Maddie List/USFWS

Holyoke Range from the Fort River Division, Massachusetts

State of Massachusetts

- Overview Dead Branch Conservation Focus Area (Existing Refuge Division)
- Overview Fort River Conservation Focus Area (Existing Refuge Division)
- Overview Mill River Conservation Focus Area (Existing Refuge Division)
- Overview Westfield River Conservation Focus Area (Existing Refuge Division)
- Overview Fannie Stebbins (Existing Refuge Unit)
- Overview Hatfield Unit (Existing Refuge Unit)
- Overview Honeypot Road Wetlands Unit (Existing Refuge Unit)
- Overview Mount Toby Unit (Existing Refuge Unit)
- Overview Mount Tom Unit (Existing Refuge Unit)
- Overview Third Island Unit (Existing Refuge Unit)
- Overview Wissatinnewag Unit (Existing Refuge Unit)

Overview
Dead Branch Conservation Focus Area (Existing Refuge Division)

Chesterfield, Westhampton, and Huntington, Massachusetts

Conservation Focus Area (CFA)—Acreage Profile	Acres	Percentage of CFA
Total CFA Acres to be Conserved by Service	5,186	74%
■ *Existing Refuge Ownership in CFA*[1]	*98*	
■ *Additional Acres in CFA proposed for Refuge Acquisition*[2]	*5,088*	
Existing Acres in CFA Permanently Conserved by Others[2,3]	1,812	26%
Total Acres in CFA[2, 4]	6,998	100 %

[1] Acres from Service's Realty program (surveyed acres).

[2] Acres calculated using GIS.

[3] The Service does not plan to acquire existing conserved lands, except under extenuating circumstances (conserved acres from TNC 2014 data).

[4] The Service would conserve up to this number of acres. The Service only acquires lands from willing sellers.

What specific criteria and/or considerations drove the selection of this CFA?

The refuge's existing Dead Branch Division was established in 2011. It lies within the Westfield River CPA. The proposed Dead Branch CFA is part of an area identified by the State of Massachusetts as a priority for conservation. It would offer the opportunity to conserve and restore forested habitat and protect small dispersed wetlands. It would also help conserve lands along a high-quality segment of the Westfield River that supports a cold-water fisheries, such as eastern brook trout. The proposed CFA is located in an area with an extensive conserved lands network, including the Peru, Middlefield, and October Mountain State Parks, several TNC lands (e.g., Westfield River Highlands), Hinsdale Flats, Fox Den, Peru, and Walnut Hill Wildlife Management Areas, and other privately conserved lands. Most of the Dead Branch CFA overlaps terrestrial Tier 1 Core and Connector lands identified through the *Connect the Connecticut* landscape conservation design. Additional land protection by the Service in this area will help better connect these conserved lands.

What are the priority habitat types within the proposed CFA? What percentage of the total CFA acreage do they represent?

- Hardwood Forest – 88.4%
- Freshwater Marsh – 1.0%
- Shrub swamp and floodplain forest – 1.5%

For more information on habitats in the CFA, see map A.23 and table A.18.

What are the resources of conservation concern for the proposed CFA?

As noted in table A.19 below, there are eight priority refuge resources of concern (PRRC) terrestrial and aquatic species that may rely upon the diverse habitats in this CFA. There are also habitat types that are not being managed for a particular PRRC species, but are important for their contribution to Biological Integrity Diversity and Environmental Health (BIDEH) of the landscape. The refuge will seek to protect and restore (if necessary)

these habitat types. Additionally, we recognize the value of this area to State Species of Greatest Conservation Need (SGCN), wetland dependent species and forest interior dwelling bird species. These species and others are discussed further below.

1. Federal Threatened and Endangered Species
   This CFA is within the range of the federally listed northern long-eared bat and tricolored bat, a species petitioned for listing under the ESA. During summer nights, these bats forage on insects within wetlands and forested habitats. Northern long-eared bats roost under the bark or within cavities of large (> 3 dbh) diameter trees during the day (USFWS 2014). Tricolored bats will also roost in trees, though they tend to roost in the foliage of live or dead trees within a mature stand (MADFW 2015). These roosting habitats also provide maternity sites where females will raise their young. In the winter, these bats will hibernate in underground caves or cave like structures, often within close proximity to their summer roosting and feeding areas. Areas within the CFA may contain important maternity and summer roosting sites, as well as foraging areas for this species.

2. **Migratory Birds**
   The Connecticut River watershed is a major migration corridor. The lower portion of the watershed (CT and MA) receives higher use by migrants, with this use concentrated in habitats along the Connecticut River main stem. Migrants become more evenly distributed in watershed habitats beyond the Connecticut River main stem (Smith College 2006). The Dead Branch CFA not only provides important stopover habitat for migrating landbirds, but breeding habitat for a diversity of bird species as well.

   The Dead Branch CFA is within the East Branch of the Westfield River Watershed which provides a contiguous core of mostly undeveloped forested acres. The Dead Branch CFA provides a diversity and mosaic of habitats including large patches of emergent and shrub wetlands. These habitats are important for breeding landbirds and waterbirds including those that are a priority for conservation. The priority refuge resources of concern for the Dead Branch CFA include blackburnian warbler, wood thrush, chestnut-sided warbler, Canada warbler, and American woodcock. This CFA is in the core range for these species, and many other species of conservation concern including black-throated blue warbler, black-throated green warbler, veery, purple finch and broad-winged hawk. The wetlands in the CFA support nesting and migrating American bittern, a state SGCN, and great blue heron.

3. **Waterfowl**
   The Dead Branch CFA wetland and riparian habitats provide potential breeding and foraging areas for American black duck, a PRRC species, as well as green-winged teal, common merganser, wood duck, and mallard.

4. **Diadromous fish and other aquatic species**
   The Dead Branch is an important cold-water tributary of the East Branch Westfield River. This tributary provides important cold water habitat for brook trout and Atlantic salmon. These species are PRRC, SGCN and a conservation concern for the Service's Northeast Region. Other cold aquatic species that occur within this watershed include slimy sculpin, lake chub, and many species of invertebrates, including the State rare riffle snaketail dragonfly.

5. **Wetlands**
   The Dead Branch CFA contains 187 acres of hardwood swamp, 113 acres shrub-swamp, and floodplain forest, and 75 acres of freshwater marsh. Many of these wetlands occur along slow-moving streams or small ponds, and are extensive beaver-controlled wetlands that support abundant odonates (dragonflies and damselflies), amphibians, waterfowl, and waterbirds. Habitat patches range from 2 acres to over 100 acres in size.

What habitat management activities would likely be a priority on refuge lands within the proposed CFA?

We will conduct a comprehensive, multi-scale wildlife habitat inventory following acquisition. Baseline information on the condition of habitats (ie. forested, non-forested and open water habitats) will further inform more detailed, habitat prescriptions within a required step-down Habitat Management Plan. Once inventory has been completed, then management will focus on maintaining the following conditions:

- Forest management activities will provide diversity of seral stages including early successional and mature forested habitats. The forests in the CFA will be structurally diverse and appropriate for site conditions and location. Appendix J provides general forest management guidelines, including descriptions of forestry techniques and explanations about how we will determine where and how to conduct active management.
- We will also manage wetland habitats, and pasture, hay, grassland habitats. Wetland management will focus on maintaining the natural hydrology and native species composition. Invasive plant management will be a priority.
- In open water (stream, rivers, ponds) habitats, we will focus on maintaining forested stream buffers, a structurally diverse instream habitat, and clear aquatic species passage to spawning and wintering habitat.

What public use opportunities would likely be a priority on refuge lands within the proposed CFA?

We would focus on providing opportunities for the six priority, wildlife-dependent recreational uses: hunting, fishing, wildlife observation and photography, environmental education, and interpretation. Map A. 22 below depicts the snowmobile trail that crosses the refuge.

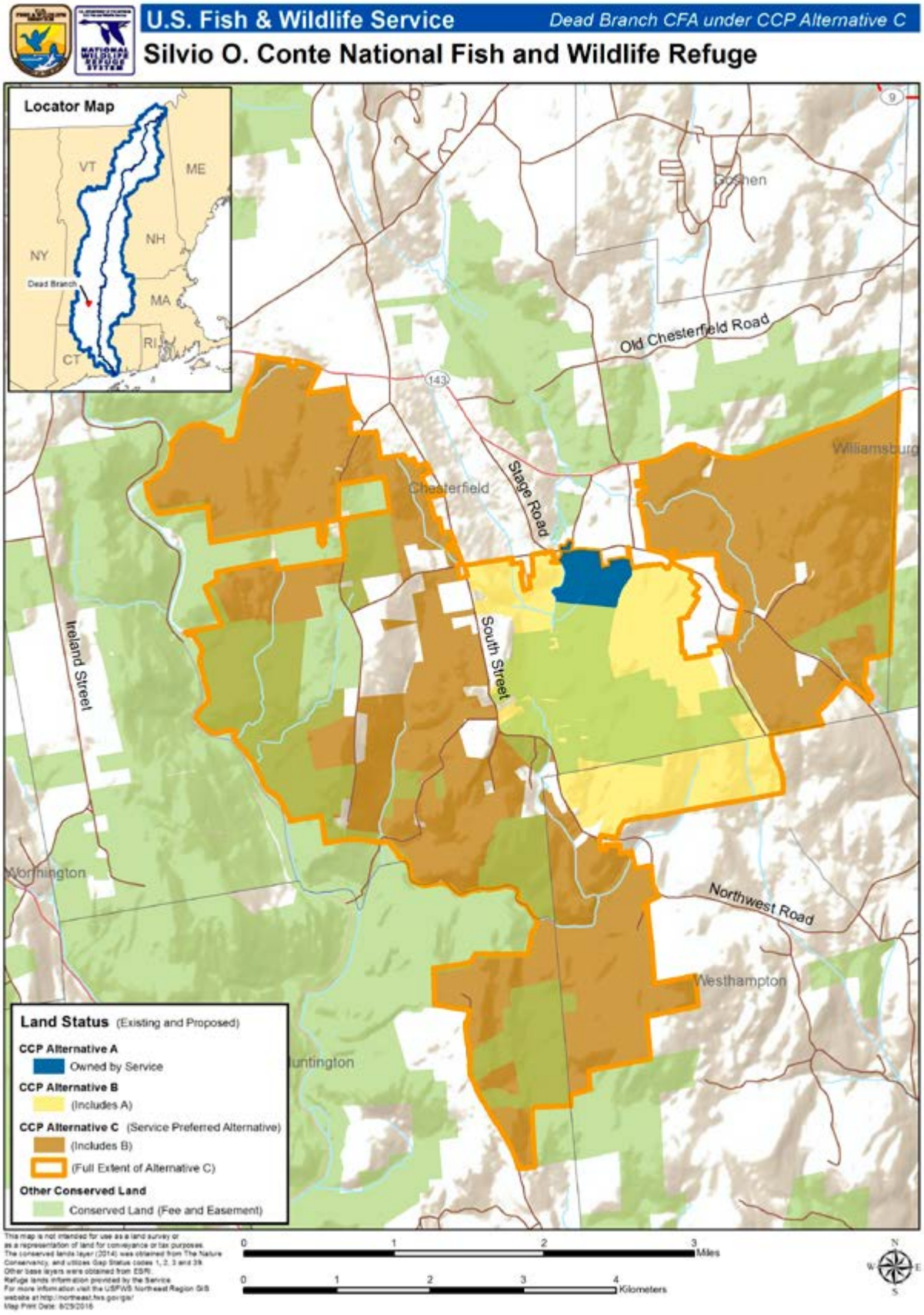
Were there other special considerations in delineating the CFA boundary?

The Westfield River Watershed has been recognized by The Nature Conservancy, the State of Massachusetts and the National Wild and Scenic Rivers program as one of the most intact river systems in Massachusetts and one of the healthiest tributaries to the Connecticut River. The watershed is currently over 80% forested and only 4% developed, remarkable for southern New England.

