydro projects
- Bird conservation areas
- Hawkwatch sites
- Important bird areas
- Black duck, woodcock habitat
- Endangered species
- Protected lands
- Albany pine bush
- Saratoga west Karner area
- Queensbury Karner area
- Saratoga Sandplains Karner area
- Karner habitat
- Lakes
- Indiana bat habitat
- Upper Hudson focal area





American Black Duck (*Anas rubripes)*: Upper Hudson Focal Area

American Black Duck Species Action Plan

FOCAL AREA: UPPER HUDSON

Other species benefitting:

American bittern, bald eagle, king rail, least bittern, waterfowl (canvasback, common goldeneye, Greater and lesser scaup, long-tailed duck)

BIOLOGICAL PLANNING

Introduction to species

Species information: The American black duck (black duck) was once a common breeder in the U.S. portion of Bird Conservation Region (BCR) 13 (the Lower Great Lakes/St. Lawrence Plain including the upper Hudson River Valley), but densities have dramatically declined over the years with the conversion and subsequent destruction of forested wetlands. Black ducks breed in a variety of North American wetlands, including freshwater wetlands created by beaver (*Castor canadensis*); brooks lined by speckled alder (*Alnus incana*); lakes, ponds, and bogs throughout mixed hardwood and boreal forests; and, salt marshes. Migrants eat seeds, foliage, and tubers of aquatic plants, seeds and fruits of terrestrial species, and a variety of invertebrates, agricultural grains, and occasionally fish and amphibians.

Justification for species selection: The black duck was chosen as a priority species because of its importance in the northeast as well as in New York. The black duck is a New York State Species of Greatest Conservation Need and is also rated High-High in the Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain BCR 13 (USFWS 2007). The high continental concern and precipitous decline in the northeast make freshwater wetlands and their relationship to local agriculture a key conservation concern. (Dettmers and Rosenberg 2003).

The Lower Great Lakes Plain population is estimated at 200 pairs in freshwater wetland habitat, with populations declining at approximately 15% per year (Dettmers and Rosenberg 2003).

State contribution to overall species population: Range extends across New York in freshwater habitat.

Research needed:

- Develop GIS tools to determine how much habitat remains.

  (Who: New York Field Office [NYFO], Ducks Unlimited [DU] to assist with wetland surveys to determine presence/absence and population densities, coupled with habitat investigation; Cost: use existing staff)

American Black Duck (*Anas rubripes)*: Upper Hudson Focal Area

- Need to complete population modeling and habitat suitability indices to ascertain how much habitat is needed and where.

  (Who: U.S. Fish and Wildlife Service [USFWS] [Ralph Tiner] and Buffalo District, U.S. Army Corps of Engineers [USACE]; Cost: unknown at this time)

- Design a regional management program, including increased coordination among managers and biologists, to prevent duplication of research efforts and to share current information (Fish and Wildlife Information Needs System [FWINS]).

- Regional monitoring program to provide better abundance and population trend information needed for secretive wetland birds.

  (Who: Audubon, Cornell Lab of Ornithology, NYFO (GIS); Cost: use existing staff)

- Evaluate habitat requirements, including nest site characteristics, water quality, and minimum wetland area needed during breeding.

  (Who: State University of New York – College of Environmental Science and Forestry [SUNY-ESF], Audubon, Cornell Lab of Ornithology)

Threats and threat assessment:

1. **Loss of habitat and habitat function.** Loss of sufficient quality/quantity habitat within the basin due to water level alternations, draining, dredging, filling, pollution (including combined sewer overflows [CSO]), acid rain, agricultural practices, siltation, and invasive species).

   Research needed:

   - Need to characterize habitat loss.

   - Analyze existing areas of wetland habitat and recently altered wetland landscapes to determine potential breeding areas.

   - Develop GIS tools to determine how much high value habitat remains and how much is needed and where

   - Characterize loss in habitat function (i.e. determine the cause).

   - Investigate wetland management alternatives that provide a variety of habitat conditions suitable to the needs of black ducks.

2. **Invasive species.** Invasive species, such as *Lythrum salicaria or Phragmites australis,* have impacts on wetland habitat, potentially adversely affecting black ducks.

Research needed:

- Complete population modeling and habitat suitability indices to quantify invasive species' impacts on black duck productivity.
- Assess the extent and nature of infestation by invasives (Natural Heritage, The Nature Conservancy [TNC], and other data gathering institution).
- Evaluate effects of invasive plants.
- Develop GIS tools to determine how much habitat remains free of invasives
- Need to characterize habitat loss due to invasives (i.e. what is causing it).

3. **Hybridization with mallards.** Hybridization between mallards (*Anas platyrhynchos*) and black ducks has been linked as one cause of the decline of the black duck (Ankney et al. 1987).

   Research needed:

   - Assess the extent of hybridization within New York (Natural Heritage, TNC, and other data gathering institution).

4. **Climate change.** Most existing climate change models predict less runoff and therefore lower water levels in the region.

   Research Needed:

   - Assess changes in habitat community structure
   - Determine climate change impacts on prey base during breeding season.

5. **Public use** (recreational disturbances).

6. **Environmental contaminants.** Assess the effects of contaminants on black ducks, especially at Areas of Concern (AOC) and Confined Disposal Facilities that are used by black ducks. |FY? $0 BP EC ? Future

7. **Changes in prey base** during breeding season.

Population goal(s) for New York State:

No New York-specific objectives have been articulated in the Joint Venture plans due to lack of reliable population estimates for most of the species in this habitat suite; numerical population and habitat-area objectives have not been determined (Dettmers and Rosenberg 2003).

American Black Duck (*Anas rubripes)*: Upper Hudson Focal Area

Research needed:

- To determine the population management goal for New York, work with the Division of Migratory Birds and local partners (Audubon, Cornell, etc.) to determine appropriate goal for Great Lakes in New York.

CONSERVATION DESIGN

Strategies for addressing the threats

1. **Loss of habitat.**

   a. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding wetland draining, agricultural practices that diminish wetland values for wildlife, and dredging and placement of fill in wetlands with a focus on coastal wetlands.

   b. Target USFWS habitat restoration and enhancement projects to benefit black ducks.

   c. Participate in the New York State Wetlands Forum (NYSWF) to coordinate wetland restoration/protection activities that would benefit black ducks.

   d. Consider black duck habitat restoration in NRDARs.

   e. Facilitate habitat preservation through coordination with land trusts.

   f. Preserve, restore, and/or enhance freshwater wetlands in Atlantic Coast Joint Venture (ACJV) and North American Waterfowl Management Plan (NAWMP) in breeding areas and migratory corridors.

   g. Protecting all remaining habitat. Use GIS or develop new tools to help identify and target, especially the wetlands that have the highest potential to produce black ducks.

2. **Loss of habitat function** (values diminished).

   a. Seek to minimize loss of habitat function when habitat is degraded by adjacent land uses by influencing regulatory agency decisions.

3. **Invasive Species**

   a. Target invasive species control projects on wetland sites that would benefit black ducks. Seek to minimize success of invasives colonization in habitat along Upper Hudson River.

   b. Determine how agency water management schedules may impact colonization of invasive species.

4. **Environmental contaminants.**

    a. Seek to minimize loss of habitat, due to contamination, by influencing regulatory agency decisions related to State and Federal Superfund sites. |FY11-FY13 $0 DES EC ASR Ongoing

    b. Evaluate USFWS NRDAR along the Upper Hudson River. |FY12-FY13 $0 DES EC DG Planned

    c. Respond as appropriate to spills impacting fish and wildlife resources. |FY12-FY14 $0 DES EC ALS Planned

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY 2010 - 2012

1. **Loss of habitat.**

    a. Influence regulatory agency decisions regarding wetland draining, agricultural practices that diminish wetland values for wildlife, and dredging and placement of fill in wetlands by:

    b. Meet with Natural Resources Conservation Service (NRCS) to assess potential Wetland Reserve Program (WRP) sites in Washington County (Partners for Fish and Wildlife [PFW]). |FY11-FY13 $0 DEL PFW CS Ongoing

        i. Develop fact sheets and best management practices (BMP) to minimize impacts to black ducks.

        ii. Post these fact sheets/BMP on our website.

        iii. Write substantive comments on proposed Federal agency actions with likely adverse impacts on black ducks.

        iv. Develop a poster for the New York State Wetlands Forum (NYSWF) which targets black duck conservation.

        v. Work with partners and fellow trustee agencies, identify habitat that could be restored using NRDAR funds associated with the Hudson River case.

    c. Influence regulatory agency decisions regarding siting, construction, and operation of wind turbines proposed for the Great Lakes watershed by:

        i. Develop fact sheets and BMP to minimize impacts to black ducks and other waterfowl.

ii. Post these fact sheets/BMP on our website.

2. **Loss of habitat function** (values diminished).

   a. Influence regulatory agency decisions regarding wetland draining, agricultural practices that diminish wetland values for wildlife, dredging, and placement of fill in wetlands by:

      i. Develop fact sheets and BMP to minimize impacts to black ducks.

      ii. Post these fact sheets/BMP on our website.

      iii. Write substantive comments on proposed Federal agency actions with likely adverse impacts on black ducks.

3. **Invasive species.** Project ideas can be developed once more information is available about causes of and remedies to invasives species invasion.

4. **Environmental contaminants.**

   a. Seek to minimize loss of habitat, due to contamination, by influencing regulatory agency decisions related to State and Federal Superfund sites.

      i. Manage assessment for USFWS for the Hudson River NRDAR; monitor waterfowl PCB levels and determine potential injuries (Environmental Contaminants. |FY12 $0 DEL EC KJ Planned

      ii. Coordinate Hudson River PCBs Site BTAG activities to maximize potential for a remedy which protects wildlife, with USEPA (2011 – 2013 [EC]). |FY11-FY13 $0 DEL EC ASR Ongoing

   b. Evaluate and prioritize USFWS NRDA along the Upper Hudson River.

Partners/potential funding

Haudenosaunee Confederacy, U.S. Geological Survey (USGS), NRCS, NYSDEC, County Soil and Water Conservation Districts (SWCD), TNC, DU, Audubon New York, Cornell Lab of Ornithology, New York State Department of Transportation (NYSDOT), New York Power Authority (NYPA), universities.

OUTREACH

- Landowner education

- Public involvement - Create Outdoor Classroom wetland projects in the Upper Hudson watershed

American Black Duck (*Anas rubripes)*: Upper Hudson Focal Area

MONITORING

- Develop protocols to measure success of all conservation delivery activities.
- Work with Partners to identify leads for accomplishing monitoring activities.
- Develop BMP from results of monitoring to inform future black duck population restoration activities.

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Zimpfer, N.L., Rhodes, W.E., Silverman, E.D., Zimmerman, G.S., and M.D. Kone. 2009. Trends in Duck Breeding Populations, 1955-2009. USFWS, Laurel, MD

American Black Duck (*Anas rubripes)*: Upper Hudson Focal Area

http://www.fws.gov/migratorybirds/NewReportsPublications/PopulationStatus/Trends/Trend%20Report%202009.pdf.

Existing strategies for American black duck restoration:

Please refer to the following document for existing strategies:

- Partners in Flight Landbird Conservation Plan: Physiographic Area 18: St. Lawrence Plain (Rosenberg 2000). (http://www.blm.gov/wildlife/plan/pl_18_10.pdf).

- NYS Comprehensive Wildlife Conservation Strategy (NYSDEC 2005). (http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf).

- Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Region (USFWS 2007). (http://www.acjv.org/BCR_13/BCR13_Final_Plan_July07.pdf).

- North American Waterfowl Management Plan: Strategic Guidance (2004). http://www.fws.gov/birdhabitat/NAWMP/files/NAWMP2004.pdf.

- North American Waterfowl Management Plan: Implementation Framework (2004). http://www.fws.gov/birdhabitat/NAWMP/files/ImplementationFramework.pdf.

- North American Waterfowl Management Plan: UMR/GL Region Joint Venture Implementation Plan (1998). http://www.fws.gov/midwest/NAWMP/documents/WaterfowlManagementPlan.pdf.

- North American Waterfowl Management Plan: Atlantic Coast Joint Venture Implementation Plan (2005). http://www.acjv.org/wip/acjv_wip_main.pdf.

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American Woodcock (*Scolopax minor)*: Upper Hudson Focal Area

American Woodcock Species Action Plan

FOCAL AREA: UPPER HUDSON

Other species benefitting:

American black duck, mallard, Canada warbler, willow flycatcher, wood duck (scrub-shrub wetlands); brown thrasher, field sparrow, golden-winged warbler, blue-winged warbler, northern oriole, northern flicker, prairie warbler, ruffed grouse, red-headed woodpecker, song sparrow (shrub/early successional habitat); wood turtle, New England cottontail

BIOLOGICAL PLANNING

Introduction to species

Species information: This shorebird species, also known as timber doodle, is a popular game bird. It is a migratory species, nesting in young forests and old fields; courtship displays and nesting span a 6 month period beginning in mid-winter in the south and extending into June in the north (Keppie & Whiting 1994). Across its northern range, woodcock appear to be the earliest migrant species to breed. It is strongly associated with both upland and wetland habitat types in BCR13. Woodcock are most abundant where available habitats include a mix of fields or openings, forests of different ages, and feeding habitat with moist soils and high shrub cover.

Justification for species selection: Since woodcock surveys began in 1966, it is estimated that woodcock numbers have declined 1% annually within their geographic range. Land-use changes such as wetland drainage and land conversion from early succession to mature forest are likely causes of population declines. However, hunter harvest may contribute, as roughly two million birds are shot annually. As a result, national and international bird conservation organizations consider the American woodcock a species of continental concern, and protecting the woodcock is a high priority in its habitat ranges. The American woodcock was chosen as a priority species because of its importance in the eastern U.S. as well as in New York. It is ranked "High" (H) on the BCR 13 list of "Priority Bird Species in Bird Conservation Regions partially or wholly within the Atlantic Coast Joint Venture". It is ranked as highly imperiled in the Northern Atlantic Regional Shorebird Plan, and is identified as a "Bird in Trouble" in the Eastern Forest in the North American Bird Conservation Initiative's 2009 report, "The State of the Birds, United States of America."

The population estimate for this species for the U.S. and Canada is 5,000,000, with no estimate available of the population in BCR 13 (Rich et al. 2004).

There has been a loss of over 829,000 singing male woodcock since the early 1970s (Kelley et al. 2008). According to Breeding Bird Survey data during the period from 1966-2002 (NYSDEC 2005), in New York, the American woodcock has exhibited a precipitous decline of 64% over this time period.

American Woodcock (*Scolopax minor)*: Upper Hudson Focal Area

State contribution to overall species population: Woodcock are managed on the basis of two regions or populations, Eastern and Central (Cooper 2008), with New York in the eastern population. Singing-ground survey data for the eastern region for 1998-2008 indicate no significant trend in the population (Cooper 2008); however, in New York the species has declined. Annual spring surveys of their breeding grounds show that woodcock numbers in the eastern flyway and in New York have been falling by about 2 percent since the 1960s - a loss of over 55 percent in the last 40 years. The New York State Department of Environmental Conservation (NYSDEC) manages for early successional species on several Wildlife Management Areas (WMA) or Bird Conservation Areas (BCA).

The woodcock's range extends across New York in upland and wetland habitats. Relatively high concentrations of woodcock can found in WMA and BCA in the eastern Adirondacks, Lower Hudson, St. Lawrence Valley, and Central and Western New York.

Threats and threat assessment:

1. **Loss of habitat and habitat function.** The woodcock's decline is attributed to loss of upland and wetland habitat due to development, succession, and forest maturation. In addition, the reduction in forestry practices, especially in riparian areas (critical for breeding and migrating), contributes to loss of woodcock. In BCR 13 there has been a net loss of 2.3 million acres (0.9 million hectares [ha]) of early-successional habitats since the 1970s, resulting in declines in bird species such as American woodcock that utilize this habitat type. Loss of sufficient quality/quantity habitat within the focal areas and the function the habitat provides has adversely affected this species. As the rate of change from farmland into young growth forests increases, there is a decrease in quantity and quality of habitat for this species (NAS 2009).

2. **Decline in food supply** (i.e. earthworms) from changes in soil pH due to acid deposition (NAS 2009).

   Research needed:

   - Per McAuley et al. 2005, specific research is needed to evaluate if low recruitment observed on northeast sites is caused by contaminants, habitat fragmentation, or habitat degradation (such as decline in food supply).

3. **Contaminants**. Lead contamination that is either ingested as shot or ingested through contaminated earthworms after being spread through the food chain adversely affects this species (NAS 2009). Other contaminants also may adversely affect this species.

   Research needed:

   - Determine extent of lead contamination in current and potential habitat areas by conducting a literature review and, if necessary, conducting limited soil sampling. |FY? $0 BP EC ? Future

- Determine impacts of other contaminants on American woodcock by conducting a literature review. |FY? $0 BP EC ? Future

4. **Climate change.** Early successional habitat sequesters more carbon than mature forest. Climate change effects could include decreased water levels in rivers and lakes, changes in seasonal climate that could shift migration patterns of birds such as woodcock, and changes in food availability. Additional research would be needed to determine impacts due to climate change.

   Research needed:

   - Research is needed to determine the effects of climate change on this species.

Population goal(s) for New York State:

In New York, based on singing-ground surveys, there is a deficit of 72,249 males that would be needed to restore the population to 1970s levels. Of this, in BCR 13, there is a deficit of 51,804 males that would be needed to restore the population to 1970s levels. To restore woodcock densities in BCR 13 to those observed during the early 1970s, a total of nearly 3.6 million acres (1.4 million ha) of new woodcock habitat needs to be created. In BCR 13, the vast majority of timberland is under private ownership. Therefore, State and Federal resource agencies will need to enlist the help of individual and commercial private forestland owners in order to achieve habitat-management goals. This is a tremendous amount of acreage to manage and will require a monumental undertaking and cooperation from a diverse group of parties, as well as considerable monetary investment (Kelley et al. 2008).

Management Objectives for the Population:

- Halt population declines by 2012 as measured by Singing Ground Surveys

- Have positive population growth by 2022

  Note: Woodcock are banded from late spring through early fall. Birds are weighed, sexed, aged, and their bills are measured, and then each bird is banded. The U.S. Geological Survey (USGS) maintains a toll-free number so that banded birds that are recovered can be reported. Band return data are used to estimate population sizes and determine migration routes.

Overall Goal:

To halt the decline of woodcock populations and to return them to densities which provide adequate opportunity for utilization of the woodcock resource.

American Woodcock (*Scolopax minor)*: Upper Hudson Focal Area

Management Objectives for Habitat for This Species:

- Halt decline of early successional habitat by 2012 (includes creation of 4.7 million acres of new habitat per year)

- To increase early successional habitat by 2022

CONSERVATION DESIGN

Strategies for addressing those threats

In 2001, Federal and State wildlife agencies, along with non-governmental organizations (NGO) including the Wildlife Management Institute (WMI), the Association of Fish and Wildlife Agencies, and the Ruffed Grouse Society (RGS), formed the Woodcock Task Force. Since then, using funding from the National Fish and Wildlife Foundation which is administered by the WMI, biologists and land managers have developed a Woodcock Conservation Plan.

1. **Loss of habitat and habitat function.**

    a. Influence regulatory agency decisions regarding proposed development, agricultural practices, etc., that result in loss of habitat and habitat functions for this species.

    b. Target U.S. Fish and Wildlife Service (USFWS) habitat creation, restoration, and enhancement projects to benefit woodcock.

        i. Use Natural Resource Damage Assessment and Restoration (NRDAR) funds to accomplish habitat restoration and protection using guidance found in Woodcock Conservation Plan.

        ii. Work with land trusts to target woodcock conservation.

        iii. In creating woodcock habitat, consider the management recommendation of the National Audubon Society (NAS) 2009 (appended to the end of this document). Facilitate habitat preservation through coordination with land trusts (Partners for Fish and Wildlife [PFW]).

        iv. Use geospatial tools to:

            - Analyze existing areas of habitat to determine potential breeding areas;

            - Analyze breeding bird survey data to focus efforts; and,

            - Create map for possible woodcock sites of concern.

2. **Decline in food supply.**

    a. Strategy will depend upon results of research need noted above.

3. **Contamination.**

    a. Use Natural Resource Damage Assessment and Restoration (NRDAR) funds to accomplish habitat restoration and protection using guidance found in Woodcock Conservation Plan. |FY? $0 DES EC ? Future

    b. Evaluate USFWS NRDAR along the Upper Hudson River. |FY12-FY13 $0 DES EC ALS,DG Planned

    c. Seek to minimize loss of habitat due to contamination by influencing regulatory agency decisions related to State and Federal Superfund sites. |FY12-FY13 $0 DES EC ASR Planned

    d. Strategy will depend upon results of research need noted above.

4. **Climate change.**

    a. Strategy will depend upon results of research noted above.

Partners/potential funding

RGS, WMI, USGS, Natural Resources Conservation Service (NRCS), National Park Service, NYSDEC, County Soil and Water Conservation Districts (SWCD), The Nature Conservancy (TNC), Audubon New York, Cornell Lab of Ornithology, New York State Department of Transportation (NYSDOT), universities.

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats FY 2010 - 2012

1. **Loss of habitat and habitat function.**

    a. Provide substantive Federal agency comments on proposed Federal agency actions with likely adverse impacts to woodcock and/or their habitat.

    b. Prioritize permit review in early successional habitat types or areas that have the potential for restoration.

    c. Develop Fact Sheets with best management practices (BMP) to minimize impacts to woodcock, and use these to influence landowners regarding habitat needs of this species. In developing BMPs, consider the management recommendation of the NAS 2009 (appended to the end of this document).

d. Post on New York Field Office (NYFO) web site Fact Sheets with BMP to minimize impacts to woodcock and/or their habitat.

e. Provide technical assistance to NRCS for Wetlands Reserve Program (WRP) for the restoration and conservation of habitat that would also be suitable for woodcock.

f. Work with partners (USC, RGS, NYSDEC, National Wildlife Refuges [NWR], etc.) to enhance/create early successional habitat within the Focal Area.

g. Restore 100 acres of early successional habitat within the St. Lawrence, Upper Susquehanna, Upper Hudson, and Great Lakes Focal Areas. |FY11-FY13 $20,000 DEL PFW EJR Planned

2. Decline in food supply.

a. Delivery will depend upon strategy determined from research noted above.

3. Contamination.

a. Manage assessment for USFWS for the Hudson River NRDAR; assess avian injury for the Hudson River NRDAR, including peer review of avian studies (Environmental Contaminants. |FY12 $0 DEL EC KJ Planned

b. Coordinate Hudson River PCBs Site Biological Technical Assistance Group activities to maximize potential for a remedy that protects wildlife, with USEPA. |FY12-FY13 $0 DEL EC ASR Planned

4. Climate change.

a. Delivery will depend upon strategy determined from research noted above.

Partners/potential funding

To implement the Woodcock Conservation Plan, Woodcock Habitat Regional Initiatives have been set up: Northern Forest Initiative, Appalachian Mountains Initiative, and Upper Great Lakes Initiative. These initiatives are partnerships of agencies and organizations in geographic areas within the woodcock's range. None of these encompass the Upper Hudson River Focal Area or the St. Lawrence Focal Area.

Partners in the Woodcock Conservation Plan include: Connecticut Woodcock Council, Minnesota Woodcock, Woodcock Limited of Pennsylvania, Golden-Winged Warbler Working Group, RGS, and WMI. Other potential partners include: USGS, NRCS, National Park Service, NYSDEC, County SWCD, TNC, Audubon New York, Cornell Lab of Ornithology, NYSDOT, universities.

American Woodcock (*Scolopax minor)*: Upper Hudson Focal Area

OUTREACH

Landowner education during site visits when potential habitat projects are present (PFW).

Public involvement and education regarding the need for protection and restoration of shrubland and early successional habitat for woodcock and similar species. This could be addressed through the development of a new traveling exhibit.

The NYFO could develop an educational workbook devoted to early successional species. The NYFO could develop Fact Sheets aimed at some of the groups listed below (landowners, public).

Put Landowners Guide to Woodcock Management up on NYFO web site (IT).

Woodcock Conservation Plan notes the following: "Outreach will play a critical role in the northeast as woodcock and the entire early successional bird suite is more threatened, due to more widespread and greater declines in populations, than any other species suite (grassland suite is in similar predicament). This is contrary to the misconception that forest interior species are in most decline and most threatened. Managers, environmentalists and the public need to be educated that shrubland and early succession habitats are important to birds and need to be protected or managed for. These habitats provide critical diversity to the area. A program to develop demonstration sites throughout the various states and provinces would be beneficial in helping to educate the public and would provide habitat guidance to those interested in managing for woodcock and other early successional birds."

Potential Outreach Partners

Audubon New York, Cornell Lab of Ornithology, NYSDEC, NWR, NRCS, RGS, Private Landowners, and NGOs.

MONITORING

- Develop protocols to measure success of all conservation delivery activities.
- Work with Partners to identify leads for accomplishing monitoring activities.
- Develop best management practices from results of monitoring to inform future American woodcock population restoration activities.

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NYSDEC FAQs on Grouse Hunting and Management (with map) http://www.dec.ny.gov/outdoor/48393.html.

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Thogmartin, W.E., J.R. Sauer and M.G. Knutson. 2007. Modeling and Mapping Abundance of American Woodcock Across the Midwestern and Northeastern United States. The Journal of Wildlife Management. 71(2): 376-382.

Existing strategies for American woodcock restoration:

American Woodcock (*Scolopax minor)*: Upper Hudson Focal Area

Please refer to the following documents for existing strategies:

- Bird Conservation Plan for BCR13 (Atlantic Coast Joint Venture 2007) http://www.acjv.org/bcr13_plan.htm.

- American Woodcock Conservation Plan (Kelley et al. 2008) http://www.timberdoodle.org/sites/default/files/woodcockPlan_0.pdf.

- Partners in Flight Landbird Conservation Plan (Rich et al. 2004) http://www.partnersinflight.org/cont_plan/default.htm.

- NYS Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf

Woodcock Management Recommendations (NAS 2009):

- Create or maintain the various types of habitat required for feeding, display, roosting, and nesting. Habitat types need to be in close proximity (e.g., within 1/2 mile).

- Maintain at least 0.5 acres of open habitat for singing displays through plowing, mowing, or prescribed burns. Suggestion of one patch per 20-25 acres. The goal is for fields to appear "patchy," rather than uniform in structure. Moderate use of livestock grazing can also accomplish this. Mow every 2-4 years.

- Encourage native trees and shrubs.

- Maintain larger areas, 3-5 acres, of open habitat for nighttime roosts. Suggestion of one patch per 100 acres. Plant shrubs in open fields and around the perimeter of cultivated fields to provide roosting and escape cover.

- Maintain young, dense forest of at least 5 acres for nesting and feeding.

- Maintain grassy areas near water sources for feeding and display grounds.