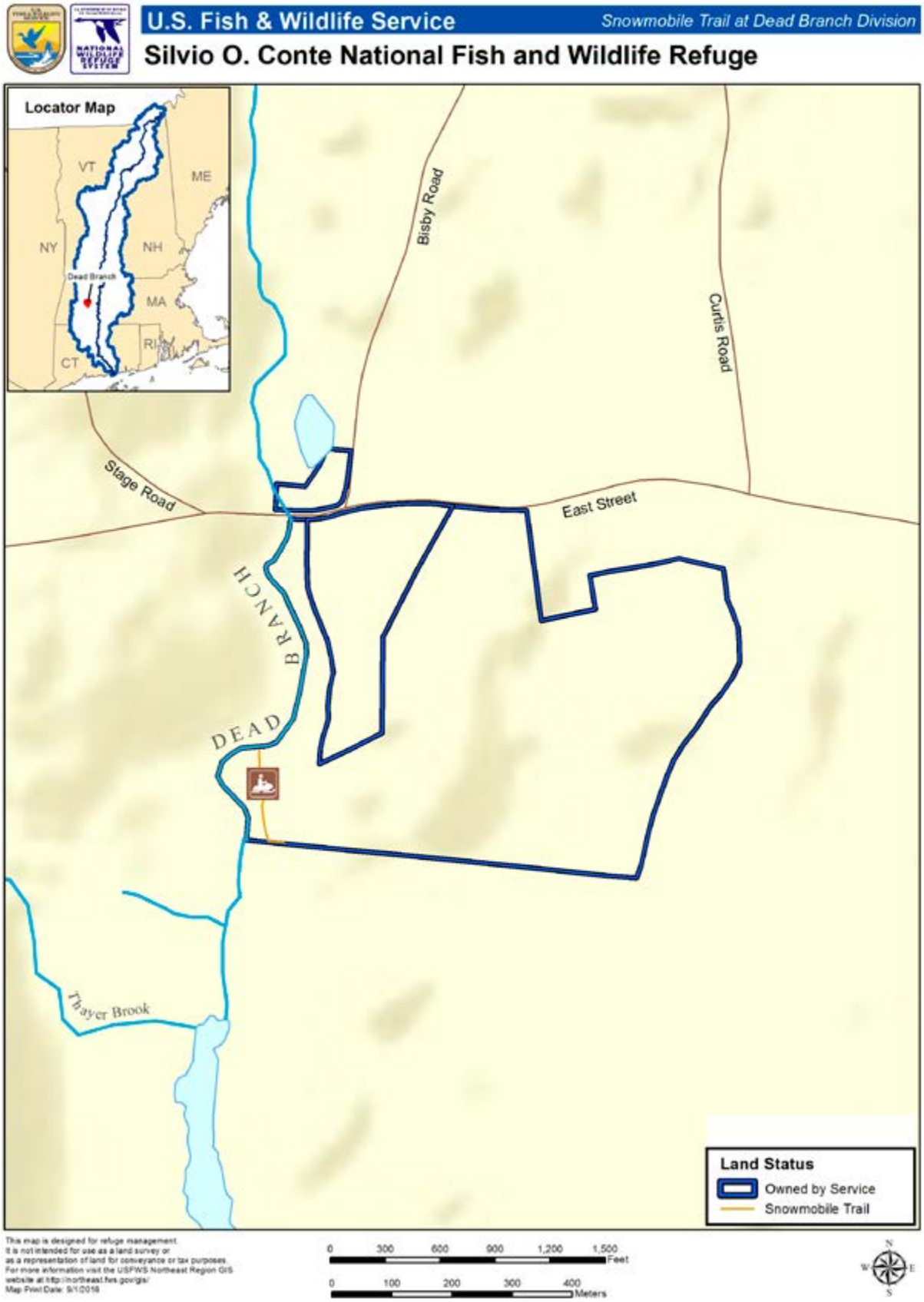
The migratory fish runs of the Westfield River are a subject of ongoing research by Conte Anadromous Fish Research Laboratory, and the Westfield is used as a “quality river” reference for Target Fish Community analyses in other large river systems. Westfield State University uses the rivers and forests as an outdoor laboratory for study of physical and biological sciences and environmental education.

The East Branch of Westfield River/Westhampton area is striking in its beauty and offers access for recreation compatible with the protection of the significant natural resources it supports. Such uses include hiking, birding and wildlife observation, catch-and-release fly fishing between Chesterfield Gorge and the Knightville dam, whitewater and flatwater paddling, photography, snowshoeing, cross-country skiing, and environmental education.

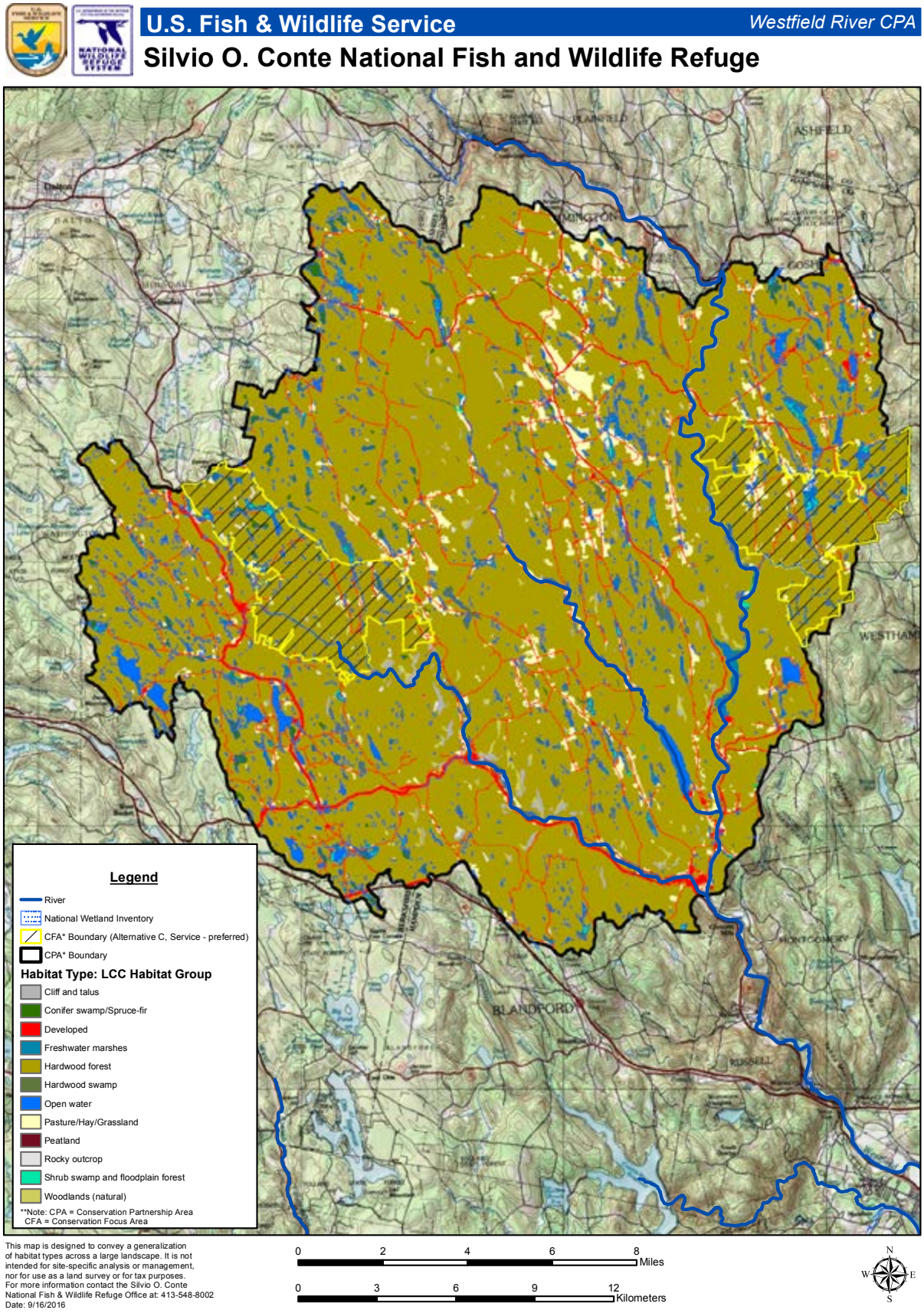
Map A.21. Dead Branch CFA – Location.



Map A.22. Snowmobiling at Dead Branch CFA.



Map A.23. Westfield River CPA – Habitat Types (includes the Dead Branch CFA).



This map is designed to convey a generalization of habitat types across a large landscape. It is not intended for site-specific analysis or management, nor for use as a land survey or for tax purposes. For more information contact the Silvio O. Conte National Fish & Wildlife Refuge Office at: 413-548-8002
Date: 9/16/2016

Table A.18. Westfield River CPA/Dead Branch CFA – Habitat Types.

LCC General Habitat Type[1]	CPA[2]		CFA[3]				
	Total Acres	Percent of CPA[4]	Total Acres	Conserved by Others[5]	USFWS Owned[6]	Percent CFA[7]	Percent Habitat[8]
Forested Uplands and Wetlands[9]							
Conifer swamp/spruce-fir	1,710	1.1%	-	-	-	0.0%	0.0%
Hardwood forest	127,135	85.3%	6,774	1,772	85	88.3%	5.3%
Hardwood swamp	2,445	1.6%	186	50	-	2.4%	7.6%
Shrub swamp and floodplain forest	1,018	0.7%	112	63	-	1.5%	11.0%
Woodlands (natural)	562	0.4%	5	5	-	0.1%	0.8%
Forested uplands and wetlands subtotal	*132,871*	*89.1%*	*7,077*	*1,891*	*85*	*92.2%*	*5.3%*
Non-forested Uplands and Wetlands[9]							
Cliff and talus	775	0.5%	5	3	-	0.1%	0.6%
Freshwater marshes	676	0.5%	75	34	1	1.0%	11.1%
Pasture/hay/grassland	6,224	4.2%	337	94	6	4.4%	5.4%
Peatland	4	0.0%	-	-	-	0.0%	0.0%
Rocky outcrop	256	0.2%	-	-	-	0.0%	0.0%
Non-forested uplands and wetlands subtotal	*7,935*	*5.3%*	*417*	*132*	*7*	*5.4%*	*5.3%*
Inland aquatic habitats[9]							
Open Water	1,547	1.0%	16	10	-	0.2%	1.0%
Inland aquatic habitats subtotal	*1,547*	*1.0%*	*16*	*10*	*-*	*0.2%*	*1.0%*

LCC General Habitat Type[1]	CPA[2]		CFA[3]				
	Total Acres	Percent of CPA[4]	Total Acres	Conserved by Others[5]	USFWS Owned[6]	Percent CFA[7]	Percent Habitat[8]
Other							
Developed	6,751	4.5%	163	19	3	2.1%	2.4%
Other subtotal	*6,751*	*4.5%*	*163*	*19*	*3*	*2.1%*	*2.4%*
TOTAL[10]	**149,103**	**100.0%**	**7,673**	**2,052**	**95**	**100.0%**	**5.1%**

Notes:

1 - North Atlantic Landscape Conservation Collaborative general habitat typings for USFWS representative species; linked to the National Vegetation Classification System (NVCS). See table A.52 at the end of this appendix for a comparison of these generalized habitat types with the more specific The Nature Conservancy's Northeastern Terrestrial Habitat Classification System. More detailed habitat tables that include the Northeastern Terrestrial Habitat Classification System habitat types are available for each CFA and refuge unit online at: *http://www.fws.gov/refuge/Silvio_O_Conte/what_we_do/conservation.html.*

2 - Conservation Partnership Area

3 - Conservation Focus Area; representing Service-preferred Alternative C

4 - Percentage of the CPA represented by the habitat type

5- Acres in the CFA currently conserved by others (TNC 2014)

6 - Acres in the CFA currently owned by the Service

7 - Percentage of the CFA represented by the habitat type

8 - Percentage of a given habitat within the CPA protected within the CFA under Service-preferred Alternative C

9 - CCP Objective from Conte Refuge final CCP/EIS, Chapter 4, Service-preferred Alternative C

10 – Acreages in this table may differ slightly from the acreages presented in the Overview summary. This table's values were calculated using raster data (an array of pixels, as in a digital photo), while the values in the Overview, and used throughout the final CCP/EIS were calculated using vector data (created from shapes). For the purposes of CFA analysis, the acreages presented in the Overview are more accurate because they better reflect boundaries like parcel lines.