Blanding's Turtle (*Emydoidea blandingii)*: Upper Hudson Focal Area
Blanding's Turtle Species Action Plan

FOCAL AREA: UPPER HUDSON

Other species benefitting:

(shrub swamps/marshes/vernal pool habitats) New England cottontail, black duck, wood duck, American woodcock, golden-wing warbler, northern pike, spotted salamanders

BIOLOGICAL PLANNING

Introduction to species

Species information: The Blanding's turtle is a long-lived, late-maturing species that inhabits a wide range of habitats throughout its range, including shrub swamps, marshes, vernal pools, bogs, ponds, lakes, wet prairies, forested wetlands, and low-gradient streams and rivers. Blanding's turtles main range extends disjunctly from southeastern Ontario, adjacent Quebec, and southern Nova Scotia, south into New England, and west through the Great Lakes to western Nebraska, Iowa, and extreme northeastern Missouri. Several disjunct populations occur in the Northeast (eastern New York, eastern Massachusetts, southern New Hampshire, southern Maine, and southern Nova Scotia). These eastern populations have been effectively isolated from the main range for several millennia, are genetically distinct, and may qualify for federal listing as a Distinct Population Segment under the U.S. Endangered Species Act (ESA). Blanding's turtles mature between 14-21 years, and can attain ages greater than 75 years and still reproduce successfully.

In addition, Blanding's turtles use uplands for several parts of their life cycle for nesting, moving among wetlands, basking, aestivation, and possibly feeding. Most individuals move overland (over 3 km) among multiple wetlands throughout the season. In addition, females often move long distances to nesting sites. Habitat, therefore, must be considered in the context of its landscape setting.

Because Blanding's turtles have a generation time of nearly 40 years and population increases take place slowly, recoveries from declines may take many decades or centuries. Therefore, to be effective, conservation efforts must take place well in advance of severe declines.

Justification for species selection: Blanding's turtles are State-listed as either threatened or endangered in nine of 15 states where they occur, including three of the four states in the Northeast. In New York, the Blanding's turtle is State-listed as threatened. At the Federal level, the species in not currently listed under the U.S. Fish and Wildlife Service (USFWS) ESA; under the Canada Species at Risk Act, the species is considered threatened (endangered in Nova Scotia).

State contribution to overall species population: In New York, Blanding's turtles are known from the following counties: Dutchess, Saratoga, St. Lawrence, Jefferson, Niagara, and Erie. Evidence suggests there are 3 evolutionary significant units (ESU) for Blanding's turtles across their range. Two of these units occur in New York – the St. Lawrence/western New York

populations and those populations in the Hudson River basin. It is likely that there would be a minimum of two recovery units established in New York, if the species is Federally-listed. With two ESUs, it could be stated that New York's Blanding's turtle population is genetically more diverse than any other State.

Threats and threat assessment:

Threats[25] (see Status Assessment in references):

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Wetland loss, including vernal pools. Upland habitat loss (nesting habitat).

B. Fragmentation of habitat (connectivity of wetland and upland habitat).

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:

A. Collections for the pet trade will always remain a threat, but at this time it is not currently believed to be a major problem.

Factor C. Disease or predation:

A. At this time, no disease threats have been identified. Predation of adults is not a significant factor. Predation of nests, hatchlings, and juveniles is naturally high.

Factor D. The inadequacy of existing regulatory mechanisms:

A. Although State-listing affords species protection from direct take, protection provided to habitat is weak and variable. Upland habitat is rarely protected.

Factor E. Other natural or manmade factors affecting its continued existence:

A. Road mortality is a significant threat to adult turtles. Forestry (crushing of turtles, degradation of vernal pools), agriculture (nest disturbance, pollution), and water impoundment management (winter draw-downs may expose overwintering adults to freezing temperatures). Environmental contaminants (effects on reproductive success). Climate change (narrow latitudinal range of this species, combined with a long generation time may leave the species especially vulnerable to climate change impacts).

[25] Refers to 5 listing factors A-E in Section 4 of ESA.

Blanding's Turtle (*Emydoidea blandingii)*: Upper Hudson Focal Area

Recovery Goals

Conservation goal(s) for New York State:

The New York State Department of Environmental Conservation (NYSDEC) is currently writing a Blanding's Turtle Recovery Plan. Although no population goals have been established for New York, the New York Field Office (NYFO) will continue to collaborate with partners to establish target population goals. Empirically determining the status and trends of Blanding's turtles is difficult; this is the result of sparse data and a long generation time for the species. In general, trends must be inferred based upon the species life history and condition/trends of habitat.

Research:

- Extensive surveys to assess known sites and identify new populations. |FY? $0 BP ESA ? Future

- Conduct genetic analyses needed to address Distinct Population Segment issue before species can be considered for listing. |FY12 $0 BP ESA ? Ongoing

- Conduct study on road designs to reduce adult mortality (underpass or overpass designs, crossing signage). |FY? $0 BP ESA ? Future

CONSERVATION DESIGN

Strategies for addressing those threats

Please go to these documents for the existing strategies:

- Status Assessment – 2007
- Nova Scotia Recovery Plan – 2003
- Quebec Recovery Plan – 2005

In addition, the NYSDEC is developing a Blanding's turtle recovery plan for New York State (A. Ross).

Research/Actions needed: Specific actions for the next 3 years addressing conservation design include the following:

A. Assist with development/review of New York State Recovery Plan. |FY12 $0 DES ESA ? Ongoing

   Recovery Plan is currently being drafted by NYSDEC.

Blanding's Turtle (*Emydoidea blandingii)*: Upper Hudson Focal Area

B. Assist with development/review of Northeast Blanding's Turtle Conservation Initiative. Northeast States recently applied for FY10 multi-State Wildlife Grant (SWG) to develop a conservation plan for Blanding's turtles in the northeast region of the United States and initiate implementation of the plan. |FY12 $0 DES ESA ? Ongoing

C. Determine potential role with New England Field Office (NEFO)/NYSDEC. |FY12 $0 DES ESA ? Ongoing

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats FY2010-2012.

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Wetland loss, including vernal pools. Upland habitat loss (nesting habitat). Fragmentation of habitat (connectivity of wetland and upland habitat).

1. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding wetland impacts and modifications, uplands impacts associated with wetland impacts, road development, and agricultural practices that diminish wetland values.

    a. Draft standard language and compile materials to share with the public (Endangered Species [ESA]). |FY? $0 DEL ESA ? Future

    b. Provide substantive comments on proposed Federal agency actions with likely adverse impacts on Blanding's turtles (Conservation Planning Assistance [CPA]) and Environmental Contaminants [EC] Biological Technical Assistance Group to USEPA. |FY11-FY13 $0 DEL CPA,EC TRS,SLD,ASR Ongoing

2. Develop standard avoidance and minimization measures for development projects.

    a. Develop standard guidelines to minimize development impacts to the Blanding's turtle. |FY? $0 DEL ESA ? Future

    b. Lead meetings to educate local government/townships of presence of the species and provide recommendations regarding development guidelines to reduce impacts. |FY? $0 DEL ESA ? Future

3. Target wetland mitigation projects, including vernal pool creation/restoration.

    a. Provide comments and recommendations on wetland mitigation projects in known range of the Blanding's turtles to ensure projects are beneficial to the species. |FY12 $0 DEL CPA TRS,SLD Ongoing

4. Work with NYSDOT and FHWA to reduce road mortality.

a. Provide substantive comments on proposed Federal agency actions with likely adverse impacts on Blanding's turtles (CPA). |FY12 $0 DEL CPA TRS,SLD Ongoing

5. Work with partners to proactively protect the complexes of wetlands and uplands used by extant populations.

   a. Work to ensure information on known locations of Blanding's turtles is conveyed to land protection partners and land trusts to focus their efforts (ESA). |FY? $0 DEL ESA ? Future

6. Participate in New York State Recovery Plan and Conservation Initiative meetings.

   a. Attend and provide input at NYSDEC Recovery Plan meetings as requested. Assist NYSDEC with development of best management practices (BMP), threat assessment, and mitigation strategies as requested (ESA). |FY12 $0 DEL ESA ? Ongoing

   b. Provide Service support for 2011 multi-State State Wildlife Grant Blanding's turtle proposal submission, with a priority given to the population genetics research, as requested (ESA). |FY12 $0 DEL ESA ? Ongoing

7. Assist with NYSDEC surveys.

   a. Coordinate with the NYSDEC to determine survey schedule (ESA). |FY12 $0 DEL ESA ? Ongoing

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:

A. Collections for the pet trade will always remain a threat, but at this time it is not currently believed to be a major problem

   1. No work identified at this time.

Factor C. Disease or predation:

A. At this time, no disease threats have been identified. Predation of adults is not a significant factor. Predation of nests, hatchlings, and juveniles is naturally high.

   1. No work identified at this time.

Factor D. The inadequacy of existing regulatory mechanisms:

A. Although State-listing affords species protection from direct take, protection provided to habitat is weak and variable. Upland habitat is rarely protected.

Blanding's Turtle (*Emydoidea blandingii)*: Upper Hudson Focal Area

1. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding wetland impacts and modifications, uplands impacts associated with wetland impacts, road development, and agricultural practices that diminish wetland values.

    a. Provide substantive comments on proposed Federal agency actions with likely adverse impacts on Blanding's turtles (CPA). |FY12 $0 DEL CPA,ESA TRS,SLD,? Future

Factor E. Other natural or manmade factors affecting its continued existence:

A. Road mortality is a significant threat to adult turtles. Forestry (crushing of turtles, degradation of vernal pools), agriculture (nest disturbance, pollution), and water impoundment management (winter draw-downs may expose overwintering adults to freezing temperatures). Environmental contaminants (effects on reproductive success). Climate change (narrow latitudinal range of this species, combined with a long generation time may leave the species especially vulnerable to climate change impacts).

1. Continue to manage the Hudson River Natural Resources Damage Assessment (NRDA) case. |FY11-FY13 $0 DEL EC KJ Ongoing

    a. Consider Blanding's turtle restoration projects in NRDAs. |FY11-FY13 $0 DEL EC KJ Ongoing

2. Identify potential effects to the Blanding's turtle from climate change. |FY? $0 DEL ESA ? Future

    a. Work with the National Weather Service to create models for determining climate change impacts to the Blanding's turtles.

OUTREACH

Develop education and outreach tools - on land protection needs and conservation restriction options for landowners, on turtles crossing roads, on turtles as pets, on life history strategy, and on nesting turtles. |FY? $0 OUT ESA ? Future

MONITORING

- Work with partners to review and track recovery progress. |FY? $0 MON ESA ? Future

- Establish benchmarks for success based on NYS Blanding's turtle Recovery Plan (pending). |FY? $0 MON ESA ? Future

Blanding's Turtle (*Emydoidea blandingii)*: Upper Hudson Focal Area

Partners

NYSDEC, NYSDOT, FHWA, USGS, NYNHP, USFWS (NEFO), Hudsonia Ltd., Wilton Wildlife Preserve and Park, The Nature Conservancy [TNC], UMass, SUNY-Potsdam, land trusts, adjacent States.

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Brook Trout (*Salvelinus fontinalis)*: Upper Hudson Focal Area

Brook Trout Species Action Plan

FOCAL AREA: UPPER HUDSON

Other species benefitting:

American eel, American shad, longtail salamander, wood turtle

BIOLOGICAL PLANNING

Introduction to species

Species information: The brook trout is a native salmonid that prefers cold, clean streams in eastern North America and is the only native trout that inhabits this habitat. The species prefers clear waters of high purity and a narrow pH range in lakes, rivers, and streams, being sensitive to poor oxygenation, pollution, and changes in pH caused by environmental effects, such as acid rain. Its diverse diet includes crustaceans, frogs and other amphibians, insects, molluscs, smaller fish, and even small aquatic mammals such as voles. The brook trout is a short-lived species, rarely surviving beyond 4 or 5 years in the wild.

Intact stream populations of brook trout, where wild brook trout occupy > 90% of historical habitat, exist in only 5% of the watersheds assessed in 2005 by the Eastern Brook Trout Joint Venture (EBTJV) (see below). Populations of stream-dwelling brook trout are greatly reduced or have been extirpated from nearly half of the watersheds in their native range. The vast majority of historically occupied large rivers no longer support self-reproducing populations of brook trout. In New York, 5% of the watersheds that historically contained brook trout in streams and rivers remain intact, located primarily in portions of the Adirondacks and the Tug Hill Plateau. Western and South Central New York have suffered the greatest losses of brook trout. Data gaps remain in the central part of the State from Albany to Syracuse. While many lakes and ponds still contain brook trout, losses have been substantial due to competition with non-native fish and acid deposition, particularly in parts of the State where soils and bedrock provide little buffering capacity to offset acid precipitation. Furthermore, the EBTJV has identified several sub-watersheds within the Allegheny River watershed as highest priority for protection of brook trout populations.

Justification for species selection: The brook trout is a highly prized native sport fish**,** but intact populations of brook trout exist in only 5% of sub-watersheds in New York. Brook trout are an excellent sentinel of water quality and will also likely be a sentinel of the effects of climate change over the next century. Heritage brook trout populations are designated as a New York State (NYS) species of greatest conservation need, and the U.S. Fish and Wildlife Service (USFWS) and New York State Department of Environmental Conservation (NYSDEC) are partners in the EBTJV. The EBTJV is a partnership of State and Federal agencies, nongovernmental organizations (NGO), and academic institutions. This collaborative approach to brook trout management is justified because: (1) brook trout are declining across their entire eastern range; (2) causes for these declines are similar; (3) an integrated approach would be cost effective; and, (4) watersheds of concern span state borders and state and Federal jurisdictions.

Brook Trout (*Salvelinus fontinalis)*: Upper Hudson Focal Area

State contribution to overall species population: Currently there are over 400 lakes and ponds that are managed by the NYSDEC for native and stocked brook trout, in which 100 or so contain naturally-reproducing brook trout. In addition, thousands of miles of tributary streams in the Adirondacks, Tug Hill Region, and Catskill Mountains, and a lesser number in western New York, east of the Hudson River, on Long Island, and in the Upper Susquehanna watershed support brook trout. Although watershed-wide population numbers are not known for the Upper Hudson watershed, several sub-watersheds (HUC12s) support healthy populations of native brook trout.

Research needed:

- Conduct surveys to determine current population levels and presence/absence.

  (Who: NYSDEC and Trout Unlimited [TU] to assist with brook trout surveys to determine presence/absence and population densities, coupled with habitat investigation; Cost: use existing staff)

- Determine genetic diversity of brook trout in the watershed.

  (Who: Lamar Fish Health Unit, EBTJV; Cost: unknown at this time)

Threats and threat assessment:

1. **Loss of habitat and habitat function**; habitat degradation and alteration-nutrients, sediment, development/clearing of riparian zone (medium/low threat, agriculture; medium threat, urbanization).

   Research needed:

   - Extensive and frequent stream surveys to determine population size.

     (Who: NYSDEC, TU, New York Field Office [NYFO]; Cost: NYFO staff time)

   - Identify priority stream reaches for habitat restoration by evaluating water quality criteria, habitat, and other requirements of brook trout.

     (Who: TU, EBTJV, NYSDEC, NYFO (GIS), Landscape Conservation Cooperatives [LCC]; Cost: unknown at this time)

   - Need to locate heritage streams and heritage populations.

     (Who: U.S. Geological Survey [USGS], EBJTV, NYSDEC; Cost: unknown at this time)

2. **Barriers to Migration** (including dams and impassable culverts).

   Research needed:

   - Assess importance of isolating heritage populations versus providing passage for stocked brook trout and other salmonids.

     (Who: NYSDEC, TU, EBTJV; Cost: unknown at this time)

   - Identify which known barriers are having an influence on brook trout distribution.

     (Who: EBTJV, NYSDEC, NYFO, TU; Cost: unknown at this time)

3. **Competition from non-native salmonids.**

   Research needed:

   - Assess impact of competition from stocked and/or naturally reproducing non-native salmonids. Competition/interbreeding with stocked brook trout.

     (Who: EBTJV, NYSDEC, TU; Cost: unknown at this time)

   - Determine genetic diversity of brook trout in the watershed.

     (Who: Lamar Fish Health Unit, EBTJV; Cost: unknown at this time)

4. **Climate change; increased water temperatures.**

   Research needed:

   - Identification of climate change related impacts to brook trout.

     (Who: National Weather Service, LCC, academics; Cost: unknown at this time)

Partners/potential funding

NYSDEC, New York State Office of Parks, Recreation & Historic Preservation (NYSOPRHP), TU, County Soil and Water Conservation Districts (SWCD), The Nature Conservancy (TNC).

Population goal(s) for New York State:

The EBTJV has numerous conservation goals, including "Conserve, enhance or restore brook trout populations", and "…to perpetuate and restore brook trout populations throughout their historic range"; however, specific population goals have not been quantified. Although population goals have not been established for New York, the NYFO will continue to collaborate

with EBTJV, USGS, and NYSDEC to establish target population numbers for the Allegheny watershed. Establishing population goals remains a research need.

CONSERVATION DESIGN

Strategies for addressing those threats

1. **Loss of habitat.**

    a. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding stream relocation and modifications, including bulkheading; operation of hydroelectric power producing facilities; and, "unnatural" erosion mitigation practices, agricultural practices that diminish stream and wetland values for wildlife, dredging, and placement of fill in streams and wetlands.

    b. Target USFWS habitat restoration and enhancement projects to benefit brook trout, including adding enhancements to natural stream design projects (including planting trees and shrubs to provide shade for water temperature control); promoting habitat restoration projects which also control sediment entering streams; provide technical assistance on stream restoration projects via natural stream design in the watershed (Partners for Fish and Wildlife [PFW]). Be mindful of the need to consider providing additional access to heritage streams if they are blocked in a way that keeps stocked fish out.

    c. Facilitate habitat preservation through coordination with land trusts.

    d. Preserve, restore, and/or enhance streams known to support heritage strains of brook trout.

    e. Manage assessment for USFWS for the Hudson River Natural Resource Damage Assessment (NRDA): review fish data and assess status of fish injury; if possible, use NRDA restoration funds to restore and protect streams identified. |FY11 $0 DEL EC KJ Completed

    f. Manage assessment for USFWS for the Hudson River Natural Resource Damage Assessment (NRDA): review fish data and assess status of fish injury; if possible, use NRDA restoration funds to restore and protect streams identified. |FY12 $0 DEL EC KJ Ongoing

    g. Seek to minimize loss of habitat function when habitat is degraded by adjacent land uses by influencing regulatory agency decisions. |FY11-FY13 $0 DES CPA,EC TRS,ASR Ongoing

    h. Seek to minimize loss of habitat value by influencing Federal Energy Regulatory Commission (FERC) minimum flow decisions.

2. **Barriers to migration** (including dams and impassable culverts).

    a. Working with partners, identify and remove barriers.

    b. Work with New York State Department of Transportation (NYSDOT) and Federal Highway Administration (FHWA) to develop criteria for designation of culverts, the modification of which would improve brook trout passage.

    c. Work with NYSDOT and FHWA to correct bridge abutments from being undermined by stream erosion; design and construct natural stream design features that will change stream bottom elevation and facilitate fish passage.

3. **Competition from non-native salmonids.**

    a. Target USFWS natural stream design stream restoration projects for smaller streams most likely to support only one or two salmonid species.

4. **Climate change; increased water temperatures.**

    a. Design and construct habitat enhancement projects which provide increased flow, stream shading, pool cover, and increased availability of riffle habitat.

    b. Identify sub-watersheds likely to be refugia for cold water fish in the future, and protect or restore the habitat for brook trout.

5. **Environmental Contaminants**

    a. Evaluate USFWS NRDA along the Upper Hudson River. |FY12-FY13 $0 DES EC DG,ALS Planned

    b. Respond as appropriate to spills impacting fish and wildlife resources. |FY12-FY14 $0 DES EC ALS Planned

Partner organizations

NYSDEC, NYSOPRHP, TU, Alleghany County SWCD, Cattaraugus County SWCD, Chautauqua County SWCD, TNC, Chautauqua Watershed Conservancy.

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY 2010 – 2012

1. **Loss of habitat.**

    a. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding wetland draining, stream relocation, and modifications, including bulkheading;

operation of hydroelectric power producing facilities; and, "unnatural" erosion mitigation practices, agricultural practices that diminish stream and wetland values for wildlife, dredging, and placement of fill in streams and wetlands.

i. Developing fact sheets and best management practices (BMP) to minimize impacts to brook trout from a suite of different construction activities.

ii. Post these fact sheets/BMPs on our website.

- Write substantive comments on proposed Federal agency actions with likely adverse impacts on brook trout (Conservation Planning Assistance [CPA], Environmental Contaminants-Biological Technical Assistance Group to EPA). |FY12-FY13 $0 DEL CPA,EC TRS,ASR Planned

- Develop a poster for the New York State Wetlands Forum which targets brook trout conservation.

- Develop recommendations and BMPs for culvert design and placement of structures based on NYS Culvert Working Group recommendations, the U.S. Forest Service's Stream Simulation Model, and Fish-Xing software, via CPA review. (CPA).

- Develop stream buffer guidelines/BMP and post on website.

b. Target USFWS habitat restoration and enhancement projects to benefit brook trout, including adding enhancements to natural stream design projects (including planting trees and shrubs to provide shade for water temperature control); promoting habitat restoration projects which also control sediment entering streams; provide technical assistance on stream restoration projects via natural stream design in the watershed (PFW).

i. Add enhancements to natural stream design projects, including planting trees and shrubs to provide shade for water temperature control (CPA, PFW) (Funding – base funds, partnership with NYSDOT-PFW).

ii. Restoration work via natural stream design on 500 feet of the Onesquethaw Creek (PFW with funding from base funds NRCS, TU, and NYSDOT). |FY11 $0 DEL PFW CS Completed

iii. Restoration work via natural stream design on 2,000 feet of the Kayaderosseras Creek (PFW with funding from base funds NRCS, TU, and NYSDOT). |FY12 $0 DEL PFW CS Ongoing

iv. Restoration work via natural stream design on 1 mile of the Battenkill (Lake Champlain Fish and Wildlife Resources Office [LCFWRO], PFW with funding

from base funds, TU, and the Battenkill Alliance). |FY12 $0 DEL PFW CS Ongoing

v. Restoration work via natural stream design on 1 mile of the upper reaches of the Hoosic River (PFW with funding from base funds NRCS, TU, and NYSDOT) (2011). |FY12 $0 DEL PFW CS Ongoing

c. Facilitate habitat preservation through coordination with land trusts or NGO.

i. Work with NGO (TU, Battenkill Alliance) to identify parcels for protection.

d. Promote habitat restoration projects which also control sediment entering streams (CPA) (PFW).

i. Nothing planned at this time.

e. Provide technical assistance on stream restoration projects via natural stream design in the watershed.

i. Statewide – Conduct a training session for County SWCD staff on natural stream design (PFW – March 2011). |FY11 $0 DEL PFW CS,GD Completed

2. **Barriers to migration** (including dams and impassable culverts).

a. Working with partners, identify and remove barriers.

i. Work with NYSDEC, NRCS, to identify projects for barriers to migration in 2011 – 2013 (PFW). |FY11 $0 DEL PFW CS Completed

b. Work with NYSDOT and FHWA to develop criteria for designation of culverts, the modification of which would improve brook trout passage.

i. No work indentified at this time.

c. Work with NYSDOT Region 1 and FHWA to correct bridge abutments from being undermined by stream erosion, design and construct natural stream design features that will change stream bottom elevation and facilitate fish passage (2011 – 2013) (PFW).

i. Design and install culvert baffle systems with NYSDOT Region 1 to bury perched culverts as opportunities present themselves within this NYSDOT region (PFW 2011 – 2113). |FY11 $0 DEL PFW CS Completed

3. **Competition from non-native salmonids.**

    a. Target USFWS natural stream design stream restoration projects for smaller streams most likely to support only one or two salmonid species. If possible, seek opportunities in heritage trout streams to increase available habitat.

        i. No work indentified at this time.

4. **Climate change; increased water temperatures.**

    a. Identify sub-watersheds likely to be refugia for cold water fish in the future, and protect or restore the habitat for brook trout.

        i. Work with the National Weather Service to create models for determining temperature impacts to brook trout within the watershed.

    b. Add enhancements to natural stream design projects, including planting trees and shrubs to provide shade for water temperature control (CPA, PFW) (Funding – base funds, partnership with NYSDOT-PFW) (2011 – 2013).

        i. Onesquethaw Creek. |FY11 $0 DEL PFW CS Completed

        ii. Kayaderosseras Creek. |FY11-FY12 $0 DEL PFW CS Ongoing

        iii. Battenkill. |FY11-FY12 $0 DEL PFW CS Ongoing

        iv. Upper Hoosic River. |FY11-FY12 $0 DEL PFW CS Ongoing

5. **Environmental Contaminants**

    a. Evaluate USFWS NRDA along the Upper Hudson River.

OUTREACH

In addition to the web site, there is an EBTJV Google Group (http://groups.google.com/group/ebtjv).

The EBTJV also has a blog, a Facebook page, and is on two other social networking sites (including Twitter).

The NYFO can create a brook trout page of "ongoing activities" on our website.

Work with Albany University, or other universities, students to get volunteers for surveys and restoration portions of planned projects.

See also Finger Lakes Onondaga pilot classroom project Trout in the Classroom.

Brook Trout (*Salvelinus fontinalis)*: Upper Hudson Focal Area

MONITORING

1. Work with NYSDEC and LCFWRO; LGLFWCO to monitor brook trout habitat after restoration is complete. This includes electroshocking restored site to determine if brook trout are successfully using site, as well as conducting macroinvertebrate surveys to identify any changes in benthic community.

2. Establish benchmarks for success based on EBTJV.

3. Evaluate reclamation of streams (i.e. - remove non-native salmonids) and resulting effects on brook trout population levels, as well as cessation in stocking non-native salmonids.

4. With NYSDEC, develop protocol for pre-construction and post-construction surveys of streams targeted for natural stream design.

5. Seek funding and support for monitoring.

Partners

NYSDEC, NYSOPRHP, TU, County SWCD, TNC, USEPA, U.S. Army Corps of Engineers, Conservation Fund.

References

Eastern Brook Trout Joint Venture main website (http://www.wasternbrooktrout.org).

Eastern Brook Trout Joint Venture data and maps (http://sain.utk.edu/ebtjv/index.php).

Eastern Brook Trout Joint Venture webpage for priority sub-watersheds in New York (http://sain.utk.edu/ebjtv/download/priorityscores.php).

Trout Unlimited Brook Trout Conservation Strategy (http://www.tu.org/conservation/eastern-conservation/brook-trout).

New York State Brook Trout Conservation Strategies
(http://www.easternbrooktrout.org/docs/EBTJV_NewYork_CS.pdf)
(http://www.easternbrooktrout.org/docs/brookie_NY.pdf).

Field Sparrow (*Spizella pusilla)*: Upper Hudson Focal Area

Field Sparrow Species Action Plan

FOCAL AREA: UPPER HUDSON

Other species benefitting:

Brown thrasher, golden-winged warbler, American woodcock, blue-winged warbler, Baltimore oriole, northern flicker, prairie warbler, red-headed woodpecker, song sparrow

BIOLOGICAL PLANNING

Introduction to species

Species information: The field sparrow is a common bird in decline. It is a small songbird of eastern North America (found in the U.S. east of the Rocky Mountains), breeding in brushy pastures and second growth scrub. It is a partial migrant with some individuals remaining on or near their breeding grounds in winter while others move farther south. In winter, field sparrows forage in small flocks for grass seeds. Insects (adult and larval) are added to the diet in the breeding season. Field sparrow nests are located near the ground in early spring, later found in small saplings and shrubs. Field sparrow pairs will renest rapidly following predation or desertion. (Carey et al. 2008)

Justification for species selection: The field sparrow was chosen as a priority species because of its importance in the eastern U.S. as well as in New York. It is ranked "High" (H) on the Bird Conservation Region (BCR) 13 list of "Priority Bird Species in Bird Conservation Regions partially or wholly within the Atlantic Coast Joint Venture". It is #9 on Audubon's 2007 list of "The Top Ten Common Birds in Decline", and ranked in the 2005 Partners in Flight assessment as a species of regional concern (RC) for BCR 13 (and 28 and 30). The field sparrow has been identified as a "Bird in Trouble" in the Eastern Forest in the North American Bird Conservation Initiative's 2009 report, "The State of the Birds, United States of America." The Upper Hudson still retains agricultural lands (which have been lost elsewhere throughout BCR 13) that are important to this species.

The population estimate for this species for the U.S. and Canada is 8,200,000 with 235,148 in BCR 13 (Rich et al. 2004). According to Breeding Bird Survey data during the period from 1966-2002 (NYSDEC 2005), in New York, the field sparrow has exhibited a precipitous decline of 75% over this time period.

State contribution to overall species population: Range extends across New York in abandoned field habitats. The species is a confirmed breeder across New York with the exception of the Adirondacks.

Threats and threat assessment:

1. **Loss of habitat and habitat function.** The major threat to this species is habitat loss from succession, and from human developments for agriculture, forestry, and buildings

(National Audubon Society 2010). In BCR 13, since the 1970s, there has been a net loss of 2.3 million acres (0.9 M hectares [ha]) of early-successional habitats as old fields, shrublands, or young (e.g., sapling or pole-sized) forests have given way to older forests, resulting in declines in bird species such as the field sparrow that are dependent upon this habitat type. Loss of sufficient quality/quantity habitat within the focal area and the function the habitat provides has adversely affected this species. Factors included are: maturation of early succession habitat to forest, lack of fire, early mowing of hayfields that destroys nests and young, and changes in agricultural practices that convert pasture/hay fields to row crops.

Research needed:

- Research is needed to identify limiting factors for this species during breeding, migration, staging, and wintering. According to Carey et al. (2008), the "largest need is for studies of migration and wintering ecology. Few data exist on foods and feeding ecology of adults, both in breeding and non-breeding seasons. The breeding ecology of local migratory populations is well known over both the short and long term. However, similar studies in other geographic regions would be of comparative benefit. Especially useful might be year-round studies of non-migratory populations in southern portions of the species' range."

2. **Invasive species.** Encroachment of invasive species (particularly knapweed [*Centaurea* spp.]) may change vegetation structure and composition, adversely affecting species such as the field sparrow.

Research needed:

- Research is needed to determine this species' preference for native woody vegetation versus invasive exotics.

3. **Nest predation**. Field sparrow eggs and young are predated upon by snakes, chipmunks, foxes, weasels, skunks, raccoons, and feral cats, and birds such as blue jay, American crow, and house wren. They also suffer from parasitism by brown-headed cowbirds. Landscape fragmentation (a concern in this focal area) contributes to higher nest predation and parasitism rates, lower reproductive success, and lower adult and juvenile survival (Doherty and Grubb 2002).

Research needed:

- Research is needed to determine the effects of feral cats and other predators on reproductive success of this species in agricultural and developing landscapes.

4. **Climate change**. Effects of climate change could include changes in seasonal climate that could shift migration patterns of birds, such as field sparrows, and changes in food availability.

Field Sparrow (*Spizella pusilla)*: Upper Hudson Focal Area

Research needed:

- Research is needed to determine the effects of climate change on this species.

Partners/potential funding:

Partners in Flight (PIF), U.S. Geological Survey (USGS), Natural Resources Conservation Service (NRCS), National Park Service (NPS), New York State Department of Environmental Conservation (NYSDEC), County Soil and Water Conservation Districts (SWCD), The Nature Conservancy (TNC), Audubon New York, Cornell Lab of Ornithology, New York State Department of Transportation (NYSDOT), New York Power Authority (NYPA), universities.

Population goal(s) for New York State:

No New York-specific population objectives have been articulated in the existing conservation plans. However, the PIF program (Rich et al. 2004), which provides a population estimate for U.S. and Canada for this species of 8,200,000 (with 245,148 in BCR13), has as its objective a 100% increase in this species. Audubon notes that, "Field sparrows may never regain their former abundance, but it might be possible to stabilize their populations by working to ensure the management of suitable habitat for this and other species that depend on succession grassland and shrub habitats."

Research needed:

- To determine a population management goal for New York, work with the Division of Migratory Birds and local partners (Audubon, Cornell, PIF, etc.) to determine appropriate goal for the Upper Hudson.

CONSERVATION DESIGN

Strategies for addressing those threats

1. **Loss of habitat and habitat function.**

   a. Use geospatial tools to analyze existing areas of habitat to determine potential breeding areas and analyze breeding bird survey data to focus efforts. |FY12 $? DES CPA ? Future

   b. Influence landowner and regulatory agency decisions regarding proposed development, agricultural practices, etc., that result in loss of habitat and habitat functions for this species. This includes: encouraging landowners to enroll in the Conservation Reserve Program (CRP), which pays farmers to keep marginal farmlands idle and supports good bird habitat; working to promote proper management of power line rights-of-way for field sparrows and other species that depend on successional habitats; encouraging managers of parks and natural areas to create and/or leave suitable habitat; and, facilitating habitat preservation through

coordination with land trusts. Such actions will increase the number of acres supporting birds dependent on such lands and the functions those habitats provide. |FY12 $? DES CPA ? Future

c. Develop Fact Sheets with best management practices (BMP) to minimize impacts to field sparrows (including mowing guidelines), and use these to influence landowners, including farmers and other private owners, utility agencies, and park managers regarding early succession habitat needs of this species. |FY12 $? DES CPA ? Future

d. Target U.S. Fish and Wildlife Service (USFWS) habitat restoration and enhancement projects to benefit early successional species, including the field sparrow, through creation of new patches of succession habitat. If possible, use Natural Resource Damage Assessment and Restoration (NRDAR) funds to accomplish habitat restoration and protection. |FY? $0 DES EC KJ,DG Future

   i. Continue to manage the Hudson River NRDAR case. |FY11-FY13 $0 DES EC KJ Ongoing

2. **Invasive species.**

   a. Strategy will depend upon results of research need noted above.

3. **Nest predation.**

   a. Strategy will depend upon results of research need noted above.

4. **Climate change.**

   a. Strategy will depend upon results of research need noted above.

Partners/potential funding:

PIF, USGS, NRCS, NPS, NYSDEC, County SWCD, TNC, Audubon New York, Cornell Lab of Ornithology, NYSDOT, NYPA, universities

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats FY 2010 - 2012

A. **Loss of habitat and habitat function.**

   1. Influence landowner and regulatory agency decisions regarding proposed development, agricultural practices, etc. that result in loss of habitat and habitat functions for this species.

a. Create maps of potential field sparrow sites of concern. |FY12 $? DEL CPA ? Future

b. Provide substantive Federal agency comments on proposed Federal agency actions with likely adverse impacts to field sparrows and/or their habitat based on identification of priority grassland habitats. |FY12 $0 DEL CPA ? Planned

c. Post on New York Field Office (NYFO) web site Fact Sheets with BMP to minimize impacts to field sparrows and/or their habitat. |FY12 $0 DEL CPA ? Future

B. **Invasive species.**

1. Delivery will depend upon strategy determined from research noted above.

C. **Nest predation.**

1. Delivery will depend upon strategy determined from research noted above.

D. **Climate change.**

1. Delivery will depend upon strategy determined from research noted above.

Partners/potential funding:

PIF, USGS, NRCS, NPS, NYSDEC, County SWCD, TNC, Audubon New York, Cornell Lab of Ornithology, NYSDOT, NYPA, universities.

OUTREACH

Potential outreach needs:

- Become a member of the Northeast PIF Working Group: Various PIF working groups have been established to deliver the PIF Landbird Conservation Plan including the PIF Northeast Working Group. A NYFO Outreach representative will join that Working Group. |FY12 $? OUT CPA ? Future

- Landowner education. |FY12 $? OUT CPA ? Future

- Public involvement and education to address the perception that forest management is harmful to birds (NYSDEC 2005). |FY12 $? OUT CPA ? Future

Partners/potential funding:

PIF, USGS, NRCS, NPS, NYSDEC, County SWCD, TNC, Audubon New York, Cornell Lab of Ornithology, NYSDOT, NYPA, universities

Field Sparrow (*Spizella pusilla)*: Upper Hudson Focal Area

MONITORING

Develop protocols to measure success of all conservation delivery activities. |FY12 $? MON CPA ? Future

Work with partners to identify leads for accomplishing monitoring activities. |FY12 $? MON CPA ? Future

Develop BMP from results of monitoring to inform future field sparrow population restoration activities. |FY12 $? MON CPA ? Future

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National Audubon Society. State of the Birds. #9 Common Bird in Decline, Field Sparrow *(Spizella pusilla).* http://www.audubon.org/bird/stateofthebirds/cbid/profile.php?id=9. Accessed 3 March 2010.

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Partners in Flight website http://www.partnersinflight.org/cont_plan/ (VERSION: March 2005).

Existing strategies for field sparrow restoration:

Please refer to the following documents for existing strategies:

Field Sparrow (*Spizella pusilla)*: Upper Hudson Focal Area

- Bird Conservation Plan for BCR13 (Atlantic Coast Joint Venture 2007)
  http://www.acjv.org/bcr13_plan.htm

- Partners in Flight Landbird Conservation Plan (Rich et al. 2004)
  http://www.partnersinflight.org/cont_plan/default.htm

- NYS Comprehensive Wildlife Conservation Strategy (NYSDEC 2005)
  http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf

- A Plan for Conserving Grassland Birds in New York," Final Report to NYSDEC (Morgan & Burger 2008)
  http://ny.audubon.org/PDFs/ConservationPlan-GrasslandBirds-NY.pdf.

Indiana Bat (*Myotis sodalis)*: Upper Hudson Focal Area

Indiana Bat Species Action Plan

FOCAL AREA: UPPER HUDSON RIVER

BIOLOGICAL PLANNING

Other species benefitting:

eastern small-footed, little brown, tri-colored, northern, big brown, bog turtle

Introduction to species

Species information: The Indiana bat typically hibernates in caves/mines in the winter and roosts under bark or in tree crevices in the spring, summer, and fall. Suitable potential summer roosting habitat is characterized by trees (dead, dying, or alive) or snags with exfoliating or defoliating bark, or containing cracks or crevices that could potentially be used by Indiana bats as a roost. The minimum diameter of roost trees observed to date is 2.5 inches for males and 4.3 inches for females. However, maternity colonies generally use trees greater than or equal to 9 inches d.b.h. Overall, roost tree structure appears to be more important to Indiana bats than a particular tree species or habitat type. Females appear to be more habitat specific than males presumably because of the warmer temperature requirements associated with gestation and rearing of young. As a result, they are generally found at lower elevations than males may be found. Roosts are warmed by direct exposure to solar radiation, thus trees exposed to extended periods of direct sunlight are preferred over those in shaded areas. However, shaded roosts may be preferred in very hot conditions. As larger trees afford a greater thermal mass for heat retention, they appear to be preferred over smaller trees. Additional information on potentially suitable summer habitat can be found on our website at http://www.fws.gov/northeast/nyfo/es/IndianaBatapr07.pdf.

Streams associated with floodplain forests, and impounded water bodies (ponds, wetlands, reservoirs, etc.) where abundant supplies of flying insects are likely found provide preferred foraging habitat for Indiana bats, some of which may fly up to 2-5 miles from upland roosts on a regular basis. Indiana bats also forage within the canopy of upland forests, over clearings with early successional vegetation (*e.g.,* old fields), along the borders of croplands, along wooded fencerows, and over farm ponds in pastures (Service 2007). While Indiana bats appear to forage in a wide variety of habitats, they seem to tend to stay fairly close to tree cover.

Justification for species selection: The Indiana bat is Federally- and New York State-listed as endangered. The New York Field Office (NYFO) has the Region 5 species lead.

State contribution to overall species population: New York used to have ~11% of wintering Ibats rangewide before White-nose syndrome (WNS). New York still has the largest number of wintering (and likely summering) Ibats in the region. There are draft recovery units and New York is part of the northeast recovery unit.

Indiana Bat (*Myotis sodalis)*: Upper Hudson Focal Area

Threats and threat assessment:

Threats[26] (See 5-year review for full assessment):

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range: *See the Plan for in-depth discussion (Service 2007, page 71).*

A. Destruction and degradation of the bat's winter hibernacula (i.e., caves and mines) and summer habitat (i.e., forests) has been identified as a long-standing and ongoing threat to the species.

B. Winter – potential to impact hibernacula with gas drilling, filling, etc.

C. Spring/summer (maternity colony roosts, travel corridors, foraging habitat) – residential and commercial development

D. Fall (swarming) – same pressures as spring/summer habitat

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes: *See the Plan for in-depth discussion (USFWS 2007, page 80).*

A. Human disturbance of hibernating bats was originally identified as one of the primary threats to the species and still remains a threat at several important hibernacula in the bat's range. The primary forms of human disturbance to hibernating bats result from cave commercialization (cave tours and other commercial uses of caves), recreational caving, vandalism, and research-related activities.

Factor C. Disease or predation:

A. WNS is most significant threat in New York. Predation is also a threat.

Factor D. The inadequacy of existing regulatory mechanisms: *See the Plan for in-depth discussion (USFWS 2007, page 90).*

A. Generally, existing regulatory mechanisms are more effective at protecting Indiana bat hibernacula than summer habitat. Hibernacula are discrete and easily identified on the landscape, whereas summer habitat is more diffuse.

Factor E. Other natural or manmade factors affecting its continued existence: *See the Plan for in-depth discussion (USFWS 2007, page 91).*

A. Several natural factors have threatened the existence of local bat populations including flooding and freezing events at winter hibernacula. These natural events typically are not wide-spread, but rather associated with specific flood/freeze-prone sites.

[26] Refers to 5 listing factors A-E in Section 4 of Endangered Species Act

Indiana Bat (*Myotis sodalis)*: Upper Hudson Focal Area

B. Anthropogenic factors that may affect the continued existence of Indiana bats include numerous environmental contaminants (e.g., organophosphate and carbamate insecticides, oil spills, and PCBs), collisions with man-made objects (e.g., poorly constructed cave gates, vehicles, aircraft, communication towers, and wind turbines) and climate change.

Recovery Goals

Range-wide Recovery Goals/Objectives: Intermediate- reclassification, Long-term- delisting

Conservation goal(s) for New York State: The Plan does not have specific criteria for New York. However, New York has several P1 and P2 hibernacula and there are criteria for protecting 80% of P1 hibernacula in each Recovery Unit. In general, protection of wintering populations, summer populations, and areas for safe migration between those areas are needed.

Research/Actions needed:

A. Reduce current threats at known hibernacula (Recovery Action 1.1.1) (primarily WNS-related actions- not included in recovery plan- WNS will eventually have a separate plan).

B. WNS-related research is needed to better understand the threat.

   1. Assist with requests for proposals (RFPs) as requested. |FY11-FY12 $0 BP ESA NR,RAN Ongoing
   2. Review proposals if requested to be on review team. |FY11-FY12 $0 BP ESA RAN,NR Ongoing
   3. Provide grant oversight for FY08 and FY09 projects. |FY11-FY12 $0 BP ESA RAN,NR Ongoing
   4. Assist with WNS-related research field work as requested. |FY11-FY12 $0 BP ESA RAN,NR Ongoing

C. Develop models of Indiana bat population dynamics as tools to assess progress towards recovery in different geographic areas, to determine sensitivities of various life history attributes contributing to population growth rates, and to evaluate the impact of catastrophic losses at key hibernacula on time to recovery (Recovery Action 3.1.6).

   1. Assist with Indiana bat demographic modeling structured decision making (SDM) effort until completion.

      a. Respond to data requests from U.S. Geological Survey (USGS) and Region 3 (R3). |FY11 $0 BP ESA RAN Completed
      b. Participate in calls during demographic model Beta testing. |FY11-FY12 $0 BP ESA RAN Ongoing
      c. Attend workshop to test demographic model. |FY12 $0 BP ESA RAN Planned
      d. Assist with roll-out of demographic model. |FY12 $0 BP ESA RAN Planned

e. Provide technical assistance to Field Offices (FOs) with use of demographic model. |FY12-FY13 $0 BP ESA RAN Planned

D. Conduct research on the potential impacts of environmental contaminants on Indiana bats (Recovery Action 3.4).

1. Environmental Contaminants (EC) WNS research - send all samples out for analysis. |FY11 $0 BP EC ALS Completed
2. Environmental Contaminants (EC) WNS research - review and interpret contaminants results. |FY12 $0 BP EC ALS Planned

CONSERVATION DESIGN

Strategies for addressing those threats

Please go to these documents for the existing strategies:

- Draft Recovery Plan 2007 (Service 2007)
- Last 5-year review completed 2009 (Service 2009)

Research or Actions needed: Specific actions for the next 3 years addressing conservation design include the following:

A. Assist Region 3 with finalizing Recovery Plan as requested. |FY12 $0 DES ESA RAN Planned

B. Assist with National WNS Response (not included in recovery plan- WNS will eventually have a separate plan)

1. Support development of WNS National Plan

a. Provide technical assistance during USFWS and/or public review periods of WNS National Plan. |FY11 $0 DES ESA RAN,NR Completed
b. Participate in Communications Group. |FY11-FY13 $0 DES ESA NR Ongoing
c. Participate in Conservation and Recovery Working Group. |FY11-FY13 $0 DES ESA RAN,NR Ongoing
i. Develop Conservation and Recovery Implementation Plan. |FY11-FY12 $0 DES ESA RAN,NR Ongoing

2. Attend annual WNS Symposium. |FY11-FY13 $0 DES ESA RAN,NR Ongoing

3. WNS-related research is needed to develop conservation strategies to respond to WNS.

a. Assist with WNS captive bat management SDM effort. |FY11-FY12 $0 DES ESA RAN,NR Ongoing

C. Standardized approaches to evaluating wind projects and developing conservation measures are needed.

   1. Participate in multi-region project to develop Indiana bat/wind guidance. |FY10-FY11 $0 DES ESA RAN Completed
   2. Participate in team to update multi-region Indiana bat/wind guidance over time. |FY12-FY13 $0 DES ESA RAN Planned
   3. Coordinate first R3, Regions 4 and 5 (R4,R5) threatened and endangered species wind call - 2/3/10). |FY10 $0 DES ESA RAN Completed
   4. Participate in R5 Indiana bat wind guidance development. |FY11-FY13 $0 DES ESA RAN Ongoing

D. Develop guidance and template on how to complete a hibernacula management plan (Recovery Action 1.1.1.2.1)

   1. Assist R3 with this development of guidance on how to complete hibernacula management plan. |FY13 $0 DES ESA RAN Future

E. Develop standardized protocols for conducting telemetry (Recovery Action 2.7.2.1)

   1. Participate in multi-region team to develop radio telemetry guidance. |FY11-FY12 $0 DES ESA RAN Ongoing

F. Develop standardized protocols for use of bat detection systems to survey for Indiana bats (Recovery Action 2.7.2.6)

   1. Assist with funding automation of acoustic survey data analysis

      a. Participate in Regional WNS funding discussions and promote funding of acoustic automation system. |FY10 40 DES ESA RAN Completed
      b. Assist with USACE Phase 1 grant agreement for acoustic automation system. |FY10 $0 DES ESA RAN Completed

   2. Determine whether netting guidelines should be revised to include acoustic detectors

      a. Participate in multi-region Indiana bat/Wind Initiative survey protocol workgroup. |FY10 $0 DES ESA RAN Completed
      b. Participate in multi-region team to revise Indiana bat survey protocols. |FY11-FY12 $0 DES ESA RAN Ongoing
      c. Present revised draft Indiana bat survey protocols at Northeast Bat Working Group meeting. |FY12 $500 DES ESA RAN Planned

G. Determine land management practices that will increase or maintain suitability of habitat for maternity colonies of Indiana bats, and the impacts of habitat perturbations on persistence of maternity colonies (Recovery Action 3.3.9)

1. Fund or otherwise coordinate wind project research

H. Regional coordination role

1. Participate in R5 planning team to develop standardized roles/responsibilities for species leads as requested. |FY11 $0 DES ESA RAN Completed

2. Act as Regional POC for Indiana bat issues and conduct the following activities.

   a. Provide updates to FOs on Indiana bat literature, information from other regions. |FY10-FY13 $0 DES ESA RAN Ongoing
   b. Provide technical assistance to FOs on Indiana bat formal consultations/Habitat Conservation Plans (HCPs). |FY10-FY13 $0 DES ESA RAN Ongoing
   c. Provide R5 comments on national issues (e.g., survey protocol updates). |FY10-FY13 $0 DES ESA RAN Ongoing
   d. Provide R5 Indiana bat end-of-year reporting info to R3. |FY10-FY13 $0 DES ESA RAN Ongoing
   e. Maintain understanding of current Indiana bat literature. |FY10-FY13 $0 DES ESA RAN Ongoing
   f. Participate in or provide technical assistance for WNS-related projects as needed. |FY10-FY13 $0 DES ESA RAN Ongoing
   g. Coordinate Regional review of Indiana bat permit conditions. |FY10-FY13 $0 DES ESA RAN Ongoing

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats FY 2010 - 2012

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Encourage activities that enhance or improve summer habitat on private lands (Recovery Action 2.1.3)

B. Conserve and manage Indiana bats and their habitat on Federal lands (Recovery Action 2.2)

C. Encourage habitat protection through acquisition/easements

1. Provide technical assistance to NYSDEC for Recovery Land Acquisition grants. |FY11-FY13 $0 DEL ESA RAN Ongoing
2. Provide technical assistance to the Natural Resource Conservation Service (NRCS) for potential easements

D. Minimize adverse impacts to Ibat during project reviews (Recovery Action 2.6)

Indiana Bat (*Myotis sodalis)*: Upper Hudson Focal Area

1. Ensure implementation of conservation measures of existing BOs through follow up with Federal agency/project sponsor

    a. Review annual BO reports for Adams Fairacre Farms. |FY11-FY13 $0 DEL ESA RAN Ongoing

2. Habitat protection through informal and formal consultations and HCPs.

    a. Assist with development of Indiana bat conservations measures for NiSource HCP. |FY10-FY12 $0 DEL ESA RAN Ongoing
    b. In coordination with the R5 IPAC Team, develop conservation framework, including standard conservation measures, for residential and commercial projects. |FY11-FY13 $0 DEL ESA RAN Ongoing
    c. Develop conservation framework, including standard conservation measures, for wind energy development projects (see Ibat Wind Guidance). |FY11-FY13 $0 DEL ESA RAN Ongoing

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes: No work planned for FY11-FY13.

Factor C. Disease or predation: Need to determine what conservation measures will be available for WNS-response.

Factor D. The inadequacy of existing regulatory mechanisms: No work planned for FY11-FY13.

Factor E. Other natural or manmade factors affecting its continued existence: Wind project work being addressed through consultations/HCPs (see above).

OUTREACH

A. Develop and implement outreach activities to enhance specific recovery tasks for the Indiana bat, including development of guidelines, best management practices, land acquisition/easements efforts, landowner incentives programs, Endangered Species landowner programs, research activities, and Federal review activities. Employ appropriate communications goals and messages as outlined in comprehensive Indiana bat outreach plan. (Recovery Action 4.1)

B. Seek opportunities to raise awareness of the Indiana bat's special characteristics; foster a sense of appreciation for the bat, its habitat, and the unique life history of bats in general. (Recovery Action 4.2.3)

    1. Current Indiana bat/WNS exhibit

        a. Rotate Indiana bat/WNS exhibit at nature centers. |FY10-FY11 $0 OUT ESA SLD Completed

b. Update Indiana bat/WNS exhibit at least once/year. |FY10-FY13 $0 OUT ESA ALL Ongoing

2. New bat and WNS exhibit

a. Provide technical assistance to the U.S. Forest Service (USFS) in development of a new display. |FY10-FY11 $0 OUT ESA ALL Completed
b. Provide technical assistance to RO to finalize display text and formatting. |FY12 $0 OUT ESA SLD Planned

3. New Indiana bat cave exhibit

a. Develop new cave exhibit. |FY13 $? OUT ESA SLD Future

4. Attend meetings/workshops

C. Use USFWS websites as a repository of information about the Indiana bat. This information should be organized so that it is easily located and accessible and specific to key audiences (i.e., educators, planners, industry representatives, consultants) (Recovery Action 4.2.5)

1. Update NYFO Indiana bat fact sheet and web materials. |FY10-FY13 $0 OUT ESA,IT RAN,AFL Ongoing

D. Assist with Freedom of Information Act (FOIA) responses as needed.

1. Assist with WNS FOIA request. |FY11 $0 OUT ESA NR Completed

MONITORING

A. Survey winter populations of Ibats at known hibernacula (monitor status of sites/impacts of WNS) (Recovery Action 1.3.1)

1. Assist NYSDEC with 2010 hibernacula surveys at Barton Hill, Graphite, and Williams Complex. |FY10 $0 MON ESA RAN,NR Completed
2. Assist NYSDEC with 2012 hibernacula surveys as needed. |FY12 $0 MON ESA RAN,NR Planned

B. Review and track recovery progress.

Partners

NYSDEC, R3, R4, R5 FOs, NYSDOT, FHWA, USGS, Hudsonia, TNC

Indiana Bat (*Myotis sodalis)*: Upper Hudson Focal Area

References

U.S. Fish and Wildlife Service (USFWS). 2007. Indiana Bat (*Myotis sodalis*) Draft Recovery Plan: First Revision. U.S. Fish and Wildlife Service, Fort Snelling, MN. 622 pp. (This document has been peer-reviewed and is available at http://www.fws.gov/midwest/Endangered/mammals/inba/index.html).

U.S. Fish and Wildlife Service. 2009. Indiana Bat 5-Year Review: Summary and Evaluation.

U.S. Fish and Wildlife Service, Bloomington, IN.