Table A.19. Westfield River CPA/Dead Branch CFA – Preliminary Priority Refuge Resources of Concern.

Priority Refuge Resources of Concern[1]	Habitat Structure[2]	Associated Species[3]
Forested Uplands and Wetlands[4]		
Hardwood Forest[5] - 6,773 acres		
Wood Thrush[A, B, C]	Breeding habitat includes contiguous mature forests (80+ years old) dominated by deciduous tree species, moist soils, a moderate to dense sub-canopy and shrub density, open forest floor and closed canopy (Roth et al. 1996, Rosenberg et al. 2003).	Black-billed Cuckoo[A,J] Broad-winged hawk[I,J] Purple Finch[A] Northern Flicker[A, J] Ruffed Grouse[A, I] Whip-poor-will[A, I, J] Black-throated Blue Warbler[A] Black-throated Blue Warbler[A] **Louisiana Waterthrush[I]** Brown Thrasher[I] **Ovenbird[A]** **Eastern Red Bat[I]** American Redstart[A, J] Veery[A] Little Brown Bat[I] Sharp-shinned Hawk[J] Yellow-bellied Sapsucker[A,J] Black Racer[I] Tricolored Bat[I] Little Brown Bat[I] Bobcat[I] Jefferson Salamander[I,J] Moose[I] Black Bear[I] Rose-breasted Grosbeak[A]
Canada Warbler[A, B, C]	Breeding habitat includes contiguous deciduous, mixedwood and coniferous forests interspersed with openings that provide an average overstory tree height of 55 ft within >30% canopy closure, a dense foliar mid-story and well developed shrub layer 7-20' in height, and moist soils (Chace et al. 2009, Lambert et al. 2005, Dunn et al. 1997).	
Northern Long-eared Bat[D] Tricolored Bat[E]	Winter habitat includes high humidity underground caves or cave like structures; summer habitat includes roost trees that are typically $\geq$ 3 inches dbh, are alive, dead or dying, exhibits exfoliating bark, cavities, crevices, or cracks and located within a variety of forest types interspersed with non-forested habitats (USFWS 2014, MADFW 2015).	
Blackburnian Warbler[A]	Breeding habitat includes mature conifer, and conifer-deciduous forests (80+ years old) (DeGraaf et al. 2001, Dunn et al. 1997, Morse 2004).	
Chestnut-sided Warbler[A, B, I]	Early successional deciduous forested upland and wetland habitat (Dunn et al, 1997, Richardson et al, 1995)	
American Woodcock[A, B, C]	Breeding and roosting habitat includes young deciduous and mixed forests (1-20 years old) dominated by aspen and birch, and 3+ acre forest openings with 60% shrub cover, in proximity to alder wetlands and herbaceous openings (Kelley et al. 2008, Sepik et al. 1994).	
Hardwood Swamp[5] - 187 acres		
Canada Warbler[A, B, C]	Breeding habitat includes contiguous deciduous, mixedwood and coniferous forests interspersed with openings that provide an average overstory tree height of 55 ft within >30% canopy closure, a dense foliar mid-story and well developed shrub layer 7-20' in height, and moist soils (Chace et al. 2009, Lambert et al. 2005, Dunn et al. 1997).	**Northern Waterthrush** Red-shouldered Hawk[J] Rose-breasted Grosbeak[J] Veery[A,J] White-eyed Vireo[J] Northern Parula[A,I] Wood Duck[J]

Priority Refuge Resources of Concern[1]	Habitat Structure[2]	Associated Species[3]
Forested Uplands and Wetlands[4]		
Shrub Swamp and Floodplain Forest[5] - 113 acres		
American Woodcock[A, B, C]	Foraging habitat includes alder dominated wetlands in proximity to early successional forests, shrublands, and herbaceous openings (Kelley et al. 2008, Sepik et al. 1994).	Chestnut-sided Warbler[A] Ruffed Grouse[A, I] Eastern Ribbon Snake[I] **Warbling Vireo** **Spotted Turtle[I]** American Redstart[A, J] Eastern Kingbird[J] Gray Catbird[J] Eastern Towhee[I] White-throated Sparrow[I] **Willow Flycatcher** Black Racer[I] Wood Duck[J] **Wood Turtle[I]**
American Black Duck[A, B, C, G]	Breeding and migrating habitat includes herbaceous wetlands, fens, and flooded meadows and shrub-swamps (Longcore et al. 2000, DeGraaf et al. 2001).	
Woodlands (natural)[5] - 5 acres		
Central Appalachian pine-oak rocky woodland[H]	This system of the central Appalachians encompasses open or sparsely wooded hilltops and outcrops or rocky slopes. The substrate rock is granitic or of other acidic lithology. The vegetation is patchy, with woodland as well as open portions. Pine species are indicative and often are mixed with Oak species. Some areas have a fairly well-developed heath shrub layer, others a grass layer. Conditions are dry and nutrient-poor, and many, if not most, sites have a history of fire (Gawler 2008).	Uncommon plant community within the landscape that contributes to BIDEH*

Priority Refuge Resources of Concern[1]	Habitat Structure[2]	Associated Species[3]
Non-Forested Uplands and Wetlands[4]		
Cliff and Talus[5] - 5 acres		
North-central Appalachian acidic cliff and talus[H] North-central Appalachian circumneutral cliff and talus[H]	The *North Central Appalachian acidic cliff and talus system* comprises sparsely vegetated to partially wooded cliffs. Most of the substrate is dry and exposed, but small (occasionally large) areas of seepage are often present. Vegetation in seepage areas tends to be comparatively well-developed and different from the surrounding dry cliffs. The vegetation is patchy and often sparse, punctuated with patches of small trees that may form woodlands in places. Eastern red cedar is a characteristic tree species, poison ivy a characteristic woody vine, and common polypody a characteristic fern. Substrates within the *circumneutral cliff and talus system* include limestone, dolomite and other rocks. The vegetation varies from sparse to patches of small trees, in places forming woodland or even forest vegetation. Ash, basswood, and American bladdernut are woody indicators of the enriched setting. The herb layer includes at least some species that are indicators of enriched conditions, e.g., yellow jewelweed, purple cliffbrake, ebony spleenwort, or bluntlobe cliff fern. (Gawler 2008).	Uncommon plant community within the landscape that contributes to BIDEH*
Freshwater Marshes[5] - 75 acres		
American Black Duck[A, B, C, G]	Breeding and migrating habitat includes herbaceous wetlands, fens, and flooded meadows and shrub-swamps (Longcore et al. 2000, DeGraaf et al. 2001).	**Marsh Wren** **American Bittern[A,I]** Northern Harrier[A,I,J] Spotted Turtle[I] Bridle Shiner[I] Northern Leopard Frog[I] Spatterdock Darner[I] Wood Turtle[I] Canada Goose[A,J] Wood Duck[J]

Priority Refuge Resources of Concern[1]	Habitat Structure[2]	Associated Species[3]
Pasture/Hay/Grassland[5] – 337 acres		
American Woodcock[A, B, C]	Roosting habitat includes old fields with scattered tall herbaceous vegetation and/or shrubs. Herbaceous openings such as log landings and pasture used for singing grounds (Kelley et al. 2008, Sepik et al. 1994).	Field Sparrow[I,J] Northern Harrier[A,I,J] **Bobolink[A,I]** **Eastern Meadowlark[I]** **Grasshopper Sparrow[I]** Black Racer[I] White-throated Sparrow[I] American Kestrel[I] Northern Leopard Frog[I] Prairie Warbler[I]
Inland Aquatic Habitats[4]		
Open Water[5] – 14 acres		
Brook Trout[B, F]	Spawning habitat includes clear, well oxygenated cold water lakes/ponds/streams with silt-free rocky substrate, abundant cover, vegetated banks, stable temperatures and stream flow (VTWAP 2005).	Longnose Sucker[I] Bridle Shiner[I] **Slimy Sculpin[I]** Creek Chubsucker[I] Longnose Dace[I] Riffle Snaketail[I] **Spring Salamander** Lake Chub[I] Wood Turtle[I]
Atlantic Salmon[B, F, G]	Spawn in cold freshwater moving streams w/coarse clean gravel and adequate food/cover. Migrate in large rivers (VTWAP 2005).	

Notes:

1 - These species of conservation concern and associated habitats, as well as under-represented and sensitive ecological systems constitute the management focus for the CFA, and recommended for the CPA. They were identified based on specific criteria, and are included in the following plans, databases and/or have Federal status.

A: 2008 Bird Conservation Region 14.
B: 2009 North Atlantic Landscape Conservation Cooperative Development and Operations Plan.
C: 2008 USFWS Birds of Conservation Concern.
D: Federal Threatened and Endangered status as of 2016, including Candidate Species
E: Federal Elevated Concern species or species petitioned for threatened and endangered listing as of 2016
F: 2009-2013 USFWS Northeast Region Fisheries Program Strategic Plan
G: Silvio O Conte Refuge Purpose Species.
H: 2008 Northeastern Terrestrial Habitat Classification System.

2 - This habitat structure will benefit the listed priority refuge resources of concern, and is based on the most recent literature.

3 - These species are a compilation from the following plans, and are associated with the habitat type and/or will benefit from all or a portion of the habitat structure associated with the priority species. This is not a comprehensive list of species.

A:2008 Bird Conservation Region 14.
I: 2015 Massachusetts Comprehensive Wildlife Conservation Strategy
J: 2012 Terrestrial and Wetland Representative Species of the North Atlantic: Species Selected, Considered, and Associated Habitats (Ecological Systems). These species were LCC candidate species and are represented by the selected LCC Representative Species.

4 - CCP Objectives from Silvio O. Conte NFWR Comprehensive Conservation Plan, Chapter 4, Service - preferred Alternative.

5 - These habitat types are based on the North Atlantic Landscape Conservation Cooperative (NALCC) habitat groupings for associated Representative Species, which were derived from The Northeastern Terrestrial Habitat Classification System (NETHCS). See table A.52 for a comparison of the NALCC habitat groupings and NETHCS.

BOLD - These species are LCC Representative Species, which is a species that, because of its habitat use, ecosystem function, or management response, typifies lifecycle or habitat requirements for a larger group of species.

* The Refuge Improvement Act directs the US Fish and Wildlife Service to maintain Biological Integrity, Diversity, and Environmental Health (BIDEH). Elements of BIDEH are represented by native fish, wildlife, plants and their habitats as well as those ecological processes that support them.

Goals, Objectives, and Strategies for Refuge Lands in the Dead Branch CFA under Alternative C

Goal 1: Wildlife and Habitat Conservation: Promote the biological diversity, integrity, and resiliency of terrestrial and aquatic ecosystems within the Connecticut River watershed in an amount and distribution that sustains ecological function and supports healthy populations of native fish, wildlife, and plants, especially Federal trust species of conservation concern, in anticipation of the effects of climate, land use, and demographic changes.

Objective 1.1: Forested Uplands and Wetlands

Sub-objective 1.1a. (Hardwood Forest)
Improve the diversity of seral stages and (where and when possible) restore historic composition and structure, and improve landscape connectivity of hardwood forest habitat to support species of conservation concern and aid in climate change adaptation. Management will provide breeding and foraging habitat for priority refuge resources of concern, including wood thrush, American woodcock, chestnut-sided warbler, Canada warbler, blackburnian warbler, and northern long-eared bat and tricolored bat (if appropriate).