Karner Blue Butterfly (*Lycaeides melissa samuelis*): Upper Hudson Focal Area

Karner Blue Butterfly Species Action Plan

FOCAL AREA: UPPER HUDSON

Other species benefitting:

frosted elfin, Persius duskywing, spadefoot toad, hognose snake, other pine barrens species

BIOLOGICAL PLANNING

Introduction to species

Species information: Potential habitat of the Karner blue butterfly (Kbb) is distinguished by the presence of dry, sandy, nutrient poor soils, with open woods and clearings supporting the plant wild lupine (*Lupinus perennis*), which is the only known food plant for the larvae; however, a variety of other plants provide nectar sources used by the butterflies. This type of habitat is usually associated with pitch pine/scrub oak or oak savannah communities that are maintained by fire at an early stage of plant succession. Some life history stage of the Karner blue butterfly (eggs, larvae, pupae, or adults) is present all year in the wild blue lupine habitat where it occurs

Justification for species selection: The Kbb is Federally- and New York State-listed as endangered. The New York Field Office (NYFO) is the regional lead field office.

State contribution to overall species population: The Kbb only occurs in 2 states in R5 (New York and New Hampshire). Four counties in northeastern New York currently contain Kbbs. New York has one Recovery Unit (RU) (Glacial Lake Albany) which is necessary for the overall recovery of the species. There are two potential recovery units with potential for future restoration in the Rome Sandplains and Iroquois/Tonawanda area as well.

Threats and threat assessment:

Threats[27] (See 2003 recovery plan for full assessment):

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Loss and/or fragmentation of habitat due to: vegetational succession due to lack of management (significant threat), commercial, industrial, and residential development

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes: NA

Factor C. Disease or predation:

[27] Refers to 5 listing factors A-E in Section 4 of Endangered Species Act

Karner Blue Butterfly (*Lycaeides melissa samuelis*): Upper Hudson Focal Area

A. Heavy lupine browse by mammals

B. Thrips (*Odonatothrips loti*) may be a problem at some New York sites where they have been found on lupine plants

Factor D. The inadequacy of existing regulatory mechanisms:

A. Without the Endangered Species Act (ESA), there is inadequate protection in some states.

Factor E. Other natural or manmade factors affecting its continued existence:

A. Nuisance plants
B. Stochastic events such as droughts and cool springs
C. Climate change - Kbb's have narrow climatic constraints and a dependency on snow cover
D. Pesticide use
E. Potential hybridization between the melissa blue *(Lycaeides melissa melissa*) found in western Wisconsin (near Hudson)

Recovery Goals

Range-wide Recovery Objectives:

Interim - Restore viable metapopulations of Kbbs across the species extant range so that it can be reclassified from endangered to threatened.
Long-term - Delist

Conservation goal(s) for New York State: Establish 3 viable populations of Kbbs in the Glacial Lake Albany RU.

Research/Actions needed: NA

CONSERVATION DESIGN

Strategies for addressing those threats

Please go to these documents for the existing strategies:

- Recovery Plan completed 2003 (Service 2003)
- Spotlight Species Action Plan completed 2009 (Service 2009)
- 5-year review initiated
  - Assist Region 3 with review/comments of 5-year review as requested. |FY12 $0 BP ESA RAN Planned

Karner Blue Butterfly (*Lycaeides melissa samuelis*): Upper Hudson Focal Area

Research or Actions needed: Specific actions for the next 3 years addressing conservation design include the following:

A. Develop protection and management plans for New York (Recovery Action 1.312) AND Develop implementation strategies to promote recovery (Recovery Action 1.5)

   1. Assist agencies with development of localized plans

      a. Attend Saratoga New York State Department of Environmental Conservation (NYSDEC) Area Management Plan meeting in Wilton- 2/10/2010. |FY10 $0 BP ESA RAN Completed

      b. Attend Albany Pine Bush Preserve Commission (APBPC) Management Plan meeting. |FY10 $0 BP ESA RAN Completed

      c. Assist with other localized plans as requested. |FY10-FY13 $0 BP ESA RAN Ongoing

   2. Assist NYSDEC with development of a State Recovery Plan

      a. Participate in process of developing a State recovery plan as needed/requested. |FY10-FY13 $0 BP ESA RAN Ongoing

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY 2010 - 2012

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Continue/start management activities for New York (Recovery Action 1.23)

   1. Multi-year Spencer Christmas Tree Farm office project

      a. Assist with clearing at Spencer Site - December 2009. |FY10 $0 DEL ESA RAN Completed

      b. Assist with additional clearing at Spencer Site (ESA to coordinate). |FY11 $? DEL ESA RAN UnabletoComplete

   2. Assist with other projects

      a. Provide grass seed to New York State Office of Parks, Recreation and Historic Preservation (NYSOPRHP) for Saratoga Spa State Park - December 2009. |FY10 $0 DEL ESA,PFW RAN,ER Completed

b. Provide technical assistance to partners for grant development. |FY10-FY13 $0 DEL ESA RAN Ongoing

c. Provide funding when possible

i. Submit habitat management recovery projects to Regional Office (RO) for funding (FY2010) [completed- funded with end-of-year]

- NYSDEC project - Fund habitat management. |FY11 $11,500 DEL ESA RAN Completed
- Complete NYSDEC grant agreement paperwork. |FY11 $0 DEL ESA RAN Completed
- Provide NYSDEC grant oversight. |FY11-FY12 $0 DEL ESA RAN Ongoing

d. Collect lupine/nectar seed (1-2 days) at one site (ESA to coordinate). |FY11 $? DEL ALL ALL UnabletoComplete

e. Collect lupine/nectar seed (1-2 days) at one site (ESA to coordinate). |FY11 $? DEL ALL ALL Planned

f. Consider need for additional habitat restoration in Rome Sandplains or Iroquois/Tonawanda potential recovery units (Great Lakes) and possible future translocation/reintroduction.

i. Attend field trip at APBPC and Wilton with Iroquois NWR and RO staff to learn about restoration techniques. |FY11 $0 DEL ESA RAN Completed

3. Law enforcement cases/settlements

a. Conduct site visits and document completed projects for two law enforcement cases/settlements. |FY11 $0 DEL ESA RAN UnabletoComplete

b. Conduct site visits and document completed projects for two law enforcement cases/settlements. |FY12 $0 DEL ESA RAN Planned

B. Implement long term land protection strategies in New York (Recovery Action 1.3222)

1. Meet with partners to determine how many acres of protected lands are needed in each viable population area. |FY11 $0 DEL ESA RAN Completed

2. Provide technical assistance to partners to acquire funding for protection

a. Provide technical assistance to NYSDEC regarding non-traditional S6 grants. |FY11-FY13 $0 DEL ESA RAN Ongoing

3. Continue efforts to protect and restore habitat in the 4 New York target areas- assist with funding or implementation

4. Increase efforts in the Queensbury area (very small fragmented sites left - but National Grid Habitat Conservation Plan [HCP] will help)

C. Section 7 Consultations (Recovery Action 1.411)

1. Saratoga County Airport consultations have involved restoration of ~60 acres and more can be done

a. Monitor Saratoga Airport Biological Opinion (BO) implementation. |FY11-FY12 $0 DEL ESA RAN Ongoing

b. Provide technical assistance to County and FAA during development of next 5-year master plan. |FY12 $0 DEL ESA RAN Planned

2. Albany Landfill consultation will involve habitat restoration

a. Finish Albany Landfill BO. |FY10 $0 DEL ESA RAN Completed

b. Monitor Albany Landfill BO implementation. |FY11-FY13 $0 DEL ESA RAN Ongoing

3. Beaver Pond residential development

a. Complete Beaver Pond consultation - Corps refuses to consult - write final TA letter. |FY12 $0 DEL ESA RAN Planned

D. 10(a)(1)(A) permit review (Recovery Action 1.412)

1. Meet with NYSDEC on annual basis to review work conducted under their permit. |FY11-FY13 $0 DEL ESA RAN Ongoing

E. 10(a)(1)(B) permit review (Recovery Action 1.413)

1. National Grid HCP-

a. Release National Grid HCP for public comment. |FY12 $0 DEL ESA RAN Completed

b. Complete National Grid HCP permit decision. |FY12 $0 DEL ESA RAN Planned

c. If permit is issued, monitor National Grid HCP permit annually. |FY12-FY13 $0 DEL ESA RAN Future

2. Town of Wilton HCP - get out for public comment and complete permit decision in FY10 ***revision****- completed as 10(a)(1)(A) recovery permit action with NYSDEC. No HCP for Town needed*

F. Initiate/continue reintroductions and accelerated colonization in New York (Recovery Action 2.213)

1. Increase Kbb populations at restored sites with translocation and augmentation (NYSDEC lead)

a. Complete grant agreement with APBPC for FY2010 captive rearing, augmentation efforts. |FY10 $15,000 DEL ESA RAN Completed

b. Complete grant agreement with APBPC for 2011 captive rearing, augmentation efforts. |FY11 $10,000 DEL ESA RAN Completed

c. Manage two grant agreements with APBPC

i. Visit APBPC translocation sites. |FY10-FY12 $0 DEL ESA RAN Ongoing

ii. Review APBPC reports and invoices. |FY10-FY12 $0 DEL ESA RAN Ongoing

G. Identify mechanisms to streamline the Federal permit process for private landowners (Recovery Action 1.43) and encourage private landowners to conserve the Kbb (Recovery Action 4.3)

1. Complete Safe Harbor Agreement (The Nature Conservancy [TNC]) (FY2010)

a. Meet with NYSDEC, TNC, APBPC- 2/10/2010. |FY10 $0 DEL ESA RAN Completed

b. Complete U.S. Fish and Wildlife Service (USFWS) documents and provide to public for comments. |FY10 $0 DEL ESA RAN Completed

c. Revise Safe Harbor Agreement (SHA) and appendices. |FY10 $0 DEL ESA RAN Completed

d. Assist with permit conditions. |FY10 $0 DEL ESA RAN Completed

2. Work with APBPC/TNC to showcase SHA after first landowner is enrolled and make a push for landowner sign-ups. |FY12-FY13 $0 DEL ESA RAN Planned

3. Provide technical assistance to APBPC and TNC as requested during development of certificates of inclusion. |FY12-FY13 $0 DEL ESA RAN Planned

4. Assist with habitat restoration on private lands associated with SHA. |FY12-FY13 $? DEL PFW,ESA RAN Future

5. Monitor SHA permit annually after sign ups. |FY12-FY13 $0 DEL ESA RAN Future

Factor C. Disease or predation: No work in New York planned.

Factor E. Other natural or manmade factors affecting its continued existence: No work in New York planned.

OUTREACH

Recovery Action 4

1. Attend annual Lupine Festival at APBPC. |FY12-FY13 $0 OUT ESA RAN Planned

2. There are many opportunities to better spread the word about USFWS involvement.

   a. Attend 1 work day with TNC or APBPC. |FY12-FY13 $0 OUT ESA RAN Planned

   b. Attend events at Saratoga Spa State Park when invited. |FY12-FY13 $0 OUT ESA RAN Future

   c. Develop brochure for the Partners for Fish and Wildlife (PFW) program, specifically for Kbb habitat restoration. |FY13 $0 DEL ESA,PFW RAN,ER Future

   d. Visit Farnsworth Middle School, Queensbury, or Shenandoah High School as appropriate. |FY10-FY13 $0 OUT ESA RAN Ongoing

   e. Attend public meetings in Wilton, Queensbury, Milton, as appropriate. |FY10-FY13 $0 OUT ESA RAN Ongoing

   f. Work with Crossgates to update outreach materials at the mall. |FY13 $0 OUT ESA RAN Future

   g. Publicize restoration activities in local papers. |FY12-FY13 $0 OUT ESA,ExternalAffairs RAN Future

h. Update our website with recent projects like Spencer (annually FY2011-13) (PFW, IT, and ESA). |FY10-FY13 $0 OUT ESA,IT RAN,AFL Future

MONITORING

1. Monitor population trends, habitat, and distribution in New York (Recovery Action 1.14) and monitor Glacial Lake Albany RU metapopulation decline (Recovery Action 5.16)

   a. NYSDEC, APBPC, and TNC have developed protocols to measure progress/success.

   b. NYSDEC, TNC, and APBPC monitor almost all sites on an annual basis (Federal Aid grants to NYSDEC); review results. |FY10-FY13 $0 MON ESA RAN Ongoing

   c. Explore additional funding opportunities for monitoring. |FY12-FY13 $0 MON ESA RAN Planned

   d. NYSDEC, TNC, and APBPC monitor response of Kbbs to restoration projects. Assist with funding. |FY12-FY13 $? MON ESA RAN Future

2. Monitor habitat management relative to the Kbb (Recovery Action 5.11)

   a. NYSDEC, TNC, and APBPC assess habitat suitability at restoration sites; review results. |FY10-FY13 $0 MON ESA RAN Ongoing

3. Monitor Kbb translocation methods (Recovery Action 5.13)

   a. Revisit Kbb translocation methods annually with NYSDEC and APBPC. |FY10-FY13 $0 MON ESA RAN Ongoing

4. Conduct Recovery Team meetings (Recovery Action 6.2)

   a. Participate in twice yearly Kbb Recovery Team calls (NYFO ESA). |FY10-FY13 $0 MON ESA RAN Ongoing

Partners

TNC, APBPC, NYSDEC, New York State Natural Heritage Program (NYSNHP), NYSOPRHP, New York State Department of Transportation (NYSDOT)

References

U.S. Fish and Wildlife Service. 2003. Final Recovery Plan for the Karner Blue Butterfly (*Lycaeides melissa samuelis*). U.S. Fish and Wildlife Service, Fort Snelling, Minnesota. 273 pp.

Karner Blue Butterfly (*Lycaeides melissa samuelis*): Upper Hudson Focal Area

U.S. Fish and Wildlife Service. 2009. Karner Blue Butterfly Spotlight Species Action Plan.

New England Cottontail (*Sylvilagus transitionalis)*: Upper Hudson Focal Area

New England Cottontail Species Action Plan

FOCAL AREA: UPPER HUDSON

Other species benefitting:

American woodcock, golden-winged warbler, blue-winged warbler, brown thrasher, common nighthawk, ruffed grouse, whip-poor-will

BIOLOGICAL PLANNING

Introduction to species

Species information: The New England cottontail (NEC) is New England's only native cottontail rabbit. The NEC populations historically occurred throughout the New England states and eastern New York and have declined dramatically in recent decades due to habitat loss and fragmentation resulting from land use change; habitat loss continues within its currently limited range. The NEC is a Species of Greatest Conservation Need (SGCN) in all seven states in its range, and a Candidate Species for Federal listing under the Endangered Species Act (ESA). The NEC requires thicket habitat and is frequently associated with shrublands and early successional forests. Studies show that the NEC's mortality rate is twice as high on patches smaller than 6 acres than it is on patches over 12 acres. On small patches, the habitat may provide insufficient food to support the cottontails throughout the winter. In these conditions, NECs either starve or risk predation in search of food outside the safety of dense cover. Habitat blocks of at least 25 acres in size (ideally much larger) and close to additional patches of habitat are necessary for the species to survive (Arbuthnot 2008).

Justification for species selection: The NEC is a Federal candidate (since 2006) for listing and is a New York State Species of Concern. It is also a U.S. Fish and Wildlife Service (USFWS) Spotlight Species. There is a 2007 Memorandum of Understanding among the Natural Resources Conservation Service (NRCS), USFWS, and Association of Fish and Wildlife Agencies to strengthen cooperation to conserve at-risk species and prevent their need for future listing under the ESA. Among the highest priorities in the New York Comprehensive Wildlife Conservation Strategy in 2009 is a Private Landowner Management Program for shrubland species, including NEC. There is a National Fish and Wildlife Foundation Keystone Initiative for the NEC.

State contribution to overall species population: Currently unclear. Working with New England Field Office (NEFO) and State partners to determine how many populations/acres we should target in New York.

New England Cottontail (*Sylvilagus transitionalis)*: Upper Hudson Focal Area

Threats and threat assessment:

Threats[28]:

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Habitat succession
B. Residential and commercial development

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:

A. Limited hunting

Factor C. Disease or predation:

A. Numerous diseases affect cottontail rabbits, but no information to suggest this is a significant threat.
B. Predation is a significant threat, particularly because current patches are insufficient to provide adequate cover and food. Common predators include coyotes, red foxes, bobcats, fishers, domestic cats, and owls.

Factor D. The inadequacy of existing regulatory mechanisms:

A. Ongoing threat.

Factor E. Other natural or manmade factors affecting its continued existence:

A. Invasive species.
B. Eastern cottontail competition.
C. White-tailed deer competition.
D. Weather.
E. Road-kill.

Conservation Goals

Range-wide Conservation Goals/Objectives: The 2009 Spotlight Species Action Plan goal is to reduce listing priority number from 2 to 8 by 2012. The ultimate goal of the USFWS is to preclude the need to list the NEC.

Conservation goal(s) for New York State: Long-term habitat and population goals have been developed for New York through a predictive modeling project completed by the Wildlife Management Institute (WMI). Draft habitat and population goals for 7 focal areas are identified for New York and are listed below. The NRCS goal for New York is 40 acres entered into the Wildlife Habitat Incentive Program (WHIP).

[28] Refers to 5 listing factors A-E in Section 4 of Endangered Species Act

New England Cottontail (*Sylvilagus transitionalis)*: Upper Hudson Focal Area

Focal Areas

Central Dutchess County: To establish 1,000-6,000 acres of habitat*/population size of 500.

Harlem-Housatonic: To establish 4,000-24,000 acres of habitat*/population size of 2,000.

Northern Columbia County: No habitat or population goals are identified for this focal area to date. No surveys have been done to see if NEC are present, but may be planned for the future as adequate habitat is likely present.

Rensselaer County: No habitat or population goals are identified for this focal area to date. NEC have been documented in this county, but records are at least 30 years old. Surveys may be planned for the future, but initial conservation efforts are going to focus on counties with NEC currently present.

Southern Columbia County: To establish 1,000-6,000 acres of habitat*/population size of 500.

Western Putnam County: To establish 3,000-6,000 acres of habitat*/population size of 1,500.

Westchester County: To establish 1,000-6,000 acres of habitat*/population size of 500.

*Indicate that NEC habitat may already be captured in the acreage goal identified in the form of protected natural or managed habitat or on private lands where no management may be needed for many years.

Research/Actions needed:

1. Assist NEFO and WMI with developing range-wide Conservation Strategy. |FY10-FY12 $0 BP ESA NR,RAN Ongoing

    a. Participate in Steering Committee. |FY10-FY12 $0 BP ESA NR,RAN Ongoing

2. Assist the New York State Department of Environmental Conservation (NYSDEC) with developing New York conservation goals using predictive modeling from the State Wildlife Grant Program (SWG) projects as starting point. |FY11 $0 BP ESA NR,RAN Completed

    a. Conduct additional surveys to better understand current range of NEC in New York.

    b. Assist NYSDEC with pellet collection. |FY11-FY12 $0 BP ESA NR,RAN Ongoing

    c. Assist the NYSDEC with vegetation surveys. |FY11-FY12 $0 BP ESA NR,RAN Ongoing

d. Assist NYSDEC with pellet analysis by funding the University of New Hampshire (UNH) to do DNA mitochondrial sequencing. |FY11 $11,500 BP ESA NR Complete

i. UNH grant oversight for project duration. |FY11-FY12 $0 BP ESA NR Ongoing

3. Scientific research in New York:

a. Evaluate the interrelationships between New England cottontail and Eastern cottontail, especially with regard to year-round and seasonal habitat selection, habitat use, home range and dispersal, population density, survivorship, and population dynamics. The State University of New York College of Environmental Science and Forestry (SUNY-ESF) will be addressing this question in FY12-FY16.

b. Complete a diet analysis for both New England and Eastern cottontail including the nutritive values of various non-native species and native shrub species present at occupied sites and consumed by the rabbits. Dominant species at occupied sites include multiflora rose, Japanese and common barberry, autumn and Russian olive, Japanese and tartarian honeysuckle, oriental bittersweet, common buckthorn, alder, *Rubus*, and various species of dogwood and *Viburnum*. SUNY-ESF will be addressing this question in FY12-FY15.

c. Evaluate the occurrence of New England cottontail and Eastern cottontail with respect to landscape characteristics, including factors such as patch size, land use surrounding occupied and unoccupied patches, and connectedness of patches. It is believed that SUNY-ESF will be partially addressing this question, but a larger study needs to be done.

d. Evaluate the impact of rabbit hunting on New England cottontail on sites where they co-occur with Eastern cottontail. The NYSDEC is attempting to address this by collecting heads directly from hunters, but a larger study needs to be done.

CONSERVATION DESIGN

Strategies for addressing those threats

Please go to these documents for the existing strategies:

- Spotlight Species Action Plan completed in 2009 (Service 2009)
- Landowners Guide to Habitat Management (Arbuthnot 2008)

Research or Actions needed: Specific actions for the next 3 years addressing conservation design include the following:

A. Participate in multi-state SWG project and NEC USFWS Initiative.

1. Range-wide efforts.

a. Participate in monthly USFWS calls. |FY10-FY12 $0 DES ESA NR,RAN Ongoing

b. Participate in steering committee calls/meetings. |FY10-FY12 $0 DES ESA NR,RAN Ongoing

c. Participate in technical committee calls/meetings. |FY10-FY12 $0 DES ESA NR,RAN Ongoing

d. Assist with development of range-wide conservation strategy. |FY10-FY12 $0 DES ESA NR,RAN Ongoing

e. Participate in established working groups (i.e., BMP and Research and Monitoring working groups). |FY11-FY12 $0 DES ESA NR,RAN Ongoing

f. Review products from SWG grant. |FY10-FY12 $0 DES ESA NR,RAN Ongoing

2. New York efforts

a. Attend New York NEC initiative kick-off meeting October 2009. |FY10 $0 DES ESA NR,RAN Completed

b. Host New York NEC meeting June 2011 to continue focal area conservation efforts. |FY11 $0 DES ESA NR,RAN Completed

c. Assist with development/review of focus area maps. |FY10-FY11 $0 DES ESA NR,RAN Completed

d. Hold joint New York bog turtle/NEC initiative meeting June 2010. |FY10 $0 DES ESA RAN Completed

e. Develop population and habitat goals for New York populations (see biological planning above). |FY11 $0 DES ESA RAN,NR Completed

f. Work with the NYSDEC and NRCS to overlay northeastern vegetation classifications, abiotic factors model, wetlands, state lands, bog turtle occurrences, etc., to better prioritize conservation areas for NEC. |FY12 $0 DES ESA RAN,NR Planned

g. Develop business plans for each of the focal areas to prioritize and implement work planned. |FY12 $0 DES ESA RAN,NR Planned

h. Work with PFW to identify areas where habitat restoration/enhancement can be done. |FY12 $0 DES ESA RAN,NR Planned

i. Discuss with the NYSDEC the feasibility of trap and transfer of NEC to populate areas with adequate habitat. |FY? $0 DES ESA RAN,NR Future

B. Participate in NRCS NEC Restoration Initiative (FY2011 and potentially beyond)

1. Participate in initial conference calls. |FY11 $0 DES ESA,PFW RAN,NR,CS Completed

2. Assist NRCS with ranking criteria for FY11 WHIP. |FY11 $0 DES ESA,PFW RAN,NR,CS Completed

3. Discuss with NRCS about possibly adding NEC to the Wetlands Reserve Program to allow for additional habitat restoration work. |FY12 $0 DES ESA RAN,NR Planned

4. Assist NRCS with signing up landowners for FY11 WHIP.

   a. Co-host landowner meeting in Millbrook, New York, March 2, 2011. The meeting will focus on signing up landowners for WHIP, if possible, and to develop landowner outreach strategy to sign additional properties into the program to meet the NRCS FY11 acreage goal. |FY11 $0 DES ESA RAN,NR Completed

      i. Fund Kelly Perkings at the Natural Heritage Program (NHP) to draft 3 management plans for landowners who enter into WHIP. Currently, no landowners are signed up. |FY11 $10,000 DES ESA RAN Completed

      ii. Grant oversight of the NHP project. |FY11-FY12 $0 DES ESA RAN Ongoing

   b. Co-host second landowner outreach meeting (date and location to be determined). |FY12 $0 DES ESA RAN,NR Planned

      i. Pre-meeting logistics. |FY12 $0 DES ESA RAN,NR Planned

         - Develop meeting goals, objectives, and agenda. Goals will be the same as for the Millbrook meeting. |FY12 $0 DES ESA RAN,NR Planned
         - Develop invite list and send out invitations. |FY12 $0 DES ESA RAN,NR Planned

      ii. Post-meeting

         - Send notes and action items. |FY12 $0 DES ESA RAN,NR Planned
         - Fund possibly the NHP to draft management plans for landowners entered into WHIP. |FY13? $10,000? DES ESA RAN,NR Future

5. Provide technical assistance to NRCS for development of outreach products as needed (example – Maine Field Office brochure). |FY12? $0 DES ESA RAN,NR Planned

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY 2010 - 2012

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Work with New York NEC Team to protect/manage habitat

   1. Determine whether there is overlap with current NRCS easements for bog turtle. |FY12 $0 DEL ESA RAN,NR Planned

   2. Conduct restoration activities in Wetlands Reserve Program (WRP) wetland buffers, as needed, using our equipment for creation of brush pile, hydro-axe, and plantings. |FY12-FY13? $0 DEL ESA,PFW RAN,NR,CS Planned

B. Participate in NRCS NEC Initiative (FY11 and potentially beyond) as noted above. |FY12 $0 DEL ESA,PFW RAN,NR,CS Ongoing

C. If State is interested, consider a Candidate Conservation Agreement with Assurances (CCAA) for New York based on New Hampshire's and Maine's.

   1. Participate on conference calls with NEFO, RO, and the Washington Office to further discuss this option. |FY11-FY12 $0 DEL ESA RAN,NR Ongoing

D. Develop programmatic conference opinion for NEC habitat restoration. |FY12? $0 DEL ESA RAN,NR Planned

E. Develop National Fish and Wildlife Foundation (NFWF) Business Plan for New York. |FY12? $0 DEL ESA RAN,NR Planned

F. Work with PFW to implement habitat restoration/enhancement projects. |FY12 $0 DEL ESA RAN,NR Planned

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes:

No work planned in the next 2-3 years.

Factor C. Disease or predation:

No work planned in the next 2-3 years.

New England Cottontail (*Sylvilagus transitionalis)*: Upper Hudson Focal Area

Factor D. The inadequacy of existing regulatory mechanisms:

No work planned in the next 2-3 years.

Factor E. Other natural or manmade factors affecting its continued existence: Expansion of habitat for NEC will help alleviate pressures from eastern cottontail and address invasive species (see actions under Factor A).