Rationale:
We envision healthy forests within the Dead Branch CFA where a diverse seral structure provides suitable breeding and post-breeding habitat conditions for a suite of Massachusetts wildlife. Our long-term vision for the CFA includes hardwood forests characterized by complex horizontal and vertical structure, a generally closed canopy, large-diameter trees, dead woody material, snags and cavity trees, native species diversity, softwood inclusions, and a diversity of wildlife (Foster et al. 1996, Goodburn and Lorimer 1998, Keeton 2006, D'Amato et al. 2009, Curzon and Keeton 2010, Fraver et al. 2011).

Dead Branch CFA hardwood forests are diverse and productive for wildlife, and abundant, high-quality habitat is certainly available within the CFA. To date, our review of the Dead Branch CFA habitats and wildlife species—and their condition—has been limited to coarse-scale information: the careful analysis of spatially-explicit habitat data using GIS, the consultation of local, state, and regional species conservation plans, and an understanding of forest disturbance and land-use history in New England. This allowed identification of broad habitat types, and species of conservation concern known to utilize characteristics common to these habitats. Our understanding of the forest structure within Dead Branch comes exclusively from a reading of forest history in New England—a legacy of intensive past-use that altered the vegetation structure and composition, landscape patterns, and ongoing ecological dynamics (Cronon 1983, Whitney 1996, Foster et al. 1997, Bellemare et al. 2002, Hall et al. 2002). Our sub-objective assumes the forests of the Dead Branch are more homogeneous than those of three centuries earlier, and include more sprouting and shade-intolerant species and fewer long-lived mature forest tree species (Goodburn and Lorimer 1998, Foster et al. 1998, Foster 2000, Bellemare et al. 2002, Cogbill et al. 2002, Abrams 2003). Completing a comprehensive forest and habitat inventory post-acquisition will test these assumptions, and aid in identifying stands where a forest management approach that combines passive management and the application of silvicultural treatments designed to emulate gap dynamics, will promote compositional and structural diversity, and move succession forward to emulate later seral stage characteristics.

For forest birds, the ability to survive and breed is often related to the presence of specific forest structural conditions or attributes, such as those that provide nest sites, food and foraging substrates, singing perches, and cover from predators. While our management goals may create a relatively old forest, hardwood forests within Dead Branch will contain a variety of patches in different age classes and developmental stages; it is not uniform throughout. This diversity of age classes provides a variety of bird species with a range of nesting and foraging opportunities. Further, finer-scale investigation of forest conditions may identify opportunities to improve age class diversity through the creation of early-successional forests—a habitat in decline in portions of the watershed. Species dependent upon disturbances that create early successional forested habitats, like refuge priority species of concern American woodcock, are declining as remaining patches of young forest mature (Sepik et al. 1994, Kelley et al. 2008). Across the CFA, enhanced horizontal structure should support other species of

conservation concern like chestnut-sided warbler, ruffed grouse, eastern red bat, and—if wetlands and riparian areas are present—Canada warbler (Lambert and Faccio 2005, Reitsma et al. 2008, Chace et al. 2009).

In a mature forest, many nesting bird species tend to remain within specific vegetation layers: on or near the ground, in the middle layer, or up in the canopy. Dead Branch's hardwood forests should have all forest layers present in moderate to high amounts distributed throughout a stand and across the landscape. Enhanced vertical structure will provide the greatest number of bird species with the greatest number of nesting and foraging opportunities. Patches of very dense native shrub and understory layers (0 to 5 feet in height) are of particular importance to species like Canada warbler. These habitat elements may have importance to declining mature forest-interior species identified in regional conservation plans like wood thrush and blackburnian warbler. Wood thrush nest and feed at the ground level; a sub-canopy layer of shrubs, moist soils and leaf litter are important habitat features (Roth et al. 1996, Rosenberg et al. 2003). And wood thrush has significance as a NALCC representative species for hardwood forests in the NALCC southern sub-region. Improving vertical diversity by preserving softwood inclusions during forest management may provide an important habitat component for blackburnian warblers, who dwell in the upper canopies of conifers, and are thought to be strongly associated with the hemlock forests within Dead Branch. Blackburnian warblers have been shown to decline in response to removal of hemlock by hemlock wooly adelgid (Tingley et al. 2002).

Our active forest management efforts will aim to create or maintain a canopy that is generally closed (greater than 75 to 80 percent closure) with small gap openings scattered throughout a stand and the CFA. These openings will be caused by or mimic small, single- to few-tree disturbances and create opportunities for regenerating intermediate- and shade-tolerant species. Regeneration in these openings will provide a continual supply of ephemeral nesting habitat for species like wood thrush. The distribution and concentration of these openings will vary, but interior forest conditions will be maintained on the whole. Close canopy conditions favor a suite of interior-nesting bird species that include: ovenbird, black-throated green warbler, and—where softwood inclusions are abundant—blackburnian warbler. Our efforts to regenerate a diversity of species must contend with evidence of reduced diversity or damage to tree seedlings and herbaceous plants attributed to white-tailed deer (Hough 1965, Anderson and Loucks 1979, Tilghman 1989, Rooney and Waller 2003, Côté et al. 2004, see also Rawinski 2008).

Management to maintain or improve seral stage diversity within the CFA will include the retention of large-diameter (24 inches or greater dbh) trees where appropriate. Such larger trees are either absent or are very few in younger forests, and that has implications for the habitat of wildlife species and for nutrient cycling. Structurally-sound, large-diameter trees are important nest sites for woodland raptors, such as the red-shouldered hawk. Emergent white pines—tall, large-diameter trees that extend above the canopy— provide special habitats that are utilized by species like the northern goshawk. Standing trees that are dead and/or contain cavities will be present in all size classes for those species, like black bear, that require large logs or trees for their dens (Wynne and Sherburne 1984, Chapin et al. 1997, DeGraaf and Yamasaki 2001). Live, dead or dying trees that are $\geq$3 inches in dbh with crevices, cavities, cracks or exfoliating bark are used as summer roosting sites for the federally listed northern long-eared bat. These roosting habitats also provide maternity sites where females will raise their young (USFWS 2014). Tricolored bats will also roost in trees, though they tend to roost in the foliage of live or dead trees within a mature stand (MADFW 2015). Snags and cavity trees also provide important nesting and foraging sites for bird species such as nuthatches, owls, and woodpeckers, like the yellow-bellied sapsucker.

Implementation of refuge strategies will begin with a comprehensive, multi-scale forest and wildlife habitat inventory. Forest wildlife species survival and breeding success is dependent not only on the habitat at the stand level, but also the surrounding landscape, making it necessary to consider the proportions and sizes of stand types and successional stages within the CFA and the associated landscape. Baseline information on the condition of hardwood forests at the time of acquisition will further inform more detailed, stand-level habitat prescriptions within a required step-down HMP.

Management Strategies:
Within 5 years of land acquisition and CCP approval:

- Identify forest stands with late successional characteristics for passive management, and those where active management is necessary to improve forest structure and/or composition. Appendix J provides general forest management guidelines, including descriptions of forestry techniques and explanations about how we will determine where and how to conduct active management.

- Identify forest stands where soils and species composition will support woodcock management.

- Work with partners, including the State, in support of the State Wildlife Action Plan, to ensure management on Service lands complement adjacent land management objectives.

Within 10 years of land acquisition and CCP approval:

- Implement identified active forest management opportunities using accepted silvicultural practices. Appendix J provides general forest management guidelines, including descriptions of forestry techniques and explanations about how we will determine where and how to conduct active management.

- Protect hard and soft mast producing species such as American beech inclusions, and apple and cherry trees, through the use of best management practices.

- Ensure a diversity of native species is present and non-native species are excluded or managed to keep population levels as low as possible. In particular:

  ✓ Conduct a thorough inventory of invasive plants.

  ✓ Prevent garlic mustard from spreading and evaluate the threat of multiflora rose to important habitats.

  ✓ Collaborate with partners within the Westfield River Watershed Invasive Species Partnership (WISP) to strategically prevent and manage invasive species within the watershed, including on refuge land.

- Explore research opportunities with academic partners to address efficacy of forest management in meeting wildlife objectives.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Conduct forest and wildlife inventories.

- Conduct bat acoustic surveys to obtain baseline bat inventory data. Conduct additional surveys, if appropriate, to identify active bat roosting sites and hibernacula.

- Map natural communities; protect rare or exemplary examples.

- Map vernal pools and seeps.

Sub-objective 1.1b. (Hardwood swamp)
Improve the diversity of seral stages, (where and when possible) restore historic composition and structure, and improve the natural hydrology to support natural and rare ecological communities. Management will provide breeding and foraging habitat for priority refuge resources of concern including Canada warbler.

Rationale:
Of the forest types within the Dead Branch CFA, hardwood swamps have undergone significant alteration and have great potential for restoration. This habitat type is often in basins, or on gently sloping seepage lowlands. Examples of this forest type may be found in small patches where an acidic substrate of mineral soil, often with a component of organic muck, creates a shallow, perched water table. Saturation can vary, with ponding of water common during wetter seasons and drought during the summer or autumn months. The dynamic nature of the watertable and the nutrient-poor soils drive complexes of forest upland and wetland species including eastern hemlock, red maple, and black gum. Within the Connecticut River watershed, including the CFA, agricultural practices and selective logging have largely removed this habitat from the landscape, or greatly simplified its historic species composition. Changes in hydrology, water pollution, invasive species introductions and soil compaction remain as threats.

Successional trends in hardwood swamps are not well understood. One possibility is that these areas were once in softwoods such as hemlock, fir, cedar, or spruce. Heavy cutting and clearing for agriculture often eliminated softwood species. Our conservation efforts within the Dead Branch will focus on promoting the ecological integrity of these stands through restoration of degraded floodplains, and (where and when possible) restoring composition and structure to accepted historical conditions. Restoration of the primary natural disturbance mechanism (seasonal flooding) will aide in the restoration of historical species mixtures.

Many species of conservation concern use forested swamps, including northern parula, willow flycatcher, white-eyed vireo, and rose-breasted grosbeak. Canada warbler, a priority refuge resource of concern, occupies this habitat type with high densities occurring in mixed forested swamps (Lambert and Faccio 2005, Reitsma et al. 2008, Chace et al. 2009). The wet soil conditions in swamps limit the canopy closure, and frequent blow downs create canopy gaps. This provides a well-developed shrub layer—an important habitat component for foraging and nest cover (Chace et al. 2009). Canada warbler shows area sensitivity in forests fragmented by suburban sprawl (Robbins et al. 1989). Hardwood swamps in the Dead Branch CFA are within a matrix of contiguous forest, where fragmentation is not currently a concern. Hardwood swamp patches of 10 acres or greater are thought to provide suitable breeding habitat for Canada warbler in the Dead Branch CFA, and allow monitoring of population response to management actions (Dettmers personal communication 2013).

Restoration of forest habitats, natural levees, backwater sloughs, and oxbow lakes will create high-quality habitat for neotropical migratory birds in an otherwise agricultural landscape where small, disturbed forest fragments are the rule. Closed canopy deciduous forests that include pin oak and other hardwoods provide mast and other foraging sites. Hardwood swamp stands with relatively large average stand diameters, a variety of tree conditions (including large-diameter dead stems, live trees with hollow stems and dead limbs, and small diameter suppressed and dying stems), and nearby water have a high habitat potential for cavity-dwelling wildlife species (DeGraaf et al. 2006).

Management Strategies:
Within 5 years of land acquisition and CCP approval:

- Work with partners, including the State of Massachusetts, in support of the State Wildlife Action Plan, to ensure management on Service lands complement adjacent land management.
- Evaluate hydrologic regime to inform restoration efforts.
- Identify forest stands where management is necessary to improve species composition. Appendix J provides general forest management guidelines, including descriptions of forestry techniques and explanations about how we will determine where and how to conduct active management.