OUTREACH

- Develop outreach strategy to sign up landowners into NRCS or USFWS programs
  - Co-host landowner outreach meeting with NRCS (see Conservation Design).
- Develop overall outreach strategy to increase awareness of the species in New York
  - Provide general information to non-profit organizations, hunters, nature centers. |FY12? $0 OUT ESA RAN,NR Planned
  - Update website with NEC information and ongoing projects. |FY11-FY13 $0 OUT ESA,IT RAN,NR,AFL Ongoing
  - "Brake for bunnies" bumper stickers. |FY13? $? OUT ESA RAN,NR Future

MONITORING

Review and track recovery progress annually.

- Utilize the WMI Habitat Accomplishment Database to track progress on conservation efforts range-wide over time. |FY12? $0 MON ESA RAN,NR Planned

Partners

NYSDEC, New York State Natural Heritage Program (NYSNHP), The Nature Conservancy (TNC), NRCS, Columbia County Land Trust, NFWF

References

Arbuthnot, M. 2008. A Landowner's Guide to New England Cottontail Habitat Management. Environmental Defense Fund. 37 pp.

U.S. Fish and Wildlife Service. 2008. Candidate Notice of Review.

U.S. Fish and Wildlife Service. 2009. New England Cottontail Spotlight Species Action Plan. U.S. Fish and Wildlife Service, Concord, New Hampshire, and Hadley, Massachusetts.

UPPER SUSQUEHANNA FOCAL AREA

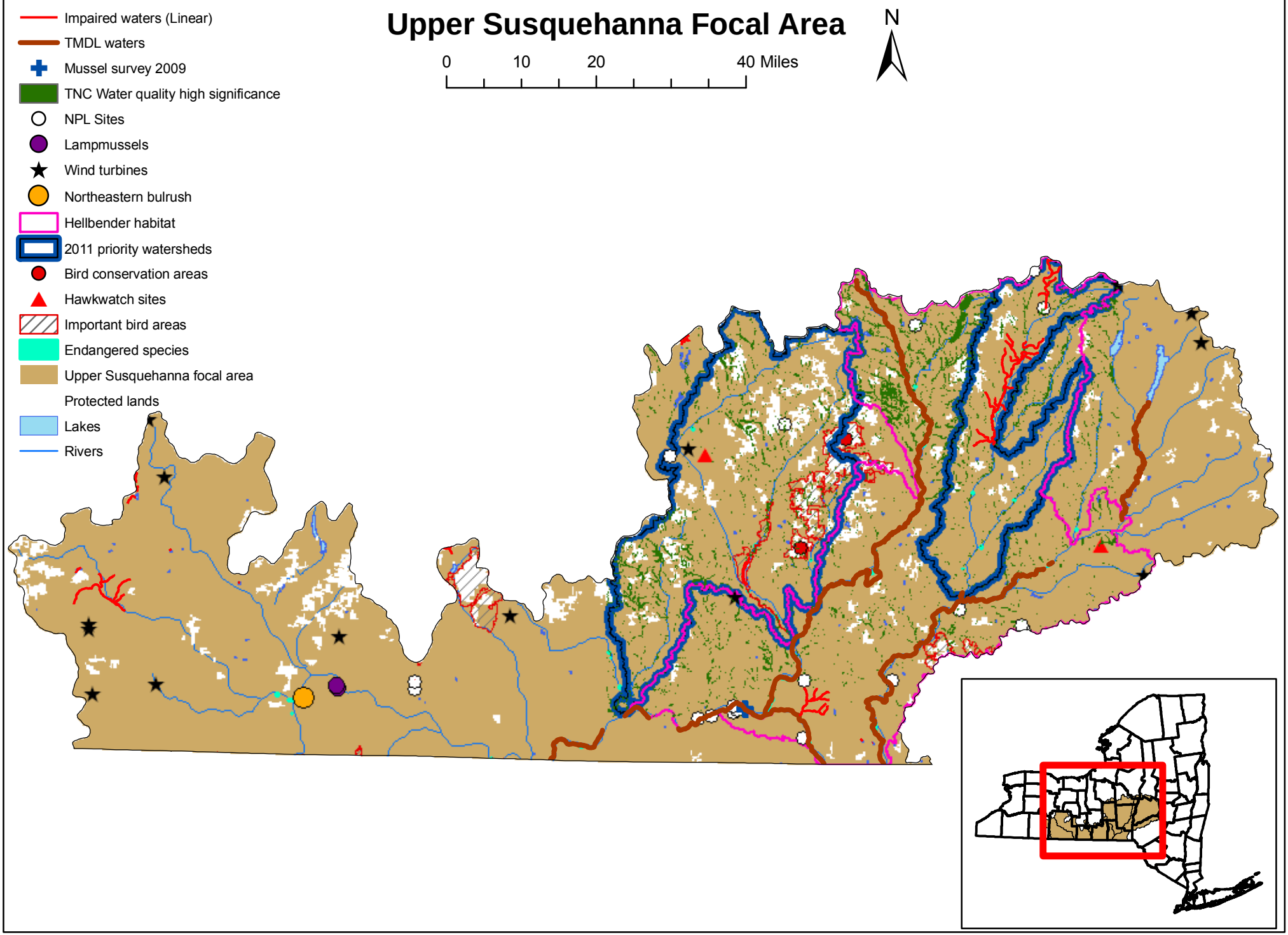
The Upper Susquehanna Focal Area (USFA) is located in the eastern portion of the Southern Tier of New York and contains approximately 6,260 square miles or 11.5% of the state. This focal area is largely demarcated by the watersheds of the Susquehanna and Chemung Rivers. It is located almost entirely within the Glaciated Allegheny Plateau with a local relief of 190-1000 feet. Overall elevation ranges from 900-2200 feet. The USFA is characterized by its extensive plateau with glacially-rounded hills and glacially-widened U-shaped valleys.

The Susquehanna River Basin is the second largest east of the Mississippi. Nearly 4,000,000 people live within the basin, and it provides half of the freshwater input for the entire Chesapeake Bay. All of, or portions of, nineteen New York counties are included within the USFA boundary including Steuben, Chemung, Tioga, Broome, Cortland, Chenango, and Otsego, with small areas in Allegany, Livingston, Ontario, Yates, Schuyler, Tompkins, Cayuga, Onondaga, Madison, Oneida, Herkimer, and Delaware counties. Approximately 450,000 people live within this focal area, concentrated primarily in the cities of Binghamton, Elmira, Oneonta, and Cortland with much of the remainder of the population in the Chemung and Susquehanna River valleys. The landscape character across the region has transitioned in the last century from predominately agricultural to predominately forested with a patchwork of agricultural lands interspersed with urban areas and rural towns.

This focal area was selected because it contains important riverine and forested wetland environments that support a unique set of regionally significant fish, wildlife, and plant resources. There are currently one Federally-listed species (endangered [E]) and five identified species of concern within the focal area. The large rivers and high quality tributaries within the focal area support remnant populations of brook trout and eastern hellbender as well as the potential to support renewed spawning grounds for American shad. Vernal pool habitats are present throughout the focal area and they support a variety of wetland species including the Jefferson salamander and northeastern bulrush (E). The matrix of successional habitat present throughout the focal area is also important habitat for woodcock. The USFA is located within Bird Conservation Region 28 (Appalachian Mountains) and Partners in Flight Physiographic Area 24 (Allegheny Plateau).

The New York Field Office actively seeks to promote the above resources by addressing issues related to interactions with Marcellus shale drilling, industry, transportation, wind power, dam removal, and development. Specific threats include habitat loss (principally), fish barriers, flooding, streambank erosion, gravel deposition, nutrient loading, and climate change. Current projects include Federal and non-federal permit review for hydroelectric, shale gas, and wind power development and relicensing, endangered species consultation and recovery activities, and habitat restoration and invasive species control implemented by the Partners for Fish and Wildlife.

Upper Susquehanna Focal Area



American Shad *(Alosa sapidissima):* Upper Susquehanna Focal Area
American Shad Species Action Plan

FOCAL AREA: UPPER SUSQUEHANNA

Other species benefitting:

Other anadromous and catadromous species such as American eel; eastern hellbender

BIOLOGICAL PLANNING

Introduction to species

Species information: Research on the biology, habitat requirements, and stock status of American shad is in progress. Coordination with the Susquehanna River Basin Commission (SRBC) and the Pennsylvania Field Office will occur. The goal for this species is restoration to sustainable levels. Historically, the Susquehanna River supported spawning runs of shad, with fish migrating as far upstream as Cooperstown, NY. Spawning is April-June.

Justification for species selection: Regional New York State Department of Environmental Conservation (NYSDEC) fisheries staff assisted with the stocking of American shad fry in the Susquehanna River. On June 2, 2004, nearly 485,000 fry were picked up at the Pennsylvania Fish and Boat Commission's VanDyke Fish Hatchery and stocked in the river at Apalachin and Binghamton. This was the third year of a five year experimental American shad stocking program in the New York portion of the Susquehanna River drainage. These fish were stocked as part of a multi-state cooperative effort to restore a self-sustaining population of shad in the Susquehanna River. The Susquehanna River Anadromous Fish Restoration Cooperative (SRAFRC) includes natural resource agencies from Pennsylvania and Maryland as well as the U.S. Fish and Wildlife Service, National Marine Fisheries Service, and the Susquehanna River Basin Commission. The New York Field Office (NYFO) selected shad as a focal species to assist with this effort and to preclude listing of the species, and because it is important to the Chesapeake Bay Initiative.

State contribution to overall species population: At this time, due to the dam at Sunbury, PA, there are no runs of American shad into New York.

Research needed:

- Population goals for American shad based on modeling and field investigations

  (Who: NYSDEC, Trout Unlimited [TU], NYFO, SRBC; Cost: Unknown at this time)

- Assist with shad surveys to determine presence/absence and population densities, coupled with habitat investigations.

  (Who: NYSDEC, TU, NYFO, SRBC; Cost: Unknown at this time)

American Shad *(Alosa sapidissima):* Upper Susquehanna Focal Area

Threats and threat assessment:

1. **Barriers to migration (dams and culverts).**

   Research Needed:

   - Determine the genetic diversity of shad in the watershed. (This becomes important when barriers are removed and to establish management units that are dependent on the level of genetic variation).

     (Who: NYSDEC, TU, SRBC, NYFO; Cost: Unknown)

   - Identify priority subwatersheds to establish shad once they make it into the upper watershed.

     (Who: NYSDEC, TU, SRBC, NYFO; Cost: Unknown)

   - Suitable habitat investigation and mapping (substrate, water temp./quality, instream cover, riparian cover, etc.).

     (Who: NYSDEC, TU, SRBC, NYFO; Cost: Unknown)

   - Monitor shad runs as habitat opens up for them to establish baseline.

     (Who: NYSDEC, TU, SRBC, NYFO; Cost: Unknown)

2. **Increased sediment load (from non-point source runoff, including agricultural practices).**

3. **Competition from introduced species.**

4. **Overfishing (in coastal areas and larger rivers in the lower basin).**

5. **Climate Change (warmer conditions will increase water temperatures, reduce winter snow and ice cover, and alter the timing, duration, and volume of seasonal stream flow).**

6. **Emerging contaminants (in Susquehanna watershed, downstream of moderate sized communities of Corning, Elmira, Triple Cities).**

Partners/potential funding:

NYSDEC, TU, SRBC

American Shad *(Alosa sapidissima):* Upper Susquehanna Focal Area

Population goal(s) for New York State:

The population goal is to achieve self-sustaining runs of shad in the Susquehanna basin and to maintain or increase the level of shad fry stocking in New York portions of the basin, and to advocate for improvements in fish passage facilities at Chemung and Susquehanna dams, including Rock Bottom Dam in Binghamton. As described above, research is needed to determine what a self-sustaining population would be.

CONSERVATION DESIGN

Strategies for addressing those threats

1. **Barriers to migration.**

    a. Promoting, where possible, dam and culvert removal and/or re-design or modification.

        i. Work with Lower Great Lakes Fish and Wildlife Conservation Office (LGLFWCO), Upper Susquehanna Coalition (USC), and NYSDEC to identify stream barriers for removal or restoration to increase fish passage (Partners for Fish and Wildlife [PFW]) (staff time only)

2. **Increased sediment load.**

    a. Assist regulatory agencies and the public in providing recommendations for reducing sediment non-point source pollution through best management strategies in priority watersheds: Butternut, Unadilla, Genegantslet, Owego Creek, Tioughnioga (Conservation Planning Assistance [CPA]) (staff time only). |FY12 $0 DES CPA ? Ongoing

    b. Participate in State technical committee, subcommittee work to provide technical assistance on programs and projects which minimize sediment loads in streams, and which may provide for establishment of buffers (PFW) (staff time only). |FY12 $0 DES PFW ? Ongoing

    c. Provide stream protection guidelines via CPA permit and project review, including best management practices (BMP) for NYFO website.

    d. Protect shoreline and buffers by stream bank fencing (typically by planting shrubs/bare root trees).

    e. Restore wetlands in landscape position to benefit streams by capturing sediment, nutrients.

    f. Natural channel restoration.

g. Provide technical assistance on stream restoration projects in the Upper Susquehanna watershed (PFW) (staff time only). |FY12 $0 DES PFW ? Ongoing

3. **Competition from introduced species.**

   a. Reduce invasive species by developing and implementing best management practices.

4. **Overfishing.**

   a. Support NYSDEC, National Oceanic and Atmospheric Administration (NOAA), and Atlantic States Marine Fisheries Commission (ASMFC) regulations.

5. **Climate Change.**

   a. Target restoration to areas that will support shad under future climate conditions.

6. **Contaminants and Emerging contaminants.**

   a. Manage Richardson Hill Road Landfill NRDA case. |FY12-FY13 $0 DES EC DG Planned

   b. Coordinate Kentucky Avenue Wellfield BTAG activities to maximize potential for a remedy that protects fish and wildlife, with USEPA. |FY12-FY13 $0 DES EC ASR Planned

   c. Conduct fish sampling within the Susquehanna watershed to evaluate emerging contaminants (staff time plus unknown dollars) (EC). |FY12-FY13 $0 DES EC ALS Planned

   d. Respond as appropriate to spills impacting fish and wildlife resources. |FY12-FY14 $0 DES EC ALS Planned

Partner organizations:

NYSDEC, TU, SRBC, USC, NOAA

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY 2010 – 2012

1. **Barriers to migration.**

   a. Remove barriers to shad migration in priority waters.

i. Work with partner organizations to prioritize barriers to be targeted for removal (PFW) (staff time only). |FY12 $0 DEL PFW ? Ongoing

ii. Work with LGLFWCO, Susquehanna Fisheries Coordinator, USC, and NYSDEC to fund removal of stream barriers to increase fish passage (PFW) (staff time plus unknown dollars)

1. **Increased sediment load.**

   a. Reduce sediment non-point source pollution by developing best management strategies.

   b. Provide stream protection guidelines via CPA permit and project review (staff time only) (CPA). |FY12 $0 DEL CPA TRS Ongoing

      i. Distribute BMP information on our website (CPA & IT) (staff time only)

   c. Protect shoreline and buffers.

      i. Develop buffer and shoreline protection guidelines and distribute them via our website.

   d. Provide technical assistance on stream restoration projects in the Upper Susquehanna watershed (PFW) (staff time only). |FY12 $0 DEL CPA TRS Ongoing

      i. Continue natural restoration of the Canasawacta (target is ¼ mile) (PFW) (staff time plus unknown dollars). |FY12 $0 DEL PFW CS Ongoing

2. **Competition from introduced species.**

   a. No work identified at this time.

3. **Overfishing.**

   a. No work identified at this time.

4. **Climate Change.**

   a. No work identified at this time.

5. **Contaminants and Emerging Contaminants**

   a. Evaluate restoration opportunities for the Richardson Hill Road Landfill NRDAR case. |FY12-FY13 $0 DEL EC DG Planned

b. Coordinate Kentucky Avenue Wellfield BTAG activities to maximize potential for a remedy that protects fish and wildlife, with USEPA.

   i. Provide substantive Federal agency comments on proposed actions at the Kentucky Avenue Wellfield Superfund Site with likely adverse impacts to fish and wildlife and/or their habitat. |FY12-FY13 $0 DEL EC ASR Planned

OUTREACH

Nothing identified at this time.

MONITORING

1. Work with NYSDEC, USC, and LGLFWCO to monitor shad habitat after restoration is complete. This includes electroshocking restored site to determine if shad are successfully using site, as well as conducting macroinvertebrate surveys to identify any changes in benthic community.

2. Monitor use of fish passage.

References

Chesapeake Bay Alosid Management Plan, 1989. (http://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=60000XSC.txt)

Susquehanna River Basin Commission. 2008. Comprehensive plan for the water resources of the Susquehanna River Basin. (http://www.srbc.net/planning/compplanfiles.asp)

Atlantic States Marine Fisheries Commission. 2000. Technical Addendum 1 to Amendment 1 of the Interstate Fishery Management Plan for shad and river herring. (http://www.asmfc.org/shadRiverHerring.htm)

American Woodcock (*Scolopax minor):* Upper Susquehanna Focal Area

American Woodcock Species Action Plan

FOCAL AREA: UPPER SUSQUEHANNA

Other species benefitting:

American black duck, mallard, Canada warbler, willow flycatcher, wood duck (scrub-shrub wetlands); brown thrasher, field sparrow, golden-winged warbler, blue-winged warbler, northern oriole, northern flicker, prairie warbler, ruffed grouse, red-headed woodpecker, song sparrow (shrub/early successional habitat); wood turtle

BIOLOGICAL PLANNING

Introduction to species

Species information: This shorebird species, also known as timber doodle, is a popular game bird. It is a migratory species, nesting in young forests and old fields; courtship displays and nesting span a 6 month period beginning in mid-winter in the south and extending into June in the north (Keppie & Whiting 1994). Across its northern range, woodcock appear to be the earliest migrant species to breed. It is strongly associated with both upland and wetland habitat types in BCR13. Woodcock are most abundant where available habitats include a mix of fields or openings, forests of different ages, and feeding habitat with moist soils and high shrub cover.

Justification for species selection: Since woodcock surveys began in 1966, it is estimated that woodcock numbers have declined 1% annually within their geographic range. Land-use changes such as wetland drainage and land conversion from early succession to mature forest are likely causes of population declines. However, hunter harvest may contribute, as roughly two million birds are shot annually. As a result, national and international bird conservation organizations consider the American woodcock a species of continental concern, and protecting the woodcock is a high priority in its habitat ranges. The American woodcock was chosen as a priority species because of its importance in the eastern U.S. as well as in New York. It is ranked "High" (H) on the BCR 13 list of "Priority Bird Species in Bird Conservation Regions partially or wholly within the Atlantic Coast Joint Venture". It is ranked as highly imperiled in the Northern Atlantic Regional Shorebird Plan, and is identified as a "Bird in Trouble" in the Eastern Forest in the North American Bird Conservation Initiative's 2009 report, "The State of the Birds, United States of America."

The population estimate for this species for the U.S. and Canada is 5,000,000, with no estimate available of the population in BCR 13 (Rich et al. 2004).

There has been a loss of over 829,000 singing male woodcock since the early 1970s (Kelley et al. 2008). According to Breeding Bird Survey data during the period from 1966-2002 (NYSDEC 2005), in New York, the American woodcock has exhibited a precipitous decline of 64% over this time period.

American Woodcock (*Scolopax minor):* Upper Susquehanna Focal Area

State contribution to overall species population: Woodcock are managed on the basis of two regions or populations, Eastern and Central (Cooper 2008), with New York in the eastern population. Singing-ground survey data for the eastern region for 1998-2008 indicate no significant trend in the population (Cooper 2008); however, in New York the species has declined. Annual spring surveys of their breeding grounds show that woodcock numbers in the eastern flyway and in New York have been falling by about 2 percent since the 1960s - a loss of over 55 percent in the last 40 years. The New York State Department of Environmental Conservation (NYSDEC) manages for early successional species on several Wildlife Management Areas (WMA) or Bird Conservation Areas (BCA).

The woodcock's range extends across New York in upland and wetland habitats. Relatively high concentrations of woodcock can found in WMA and BCA in the eastern Adirondacks, Lower Hudson, St. Lawrence Valley, and Central and Western New York.

Threats and threat assessment:

1. **Loss of habitat and habitat function.** The woodcock's decline is attributed to loss of upland and wetland habitat due to development, succession, and forest maturation. In addition, the reduction in forestry practices, especially in riparian areas (critical for breeding and migrating), contributes to loss of woodcock. In BCR 13 there has been a net loss of 2.3 million acres (0.9 M hectares [ha]) of early-successional habitats since the 1970s, resulting in declines in bird species such as American woodcock that utilize this habitat type. Loss of sufficient quality/quantity habitat within the focal areas and the function the habitat provides has adversely affected this species. As the rate of change from farmland into young growth forests increases, there is a decrease in quantity and quality of habitat for this species (NAS 2009).

2. **Decline in food supply** (i.e. earthworms) from changes in soil pH due to acid deposition (NAS 2009).

   Research needed:

   - Per McAuley et al. 2005, specific research is needed to evaluate if low recruitment observed on northeast sites is caused by contaminants, habitat fragmentation, or habitat degradation (such as decline in food supply).

3. **Contaminants.** Lead contamination that is either ingested as shot or ingested through contaminated earthworms after being spread through the food chain adversely affects this species (NAS 2009).

   Research needed:

   - Determine extent of lead contamination in current and potential habitat areas by conducting a literature review and, if necessary, conducting limited soil sampling. |FY? $0 BP EC ? Future

- Determine impacts of other contaminants on American woodcock by conducting a literature review. |FY? $0 BP EC ? Future

4. **Climate change**. Early successional habitat sequesters more carbon than mature forest. Climate change effects could include decreased water levels in rivers and lakes, changes in seasonal climate that could shift migration patterns of birds such as woodcock, and changes in food availability. Additional research would be needed to determine impacts due to climate change.

   Research needed:

   - Research is needed to determine the effects of climate change on this species.

Population goal(s) for New York State:

In New York, based on singing-ground surveys, there is a deficit of 72,249 males that would be needed to restore the population to 1970s levels. Of this, in BCR 13, there is a deficit of 51,804 males that would be needed to restore the population to 1970s levels. To restore woodcock densities in BCR 13 to those observed during the early 1970s, a total of nearly 3.6 million acres (1.4 million ha) of new woodcock habitat needs to be created. In BCR 13, the vast majority of timberland is under private ownership. Therefore, State and Federal resource agencies will need to enlist the help of individual and commercial private forestland owners in order to achieve habitat-management goals. This is a tremendous amount of acreage to manage and will require a monumental undertaking and cooperation from a diverse group of parties, as well as considerable monetary investment (Kelley et al. 2008).

Management Objectives for the Population:

- Halt population declines by 2012 as measured by Singing Ground Surveys

- Have positive population growth by 2022

  Note: Woodcock are banded from late spring through early fall. Birds are weighed, sexed, aged, and their bills are measured, and then each bird is banded. The U.S. Geological Survey (USGS) maintains a toll-free number so that banded birds that are recovered can be reported. Band return data are used to estimate population sizes and determine migration routes.

Overall Goal:

To halt the decline of woodcock populations and to return them to densities which provide adequate opportunity for utilization of the woodcock resource.

American Woodcock (*Scolopax minor):* Upper Susquehanna Focal Area

Management Objectives for Habitat for This Species:

- Halt decline of early successional habitat by 2012 (includes creation of 4.7 million acres of new habitat per year)

- To increase early successional habitat by 2022

CONSERVATION DESIGN

Strategies for addressing those threats

In 2001, Federal and State wildlife agencies, along with non-governmental organizations (NGO) including the Wildlife Management Institute (WMI), the Association of Fish and Wildlife Agencies, and the Ruffed Grouse Society (RGS), formed the Woodcock Task Force. Since then, using funding from the National Fish and Wildlife Foundation which is administered by the WMI, biologists and land managers have developed a Woodcock Conservation Plan.

1. **Loss of habitat and habitat function.**

    a. Influence regulatory agency decisions regarding proposed development, agricultural practices, etc., that result in loss of habitat and habitat functions for this species.

    b. Target U.S. Fish and Wildlife Service (USFWS) habitat creation, restoration, and enhancement projects to benefit woodcock.

        i. Use Natural Resource Damage Assessment and Restoration (NRDAR) funds to accomplish habitat restoration and protection using guidance found in Woodcock Conservation Plan.

        ii. Work with land trusts to target woodcock conservation.

        iii. In creating woodcock habitat, consider the management recommendation of the National Audubon Society (NAS) 2009 (appended to the end of this document). Facilitate habitat preservation through coordination with land trusts (Partners for Fish and Wildlife [PFW]).

        iv. Use geospatial tools to:

            - Analyze existing areas of habitat to determine potential breeding areas;

            - Analyze breeding bird survey data to focus efforts; and,

            - Create map for possible woodcock sites of concern.

2. **Decline in food supply.**

    a. Strategy will depend upon results of research need noted above.

3. **Contamination.**

    a. Use Natural Resource Damage Assessment and Restoration (NRDAR) funds to accomplish habitat restoration and protection using guidance found in Woodcock Conservation Plan. |FY? $0 DES EC ? Future

    b. Evaluate USFWS NRDAR within the Upper Susquehanna Focal Area. |FY12-FY13 $0 DES EC ALS,DG Planned

    c. Seek to minimize loss of habitat due to contamination by influencing regulatory agency decisions related to State and Federal Superfund sites. |FY12-FY13 $0 DES EC ASR Planned

    d. Strategy will depend upon results of research need noted above.

4. **Climate change.**

    a. Strategy will depend upon results of research need noted above.

Partners/potential funding:

RGS, WMI, USGS, Natural Resources Conservation Service (NRCS), National Park Service, NYSDEC, County Soil and Water Conservation Districts (SWCD), The Nature Conservancy (TNC), Audubon New York, Cornell Lab of Ornithology, New York State Department of Transportation (NYSDOT), Upper Susquehanna Coalition (USC), Upper Susquehanna Conservation Alliance (USCA), and universities.

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY 2010 - 2012

1. **Loss of habitat and habitat function.**

    a. Provide substantive Federal agency comments on proposed Federal agency actions with likely adverse impacts to woodcock and/or their habitat.

    b. Prioritize permit review in early successional habitat types or areas that have the potential for restoration.

    c. Develop Fact Sheets with best management practices (BMP) to minimize impacts to woodcock, and use these to influence landowners regarding habitat needs of this

species. In developing BMPs, consider the management recommendation of the NAS 2009 (appended to the end of this document).

d. Post on New York Field Office (NYFO) web site Fact Sheets with BMP to minimize impacts to woodcock and/or their habitat (FY 2011).

e. Provide technical assistance to NRCS for Wetland Reserve Program (WRP) for the restoration and conservation of habitat that would also be suitable for woodcock.

f. Work with partners (USC, RGS, NYSDEC, National Wildlife Refuges [NWR], etc.) to enhance/create early successional habitat within the Focal Area.

i. Restore 100 acres of early successional habitat within the St. Lawrence, Upper Susquehanna, Upper Hudson, and Great Lakes Focal Areas. |FY12-FY13 $20,000 DEL PFW EJR Planned

ii. Coordinate logistics with NWR R5 Hydro-Ax (on-going) (PFW).

2. Decline in food supply.

a. Delivery will depend upon strategy determined from research noted above.

3. Contamination.

a. Manage Richardson Hill Road Landfill NRDAR case. |FY11-FY13 $0 DEL EC DG Ongoing

i. Consider woodcock habitat restoration and preservation during Richardson Hill Road Landfill NRDAR case restoration planning. |FY11-FY13 $0 DEL EC DG Ongoing

b. Seek to minimize loss of habitat due to contamination by influencing regulatory agency decisions related to State and Federal Superfund sites within the Upper Susquehanna Focal Area. |FY12-FY13 $0 DEL EC ASR Planned

c. Delivery will depend upon strategy determined from research noted above.

4. Climate change.

a. Delivery will depend upon strategy determined from research noted above.

Partners/potential funding:

To implement the Woodcock Conservation Plan, Woodcock Habitat Regional Initiatives have been set up: Northern Forest Initiative, Appalachian Mountains Initiative, and Upper Great Lakes Initiative. These initiatives are partnerships of agencies and organizations in geographic

areas within the woodcock's range. None of these encompass the Upper Hudson River Focal Area or the St. Lawrence Focal Area.

Partners in the Woodcock Conservation Plan include: Connecticut Woodcock Council, Minnesota Woodcock, Woodcock Limited of Pennsylvania, Golden-Winged Warbler Working Group, RGS, and WMI. Other potential partners include: USGS, NRCS, National Park Service, NYSDEC, County SWCD, TNC, Audubon New York, Cornell Lab of Ornithology, NYSDOT, New York Power Authority, universities.

OUTREACH

Landowner education during site visits when potential habitat projects are present (on-going) (PFW).

Public involvement and education regarding the need for protection and restoration of shrubland and early successional habitat for woodcock and similar species. This could be addressed through the development of a new traveling exhibit.

The NYFO could develop an educational workbook devoted to early successional species. The NYFO could develop Fact Sheets aimed at some of the groups listed below (landowners, public).

Put Landowners Guide to Woodcock Management up on NYFO web site (FY 2011) (IT).

Woodcock Conservation Plan notes the following: "Outreach will play a critical role in the northeast as woodcock and the entire early successional bird suite is more threatened, due to more widespread and greater declines in populations, than any other species suite (grassland suite is in similar predicament). This is contrary to the misconception that forest interior species are in most decline and most threatened. Managers, environmentalists and the public need to be educated that shrubland and early succession habitats are important to birds and need to be protected or managed for. These habitats provide critical diversity to the area. A program to develop demonstration sites throughout the various states and provinces would be beneficial in helping to educate the public and would provide habitat guidance to those interested in managing for woodcock and other early successional birds."

Potential Outreach Partners:

Audubon New York, Cornell Lab of Ornithology, NYSDEC, NWR, NRCS, RGS, Private Landowners, USC, and other NGOs.

MONITORING

- Develop protocols to measure success of all conservation delivery activities.
- Work with Partners to identify leads for accomplishing monitoring activities.

- Develop best management practices from results of monitoring to inform future American woodcock population restoration activities.

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NYSDEC FAQs on Grouse Hunting and Management (with map) http://www.dec.ny.gov/outdoor/48393.html.

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American Woodcock (*Scolopax minor):* Upper Susquehanna Focal Area

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Thogmartin, W.E., J.R. Sauer, and M.G. Knutson. 2007. Modeling and Mapping Abundance of American Woodcock Across the Midwestern and Northeastern United States. The Journal of Wildlife Management. 71(2): 376-382.

Existing strategies for American woodcock restoration:

Please refer to the following documents for existing strategies:

- Bird Conservation Plan for BCR13 (Atlantic Coast Joint Venture 2007)
  http://www.acjv.org/bcr13_plan.htm

- American Woodcock Conservation Plan (Kelley et al. 2008)
  http://www.timberdoodle.org/sites/default/files/woodcockPlan_0.pdf
- Partners in Flight Landbird Conservation Plan (Rich et al. 2004)
  http://www.partnersinflight.org/cont_plan/default.htm

- NYS Comprehensive Wildlife Conservation Strategy (NYSDEC 2005)
  http://www.wildlifeactionplans.org/pdfs/action_plans/ny_action_plan.pdf

Woodcock Management Recommendations (NAS 2009):

- Create or maintain the various types of habitat required for feeding, display, roosting, and nesting. Habitat types need to be in close proximity (e.g., within 1/2 mile).

- Maintain at least 0.5 acres of open habitat for singing displays through plowing, mowing, or prescribed burns. Suggestion of one patch per 20-25 acres. The goal is for fields to appear "patchy," rather than uniform in structure. Moderate use of livestock grazing can also accomplish this. Mow every 2-4 years.

- Encourage native trees and shrubs.

- Maintain larger areas, 3-5 acres, of open habitat for nighttime roosts. Suggestion of one patch per 100 acres. Plant shrubs in open fields and around the perimeter of cultivated fields to provide roosting and escape cover.

- Maintain young, dense forest of at least 5 acres for nesting and feeding.

- Maintain grassy areas near water sources for feeding and display grounds.

Brook Trout (*Salvelinus fontinalis*): Upper Susquehanna Focal Area
Brook Trout Species Action Plan

FOCAL AREA: UPPER SUSQUEHANNA

Other species benefitting:

American eel, American shad, longtail salamander, hellbender, wood turtle

BIOLOGICAL PLANNING

Introduction to species

Species information: The brook trout is a native salmonid that prefers cold, clean streams in eastern North America and is the only native trout that inhabits this habitat. The species prefers clear waters of high purity and a narrow *p*H range in lakes, rivers, and streams, being sensitive to poor oxygenation, pollution, and changes in *p*H caused by environmental effects, such as acid rain. Its diverse diet includes crustaceans, frogs and other amphibians, insects, molluscs, smaller fish, and even small aquatic mammals such as voles. The brook trout is a short-lived species, rarely surviving beyond 4 or 5 years in the wild.

Intact stream populations of brook trout, where wild brook trout occupy > 90% of historical habitat, exist in only 5% of the watersheds assessed in 2005 by the Eastern Brook Trout Joint Venture (EBTJV) (see below). Populations of stream-dwelling brook trout are greatly reduced or have been extirpated from nearly half of the watersheds in their native range. The vast majority of historically occupied large rivers no longer support self-reproducing populations of brook trout. In New York, 5% of the watersheds that historically contained brook trout in streams and rivers remain intact, located primarily in portions of the Adirondacks and the Tug Hill Plateau. Western and South Central New York have suffered the greatest losses of brook trout. Data gaps remain in the central part of the State from Albany to Syracuse. While many lakes and ponds still contain brook trout, losses have been substantial due to competition with non-native fish and acid deposition, particularly in parts of the State where soils and bedrock provide little buffering capacity to offset acid precipitation. Furthermore, the EBTJV has identified several sub-watersheds within the Susquehanna River watershed as highest priority for protection of brook trout populations.

Justification for species selection: The brook trout is a highly prized native sport fish**,** but intact populations of brook trout exist in only 5% of sub-watersheds in New York. Brook trout are an excellent sentinel of water quality and will also likely be a sentinel of the effects of climate change over the next century. Heritage brook trout populations are designated as a New York State (NYS) species of greatest conservation need, and the U.S. Fish and Wildlife Service (USFWS) and New York State Department of Environmental Conservation (NYSDEC) are partners in the EBTJV. The EBTJV is a partnership of State and Federal agencies, nongovernmental organizations (NGO), and academic institutions. This collaborative approach to brook trout management is justified because: (1) brook trout are declining across their entire

eastern range; (2) causes for these declines are similar; (3) an integrated approach would be cost effective; and, (4) watersheds of concern span state borders and state and Federal jurisdictions.

State contribution to overall species population: Currently there are over 400 lakes and ponds that are managed by the NYSDEC for native and stocked brook trout, in which 100 or so contain naturally-reproducing brook trout. In addition, thousands of miles of tributary streams in the Adirondacks, Tug Hill Region, and Catskill Mountains, and a lesser number in western New York, east of the Hudson River, on Long Island, and in the Upper Susquehanna watershed support brook trout. Although watershed-wide population numbers are not known for the Susquehanna watershed, several sub-watersheds (HUC12s) support healthy populations of native brook trout.

Research needed:

- Conduct surveys to determine current population levels and presence/absence.

  (Who: NYSDEC and Trout Unlimited (TU) to assist with brook trout surveys to determine presence/absence and population densities, coupled with habitat investigation; Cost: use existing staff)

- Determine genetic diversity of brook trout in the watershed.

  (Who: Lamar Fish Health Unit, EBTJV; Cost: unknown at this time)

Threats and threat assessment:

1. **Loss of habitat and habitat function**; habitat degradation and alteration-nutrients, sediment, development/clearing of riparian zone (medium/low threat, agriculture; medium threat, urbanization).

   Research needed:

   - Extensive and frequent stream surveys to determine population size.

     (Who: NYSDEC, TU, New York Field Office [NYFO]; Cost: NYFO staff time)

   - Identify priority stream reaches for habitat restoration by evaluating water quality criteria, habitat, and other requirements of brook trout.

     (Who: TU, EBTJV, NYSDEC, NYFO (GIS), Landscape Conservation Cooperatives [LCC]; Cost: unknown at this time)

   - Need to locate heritage streams and heritage populations.

(Who: U.S. Geological Survey [USGS], EBJTV, NYSDEC; Cost: unknown at this time)

2. **Barriers to Migration** (including dams and impassable culverts).

   Research needed:

   - Assess importance of isolating heritage populations versus providing passage for stocked brook trout and other salmonids.

     (Who: NYSDEC, TU, EBTJV; Cost: unknown at this time)

   - Identify which known barriers are having an influence on brook trout distribution.

     (Who: EBTJV, NYSDEC, NYFO, TU; Cost: unknown at this time)

3. **Competition from non-native salmonids.**

   Research needed:

   - Assess impact of competition from stocked and/or naturally reproducing non-native salmonids. Competition/interbreeding with stocked brook trout.

     (Who: EBTJV, NYSDEC, TU; Cost: unknown at this time)

   - Determine genetic diversity of brook trout in the watershed.

     (Who: Lamar Fish Health Unit, EBTJV; Cost: unknown at this time)

4. **Climate change; increased water temperatures.**

   Research needed:

   3. Identification of climate change related impacts to brook trout.

      (Who: National Weather Service, LCC, academics; Cost: unknown at this time)

Partners/potential funding:

NYSDEC, New York State Office of Parks, Recreation & Historic Preservation (NYSOPRHP), TU, Broome County Soil and Water Conservation District (SWCD), Chenango County SWCD, Cortland County SWCD, Steuben County SWCD, Tioga County SWCD, The Nature Conservancy (TNC).

Brook Trout (*Salvelinus fontinalis*): Upper Susquehanna Focal Area

Population goal(s) for New York State:

The EBTJV has numerous conservation goals, including "Conserve, enhance or restore brook trout populations", and "…to perpetuate and restore brook trout populations throughout their historic range"; however, specific population goals have not been quantified. Although population goals have not been established for New York, the NYFO will continue to collaborate with EBTJV, USGS, and NYSDEC to establish target population numbers for the Upper Susquehanna watershed. Establishing population goals remains a research need.

CONSERVATION DESIGN

Strategies for addressing those threats

1. **Loss of habitat.**

    a. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding stream relocation and modifications, including bulkheading; operation of hydroelectric power producing facilities; and, "unnatural" erosion mitigation practices, agricultural practices that diminish stream and wetland values for wildlife, dredging, and placement of fill in streams and wetlands. |FY11-FY14 $0 DES CPA,EC TRS,ASR Ongoing

    b. Target USFWS habitat restoration and enhancement projects to benefit brook trout, including adding enhancements to natural stream design projects (including planting trees and shrubs to provide shade for water temperature control); promoting habitat restoration projects which also control sediment entering streams; provide technical assistance on stream restoration projects via natural stream design in the watershed (Partners for Fish and Wildlife [PFW]). Be mindful of the need to consider providing additional access to heritage streams if they are blocked in a way that keeps stocked fish out.

    c. Facilitate habitat preservation through coordination with land trusts.

    d. Preserve, restore, and/or enhance streams known to support heritage strains of brook trout.

    e. If possible, use Natural Resource Damage Assessment and Restoration (NRDAR) funds to restore and protect streams identified. |FY? $0 DES EC DG Future

    f. Conduct fish sampling, within the Susquehanna watershed, to evaluate emergent contaminants (FY2012). |FY12-FY13 $0 DES EC ALS Future

    g. Respond as appropriate to spills impacting fish and wildlife resources. |FY12-FY14 $0 DES EC ALS Planned

h. Seek to minimize loss of habitat function when habitat is degraded by adjacent land uses by influencing regulatory agency decisions.

i. Seek to minimize loss of habitat value by influencing Federal Energy Regulatory Commission (FERC) minimum flow decisions.

2. **Barriers to migration** (including dams and impassable culverts).

   a. Working with partners, identify and remove barriers.

   b. Work with New York State Department of Transportation (NYSDOT) and Federal Highway Administration (FHWA) to develop criteria for designation of culverts, the modification of which would improve brook trout passage.

   c. Work with NYSDOT and FHWA to correct bridge abutments from being undermined by stream erosion; design and construct natural stream design features that will change stream bottom elevation and facilitate fish passage.

3. **Competition from non-native salmonids.**

   a. Target USFWS natural stream design stream restoration projects for smaller streams most likely to support only one or two salmonid species.

4. **Climate change; increased water temperatures.**

   a. Identify sub-watersheds likely to be refugia for cold water fish in the future, and protect or restore the habitat for brook trout.
   b. Design and construct habitat enhancement projects which provide increased flow, stream shading, pool cover, and increased availability of riffle habitat.

Partner organizations:

NYSDEC, NYSOPRHP, TU, Alleghany County SWCD, Cattaraugus County SWCD, Chautauqua County SWCD, TNC, Chautauqua Watershed Conservancy.

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats for FY 2010 – 2012

1. **Loss of habitat.**

   a. Seek to minimize loss of habitat by influencing regulatory agency decisions regarding wetland draining, stream relocation, and modifications, including bulkheading; operation of hydroelectric power producing facilities; and, “unnatural” erosion

mitigation practices, agricultural practices that diminish stream and wetland values for wildlife, dredging, and placement of fill in streams and wetlands.

i. Developing fact sheets and best management practices (BMP) to minimize impacts to brook trout from a suite of different construction activities.

ii. Post these fact sheets/BMPs on our website.

iii. Provide substantive comments on proposed Federal agency actions with likely adverse impacts on brook trout, especially with regards to Marcellus shale gas exploration, via hydrofracking of geologic formations (Conservation Planning Assistance [CPA], Environmental Contaminants [EC] - Biological Technical Assistance Group to U.S. Environmental Protection Agency [EPA]. |FY11-FY14 $0 DEL CPA,EC TRS,ASR Ongoing

iv. Develop a poster for the New York State Wetlands Forum which targets brook trout conservation.

v. Develop recommendations and BMPs for culvert design and placement of structures based on NYS Culvert Working Group recommendations, the U.S. Forest Service's Stream Simulation Model, and Fish-Xing software, via CPA review. |FY11-FY13 $0 DEL CPA ? Ongoing

vi. Develop stream buffer guidelines/BMP and post on website.

b. Target USFWS habitat restoration and enhancement projects to benefit brook trout, including adding enhancements to natural stream design projects (including planting trees and shrubs to provide shade for water temperature control); promoting habitat restoration projects which also control sediment entering streams; provide technical assistance on stream restoration projects via natural stream design in the watershed (PFW and EC).

i. Add enhancements to natural stream design projects, including planting trees and shrubs to provide shade for water temperature control (CPA, PFW) (Funding – base funds, partnership with NYSDOT-PFW).

ii. Restoration work via natural stream design on 0.5 mile of Genegantslet Creek. |FY11-FY12 $0 DEL PFW CS Ongoing

iii. Continuing restoration work via natural stream design on 0.25 mile Canasawacta Creek. |FY11-FY12 $0 DEL PFW CS Ongoing

iv. Restoration work via natural stream design on Wilsey Creek (1/4 mile). (PFW with funding from base funds and NYSDOT) (2011) (3-4 miles from 2011 – 2013). |FY11-FY12 $0 DEL PFW CS Ongoing

v. When possible, use Natural Resource Damage Assessment and Restoration (NRDAR) funds to restore and protect vernal pools. Consider brook trout when evaluating restoration projects for Richardson Hill NRDAR case. |FY11-FY13 $0 DEL EC DG Ongoing

c. Facilitate habitat preservation through coordination with land trusts or NGO.

i. Work with Upper Susquehanna Coalition and other NGOs to identify parcels for protection.

ii. Guide conservation activities in the Upper Susquehanna watershed through continued meetings with the new Upper Susquehanna Conservation Alliance (PFW). |FY11-FY12 $0 DEL PFW CS Ongoing

d. Promote habitat restoration projects which also control sediment entering streams (CPA) (PFW).

i. Guide conservation activities in strategic locations forming buffers to protect the watershed from uncontrolled non-point source pollution in the Upper Susquehanna watershed through continued meetings with the new Upper Susquehanna Conservation Alliance (PFW). |FY11-FY12 $0 DEL PFW CS Ongoing

e. Provide technical assistance on stream restoration projects via natural stream design in the watershed.

i. Statewide – Conduct a training session for County SWCD staff on natural stream design (PFW – March 2011). |FY11-FY12 $0 DEL PFW CS,GD Completed

2. **Barriers to migration** (including dams and impassable culverts).

a. Working with partners, identify and remove barriers.

i. Work with NYSDEC, NRCS, and Upper Susquehanna Conservation Alliance to identify projects in 2011 – 2013. Priority projects identified: Genegantslet (1/4 mile); assess Owego, Butternut, Otselic Creeks. (Executive Order to Protect the Chesapeake Bay). |FY11-FY12 $0 DEL PFW CS Ongoing

b. Work with NYSDOT and FHWA to develop criteria for designation of culverts, the modification of which would improve brook trout passage.

i. No work indentified at this time.

c. Work with NYSDOT Regions 6 and 9 and FHWA to correct bridge abutments from being undermined by stream erosion, design and construct natural stream design features that will change stream bottom elevation and facilitate fish passage (2011 – 2013) (PFW). |FY11 $0 DEL PFW GD Ongoing

d. Design and install culvert baffle systems with NYSDOT Region 6 and 9 to bury perched culverts as opportunities present themselves within these DOT regions (PFW). |FY11-FY13 $0 DEL PFW CS,GD Ongoing

3. Competition from non-native salmonids.

a. Target USFWS natural stream design stream restoration projects for smaller streams most likely to support only one or two salmonid species. If possible, seek opportunities in heritage trout streams to increase available habitat.

i. No work indentified at this time.

4. Climate change; increased water temperatures.

a. Identify sub-watersheds likely to be refugia for cold water fish in the future, and protect or restore the habitat for brook trout.

i. Work with the National Weather Service to create models for determining temperature impacts to brook trout within the watershed.

b. Add enhancements to natural stream design projects, including planting trees and shrubs to provide shade for water temperature control (CPA, PFW) (Funding – base funds, partnership with NYSDOT-PFW).

i. Genegantslet (See 1.B.ii above). |FY11-FY12 $0 DEL PFW CS Ongoing

ii. Canasawacta (See 1.B.iii above). |FY11-FY12 $0 DEL PFW CS Ongoing

iii. Wilsey Creek (See 1.B.iv above). |FY11-FY12 $0 DEL PFW CS Ongoing

OUTREACH

In addition to the web site, there is an EBTJV Google Group (http://groups.google.com/group/ebtjv).

The EBTJV also has a blog, a Facebook page, and is on two other social networking sites (including Twitter).

The NYFO can create a brook trout page of "ongoing activities" on our website.

Brook Trout (*Salvelinus fontinalis*): Upper Susquehanna Focal Area

Work with SUNY Cortland, or other university, students to get volunteers for surveys and restoration portions of planned projects.

See also Finger Lakes Onondaga pilot classroom project Trout in the Classroom.

MONITORING

- Work with NYSDEC and LGLFWCO to monitor brook trout habitat after restoration is complete. This includes electroshocking restored site to determine if brook trout are successfully using site, as well as conducting macroinvertebrate surveys to identify any changes in benthic community.

- Establish benchmarks for success based on EBTJV.

- Evaluate reclamation of streams (i.e. - remove non-native salmonids) and resulting effects on brook trout population levels, as well as cessation in stocking non-native salmonids.

- With NYSDEC, develop protocol for pre-construction and post-construction surveys of streams targeted for natural stream design.

- Seek funding and support for monitoring.

Partners

NYSDEC, SUNY Oneonta, Otsego Land Trust, Noelle Rayman, USDA-NRCS, Upper Susquehanna Coalition, Susquehanna River Basin Commission, NYSDEC Fisheries, Finger Lakes Land Trust, National Park Service, USEPA, U.S. Army Corps of Engineers, Conservation Fund, TU, NYSDEC, LGLFWCO

References

Eastern Brook Trout Joint Venture main website (http://www.wasternbrooktrout.org).

Eastern Brook Trout Joint Venture data and maps (http://sain.utk.edu/ebtjv/index.php).

Eastern Brook Trout Joint Venture webpage for priority sub-watersheds in New York (http://sain.utk.edu/ebjtv/download/priorityscores.php).

Trout Unlimited Brook Trout Conservation Strategy (http://www.tu.org/conservation/eastern-conservation/brook-trout).

New York State Brook Trout Conservation Strategies
(http://www.easternbrooktrout.org/docs/EBTJV_NewYork_CS.pdf)
(http://www.easternbrooktrout.org/docs/brookie_NY.pdf).

Eastern Hellbender (*Cryptobranchus a. alleganiensis*): Upper Susquehanna Focal Area
Eastern Hellbender Species Action Plan

FOCAL AREA: UPPER SUSQUEHANNA

Other species benefitting:

brook trout, American shad, American eel, long-tailed salamander, green floater, brook floater, and yellow lampmussel

BIOLOGICAL PLANNING

Introduction to species

Species information: The hellbender is an obligately aquatic salamander whose populations have substantially declined in 14 of 17 states within its geographic range over the past several decades. Hellbenders are listed as vulnerable, imperiled or critically imperiled in these states. The two subspecies of hellbender, the Eastern (*Cryptobranchus a. alleganiensis*) and the Ozark Hellbender (*Cryptobranchus a. bishopi*) were listed as "near threatened" on the IUCN (The World Conservation Union) Red List of Threatened Species in 2004. The listing was primarily due to loss of habitat from agricultural practices, mining, clear cutting of riparian, recreation and transportation development, as well as dam construction. In 2001, the U.S. Fish and Wildlife Service (USFWS) listed the Ozark hellbender as endangered. A Federal candidate assessment was completed in 2003 for the Eastern hellbender (Mayasich *et al*. 2003) and a second assessment is currently underway by the USFWS Columbus Field Office to consider potentially listing under the Endangered Species Act. The Eastern hellbender is also included in a 404-species petition to the USFWS. Both subspecies are listed in Appendix III of the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) to protect them from international trade pressures. New York State has the Eastern subspecies which is only found in a few populations in the Allegheny and Susquehanna River watersheds. The hellbender has been State listed as special concern since 1983; current review of the State listings by the New York State Department of Environmental Conservation (NYSDEC) indicate that the listing level may be raised to threatened or endangered. Historically, hellbenders were found in substantial numbers, especially in the Allegheny River watershed. Similar to many amphibians, hellbenders are indicators of stream health and with populations at the most northern extent of their range, they face many threats and are vulnerable because they reside in sparse habitat and require flat rocks > 30 cm. They are a long-lived species and are late maturity breeders. Hellbenders are a high priority for the NYSDEC. A recovery plan is in draft (Bell *et al*. 2010). In Pennsylvania, hellbenders are listed in the State Wildlife Action Plan. They are of immediate concern in that state and are in need of a status assessment to determine distribution and abundance. Pennsylvania is seeking higher protection, although currently hellbenders can be collected with a fishing license.

Justification for species selection: The Eastern hellbender is one species included in a multi-species petition to the USFWS. It is listed as special concern in New York and will likely be elevated under current listing review. The NYSDEC has drafted a recovery plan to increase

conservation efforts in the state. Because of its specialized habitat requirements and being an edge-of-range species (exists in patchy habitat), population levels in New York will naturally be low in comparison to core populations. Laboratory work has indicated high genetic diversity in the Allegheny River watershed versus other areas of their geographic range. However, genetic variation in the Susquehanna is largely unknown due to the limited number of individuals present in the New York portion of this watershed. Fourteen of 17 states indicate population declines. The hellbender is the largest amphibian in the State and it only occurs in two watersheds in the State. They are a long-lived (25+ years) species, and are late maturity breeders (5-7yrs).

Actions/Research needed:

1. Assist NYSDEC with generating priority site map. |FY11-FY12 $0 BP ESA NR Ongoing

2. Provide technical assistance pertaining to State recovery plan. |FY10-FY12 $0 BP ESA NR Ongoing

3. Coordinate with the Regional Office, Pennsylvania Field Office, and other Ecological Services (ES) Field Offices for the states of Maryland, Virginia, and West Virginia regarding hellbender conservation efforts to tie-in with greater USFWS strategic habitat planning. |FY11-FY12 $0 BP ESA NR Ongoing

4. Coordinate with the NYSDEC and the University of Buffalo (UB) to identify appropriate size of self-sustaining population in each watershed (modeling). |FY13? $? BP ESA NR Future

5. Coordinate with the NYSDEC, UB, and other partners to identify new sites with required specialized habitat. |FY12-FY14 $? BP ESA NR Planned

6. Coordinate with the NYSDEC and UB to implement larval searches using established protocols for bank searching. |FY12-FY14 $? BP ESA NR Planned

7. Coordinate with the NYSDEC, UB, and other partners with conducting surveys of deeper water areas using SCUBA. |FY12-FY14 $? BP ESA NR Planned

8. Assist NYSDEC, UB, and other partners with conducting surveys of historic and new sites to estimate current population sizes. |FY12-FY14 $5,000? BP ESA NR Future

9. Work with the NYSDEC to identify threats at sites. |FY12-FY14 $? BP ESA NR Planned

10. Explore possible contaminants research to identify cause of abnormalities. Many individuals have been observed with abnormalities (i.e., missing or extra limbs/digits). Investigate whether this is being observed in the Susquehanna. |FY14? $? BP ESA,EC? NR Future

Eastern Hellbender (*Cryptobranchus a. alleganiensis*): Upper Susquehanna Focal Area

11. Captive propagation is already in place for the Allegheny River watershed. Work with NYSDEC to explore further the need for a propagation effort in the Susquehanna. |FY13? $? BP ESA NR Future

State contribution to overall species population: Currently, only three hellbenders are known to be found within the Susquehanna River watershed. All individuals are marked with a Passive Integrated Transponder tag (aka PIT tags) for long-term monitoring.