Within 10 years of land acquisition and CCP approval:

- Implement identified forest management opportunities to improve species composition. Appendix J provides general forest management guidelines, including descriptions of forestry techniques and explanations about how we will determine where and how to conduct active management.
- Explore research opportunities with academic partners to address efficacy of forest management in meeting wildlife objectives.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Conduct forest and wildlife inventories.
- Map natural communities; protect rare or exemplary examples.
- Map vernal pools and seeps.

Sub-objective 1.1c. (Shrub Swamps and Floodplain Forest)
Manage shrub swamp and floodplain forest communities to support natural and rare ecological communities, and provide potential breeding and foraging habitat for priority refuge resources of concern including American woodcock and American black duck.

Rationale:
Shrub swamps are restricted to poorly drained areas, small seepage zones, and wide alluvial stretches of rivers and small streams. Shrubs tend to dominate the wetland, though grasses may be present. Typical species include willow, silky dogwood, speckled alder, white meadowsweet, bluejoint, tall sedge, and common rush (Gawler 2008). These wetlands are also created through beaver activity, a natural and important disturbance process within the CFA. The landscape mosaic of flooded areas and ponds in various stages of succession provide a diversity of plant communities, and habitats for a variety of wildlife species, including American woodcock and American black duck, priority refuge resources of concern.

American woodcock are dependent on early-successional forests—a habitat in decline in portions of the watershed. Species dependent upon disturbances that create early successional forested habitats, like American woodcock, are declining as remaining patches of young forest mature. Woodcock require varying habitat conditions that are within close proximity of each other, including clearings for courtship, forest openings with sparse shrub or herbaceous cover for roosting, young deciduous forests of shade intolerant tree species for nesting and brood rearing, and functional foraging areas (Sepik et al. 1994, Kelley et al. 2008). Shrub swamps in the CFA provide moist, rich soils for foraging and the dense shrubs provide cover from predators.

Management of the shrub swamp communities may be required to maintain shrub dominance and stem densities. Tree species, such as red maple, tend to replace mature shrub species and established invasive plants compete for nutrients and space. These invading species require management in order to maintain the native shrub diversity of the community. A high shrub stem density is also important as it provides birds with cover from predators and more leaf surface area for gleaning. Cover for American woodcock, for example, is ideal in a 10-15 year old shrub swamp (USDA 2001). Shrub species, in particular alder, tend to die back as they reach maturity, and as a result stem density decreases. Periodic rejuvenation of shrubs is necessary to maintain required stem densities. Management priority will be given to shrub swamps that are part of a woodcock management area. Management of these shrub swamps will benefit other species that use these communities, including willow flycatcher, American redstart, chestnut-sided warbler, ruffed grouse, black racer, and eastern ribbon snake.

American black ducks also use shrub swamp communities, though black ducks prefer shrub swamps that are flooded or adjacent to open water habitats. Black ducks rely on these wetlands during the breeding season, and as stopover habitat during migration. Adults and their broods forage on seeds, aquatic vegetation and invertebrates in flooded shrub swamp communities, or adjacent open water habitats. Adults place well-concealed nests in the vicinity of foraging habitat in nearby uplands or dry hummocks in the wetland (Longcore et al. 2000, DeGraaf and Yamasaki 2001). American black duck is a species of concern in the North American Waterfowl Management Plan because of historic population declines, and is listed as highest priority for conservation in BCR 14. Protecting and managing these shrub wetland communities from potential threats, including invasive species introduction, altered hydrology, and fragmentation, will contribute to the conservation of this species.

Implementation of refuge strategies will begin with a comprehensive, multi-scale wildlife habitat inventory. Wildlife species survival and breeding success is dependent not only on the habitat at a fine scale, but also the surrounding landscape, making it necessary to look at the adjacent habitat conditions and land uses within the CFA and associated landscape. Baseline information on the condition of shrub swamps at the time of acquisition will further inform more detailed habitat prescriptions within a required step-down HMP.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Survey wildlife utilization of existing wetlands.
- Map natural communities; protect rare or exemplary examples.

Management Strategies:
Within 5 years of land acquisition and CCP approval:

- Minimize refuge activities that disturb wetland communities.
- Work with partners, including the State, in support of the State Wildlife Action Plan, to ensure management on Service lands complement adjacent land management objectives.

Sub-objective 1.1d. (Biological Integrity, Biological Diversity, and Environmental Health)
Where and when appropriate, protect, or restore habitats absent an identified species of conservation concern, recognizing the importance of all habitats in contributing to the biological integrity, diversity, and environmental health of refuge lands and the Watershed.

Rationale:
Achieving the refuge purposes and the Refuge System mission are the paramount considerations for refuge management. Additionally, the Service has policy for maintaining and restoring, where appropriate, refuges' "biological integrity, diversity, and environmental health" (601 FW 3). This policy provides refuge managers with a process to analyze their refuge and recommend the best management direction to prevent further degradation of environmental conditions; and where appropriate, restore lost or severely degraded components. The policy

suggests using historic conditions as a reference for comparing the ecosystem's current composition, structure, and functioning to what it was prior to substantial human related changes to the landscape. This comparison can be used to direct management to maintain or restore those natural conditions, to the extent practicable, without jeopardizing refuge purposes. For example, we consider the natural timing and frequency of disturbances, such as fires and flooding, and mimic those processes. In other words, the policy is intended to induce management for native fish, wildlife, and plants and their habitats in natural conditions, and with natural processes, using historic conditions to help identify such conditions and processes (Paveglio et al. 2010). However, we recognize that it is not always possible or desirable to try to mimic historic conditions, particularly in the face of predicted climate and land use changes and other landscape-scale considerations. Historic conditions are only one of many considerations when making decisions about how to manage refuge resources.

Conservationists often use the metaphor of coarse filters and fine filters to convey two complementary strategies for maintaining biological diversity, biological integrity, and environmental health: the first focuses on conserving ecosystems and the second focuses on species (Noss 1987, Hunter 1991, Groves 2003). The coarse-filter approach seeks to protect a representative array of natural ecosystems and their constituent processes, structures, and species (the refuge); however, some species fall through its pores, and coarse filters must be complemented by fine filter strategies tailored to fit particular species (priority species of concern). Sub-objectives throughout this plan generally represent a fine-filter approach—identifying species and their habitats that the USFWS has identified as priorities based upon our establishing legislation, refuge system mission, regional and national conservation plans, and conversations with conservation partners. In contrast, this sub-objective outlines CFA management that will benefit many of its species, the majority of which will not receive the special, tailored attention of fine-filter conservation. The BIDEH policy guidance complements coarse-filter conservation in ways that fine-filter conservation misses.

The key idea of BIDEH conservation is that most ecosystems contain certain features that are critical to the welfare of many species; thus, conserving those features can have a positive effect on a large suite of species (biological diversity). Logs in a forest, hedgerows in an agricultural landscape, and streams and pools in many terrestrial ecosystems are all examples of ecosystem features that support far more species than one would predict based on their size alone. The importance of conserving these features is widely recognized, but in an ad hoc, idiosyncratic fashion that often does not recognize the commonality between maintaining a hedgerow, a rock outcrop, and an herbaceous wetland. BIDEH conservation overlaps with many aspects of matrix management and ecosystem management (Lindenmayer and Franklin 2002). A key difference is its specific focus on ecosystem elements, which explicitly complements coarse-filter and fine-filter conservation.

Habitats that occur within the Dead Branch CFA where species-specific management guidelines are not identified will be managed under the umbrella BIDEH policy. These habitats are most often small or isolated occurrences, but are important in maintaining connectivity within the larger forested matrix, and providing additional structural and species diversity to the matrix. Rocky outcrops and upland meadows, for instance, are anomalies in an otherwise forested landscape. They often have a special flora and fauna—providing sunny, dry sites for reptiles to bask, or nectar producing flowers for foraging butterflies. One could make the case that these outcrops are small, independent ecosystems, but they are really too small to be candidates for a classic coarse-filter strategy and thus best considered in a BIDEH context. This approach will allow the conservation of large numbers of species, the majority of which are too poorly known to be conserved individually (e.g., imagine species conservation plans for particular insects or liverworts). Together, the multiple strategies are reasonably comprehensive because all species and habitats known to be in jeopardy will receive needed attention.

The negative consequences of habitat loss and fragmentation to aspects of biological integrity, diversity, and health have been shown by a large number of theoretical and empirical studies, in different environments, and for a large array of taxa (Fahrig 2003). Our understanding of the current condition of all the habitats considered under this sub-objective and their contribution to the BIDEH of the CFA is poor. A comprehensive forest and wildlife habitat inventory will be necessary to inform more detailed management strategies that provide the full range of natural processes.

Management Strategies:
Within 5 years of CCP approval:

- Work with partners, including the State, in support of the State Wildlife Action Plan, to ensure management on Service lands complement adjacent land management objectives.

Inventory and Monitoring Strategies:

Within 5 years of CCP approval:

- Conduct habitat and wildlife inventories.
- Map natural communities; protect rare or exemplary examples.

Objective 1.2: Non-forested Uplands and Wetlands

Sub-objective 1.2a. (Freshwater Marsh)
Manage freshwater marshes to support natural and rare ecological communities, and provide potential breeding and foraging habitat for priority refuge resources of concern including American black duck.

Rationale:
Freshwater marshes are often dominated by emergent and submergent herbaceous vegetation. Scattered shrubs are often present, and trees are generally absent. Herbaceous vegetation typically includes common bulrush, jewelweed, marsh fern, water lily and narrow-leaved cattail (Gawler 2008). Our coarse-scale habitat analysis of this CFA identifies freshwater marsh habitat as part of a larger wetland complex along the Dead Branch and within Dead Swamp.

This particular wetland complex is adjacent to a slow moving stream, and open water, providing foraging, and potentially breeding habitat for American black duck, and other waterfowl species. Black ducks use wetlands such as these for breeding and foraging habitat. Well-concealed nests are placed on the ground in adjacent uplands or hummocks within the wetland. Adults and their broods feed on seeds and herbaceous vegetation, including sedges, rushes, and submerged aquatic vegetation, as well as invertebrates (Longcore et al. 2000, DeGraaf and Yamasaki 2001). An evaluation of the wetlands in the CFA will be necessary to determine their potential as habitat for American black duck.

Implementation of refuge strategies will begin with a comprehensive, multi-scale wildlife habitat inventory. Wildlife species survival and breeding success is dependent not only on the habitat at a fine scale, but also the surrounding landscape, making it necessary to look at the adjacent habitat conditions and land uses within the CFA and associated landscape. Baseline information on the condition of freshwater marshes at the time of acquisition will further inform more detailed habitat prescriptions within a required step-down HMP.

Management Strategies:
Within 5 years of land acquisition and CCP approval:

- Evaluate wetland hydrology for impacts to natural flow regimes.
- Work with partners, including the State, in support of the State Wildlife Action Plan, to ensure management on Service lands complement adjacent land management objectives.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Inventory wetland plant communities.
- Survey wildlife use of wetlands.
- Map natural communities; protect rare or exemplary examples.

Sub-objective 1.2b. (Pasture/Hay/Grassland)
Manage pasture, hay, and grasslands (where appropriate) as part of a mosaic of habitat conditions required by American woodcock and other shrub-dependent conservation concern species such as chestnut-sided warbler. Also maintain large contiguous tracts of grassland habitat for grassland birds and pollinators, if present and appropriate.

Rationale:
Over four percent of the Dead Branch CFA is pasture, hay, and grassland habitat. These habitat types require active manipulation to inhibit the natural succession of converting to forest. The pasture, hay, and grassland habitats tend to be dominated by grasses. Depending on habitat patch size, continuity of patches and timing of manipulations, this habitat type will support grassland dependent species such as bobolink and grasshopper

sparrow, as well as pollinator species. If these habitats are left unmaintained (e.g. not mowed), they will convert to a mixture of shrubs and grasses providing "old field" habitat for shrub dependent species such as chestnut-sided warbler, prairie warbler and field sparrow. American woodcock, a refuge priority resource of concern, will use both habitat conditions when managed in conjunction with their other habitat needs.