Threats and threat assessment:

1. **Loss of Habitat**
   a. Increased sedimentation (i.e. causes embeddedness of natural flat rock habitat).
      i. Road construction.
      ii. Development.
      iii. Riparian clearing - riparian trees provide necessary shade to lower water temperature and provide bank stability to prevent erosion and increased sedimentation at a site.
2. **Lack of Recruitment.**
   a. Recent surveys in the Allegheny watershed have indicated a shift in age class structure to older individuals. Few larvae and juveniles are found at sites. We do not have a good handle on the age class structure in the Susquehanna watershed, but assume the trend is the same. At this time, of the 3 individuals known in the watershed, all are adults.
3. **Stream barriers.**
   a. Dams and/or possible culverts may impede movement.
4. **Illegal Collection.**
   a. Collection is primarily for the pet trade. This is a problem in parts of the hellbender geographic range and is likely a problem in New York. The NYSDEC is aware of one incident where a tagged individual from a tributary to the Allegheny River was confiscated in another state.

Eastern Hellbender (*Cryptobranchus a. alleganiensis*): Upper Susquehanna Focal Area

5. **Environmental Contaminants.**

    a. Heavy metals, pesticides, and herbicide use are potential threats, sewage treatment plants, and thermal pollution. Endocrine disruptors could be impacting hellbenders, but more research is needed.

6. **Invasive Species.**

    a. The rusty crayfish is very abundant in this watershed and will co-occur under rocks that are also occupied by hellbenders. It is unknown if there is any competition for space and food between the two species. Hellbenders prey on crayfish, but rusty crayfish may consume eggs during the breeding season. We do not know if hellbenders eat rusty crayfish or prefer the native species. We do not know if there are impacts to the different life stages of hellbenders.

        i. Further research is needed to identify impacts of the invasive and ubiquitous rusty crayfish. |FY14? $? BP ESA NR Future

        ii. Further research is needed to identify if other invasive species impact hellbender populations. |FY14? $? BP ESA NR Future

7. **Predation.**

    a. Predation by fishes (i.e., northern pike), habitat disturbance by carp or predation by other animals such as otter, waterbirds or snapping turtles may have some impact on populations.

8. **Disease.**

    a. *Batrachochytrium dendrobatidis*, also known as chytrid fungus, has been discovered in the Susquehanna watershed in New York. One dead hellbender that was found in the mainstem near Conklin, New York, and tested positive for chytrid. Other hellbender sites in the watershed need further testing. It is unknown what impacts chytrid has on hellbenders.

        i. Further research is needed to determine if chytrid fungus affects hellbenders in New York. |FY13? $? BP ESA NR Future

9. **Climate Change.**

    a. Climate change may lead to flashy streams, stream dry-up, increased UV-B radiation, potential for the increased risk of *Saprolegnia* fungus, less oxygen with increased water temps, and increased mortality due to chytrid fungus. Research is needed to determine any impact climate change may have.

Eastern Hellbender (*Cryptobranchus a. alleganiensis*): Upper Susquehanna Focal Area

i. Further research is needed to determine if climate change impacts hellbenders (i.e., identify whether flashy streams change macroinvertebrate populations). |FY14? $? BP ESA NR Future

ii. Provide technical assistance to the NYSDEC and the National Zoological Park on a project titled, "Identify biological constraints to climate change adaptation for effective management of Appalachian salamanders". |FY11 $0 BP ESA NR Completed

Recovery Goal for NYFO:

Prevent Federal listing by implementing work identified under Conservation Delivery.
Focus for Susquehanna River watershed – Initial focus should be to determine if species is present at historic sites and identify new sites.

Example metric:

For known occupied site in Susquehanna River tributary – 900 m site, estimate ~30 individuals (data based on Blais 1996). As of 2008, one individual has been found at this site.

Recovery Criteria (as stated in State Recovery Plan):

To maintain self-sustaining populations within the Susquehanna River watershed in New York.

To maintain or enhance sufficient quality habitat in the Susquehanna River watershed in New York.

See Bell *et al.* 2010

Eastern Hellbender Status Assessment Report (Mayasich *et al.* 2003)
http://www.fws.gov/midwest/eco_serv/soc/amphibians/eahe-sa.pdf.

For a partial list of publications and current research see:

http://www.hellbenders.org/publications.html (Humphries 2006)
http://www.caudata.org/cig/ (CIG undated)

Partners/potential funding:

NYSDEC, Upper Susquehanna Coalition (USC), Upper Susquehanna Conservation Alliance (USCA), Trout Unlimited (TU), New York State Department of Transportation (NYSDOT), The Nature Conservancy (TNC), Buffalo State College, SUNY College of Environmental Science and Forestry (SUNY-ESF), SUNY Cortland, Lycoming College (PA), Otsego Land Trust (OLT)

Eastern Hellbender (*Cryptobranchus a. alleganiensis*): Upper Susquehanna Focal Area

Population goal(s) for New York State:

Unknown at this time.

CONSERVATION DESIGN

Strategies for addressing those threats

1. Develop standardized data collection sheets for surveys. Partners include NYFO, NYSDEC, BSC, UB, and others. |FY12 $0 DES ESA NR Planned

2. Assist NYSDEC with developing a database repository. Partners include the NYFO, NYSDEC, BSC, UB, USC, and others. |FY12 $0 DES ESA NR Planned

3. Develop decontamination protocol to counter disease (*B.d.*). Partners include NYFO, NYSDEC, BSC, UB, and others. |FY12 $0 DES ESA NR Planned

4. Develop a surveyor list. Refer to bog turtle surveyor guidance as a model. Partners include NYFO, NYSDEC, and others. |FY13? $0 DES ESA NR Future

5. Develop schedule scheme to set priorities for surveys. Partners include NYFO, NYSDEC, BSC, UB, USC, and others. |FY12 $0 DES ESA NR Planned

6. Develop protocols for surveys. Refer to bog turtle survey guidance as a model. Partners include NYFO, NYSDEC, BSC, UB, and others. |FY13? $0 DES ESA NR Future

7. Develop protocol for PIT tagging. Partners include NYFO, NYSDEC, BSC, UB, and others. |FY12 $0 DES ESA NR Planned

8. Develop sampling protocol for DNA collection. Partners include NYFO, NYSDEC, BSC, UB, and others. |FY12 $0 DES ESA NR Planned

9. Adopt existing protocol to sample for chytrid fungus. Partners include NYFO, NYSDEC, BSC, and others. |FY12 $0 DES ESA NR Planned

10. Develop at training program for hellbender surveys (to produce a list of recommended surveyors). Partners include NYFO, NYSDEC, and others. |FY13? $0 DES ESA NR Future

11. Develop conditions to accompany scientific collectors permits for hellbender work. Partners include NYFO, NYSDEC, and others. |FY13? $0 DES ESA NR Future

12. Provide technical assistance as needed on the USFWS status assessment that is being done by the Columbus Field Office (Jeromy Applegate). |FY10-FY12 $0 DES ESA NR Ongoing

Eastern Hellbender (*Cryptobranchus a. alleganiensis*): Upper Susquehanna Focal Area

13. Research what types of funding sources exist in order to conduct surveys, enhance hellbender habitat, captively raise hellbenders, etc. Partners include NYFO, NYSDEC, BSC, UC, USC, SUNY-ESF, and others.

    a. Regional Conservation Needs Grant - submit proposal for survey needs and additional captive management work. Partners include NYFO, NYSDEC, BSC, USC, Western Pennsylvania Conservancy, and the Good Zoo, Wheeling, WV. |FY11 $0 DES ESA NR Completed

    b. Regional Conservation Needs Grant - submit proposal for 2012. Host conference calls with partners to discuss needs. |FY12 $0 DES ESA NR Planned

    c. Section 6 Tradition Grant - submit proposal for 2012. Host conference calls with partners to discuss needs. |FY12 $0 DES ESA NR Planned

Please refer to the following document for existing strategies:

Draft *Cryptobranchus alleganiensis* Recovery Plan* (Bell et al. 2010)

****The following are some of the ideas outlined in the NYSDEC Recovery Plan. Many details still require further development.**

General:

- Hold Recovery Meeting with NYSDEC and partners - March 2010. |FY10 $0 DES ESA NR Completed

- Attend NYSDEC Recovery Meeting (date and location to be determined). |FY13? $0 DES ESA NR Future

- Host periodic conference call with the New York hellbender working group to continue completing identified actions. |FY10-FY12 $0 DES ESA NR Ongoing

- Host/attend periodic meeting with the New York hellbender working group to continue completing identified actions. |FY10-FY12 $0 DES ESA NR Ongoing

- Participate in the Upper Susquehanna Conservation Alliance's (USCA) Natural Resources Working Group (Hellbender subgroup) to identify action items within the watershed. |FY11-FY13 $0 DES ESA NR Ongoing

- Attend annual USCA meeting (date and location to be determined). |FY11-FY13 $0 DES ESA NR Ongoing

Eastern Hellbender (*Cryptobranchus a. alleganiensis*): Upper Susquehanna Focal Area

1. **Loss of Habitat.**

   a. Increased sedimentation.

      i. Seek to minimize loss of habitat in the following areas that support hellbenders by influencing regulatory agency decisions regarding stream modifications, agricultural practices that diminish water quality in adjacent streams, and development including infrastructure construction.

         - Develop a training program for State and Federal permit processors to increase awareness of hellbender conservation. Partners include NYFO, NYSDEC, U.S. Army Corps of Engineers (USACE), and others. |FY13? $0 DES ESA,CPA NR,SLD Future

         - Develop a training program for the NYSDOT to consider hellbender impacts when doing bridge repair/replacement or any stream modifications/riparian work. Partners include NYFO, NYSDOT, and others. |FY13? $0 DES ESA,CPA NR,SLD Future

         - Develop conservation measures to minimize impacts and post on website in the form of fact sheets. Partners include NYFO, NYSDEC, UB, USC, and others. |FY13? $0 DES ESA,IT NR,AFL Future

         - Conduct study to determine appropriate buffer size needed to protect sites. Partners include NYFO, NYSDEC, UB, USC, SUNY-ESF, and others. |FY13? $0 DES ESA NR Future

         - Develop fact sheets, other information about appropriate stream buffers, conservation measures for landowners, etc. Partners include NYFO, NYSDEC, UB, USC, and others. |FY13? $0 DES ESA NR Future

2. **Lack of Recruitment.**

   a. NYSDEC is enhancing hellbender habitat by placing additional large rock slabs at sites in the Allegheny watershed. NYSDOT was a major partner as they purchased and stock piled large rock for habitat improvement. Details of future plans for additional sites are currently being outlined by NYSDEC in the Allegheny and discussions have begun for the Susquehanna as well. This project was done as part of the captive propagation plan for the Allegheny watershed to add habitat for captive reared individuals. A similar project could be implemented in the Susquehanna.

      i. Assist NYSDEC with rock placement in new stream locations. |FY14? $0 DES ESA NR Future

      ii. Purchase large rock slabs. |FY14? $0 DES ESA NR Future

iii. Potential land acquisition in a tributary stream to the Susquehanna. The Otsego Land Trust (OLT) has 2 landowners interested in hellbender conservation. Assist OLT with review of these properties. |FY11-FY12 $0 DES ESA SLD,NR Ongoing

3. Stream Barriers.

a. Need to identify barriers to remove, if any:

i. Further discussion is needed regarding the possibility of removing dams in the drainage that impede hellbender movement. |FY14? $0 DES ESA,PFW NR Future

b. Work with NYSDEC to identify additional dams and culverts that are problematic to migration that could be removed or replaced. Potential to utilize priority culvert list drafted by TNC. |FY13? $0 DES ESA,PFW NR Future

c. Work with NYSDEC to determine the feasibility of providing fish passage for hellbenders where barriers cannot be removed. |FY14? $0 DES ESA,PFW? NR Future

d. Work with the NYSDEC, UB, and BSC to collect DNA samples from above and below barriers to determine if removal is warranted in order to maintain/increase genetic diversity. |FY14? $0 DES ESA NR Future

4. Illegal Collection.

a. Inform law enforcement about the high risk of collection in this watershed. |FY14? $0 DES ESA NR Future

b. Educate officers on general hellbender information. |FY14? $0 DES ESA NR Future

5. Environmental Contaminants.

a. Works with the NYSDEC and NYFO to develop an emergency response plan for contaminant spills in hellbender streams. |FY14? $0 DES ESA,EC? NR Future

b. Work with the NYSDEC and USC to develop conservation measures and fact sheets regarding potential impacts of Marcellus and Utica shale drilling on water quality and increased sedimentation in streams supporting hellbender populations. |FY12 $0 DES EC,ESA ALS,NR Planned

c. Work with the NYSDEC to conduct fish sampling to evaluate emerging contaminants in this watershed. |FY12-FY13 $0 DES EC,ESA ALS,DG,NR Planned

d. Coordinate Kentucky Avenue Wellfield Biological Technical Assistance Group activities to maximize the potential for a remedy that protects fish and wildlife, with USEPA. |FY11-FY13 $0 DES EC ASR Ongoing

e. Manage Richardson Hill Road Landfill NRDA case. |FY12-FY13 $0 DES EC DG Planned

f. Respond as appropriate to spills impacting fish and wildlife resources. |FY12-FY14 $0 DES EC ALS Planned

6. Invasive species

a. Work with the NYSDEC to identify impacts of the invasive and ubiquitous rusty crayfish. |FY14? $0 DES ESA NR Future

b. Work with the NYSDEC to identify if other invasive species may impact hellbender populations. |FY14? $0 DES ESA NR Future

7. Predation.

a. Work with the NYSDEC to determine carp impact. |FY14? $0 DES ESA NR Future

b. Work with the NYSDEC to identify impacts of predatory fish (i.e., northern pike). |FY14? $0 DES ESA NR Future

8. Disease.

a. Research existing chytrid sampling protocols to adopt for surveying hellbender streams within the watershed. |FY12 $0 DES ESA NR Planned

b. Test hellbender sites to determine presence of chytrid fungus. |FY12 $0 DES ESA NR Planned

9. Climate change.

a. Research is needed to determine any impact climate change may have. |FY14? $? DES ESA NR Future

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats FY2010-2012

Eastern Hellbender (*Cryptobranchus a. alleganiensis*): Upper Susquehanna Focal Area

1. **Loss of Habitat.**

   a. Influence regulatory agency decisions regarding stream modifications, agricultural practices that diminish water quality in adjacent streams, and development including infrastructure construction by:

      i. Develop fact sheets and best management practices (BMP) to minimize impacts to hellbenders. |FY13 $0 DEL ESA NR Future

      ii. Post these fact sheets/BMP on our website. |FY13 $0 DEL ESA,IT NR,AFL Future

      iii. Write substantive comments on proposed Federal agency actions with likely adverse impacts on hellbenders. |FY12 $0 DEL ESA,CPA NR,SLD Ongoing

   b. Enhance stream habitat by placing large flat rocks.

      i. Assist NYSDEC with determining where habitat enhancement can take place in the Susquehanna watershed. |FY14? $0 DEL ESA NR Future

   c. Fence off problematic areas due to cattle grazing along stream margins. Partners include NYFO, NYSDEC, and others. |FY13? $0 DEL ESA,PFW? NR Future

2. **Lack of Recruitment.**

   a. Captive propagation is underway at the Buffalo Zoo for the Allegheny River Watershed (an action currently underway based on tasks of recovery plan) (Bell *et al.* 2010).

      i. Provide technical assistance needed to NYSDEC, SUNY-ESF, and USC regarding Susquehanna headstarting plan. |FY13? $0 DEL ESA NR Future

      ii. Assist with determining where egg masses are taken in Susquehanna. |FY13? $0 DEL ESA NR Future

      iii. Obtain genetic information from reared individuals to make sure hellbenders are released in the right locations. |FY13? $0 DEL ESA NR Future

      iv. Assist NYSDEC with post monitoring of released captive reared individuals. |FY13? $0 DEL ESA NR Future

      v. Assist in getting samples so a genetic profile of Susquehanna streams can be completed. |FY13? $0 DEL ESA NR Future

Eastern Hellbender (*Cryptobranchus a. alleganiensis*): Upper Susquehanna Focal Area

3. **Stream Barriers.**

    a. Nothing identified in the next 2-3 years.

4. **Illegal collection.**

    a. Nothing identified in the next 2-3 years.

5. **Environmental contaminants.**

    a. When possible, use Natural Resource Damage Assessment and Restoration (NRDAR) funds to restore and protect hellbender habitat. Consider hellbenders when evaluating restoration projects for Richardson Hill NRDA case. |FY? $0 DEL EC,ESA DG,NR Future

6. **Invasive species.**

    a. Nothing identified in the next 2-3 years.

7. **Predation.**

    a. Nothing identified in the next 2-3 years.

8. **Disease.**

    a. Nothing identified in the next 2-3 years.

9. **Climate change.**

    a. Nothing identified in the next 2-3 years.

OUTREACH

- Develop a stream/water quality/habitat traveling exhibit. |FY14? $0 OUT ESA NR,SLD Future

- Work with BSC on planning 2011 Hellbender Symposium. |FY11 $0 OUT ESA NR Completed

- Develop a poster to use at National Fishing Day celebration. |FY11 $0 OUT ESA NR Completed

- Develop a hellbender wind sock to accompany poster on hellbender ecology. |FY11 $0 OUT ESA NR Completed

Eastern Hellbender (*Cryptobranchus a. alleganiensis*): Upper Susquehanna Focal Area

- Assist UB and the NYSDEC with development of a brochure that promotes recovery (target fishermen). |FY12 $0 OUT ESA NR Planned

- Develop a website for hellbender or link to existing websites for outreach and contractors. |FY12 $0 OUT ESA,IT NR,AFL Planned

MONITORING

- Assist the NYSDEC with development of protocols to measure progress/success of habitat restoration projects. |FY13? $0 MON ESA NR Future

- Assist the NYSDEC with development of protocols to measure progress/success of captive rearing and release of hellbenders. |FY13? $0 MON ESA NR Future

- Assist, when needed, with monitoring to measure progress/success of restored habitat and captive reared individuals. |FY13? $0 MON ESA NR Future

References

Bell, T., R. MacBlane, and B. Wheeler. 2010. Draft *Cryptobranchus alleganiensis* Recovery Plan. New York State Department of Environmental Conservation. Division of Fish, Wildlife and Marine Resources. 52 pp.

Cryptobranchid Interest Group. Undated. Building Partnerships for Giant Salamander Conservation http://www.caudata.org/cig/.

Humphries, J. 2006. The Hellbender Homepage http://www.hellbenders.org/publications.html.
Mayasich, D.A., D. Grandmaison, and C. Phillips. 2003. Eastern Hellbender Status Assessment Report. NRRI/TR-2003/09. U.S. Fish and Wildlife Service. 43 pp. http://www.fws.gov/midwest/eco_serv/soc/amphibians/eahe-sa.pdf.

Jefferson/Blue-spotted Complex Salamander (*Ambystoma jeffersonianum/A. laterale*): Upper Susquehanna Focal Area

Jefferson/Blue-spotted Complex Salamander Species Action Plan

FOCAL AREA: UPPER SUSQUEHANNA

Other species benefitting:

Blue-spotted salamander, spotted salamander, northern redback salamander, northern spring salamander, four-toed salamander, red-spotted newt, gray tree frog, green frog, pickerel frog, wood frog, northern leopard frog, spring peeper, American toad, spotted turtle, fairy shrimp, and Northeastern bulrush

BIOLOGICAL PLANNING

Introduction to species

Species information: The Jefferson salamander is a member of a "complex" formed when species separated by ice age glaciations came into contact with each other and began interbreeding producing hybrid populations. Jefferson salamanders have a strong affinity for upland forests and reside most of the year in well-drained deciduous or mixed forest, but within 250 to 1600 meters of a small vernal pool or pond, typically surrounded by alder, red maple, button bush, and dogwood. A member of the mole salamander group, they are found beneath leaf litter, loose soil, stones, rotting logs, or in rodent burrows or subterranean burrows that they excavate.

Vernal pools are necessary for reproduction and need to include abundant dead and decaying leaves for cover and overhanging bushes or vegetation for egg deposition. Vernal pools are important for storage and filtration of surface runoff and groundwater recharge. Species that inhabit these pools are often indicators of a healthy ecosystem and are water quality indicators. According to Nature Serve Explorer data, Jefferson salamanders occur in 17 states and Ontario, Canada. Several of these states list status information for this species. Four states (Illinois, Massachusetts, New Hampshire, and Vermont) and Ontario, Canada, list this species as "imperiled." Populations in Connecticut, Maryland, New Jersey, and West Virginia are considered "vulnerable." Indiana, Kentucky, Pennsylvania, New York, and Virginia populations are "apparently secure," but even so, this species is still listed as a species of special concern in New York.

Justification for species selection: These species and associates have complex life histories and critical habitat requirements. They require both vernal pool habitat for reproduction and upland forest habitat for foraging, hibernation, and other terrestrial and fossorial activities. Breeding habitat is no longer protected by the Federal Clean Water Act. Wetlands smaller than 12.4 acres are not protected in New York. These species are subject to high mortality as they migrate between habitats, and often over roads. The temporary nature of breeding habitat may be overlooked in development plans. Development plans may protect the pool itself but destroy migratory pathways and non-breeding habitat. Several vernal pool species are either Federal- or

Jefferson/Blue-spotted Complex Salamander (*Ambystoma jeffersonianum/A. laterale*): Upper Susquehanna Focal Area

Stated-listed and include: Northern bulrush – Federally-listed as endangered; Jefferson salamander – State-listed as special concern; and blue-spotted salamander – State-listed as special concern.

State contribution to overall species population: Despite the fact that Jefferson salamander populations are found sporadically throughout New York, New York State Herp Atlas data indicate this species to be infrequent in the Upper Susquehanna River basin.

Research needed:

- Work with the Upper Susquehanna Conservation Alliance's (USCA) vernal pool working group to fund or assist with conducting surveys to determine current population levels and presence/absence of Jefferson salamanders. |FY? $? BP ESA NR,SLD Future

- Work with the USCA vernal pool working group to conduct research to document the extent of upland habitat required for Jefferson salamander. |FY? $? BP ESA NR,SLD Future

- Work with the USCA vernal pool working group to use existing or to develop standardized habitat and population survey protocols to document the character, quality, and extent of occupied habitat. |FY? $? BP ESA NR,SLD Future

- Work with the USCA vernal pool working group to determine significance of specific threats to populations of vernal pool salamanders and develop management recommendations to address significant threats. |FY? $? BP ESA NR,SLD Future

- Work with the USCA vernal pool working group to plan a meeting where partners can discuss needs and priority goals for vernal pool conservation. |FY12? $? BP ESA NR,SLD Planned

Threats and threat assessment:

1. **Habitat loss** – in the form of filling in vernal pools or modification to adjacent lands which alter hydrology in an area.

    - Work with the USCA vernal pool working group to identify degraded habitat with restoration potential. |FY? $? BP ESA,PFW? NR,SLD,CS Future

2. **Fragmentation of migration corridors** – results in the loss of habitat connectivity for species that breed in vernal pools; includes reduction in patch size, shape, and cause increased edge effects.

3. **Storm sewers and surface impermeability** - increase runoff and lowers water table.

- Work with the USCA vernal pool working group to identify problematic storm sewer systems to see if impacts to vernal pools can be reduced. |FY? $? BP ESA NR,SLD Future

- Work with the USCA vernal pool working group to identify impermeable surfaces that are impacting vernal pools. |FY? $? BP ESA NR,SLD Future

4. **Climate Change** - dependent on changes in temperature and precipitation regimes.

   - Work with the vernal pool working group to identify the impacts climate change may have on vernal pools (i.e., changing weather patterns influencing timing of frosts and rainfall). |FY? $? BP ESA NR,SLD Future

Partners/potential funding:

Natural Resources Conservation Service (NRCS), USC, Soil and Water Conservation Districts (SWCD), New York State Department of Transportation (NYSDOT), NYSDEC, Land Trusts – Chenango, Southern Madison, Finger Lakes, and Otsego

Goal(s) for New York State:

Establish and protect sufficient and appropriate habitat for amphibian, reptile, and plant species associated with vernal pools that: migrate between uplands and vernal pools, require vernal pools for breeding, and which also require upland habitat for other life history stages.

CONSERVATION DESIGN

Strategies for addressing those threats - work with the USCA vernal pool working group on all actions listed

1. Identify and map hot spots where vernal pool species are crossing roads. |FY? $? DES ESA NR,SLD Future

2. Assist with road crossing surveys. |FY? $? DES ESA NR,SLD Future

3. Maintain a list of project sites to use as possible mitigation. |FY? $? DES ESA NR,SLD Future

4. Establish central repository for data, potential project areas, and mitigation sites. |FY? $? DES ESA NR,SLD Future

CONSERVATION DELIVERY

On-the-ground actions using strategies to address threats - work with the USCA vernal pool working group and PFW on all actions listed.

Jefferson/Blue-spotted Complex Salamander (*Ambystoma jeffersonianum/A. laterale*): Upper Susquehanna Focal Area

1. **Habitat loss.**

   a. Work with NYSDEC on wetlands of special concern designation to bring vernal pools under freshwater wetlands protection jurisdiction. |FY? $? DEL ESA NR,SLD Future

   b. Work to influence agricultural and forestry practices that certain activities diminish vernal pool habitat values for wildlife. |FY? $? DEL ESA,PFW NR,SLD,CS Future

   c. Target USFWS habitat restoration and enhancement projects to benefit vernal pool species.

      i. Create vernal pool habitat in suitable locations; need to determine how much and where. Work with USCA and PFW to identify project sites. |FY? $? DEL ESA,PFW NR,SLD,CS Future

      ii. Work to facilitate habitat preservation through coordination with land trusts. |FY? $? DEL ESA,PFW NR,SLD,CS Future

   d. Work to preserve, restore, and/or enhance forested wetlands known to support vernal pool species. |FY? $? DEL ESA,PFW NR,SLD,CS Future

   e. When possible, use Natural Resource Damage Assessment and Restoration (NRDAR) funds to restore and protect vernal pools. Consider Jefferson/Blue spotted salamanders when evaluating restoration projects for Richardson Hill Road NRDA case. |FY12-FY13 $0 DEL EC DG Planned

   f. Work with NYSDEC and others to limit introductions of fish and other predatory species into habitats critical to vernal pool salamanders. |FY? $? DEL ESA NR Future

   g. Provide the NYSDEC with recommendations to limit logging activities around known breeding areas during the breeding and larval development period. |FY? $? DEL ESA NR,SLD Future

2. **Fragmentation of migration corridors**

   a. Incorporate means to increase corridors between breeding and non-breeding habitat:

      i. Influence regulatory agency decisions to incorporate measures to increase corridors between breeding and non-breeding habitat. |FY12 $0 DEL ESA,CPA NR,SLD,RAN Planned

b. Work with partners to prioritize land acquisition of forested upland tracts adjacent to wetland properties. |FY? $? DEL ESA,CPA NR,SLD Future

c. Create vernal pools on either side of roads to reduce mortality. |FY? $? DEL ESA,PFW NR,SLD,CS Future

3. **Climate Change** - dependent on changes in temperature and precipitation regimes. No work planned for the next 2-3 years.