Many shrubland bird breeding populations occur in high proportions in the northeast, and therefore, are species of conservation responsibility (Dettmers, Randy 2003). For example, over 12% of the chestnut-sided warbler population breeds in BCR 14 (Dettmers, Randy 2006). While there is evidence that southern New England supported a small but significant grassland bird community before European settlement, only a small proportion of grassland breeding bird populations occurs in the northeast (Dettmers and Rosenburg 2000). Maintaining high quality shrubland habitat in this CFA will provide habitat for a higher percentage of species in decline. However, large and contiguous grasslands are rare in the watershed, and large grassland habitat patches are important to high priority grassland species and overall biological diversity. We will maintain large grassland patches, or areas where a high proportion of grassland cover is present in the landscape (e.g., a mosaic of many medium to large patches).

Shrubland and grassland habitats will also be used by American woodcock, which require diverse structural habitat conditions within close proximity of each other: clearings for courtship, forest openings with sparse shrub or herbaceous cover for roosting, young hardwood forests of shade intolerant tree species for nesting and brood rearing, and functional foraging areas (Sepik et al. 1994, Kelley et al. 2008). Small clearings with minimal vegetation is required for courtship areas, and shrublands with clumps of tall vegetation or sparse shrubs will provide roosting habitat.

Shrubland dominated habitats in the northeast support many species of conservation concern, many of which are a high conservation responsibility for the region, indicating the importance of shrubland habitats to these species in the CFA. Large, contiguous grassland habitats are also important to a suite of priority grassland bird species. Current pasture, hay, and grassland acres can provide quality habitat, for these species, and American woodcock, if managed appropriately. Baseline information on the condition of these habitats and association with other landscape features will further inform more detailed habitat prescriptions within a required step-down HMP.

Management Strategies:
Within 5 years of land acquisition and CCP approval:

- Work with partners to protect and promote farming practices (e.g. haying and pasture of animals) that benefit wildlife and protect water quality.

Inventory and Monitoring Strategies:
Within 5 years of land acquisition and CCP approval:

- Conduct an inventory of these habitats to determine their condition, size and location, which will inform and prioritize appropriate management strategies in the HMP.

Sub-objective 1.2c. (Biological Integrity, Biological Diversity, and Environmental Health)
Where and when appropriate, protect, or restore habitats absent an identified species of conservation concern, recognizing the importance of all habitats in contributing to the biological integrity, diversity, and environmental health of refuge lands and the Watershed."

Rationale:
See the rationale for sub-objective 1.1d.

Habitats that occur within the Dead Branch CFA where species-specific management guidelines are not identified will be managed under the umbrella BIDEH policy. These habitats are most often small or isolated occurrences, but are important in maintaining connectivity within the larger forested matrix, and providing additional structural and species diversity to the matrix. Rocky outcrops and upland meadows, for instance, are anomalies in an otherwise forested landscape. They often have a special flora and fauna—providing sunny, dry sites for reptiles to bask, or nectar producing flowers for foraging butterflies. One could make the case that these outcrops are small, independent ecosystems, but they are really too small to be candidates for a classic coarse-filter strategy and thus best considered in a BIDEH context. This approach will allow the conservation of large numbers of species, the majority of which are too poorly known to be conserved individually (e.g., imagine

species conservation plans for particular insects or liverworts). Together, the multiple strategies are reasonably comprehensive because all species and habitats known to be in jeopardy will receive needed attention.

The negative consequences of habitat loss and fragmentation to aspects of biological integrity, diversity, and health have been shown by a large number of theoretical and empirical studies, in different environments, and for a large array of taxa (Fahrig 2003). Our understanding of the current condition of all the habitats considered under this sub-objective and their contribution to the BIDEH of the CFA is poor. A comprehensive forest and wildlife habitat inventory will be necessary to inform more detailed management strategies that provide the full range of natural processes.

Management Strategies:
Within 5 years of CCP approval:

- Work with partners, including the State in support of the State Wildlife Action Plan, to ensure management on Service lands complement adjacent land management objectives.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Conduct habitat and wildlife inventories.
- Map natural communities; protect rare or exemplary examples.

Objective 1.3: Inland Aquatic Habitats

Sub-objective 1.3a. (Open Water)
In collaboration with partners, manage water resources and riparian areas to provide cold temperature regimes, substrate diversity, and clear aquatic species passage that benefit priority refuge resources of concern including Eastern brook trout and Atlantic salmon.

Rationale:
The Dead Branch CFA is located in the Westfield River watershed, which has been recognized by The Nature Conservancy, the State of Massachusetts and the National Wild and Scenic Rivers program as one of the most intact river systems in Massachusetts and one of the healthiest tributaries to the Connecticut River. The Dead Branch is an important cold-water tributary of the East Branch Westfield River, and the conservation of its watershed is the focus of the Dead Branch CFA. The Dead Branch provides important cold water habitat for brook trout and Atlantic salmon. These species are sensitive to extreme temperature fluctuations, and require water temperatures between 40-70 degrees Fahrenheit for spawning, growth, and survival. Other cold aquatic species that occur within this watershed include slimy sculpin, lake chub, and many species of invertebrates, including the rare riffle snaketail dragonfly. Wood turtle, a state species of greatest conservation need also occurs in this CFA.

We will work with partners to provide aquatic habitat with clear aquatic species passage to spawning and wintering habitat and structurally diverse in-stream habitat. Due to our lack of knowledge regarding habitat conditions in the CFA, implementation of refuge strategies will begin with a comprehensive, multi-scale wildlife and habitat inventory. Aquatic species survival and breeding success is dependent on not only on the habitat at a fine scale, but also the surrounding landscape, making it necessary to look at the adjacent forest conditions and land uses within the CFA and associated landscape. Baseline information on the condition of the water resources in the CFA will further inform more detailed habitat prescriptions within a required step-down HMP.

Management Strategies:
Within 10 years of land acquisition and CCP approval:

- Implement a remediation plan for identified obstacles to aquatic species passage.

Inventory and Monitoring Strategies:
Within 5 years of land acquisition and CCP approval:

- Conduct stream assessments to evaluate the physical, chemical, and biological condition of the fish community structure, productivity, and health.

- Conduct stream assessments to identify man-made physical barriers (e.g., impassable road crossings, culverts, and dams) to the movement of fish and other aquatic organisms.

Objective 1.4: Coastal Non-forested Uplands (coastal beaches and rocky shores)

Not applicable

Objective 1.5: Coastal Wetlands and Aquatic Habitats (tidal salt marsh and estuary)

Not applicable

Goal 2: Education, Interpretation, and Outreach: Inspire residents and visitors to actively participate in the conservation and stewardship of the exceptional natural and cultural resources in the Connecticut River watershed, and promote a greater understanding and appreciation of the role of the Silvio O. Conte National Fish and Wildlife Refuge in conserving those resources.

Objective 2.1: Environmental Education

In collaboration with public and private educators from all four states in the watershed, lead or facilitate the implementation of structured natural and cultural resource curricula, with a focus on guiding educators and students to develop an awareness of, and concern about, natural and cultural resources and associated challenges; appreciate our conservation history; make informed decisions and work individually or collectively toward solutions; and model responsible environmental stewardship in their everyday lives.

Sub-objective 2.1a. (Environmental Education Planning and Training)
Encourage schools, scout groups, and summer camps to develop curricula that use the Dead Branch Division as an outdoor classroom.

Rationale:
See environmental education rationale in chapter 4 detailing the importance of environmental education for the Service. Environmental education is one of the six priority, wildlife-dependent recreational uses of the Refuge System. Environmental education is particularly important at Conte Refuge because one of its founding purposes is to provide opportunities for environmental education. Environmental education is an important tool that can help refuge visitors and local residents, particularly students, appreciate the importance of this area to the larger watershed.

Management Strategies:
Within 1 year of acquiring sufficient land:

- Encourage schools, scout groups, and summer camps to develop curricula that use the Dead Branch Division as an outdoor classroom.

Sub-objective 2.1b. (Environmental Education Delivery)
Encourage schools, scout groups, and summer camps to use the Dead Branch Division as an outdoor classroom.

Rationale:
Because this division will be unstaffed, the majority of environmental education opportunities on this division will be led by partners, volunteers, and local school groups and other educational groups (e.g., scout groups and summer camps).

Management Strategies:
Within 1 year of acquiring sufficient land:

- Encourage schools, scout groups, and summer camps to develop curricula that use the Dead Branch Division as an outdoor classroom.

Objective 2.2: Interpretation

Develop, lead, and facilitate interpretive programs that emotionally and intellectually connect the audience to natural and cultural resources in the watershed.

Sub-objective 2.2a. (Natural and Cultural Resource Interpretive Planning and Training)
With Friends groups, public and non-profit organizations, and volunteers, offer quality interpretive programming at the Dead Branch Division. The development of highly trained interpreters will be encouraged by offering interpretive training to Friends' members, partners, and volunteers on a regular basis.

***Rationale*:**
See the rationale in chapter 4 detailing the importance of interpretation for the Service. Interpretation is an important tool that can help refuge visitors and local residents appreciate the importance of this area to the larger watershed. With an ADA-compliant trail planned for the site, the Dead Branch Division will be well suited to support both self-guided, wildlife dependent interpretive experiences, as well as guided interpretive programs that convey messages about the refuge and about the Dead Branch Division's habitats and cultural resources.

Management Strategies:
(These strategies are dependent on land acquisition from willing landowners.)

Within 5 years of acquiring sufficient land:

- Inventory and evaluate each CFA to determine the appropriate interpretive materials to employ.
- Create meaningful, consistent, thematic statements to be used in the delivery of programming at the Dead Branch Division.
- Provide resources and trainings to Friends, and volunteers in support of interpretive programs.

Within 10 years of acquiring sufficient land:

- Develop standardized self-guided interpretive services, such as interpretive trails and kiosks, exhibits, and printed media.
- Employ a variety of themed interpretive offerings (e.g., presentations, audio-visual programs, brochures, and exhibits) when creating programming for natural and cultural resource interpretation.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Build an evaluation process that includes formal and informal evaluation to assess the effectiveness of all interpretation programs.

Sub-objective 2.2b. (Natural and Cultural Resource Interpretive Program Delivery)
Collaborate with Friends group, partners, and volunteers to deliver quality natural and cultural resource interpretive programs.

Rationale:
See the rationale for sub-objective 2.2a.

Management Strategies:
(These strategies are dependent on land acquisition from willing landowners.)

Within 5 years of acquiring sufficient land:

- Through partners, and a Friends group, annually provide quality interpretive programs, exhibits, printed media at the Dead Branch Division.
- Incorporate thematic statements, measureable objectives and evaluation measures into all interpretation efforts.
- Publicize interpretive programs through traditional media, on the refuge web site, and digital social media conduits.
- Maintain a supply of print interpretive brochures (e.g., general brochure and bird checklist) that incorporate refuge interpretive messages and themes.
- Work with partners to create issue-oriented experiential activities and programs for use at their facilities.

Within 10 years of acquiring sufficient land:

- Contribute refuge interpretive information for scenic byways and other state publications and signs.
- Develop self -guided interpretive messages and use state of the art as well as traditional media (e.g., brochures).

Objective 2.3: Public and Community Outreach

Support, promote, and coordinate a wide range of outreach tools and activities to facilitate and improve communications and relationships with the American public, especially communities, adjacent landowners, and elected officials in the Connecticut River watershed, and to empower citizens to recognize and resolve local natural resource issues and promote conservation and the responsible use of natural resources.

Because the Dead Branch Division would be unstaffed and does not have refuge facilities, public and community outreach for this site will occur through regular outreach activities at the headquarters and will not specifically occur at this site.

Objective 2.4: Science and Technical Outreach

Facilitate the collection and exchange of information that increases the knowledge and understanding of natural and cultural resources, addresses climate change and other conservation issues, and provides land managers with better information to make management decisions affecting resources.

Becuase the Dead Branch Division would be unstaffed and does not have refuge facilities, science and technical outreach for this site will occur through regular outreach activities at the headquarters and will not specifically occur at this site.

Goal 3: Recreation: Promote high-quality, public recreational opportunities in the Connecticut River watershed that are complementary between ownerships and provide regional linkages with emphasis on promoting wildlife-dependent activities that connect people with nature.

Objective 3.1: Hunting

Support quality public hunting opportunities in the Connecticut River watershed to promote a unique understanding and appreciation of natural resources and their management on lands and waters, while also protecting a traditional outdoor pastime deeply rooted in America's natural heritage and conservation history.

Sub-objective 3.1a. (Hunting Opportunity, Access, and Infrastructure)
Provide the opportunity for a quality hunting experience based on state regulations and division-specific regulations, if necessary.

Rationale:
Hunting is priority public use on national wildlife refuges and a popular outdoor recreational activity. The Dead Branch Division has been a popular area with hunters for many years prior to acquisition by the Service. All of the division is currently open to hunting under an interim pre-acquisition compatibility determination, excluding safety zones around buildings. Retaining hunting opportunities at this division conforms to historic use on this property and much of the surrounding land in the area. Popular game species include white-tailed deer, black bear, ruffed grouse, and cottontail rabbits. Allowing hunters to use public lands helps ensure this wildlife-dependent recreational activity continues and contribute to the state's population management objectives.

Management Strategies:
Continue to:

- Allow hunter access to the refuge outside of the normal division open hours (i.e. 30 minutes before sunrise and 30 minutes after sunset) as long as they are engaged in lawful hunting activities.
- Post newly acquired properties to ensure refuge boundary lines are discernable.
- Allow temporary tree stands and blinds that meet state hunting regulations and do not harm trees or other refuge vegetation. Tree stands and blinds must have the owner's name and phone number clearly displayed, and they must be removed at the end of the hunt season.

Within 1 year of CCP approval:

- Complete all administrative requirements to maintain hunting consistent with State hunting regulations and, if necessary, additional refuge-specific regulations.
- Install an informational kiosk in a conspicuous location to post information on hunting seasons and other notices to visitors.

Within 5 years of CCP approval:

- Work with Massachusetts Department of Fish and Game to determine whether opportunities exist for state-recognized disable hunters.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Work with Massachusetts Department of Fish and Game to evaluate the effectiveness and success of the refuge hunt program in contributing to state population objectives.

Sub-objective 3.1b. (Hunter Education and Outreach)
Provide hunter education classes access to the division and conduct directed outreach to ensure hunters are informed about regulations, hunter ethics, and safety considerations. Develop programs, including brochures, signage, website pages, media releases, etc. to increase interest in hunting at the division.

Rationale:
Hunting is a priority public use that also serves as a population management tool. Providing hunter education instructors the opportunity to use the division with their classes will strengthen connections to the hunting community and student understanding of the role hunting plays in wildlife management. Making relevant information readily available to hunters through a variety of media will improve the quality of the hunting experience.

Management Strategies:
Within 1 year of CCP approval:

- Produce a hunt brochure that includes information on regulations, hunter ethics, safety considerations, etc. and make it available on the refuge Web site, at Dead Branch Division kiosks, through a friends group, and in local businesses.

- Provide visitors with general information on the hunting program and refuge-specific and State regulations through the refuge website, information signs, and a hunting brochure. In all materials related to the hunting program, promote and encourage the use of lead-free ammunition.

- Work with the State to identify and evaluate the impacts associated with requiring the use of non-toxic ammunition for hunting on refuge lands.

Within 5 years of CCP approval:
- Offer to host hunter education field courses.

- Work with Massachusetts Department of Fish and Game to encourage youth hunting at the division as a means of introducing young people to this traditional recreation activity.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:
- Develop a system to monitor and evaluate the hunting program with hunters and other users to determine if the objective is being met and to allow for adaptive management.

Objective 3.2: Fishing

Support quality, public fishing opportunities in the Connecticut River watershed to promote an understanding and appreciation of natural resources and their management on lands and waters, while also protecting a traditional outdoor pastime deeply rooted in the America's natural heritage and conservation history.

Sub-objective 3.2a. (Fishing Opportunities, Access, and Infrastructure)
Provide quality fishing opportunities at the Dead Branch Division after completing all administrative procedures to officially open refuge lands to fishing, based on Massachusetts Department of Fish and Game regulations, and division-specific conditions, if necessary.

Rationale:
Fishing is a priority public use on national wildlife refuges and a popular outdoor recreational activity. The division has been open to fishing, following acquisitions, through pre-acquisition compatibility determinations, but no formal opening package or fishing plan has been completed. The Dead Branch and other tributaries of the Westfield River are popular with anglers.

Management Strategies:
Continue to:
- Post newly acquired properties to ensure refuge boundary lines are clearly marked.

Within 1 year of CCP approval:
- Complete all administrative requirements to maintain fishing consistent with State hunting regulations and, if necessary, additional refuge-specific regulations.

- Install an informational kiosk in a conspicuous location to post information on fishing seasons and other notices to visitors.

- The Dead Branch Division would be open to visitors actively engaged in fishing during the seasons and times established by the state in their annual fishing regulations.

Within 5 years of CCP approval:
- Work with the Massachusetts Department of Fish and Game to inventory and assess fish populations on the division.

- Develop programs, including brochures, signage, website pages, media releases, etc. to inform visitors of fishing opportunities at the division.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:
- Develop a system to monitor and evaluate the fishing program with anglers and other users to determine the objective is being met and to allow for adaptive management.

Sub-objective 3.2b. (Angler Education and Outreach)
Develop programs, including brochures, signage, website pages, media releases, etc. to inform visitors of fishing opportunities at the division.

Rationale:
This division currently includes a reach of the Dead Branch River that supports populations of brook trout. Anglers will benefit from division-specific information on this fishery.

Management Strategies:
Within 5 years of CCP approval:
- Produce a fishing brochure that includes information on regulations, angler ethics, safety considerations, etc. and make it available on the refuge website, at informational kiosks, and in local businesses. In all materials related to the fishing program, promote use of lead-free tackle.

Objective 3.3: Wildlife Observation and Photography

Support quality, public opportunities to observe and photograph wildlife in the Connecticut River watershed in a variety of natural habitats to connect a broad spectrum of people with nature.

Sub-objective 3.3a. (Infrastructure and Access for Wildlife Observation and Photography)
Provide quality opportunities for wildlife observation and photography at the Dead Branch Division.

Rationale:
Wildlife viewing and photography is a priority public use on national wildlife refuges and a popular recreational activity in western Massachusetts. Currently, there is no infrastructure in place at the division to support this use, and consequently, visitation for wildlife viewing and photography is limited and dispersed.

Management Strategies:
Continue to:
- Allow public access at the Dead Branch Division daily from 30 minutes before sunrise to 30 minutes after sunset with the exception listed for hunters and anglers, consistent with the final compatibility determination.

Within 5 years of CCP approval:
- Install an informational kiosk in a conspicuous location to post information on wildlife observation and photography opportunities, and other notices to visitors.

Within 10 years of CCP approval:
- Develop a public access strategy and required planning (i.e. NEPA, compatibility determination) that includes consideration of developed trails, parking, kiosks, viewing platforms, blinds, interpretation, signage, etc.

Within 15 years of CCP approval:
- Implement the visitor use enhancements identified in the public access strategy and the refuge Visitor Services Plan.

Sub-objective 3.3b. (Wildlife Observation and Photography Aids)

Offer viewing and photography aids that enhance the visitor experience. Use a variety of methods to reach a broad spectrum of people. Work closely with the friends group and other partners who host events designed to view wildlife on the division.

Rationale:
The entire division is available for wildlife observation and photography; however, there are steps the refuge can take to enhance their time on the division. Visitation increases are expected as this division expands and becomes better known. By providing new visitors a quality experience they are more likely to return and share their experiences with others. One way to accomplish this is to offer sufficient information to attract a variety of visitors through a variety of media.

Management Strategies:
Within 1 year of CCP approval:

- Allow photography blinds that do not negatively impact wildlife behavior or conflict with other visitors. Blinds must be removed each day, unless arrangements have been made via a special use permit.

Within 5 years of CCP approval:

- Develop interpretive panels describing typical wildlife on the refuge, bird migration patterns, and other messages we want to convey to visitors.
- Produce a list of wildlife species and associated habitats and other conservation information on the division for distribution at informational kiosks, the refuge website, and other popular media.
- Sponsor wildlife observation events such as International Migratory Bird Day, the Big Sit, etc.
- Encourage local schools and groups to offer wildlife-related trips to the division.

Sub-objective 3.3c. (Watershed-based Partner Initiatives)
Not applicable

Objective 3.4: Other Recreational Activities

In order to reach a broader demographic, support non-priority outdoor recreational opportunities and public access to quality, nature-based experiences throughout the Connecticut River watershed that facilitate and improve community relationships, raise awareness and an appreciation for conserving natural resources, and garner support for the National Wildlife Refuge System.

Sub-objective 3.4a. (Regional Water-based Trail Initiatives and Opportunities Including Refuge Lands)
Develop compatible opportunities on the Dead Branch Division that support regional water-based trail initiatives to connect people with nature, raise the visibility of the Service and the Refuge System, make the refuge more relevant to the local community, and to promote economic activity in the local area.

Rationale:
Regional water-based trails give individuals opportunities to engage in outdoor recreational opportunities in the Connecticut River watershed, such as fishing, boating, and wildlife observation. Where appropriate, we will work with these partners to promote, and distribute information about, these opportunities.

Management Strategies:
Within 5 years of acquiring land:

- As lands are acquired, evaluate any water trails (e.g., canoe/kayak trails) that are part of a regional or State network for their compatibility.

Sub-objective 3.4b. (Regional Land-based Trail Initiatives and Opportunities Including Refuge Lands)

Develop compatible opportunities on the Dead Branch Division that support regional land-based trail initiatives to connect people with nature, raise the visibility of the Service and the Refuge System, make the refuge more relevant to the local community, and to promote economic activity in the local area.

Rationale:
Regional land-based trails give individuals opportunities to engage in outdoor recreational opportunities in the Connecticut River watershed, such as hiking, wildlife observation, and interpretation. Where appropriate, we will work with these partners to promote, and distribute information about, these opportunities.

Management Strategies:
Within 5 years of acquiring land:

- As lands are acquired, evaluate any existing trails (e.g., hiking trails, snowmobile trails, horseback riding trails) that part of an established regional or State network to determine if they are appropriate and compatible uses for the refuge.

Sub-objective 3.4c. (Other Appropriate and Compatible Recreational Opportunities That Enhance Visitor Use and Enjoyment of Refuge Lands)
Allow compatible outdoor recreational opportunities on the Dead Branch Division that connect people with nature, raise the visibility of the Service and the Refuge System, make the refuge more relevant to the local community, and promote economic activity in the local area.

Rationale:
In addition to the priority public uses, there are other wildlife-dependent, appropriate and compatible recreational activities that can broaden the visitor base, giving people alternative ways to enjoy the natural resources at the division. Each of these must be found to be both appropriate and compatible to be an authorized use of the refuge.

Management Strategies:
Continue to:

- Allow dispersed hiking, snowshoeing, and cross-country skiing.
- Allow pet walking. In order to minimize conflicts with wildlife and other visitors, pets must be on leashes not longer than 10 feet in length.