4. **Environmental Contaminants**

   a. Coordinate Kentucky Avenue Wellfield Biological Technical Assistance Group (BTAG) activities to maximize potential for a remedy that protects wildlife, with U.S. Environmental Protection Agency (USEPA). |FY11-FY13 $0 DEL EC ASR Ongoing

OUTREACH - work with the USCA vernal pool working group to complete the actions below.

1. Develop an outreach program for vernal pool conservation for public and private landowners:

   a. Outline benefits and need for vernal pools. |FY? $0 OUT ESA,CPA SLD,NR Future

   b. Highlight possible detrimental effects caused by human disturbance. |FY? $0 OUT ESA,CPA SLD,NR Future

2. Enhance public education to curtail collection/translocation of Species of Greatest Conservation Need (SGCN) salamanders.

   a. Draft guide that outlines the importance of leaving animals "wild". |FY? $0 OUT ESA,CPA SLD,NR Future

3. Address vernal pools when reviewing permits. |FY? $0 OUT ESA,CPA SLD,NR Future

4. Set up a reporting system (something similar to the Hudson River Estuary Biodiversity Program or USC) – or link below websites to NYFO website. |FY? $0 OUT ESA,CPA SLD,NR Future

   http://www.dec.ny.gov/docs/remediation_hudson_pdf/hrebfsamrc.pdf
   http://www.u-s-c.org/html/vpmapping.htm

MONITORING - work with the USCA vernal pool working group to complete actions below.

1. Development of protocols to measure progress/success of vernal pool restoration. |FY? $0 OUT ESA,CPA SLD,NR Future

Jefferson/Blue-spotted Complex Salamander (*Ambystoma jeffersonianum/A. laterale*): Upper Susquehanna Focal Area

2. Monitoring to measure progress/success of created and protected vernal pools.

    a. Periodically resurvey areas of known occurrence to detect population trends. |FY? $0 OUT ESA,CPA SLD,NR Future

References

New York State Department of Environmental Conservation, Comprehensive Wildlife Conservation Strategy for New York.
http://www.dec.ny.gov/animals/30483.html

Upper Susquehanna Coalition vernal pool resources- http://www.u-s-c.org/html/vplinks.htm

Northeastern Bulrush (*Scirpus ancistrochaetus*): Upper Susquehanna Focal Area

Northeastern Bulrush Species Action Plan

FOCAL AREA: UPPER SUSQUEHANNA

***Other species benefitting*:**

Jefferson salamander, blue-spotted salamander, spotted salamander, marbled salamander, fairy shrimp, American toad, cat-tail sedge, false hop sedge, spotted turtle, Blanding's turtle, northern spring salamander, four-toed salamander, gray tree frog, red-spotted newt, northern redback salamander, spring peeper, green frog, pickerel frog, northern leopard frog, wood frog

BIOLOGICAL PLANNING

Introduction to species

Species information: Northeastern bulrush (*Scirpus ancistrochaetus* Schuyler, Cyperaceae) (NEBR) is a rhizomatous perennial sedge found throughout the northeastern United States in vernal ponds and emergent wetlands. In August 2010, the New York Natural Heritage Program (NYSNHP), funded via Section 6 of the Endangered Species Act, rediscovered NEBR in Steuben County on private lands that are currently leased for hunting.

The NEBR commonly occurs along the margins and in shallow areas of acidic to circumneutral natural ponds, shallow sinkholes, or wet depressions in areas with varied terrain. This species is not known to occur in artificial or disturbed habitats. Characteristically, the water levels within NEBR associated wetlands fluctuate over the year either through beaver or seasonal activity and often have a dry period in the summer. Wetland areas are generally small and found in conjunction with other small wetland areas where NEBR tends not to occupy all sites (U.S. Fish and Wildlife Service 1993). It has been found that NEBR prefers sites that are not light limited and, therefore, not completely shaded by bordering forest canopies (Lentz and Cipollini 1998). This has important implications for management in light of widespread forest regeneration in the northeast.

Plants are generally 80-120 cm in height with long, linear, leaves that become narrower up the stem. Flowering occurs from mid-June to July with fruit set between July and September. The inflorescence is umbellate and bears several small clusters of brown spikelets. The NEBR can be difficult to separate from dark green bulrush (*Scirpus atrovirens*) and mosquito bulrush (*Scirpus hattorianus*), but when reproductive shoots are present, the characteristically drooping rays of the inflorescence as well as the strongly hooked barbs on the perianth bristles distinguish this species. However, without reproductive shoots, identification becomes more technical. In situ NEBR generally does not co-occur with the former two species, and sterile comparisons should consult the appendix to sterile identification in the Species Recovery Plan (U.S. Fish and Wildlife Service 1993).

Northeastern Bulrush (*Scirpus ancistrochaetus*): Upper Susquehanna Focal Area

Justification for species selection: The NEBR is a Federally-listed endangered species (listed endangered 1991, recommended to reclassify threatened 2008) as well as a New York State-listed endangered species. As of 2008, there were 113 known and 7 historical sites in Massachusetts, Maryland, New Hampshire, New York, Pennsylvania, Virginia, Vermont, and West Virginia. Approximately half of these sites are located on private lands and are generally unprotected. This species is relatively widespread, but populations vary widely in size from sites with thousands of individuals to sites with <10 individuals. The vast majority of existing sites are found in Pennsylvania (70) and Vermont (22).

The NEBR habitat is fairly specific, forested vernal pools, and as a result, there can be considerable focus on this habitat and its regulation especially with regard to endangered species. However, considerable degradation of these habitats has occurred in the past and still occurs in states with limited wetland acreage requirements such as New York. Listing encourages recovery in this species, especially in those sites on public lands and near public projects in areas with limited regulatory control.

Herbivory is a recognized threat to NEBR as it is located near what are often the only sources of water in upland forests. Herbivore populations have rebounded dramatically in the last 100 years, often to unsustainable levels, especially in areas with limited hunting pressure. In particular, deer populations can place undue browsing pressure on NEBR and prevent successful growth and reproductive efforts (Lentz and Cipollini 1998).

The techniques necessary to understand and promote NEBR recovery have not been adequately determined and threats to this species still exist. All increases in population numbers since listing are apparently due to the location of additional, established populations through intensive surveys. There is no record of a new population establishing, and approximately half of all monitored sites have been found to be decreasing in size (U.S. Fish and Wildlife Service 2008). Continued action is required to attempt to mitigate and correct this trend.

State contribution to overall species population: The NEBR has a patchy distribution from Virginia to New Hampshire, but had been found in nearly all northeastern states except New York, until its rediscovery. New York is expected to have an abundance of available habitat and possible populations that will serve to connect the species across its range. The New York population was found in the central portion of a forested vernal pool that was ~1,600 m^2 in size. At this time there is no precise estimate of the number of individuals, although the population was reported to be a near monoculture of NEBR.

Threats and threat assessment:

Threats (See 5-year review for full assessment):

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Habitat loss to development and physical destruction is the primary threat to this species via the destruction/degradation of vernal wetlands. The New York population was found

on private lands that are currently leased for hunting with little development pressure, but this habitat is not protected by New York State law. Specific landowner protection agreements have not been established at this time.

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes: NA.

Factor C. Disease or predation:

A. Herbivory by deer has been shown to have a significant impact on NEBR populations. Herbivory is a common threat for emergent wetland plants, although this may be of limited extent for this population as the property is used primarily for hunting and hunting pressure is likely high.

Factor D. The inadequacy of existing regulatory mechanisms:

A. Wetlands smaller than 12.4 acres are generally not protected by the New York State Department of Environmental Conservation (NYSDEC); therefore, continued degradation of vernal pool habitats will continue to occur, especially when projects occur during times when vernal pools may be dry and easily overlooked.

B. The inadequacy of existing regulatory mechanisms continues to pose a threat to the northeastern bulrush, although most states provide for a small upland buffer around wetland sites and screen projects for the presence of endangered or threatened species. As discussed below, some activities are not screened, leaving these populations vulnerable to disturbance. In New York, the northeastern bulrush is listed as State endangered. Wetlands containing threatened and endangered species are ranked as "Class 1" wetlands, which receive more stringent standards for permits. New York also regulates a 100-foot upland buffer around all wetlands (with or without threatened endangered species). Regulated activities in New York include: (1) filling, including filled for agricultural purposes; (2) draining and altering water levels, except as part of an agricultural activity; (3) removing or breaching beaver dams; (4) clear-cutting trees and other wetland vegetation; (5) grading, dredging, or mining; constructing roads; (6) drilling a water well to serve an individual residence; (7) installing docks, piers, or wharfs (8) constructing bulkheads, dikes, or dams; (9) constructing a residence or related structures or facilities; (10) constructing commercial or industrial facilities, public buildings, or related structures; installing utility services; and (11) applying pesticides.

Factor E. Other natural or manmade factors affecting its continued existence:

A. Light restriction through canopy closure may negatively affect NEBR as it is believed to prefer sites with a semi-open canopy. Additionally, large changes in forest composition as well as a myriad of other activities may alter or degrade the hydrologic component of the vernal habitats that the NEBR prefers. Lowering of water levels may allow excess competition, while raising of water levels may cause population decline due to flooding. Pollution inputs from sediment, herbicides, etc., may also cause population declines.

Northeastern Bulrush (*Scirpus ancistrochaetus*): Upper Susquehanna Focal Area

Recovery Goals

Range-wide Recovery Goals/Objectives: According to the Recovery Plan (U.S. Fish and Wildlife Service 1993): Permanently protect 20 populations, monitor 20 representative populations and show that they are stable or increasing, and understand the species' life history in order to provide effective management. These goals were assessed in the 5-Year Review (U.S. Fish and Wildlife Service 2008) and found to be partially met. The NEBR was recommended to be downlisted to threatened, but new recovery objectives for delisting were not clearly defined in this document.

Conservation goal(s) for New York State: Increase knowledge of the distribution and abundance of NEBR in New York and promote viability in known populations in order to contribute to the known viable population level needed to delist the species.

Research/Actions needed[29]:

As this population is newly discovered, initial actions will focus primarily on biological planning research activities in order to understand the habitat, dynamics, and viability of this population as well as locate additional populations. Specifically the following:

A. Conduct an initial count with NYNHP at the known population in order to determine population size and reproductive effort. Recovery Action 4. |FY12 $2,010 BP ESA JW Planned

B. Assess the impact of threats (e.g., herbivory, hydrology) at the known population and evaluate possible management techniques, if needed. Recovery Actions 1.2 and 6.1. |FY12 $0 BP ESA JW Planned

C. Coordinate with Upper Susquehanna Coalition (USC) with regard to vernal pool locations and management. |FY11-FY13 $0 BP ESA SLD Ongoing

    1. Attend natural resource planning meeting, January 12, 2011, Recovery Action 6.1. |FY11 $0 BP ESA SLD Completed

D. Explore funding opportunities for NYNHP to survey for additional populations. Recovery Action 2.3. |FY12 $0 BP ESA JW,RAN Planned

E. Review and provide comments and data for the Five-Year Review. |FY13 $0 BP ESA JW Future

[29] Note that actions listed in orange are planned for Fiscal Year (FY) 2011.

Northeastern Bulrush (*Scirpus ancistrochaetus*): Upper Susquehanna Focal Area

CONSERVATION DESIGN

Strategies for addressing those threats

Please go to these documents for the existing strategies:

- Recovery Plan, First Revision (1993) http://ecos.fws.gov/docs/recovery_plan/930825.pdf

- 5-Year Review (2008) http://ecos.fws.gov/docs/five_year_review/doc2618.pdf
  - Next 5-year review anticipated in 2013

Research/Actions needed:

Specific actions for the next 3 years addressing conservation design include the following:

A. Coordinate with landowner on the development of management techniques to alleviate light-limitation, herbivory, or hydrologic impacts, if necessary, Recovery Task 1.4. |FY13 $0 DES ESA JW Future

CONSERVATION DELIVERY

On- the-ground actions using strategies to address threats for FY 2010 – 2013

Factor A. The present or threatened destruction, modification, or curtailment of its habitat or range:

A. Limit possible habitat and physical destruction

   1. Conduct training for U.S. Army Corps of Engineers Buffalo and Auburn Offices in identifying potential habitat and the plant. Recovery Action 1.51. |FY11 $0 DEL ESA JW,SLD Complete

   2. Coordinate with NYNHP as they contact the landowner of the single NEBR site in New York State for initial conversations about conservation. Recovery Action 1.4. |FY12 $0 BP ESA JW Planned

   3. If the potential exists, develop agreement to protect the known population from human impacts. Recovery Action 1.4. |FY13 $0 DEL ESA JW Future

Factor B. Disease or predation: No actions planned at this time.

Factor C. The inadequacy of existing regulatory mechanisms: No actions planned at this time.

Factor D. Other natural or manmade factors affecting its continued existence: No actions planned at this time.

Northeastern Bulrush (*Scirpus ancistrochaetus*): Upper Susquehanna Focal Area

OUTREACH

- Construct a NEBR web page for the NYFO site linking information resources from Pennsylvania Field Office (PAFO). Recovery Action 9. |FY13 $0 OUT ESA AFL,JW Future

MONITORING

A. Review and track recovery progress. |FY10-FY13 $0 MON ESA JW Ongoing

B. Participate in the annual Regional Data Collection. |FY10-FY13 $0 MON ESA JW Ongoing

C. Coordinate with NYNHP to survey the known populations every 5 years to correspond with the 5-Year Review data calls. Recovery Action 3.2. |FY17 $3,000 MON ESA JW Future

Partners

Private landowner, NYSDEC, NYNHP, USC

References

Lentz, K.A., and D.F. Cipollini. 1998. Effect of light and simulated herbivory on growth of endangered northeastern bulrush, shape *Scirpus ancistrochaetus* Schuyler. Plant Ecology 139:125–131.

U.S. Fish and Wildlife Service. 1993. Northeastern Bulrush (*Scirpus ancistrochaetus*) Recovery Plan. Page 68. Hadley, Massachusetts.

U.S. Fish and Wildlife Service. 2008. Northeastern Bulrush (*Scirpus ancistrochaetus*) 5-Year Review. Pennsylvania Field Office, State College, PA.

New York's 112th Congressional District Boundaries with NYFO Strategic Plan Focal Areas

Legend

- Counties
- Great Lakes
- Upper Hudson
- Long Island
- Allegheny
- Lower Hudson
- Upper Susquehanna
- Onondaga - Finger Lakes
- StLawrence
- NY Lakes

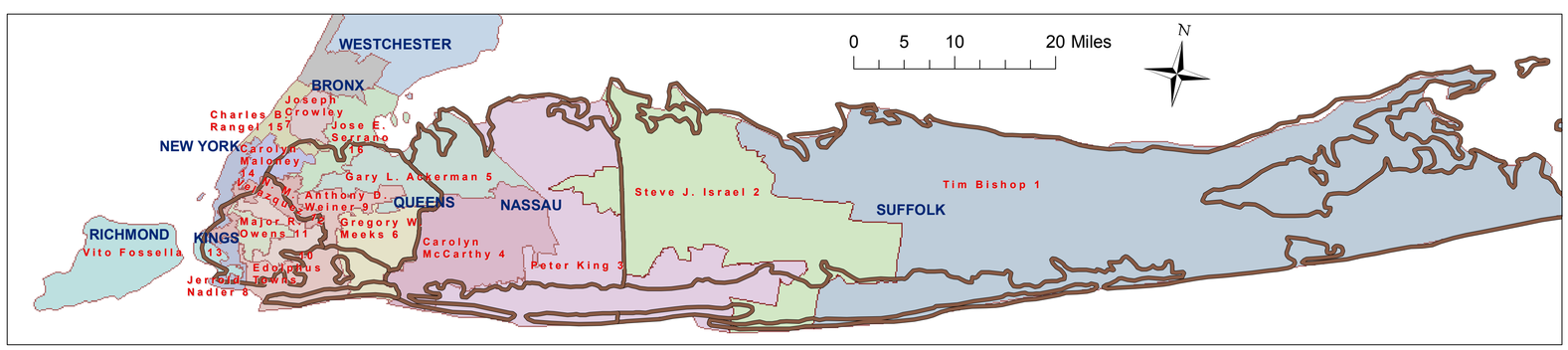
0 10 20 40 Miles

N

Bill Owens 23
Louise McIntosh Slaughter 28
Kathy Hochul 26
Ann Marie Buerkle 25
Brian Higgins 27
Tom Reed 29
Richard Hanna 24
Paul D. Tonko 21
Chris Gibson 20
Maurice Hinchey 22
Nan Hayworth 19
Eliot L. Engel 17

NIAGARA, ORLEANS, GENESEE, WYOMING, ERIE, LIVINGSTON, MONROE, WAYNE, ONTARIO, YATES, SENECA, CAYUGA, ONONDAGA, OSWEGO, JEFFERSON, LEWIS, ST LAWRENCE, FRANKLIN, CLINTON, ESSEX, HAMILTON, HERKIMER, ONEIDA, MADISON, CORTLAND, TOMPKINS, SCHUYLER, STEUBEN, CHEMUNG, TIOGA, BROOME, CHENANGO, DELAWARE, OTSEGO, SCHOHARIE, MONTGOMERY, FULTON, SARATOGA, WARREN, WASHINGTON, SCHENECTADY, RENSSELAER, ALBANY, GREENE, COLUMBIA, ULSTER, SULLIVAN, DUTCHESS, ORANGE, PUTNAM, WESTCHESTER, ROCKLAND, CHAUTAUQUA, CATTARAUGUS, ALLEGANY

Massena, Malone, Ogdensburg, Potsdam, Canton, Gouverneur, Saranac Lake, Dannemora, Plattsburgh, Watertown, Oswego, Fulton, Rome, Baldwinsville, North Syracuse, Syracuse, Solvay, Oneida, Canastota, Chittenango, Manlius, Utica, Ilion, Herkimer, Little Falls, Gloversville, Johnstown, Glens Falls, Hudson Falls, Saratoga Springs, Ballston Spa, Amsterdam, Mechanicville, Scotia, Cohoes, Watervliet, Troy, Rensselaer, Albany, Cobleskill, Oneonta, Norwich, Sidney, Cortland, Ithaca, Auburn, Waterloo, Geneva, Canandaigua, Penn Yan, Dansville, Geneseo, Le Roy, Newark, Webster, Rochester, Fairport, East Rochester, Brockport, Hilton, Medina, Lockport, Niagara Falls, North Tonawanda, Tonawanda, Kenmore, Williamsville, Buffalo, Depew, Lancaster, Lackawanna, East Aurora, Hamburg, Springville, Dunkirk, Fredonia, Jamestown, Salamanca, Olean, Wellsville, Hornell, Bath, Corning, Horseheads, Elmira Heights, Elmira, Waverly, Endicott, Johnson City, Binghamton, Saugerties, Kingston, Catskill, Hudson, Ellenville, New Paltz, Poughkeepsie, Monticello, Wappingers Falls, Walden, Newburgh, Beacon, Middletown, Washingtonville, Goshen, Port Jervis, Monroe, Kiryas Joel, Peekskill, Warwick, Haverstraw, Mount Kisco, New Square



Appendix 2: Focal Area Summary Table

	FOCAL AREA							
SPECIES	**Allegheny**	**Finger Lks/Onon**	**Great Lakes**	**Susque.**	**St. Law.**	**Lower Hud.**	**Upper Hud.**	**Long Island**
American Eel					X	X		
American Hart's Tongue Fern		X						
American Shad				X				
Bald Eagle			X		X	X		
Black Duck		X	X		X		X	
Blandings Turtle					X	X	X	
Bobolink			X		X			
Bog Turtle		X	X			X		
Broad Winged Hawk	X		X					
Brook Trout	X	X	X	X			X	
Cerulean Warbler	X	X	X					
Chittenango Ovate Amber Snail		X						
Clubshell	X							
Common Tern			X		X			
Dwarf Wedgemussel						X		
Field Sparrow							X	
Golden-Winged Warbler	X				X			
Hellbender	X			X				
Houghton's Goldenrod			X					
Indiana Bat		X	X		X	X	X	
Jefferson's Salamander				X				
Karner Blue Butterfly							X	
Lake Sturgeon		X	X		X			
Leedy's Roseroot		X						
Massasauga		X	X					
New England Cottontail						X	X	
Northeastern Bulrush				X				
Northern Monkshood						X		
Northern Pike					X			
Piping Plover			X					X
Rayed Bean	X							
Red Knot								X
Roseate Tern								X
Saltmarsh Sharp-tailed Sparrow								X
Sandplain Gerardia								X
Seabeach Amaranth								X
Small Whorled Pogonia						X		
Spotted Darter	X							
Tiger Salamander								X
Winter Flounder								X
Woodcock			X	X	X		X	

Appendix 3: Acronyms and Abbreviations

ACJV	Atlantic Coast Joint Venture
ACUB	Army Compatible Use Buffer
AFS	American Fisheries Society
AHTF	American hart's-tongue fern
AMM	avoidance and minimization measures
AMNH	American Museum of Natural History
AOC	Area of Concern
APBPC	Albany Pine Bush Preserve Commission
ASMFC	Atlantic States Marine Fisheries Commission
BBS	Breeding Bird Survey
BCA	Bird Conservation Area
BCR	Bird Conservation Region
BGEPA	Bald and Golden Eagle Protection Act
BMP	best management practices
BO	Biological Opinion
BOCES	Board of Cooperative Educational Services
BSC	Buffalo State College
BTAG	Biological Technical Assistance Group
CCAA	Candidate Conservation Agreement with Assurances
CEWAP	Cerulean Warbler Atlas Project
CITES	Convention on International Trade in Endangered Species of Wild Flora and Fauna
COAS	Chittenango ovate amber snail
CPA	Conservation Planning Assistance
CPUE	catch per unit effort
CRP	Conservation Reserve Program
CSO	combined sewer overflows
CSWMA	Cicero Swamp Wildlife Management Area
CWA	Clean Water Act
dbh	diameter at breast height
DRBC	Delaware River Basin Commission
DU	Ducks Unlimited
DWM	Dwarf wedgemussel
EBTJV	Eastern Brook Trout Joint Venture
EC	Environmental Contaminants
ECOS	Environmental Conservation Online System
EEE	Eastern Equine Encephalitis
ELFO	East Lansing Field Office
EMR	Eastern massasauga rattlesnake
EPF	Environmental Protection Fund
ESA	Endangered Species Act
ESG	Eel Study Group

ESU	evolutionary significant unit
FAC	Fisheries Advisory Council
FEMA	Federal Emergency Management Agency
FEMRF	Fish Enhancement, Mitigation, and Research Fund
FERC	Federal Energy Regulatory Commission
FHWA	Federal Highway Administration
FIIS	Fire Island National Seashore
FIMP	Fire Island to Montauk Point
FLLT	Finger Lakes Land Trust
FMCS	Freshwater Mollusk Conservation Society
FOIA	Freedom of Information Act
FWCA	Fish and Wildlife Coordination Act
FWINS	Fish and Wildlife Information Needs System
GIS	Geographic Information System
GLRI	Great Lakes Restoration Initiative
GWWA	Golden-winged warbler
ha	hectare
HCP	Habitat Conservation Plan
HOGO	Houghton's goldenrod
IEPG	International Eel Passage Group
IJC	International Joint Commission
INAD	Investigational New Animal Drugs
IPN	infectious pancreatic necrosis
IT	Information Technology
IUCN	International Union for Conservation of Nature
Kbb	Karner blue butterfly
LCC	Landscape Conservation Cooperatives
LCFWRO	Lake Champlain Fish and Wildlife Resources Office
LE	Law Enforcement (USFWS)
LGLFWCO	Lower Great Lakes Fish and Wildlife Conservation Office
LIFO	Long Island Field Office
LINWRC	Long Island National Wildlife Refuge Complex
MBRT	Mitigation Bank Review Teams
MRNFQ	ministère des Ressources Naturelles et de la Faune Quebec
mt	metric ton
NAS	National Audubon Society
NAWMP	North America Waterfowl Management Plan
NBII	National Biological Information Infrastructure
NEBR	Northeastern bulrush
NEC	New England cottontail
NEFO	New England Field Office
NFWF	National Fish and Wildlife Foundation
NGO	non-governmental organizations

NJFO	New Jersey Field Office
NLCD	National Land Cover Data
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPL	National Priorities List
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRDAR	Natural Resource Damage Assessment and Restoration
NWR	National Wildlife Refuge
NYFO	New York Field Office
NYPA	New York Power Authority
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSDOT	New York State Department of Transportation
NYSERDA	New York State Energy Research and Development Agency
NYSFA	New York State Flora Association
NYSG	New York Sea Grant
NYSNHP	New York State Natural Heritage Program
NYSOPRHP	New York State Office of Parks, Recreation and Historic Preservation
NYSWF	New York State Wetlands Forum
OBI	Ontario Bay Initiative
OMNR	Ontario Ministry of Natural Resources
ORV	off-road vehicles
PAFO	Pennsylvania Field Office
Park	Chittenango Falls State Park
PFW	Partners for Fish and Wildlife
PIF	Partners In Flight
PPLPRU	Prairie Peninsula Lake Plain Recovery Unit
ppt	parts per thousand
PRP	potentially responsible parties
pva	population viability assessment
RDC	Regional Data Collection/Call
RFP	request for proposals
RGS	Ruffed Grouse Society
RO	Regional Office
ROW	right-of-way
RU	Recovery Unit
SCEP	Student Career Experience Program
SDM	shared decision-making
Seaway	St. Lawrence Seaway
SEQRA	State Environmental Quality Review Act
SGNC	Species of Greatest Conservation Need
SHA	Safe Harbor Agreement

SNENYB	Southern New England/New York Bight
SRAFRC	Susquehanna River Anadromous Fish Restoration Commission
SRBC	Susquehanna River Basin Commission
SSP	Science Support Partnership
STEP	Student Temporary Employment Program
STR	Save The River
SUNY	State University of New York
SUNY-Cortland	Cortland College
SUNY-ESF	College of Environmental Science and Forestry
SUNY-Oswego	Oswego College
SUNY-Potsdam	Potsdam College
SWANCC	Solid Waste Association of Northern Cook County
SWCD	Soil and Water Conservation District
SWG	State Wildlife Grant
SWP	Small whorled pogonia
TBD	to be determined
TIC	Trout in the Classroom
TILT	Thousand Islands Land Trust
TNC	The Nature Conservancy
TU	Trout Unlimited
USACE	U.S. Army Corps of Engineers
USC	Upper Susquehanna Coalition
USCA	Upper Susquehanna Conservation Alliance
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WCS	Wildlife Conservation Society
WHIP	Wildlife Habitat Incentives Program
WMA	Wildlife Management Area
WMI	Wildlife Management Institute
WNS	White-nose syndrome
WRP	Wetlands Reserve Program
WVFO	West Virginia Field Office