Within 1 year of CCP approval:

- Work with users to delineate winter cross-country skiing trails and determine whether a special use permit to manage winter trails is warranted.
- Allow recreational gathering of blueberries, blackberries, strawberries, raspberries, mushrooms, fiddleheads, and antler sheds.
- When compatible, allow commercial guiding in support of priority public uses by special use permit.
- Allow snowmobiling on existing snowmobile trails (e.g., trails depicted on the Snowmobile Association of Massachusetts trail map) that are groomed by an established snowmobile organization and is compatible and consistent with applicable Service laws, policy and guidelines. The responsible snowmobile club will maintain trails under a special use permit. Designated snowmobile trails on refuge land are available in accordance with Massachusetts Department of Conservation and Recreation regulations and, where applicable, MassWildlife snowmobile guidelines.

Within 5 years of CCP approval:

- Work with Friends groups and partners to design and market a virtual geocache course at the division. The course should integrate orienteering with refuge interpretive messages that include linking this division to other refuge divisions and units.

Overview
Fort River Conservation Focus Area (Existing Refuge Division)

Hadley and Amherst, Massachusetts

Conservation Focus Area (CFA)—Acreage Profile	Acres	Percentage of CFA
Total CFA Acres to be Conserved by Service	1,660	77 %
■ *Existing Refuge Ownership in CFA*[1]	*261*	
■ *Additional Acres in CFA proposed for Refuge Acquisition*[2]	1,399	
Existing Acres in CFA Permanently Conserved by Others[2,3]	614	23%
Total Acres in CFA[2, 4]	2,274	100 %

[1] Acres from Service's Realty program (surveyed acres).

[2] Acres calculated using GIS.

[3] The Service does not plan to acquire existing conserved lands, except under extenuating circumstances (conserved acres from TNC 2014 data).

[4] The Service would conserve up to this number of acres. The Service only acquires lands from willing sellers

What specific criteria and/or considerations drove the selection of this CFA?

The Fort River area was an SFA in the 1995 Conte FEIS and the refuge's Fort River Division was established in 2005. It lies within the Fort River CPA. The proposed Fort River CFA presents two major opportunities. The first is to restore grassland and early successional habitat (shrubland habitat) to benefit declining species, such as bobolinks and other grassland-nesting species. The second opportunity is to protect floodplain forest along the Fort River and create a connection between these forests and adjacent conserved upland habitat within the Holyoke Range. The Fort River CFA overlaps two terrestrial Tier 1 Core and the Connector lands linking them, as identified in the *Connect the Connecticut* landscape conservation design

What are the priority habitat types within the proposed CFA? What percentage of the total CFA acreage do they represent?

- Pasture/Hay/Grassland – 60.4%
- Hardwood Swamp – 3.4%
- Shrub Swamp and Floodplain Forest – 2.3%

See map A.26 and table A.20 for more detailed habitat information for the CFA.

What are the resources of conservation concern for the proposed CFA?

As noted in table A.21 below, there are four priority refuge resources of concern (PRRC) species that may rely on habitats in this CFA. There are also habitat types that are not being managed for a particular PRRC species, but are important for their contribution to Biological Integrity Diversity and Environmental Health (BIDEH)

of the landscape. This includes potential for a large tract of contiguous grasslands to benefit declining grassland dependent species, and floodplain, a habitat that has undergone significant alteration within the Connecticut River watershed. The refuge will seek to protect and restore (if necessary) these, and other PRRC habitat types. Additionally, we recognize the value of this area to State species of greatest conservation need (SGCN) and migratory landbirds. These species and habitats are discussed further below.

1. **Federal Threatened and Endangered Species**
   This CFA is within the range of the federally listed northern long-eared bat and tricolored bat, a species petitioned for listing under the ESA. During summer nights, these bats forage on insects within wetlands and forested habitats. Northern long-eared bats roost under the bark or within cavities of large ($\geq$3 dbh) diameter trees during the day (USFWS 2014). Tricolored bats will also roost in trees, though they tend to roost in the foliage of live or dead trees within a mature stand (MADFW 2015). These roosting habitats also provide maternity sites where females will raise their young. In the winter, these bats will hibernate in underground caves or cave like structures, often within close proximity to their summer roosting and feeding areas. Areas within the CFA may contain important maternity and summer roosting sites, as well as foraging areas for this species and other bat species.

   Dwarf wedgemussel and small whorled pogonia occur within the vicinity of the CFA boundary. The dwarf wedgemussel occurs in a portion of the Fort River between Plum and Hop Brooks, about a mile from the CFA boundary, and small whorled pogonia occurs about a mile from the boundary within adjacent forested lands. These listed species have not been documented in the CFA, and will be added as PRRC species if it is documented in the CFA in the future.

2. **Migratory Birds**
   The Connecticut River watershed is a major migration corridor. The lower portion of the watershed (CT and MA) receives higher use by migrants, with this use concentrated in habitats along the Connecticut River main stem (Smith College 2006). The Fort River CFA is situated on the Connecticut River, and can provide significant stopover habitat for migrants in the spring and fall.

   This CFA also may provide important wintering habitat for rusty blackbirds, a species that has been experiencing drastic population declines since the mid-1900's (IRBWG 2016). This species is a refuge resource of concern. It breeds in the northern reaches of the Connecticut River watershed, winters in the southern reaches of the watershed, and migrates through the Connecticut River corridor. Wintering and migrating habitat for this species includes floodplain forests and scrub-shrub wetlands (C. Foss, Audubon New Hampshire, personal communication 2016).

3. **Diadromous fish and other aquatic species**
   The PRRC species for the Fort River CFA includes American eel, a species of conservation concern for the Service and an SGCN species. This species occurs in the lower reaches of the Fort River, which meanders through the CFA. The Fort River is the longest free-flowing tributary to the Connecticut River in Massachusetts, and ranks near the top among all New England rivers for overall freshwater mussel diversity. The federally endangered dwarf wedgemussel occurs in a portion of the river but has not been documented in the CFA.

4. **Wetlands**
   Seventy-eight acres of hardwood swamp, 53 acres of shrub swamp and floodplain forest, and 19 acres of freshwater marshes add to the diversity in the landscape. The majority of these wetland acres are within the floodplain of the Fort River. According to The Nature Conservancy, the floodplain forests along the Fort River main stem contain high species richness, and have undergone significant alternation (Marks et al 2011). The floodplain habitat within the CFA has great potential for restoration . Intact floodplain forests in the Fort River CFA will provide high-quality habitat for neo-tropical migratory birds, restore forest connectivity and travel corridors for wildlife, and increase water quality and shade for aquatic species.

5. **Other**
   Over 60 percent of the Fort River CFA is in pasture, hay, grassland, and habitat consisting mostly of large fields between 200 and 400 acres. Management of these fields as grassland habitat would benefit declining grassland bird species. Grasslands are a high priority habitat for the State of Massachusetts. These habitats provide breeding and nesting habitat for several State threatened and endangered species, including northern harrier, upland sandpiper, barn owl, and grasshopper sparrow. Upland sandpipers historically nested in the Fort River CFA, and can be seen on occasion during migration. Many grassland birds are area sensitive, and require large grassland acres (greater than 25 acres) including grasshopper sparrows, bobolinks, eastern meadowlarks, and upland sandpiper (Vickery et al. 1994). A contiguous block of grassland habitat in the Fort River Division will benefit these species, as well as declining pollinators such as the yellow-banded bumble bee and monarch butterfly, both of which are petitioned for listing under the ESA.

What habitat management activities would likely be a priority on refuge lands within the proposed CFA?

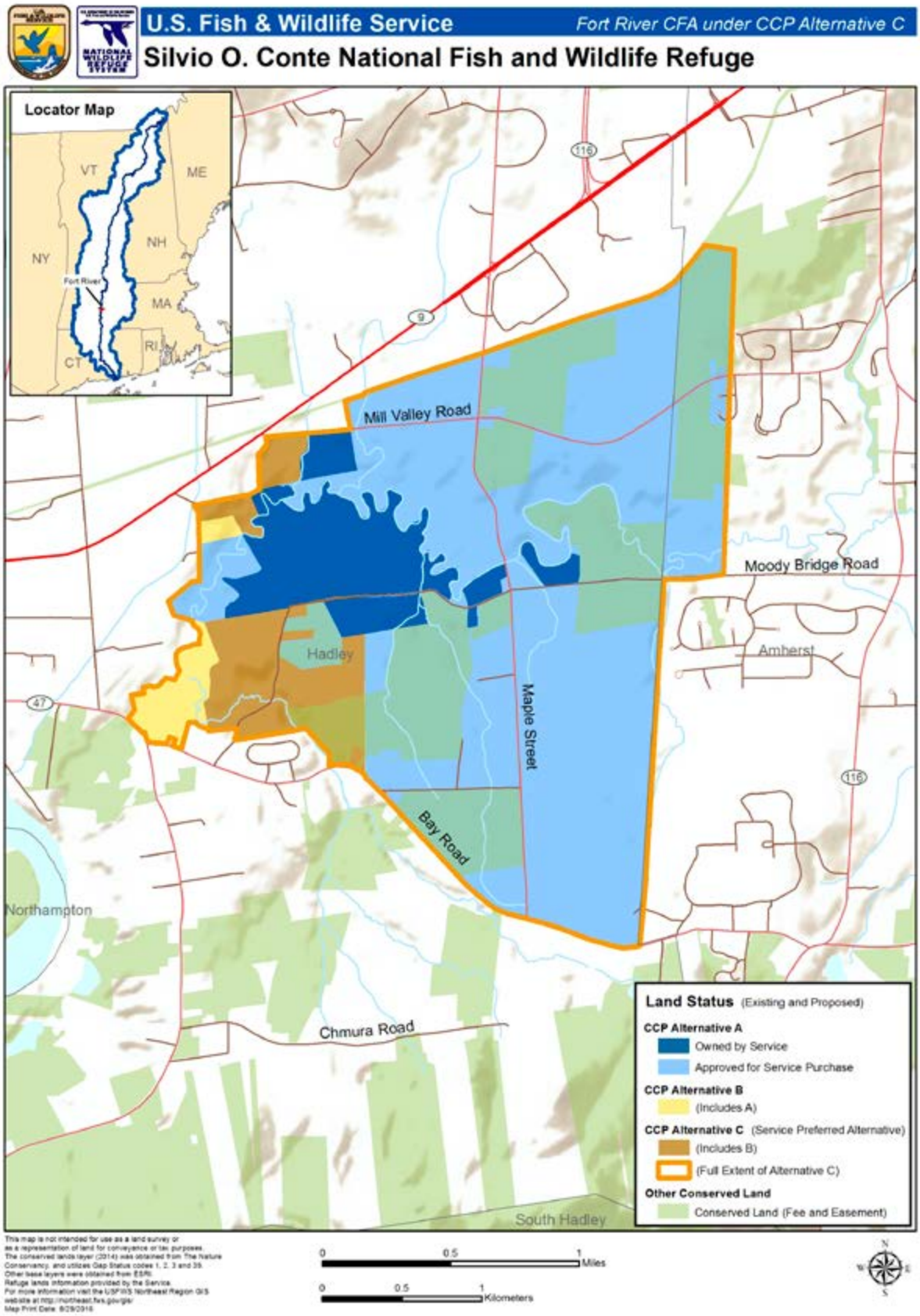
We will conduct a comprehensive, multi-scale wildlife habitat inventory following acquisition. Baseline information on the condition of habitats (i.e., forested, non-forested, and open water habitats) will further inform more detailed habitat prescriptions within a required step-down Habitat Management Plan. Once inventory has been completed, then management will focus on maintaining the following conditions:

- Forest management activities will focus on restoration of degraded floodplains, including where appropriate, restoring the primary natural disturbance mechanism (seasonal flooding) and species composition and structure to accepted historical conditions. Management of upland forests will improve structural diversity and species composition will be appropriate for site conditions and location.
- Where appropriate, and feasible, we will maintain large, contiguous acres of warm season grasses.
- Our management activities in emergent and shrub wetland habitats will focus on maintaining the natural hydrology and native species composition. Invasive plant management will be a priority.
- In open water (stream, rivers) habitats, we will focus on maintaining stream connectivity, establishing riparian buffers, and reducing run-off from the surrounding landscape.

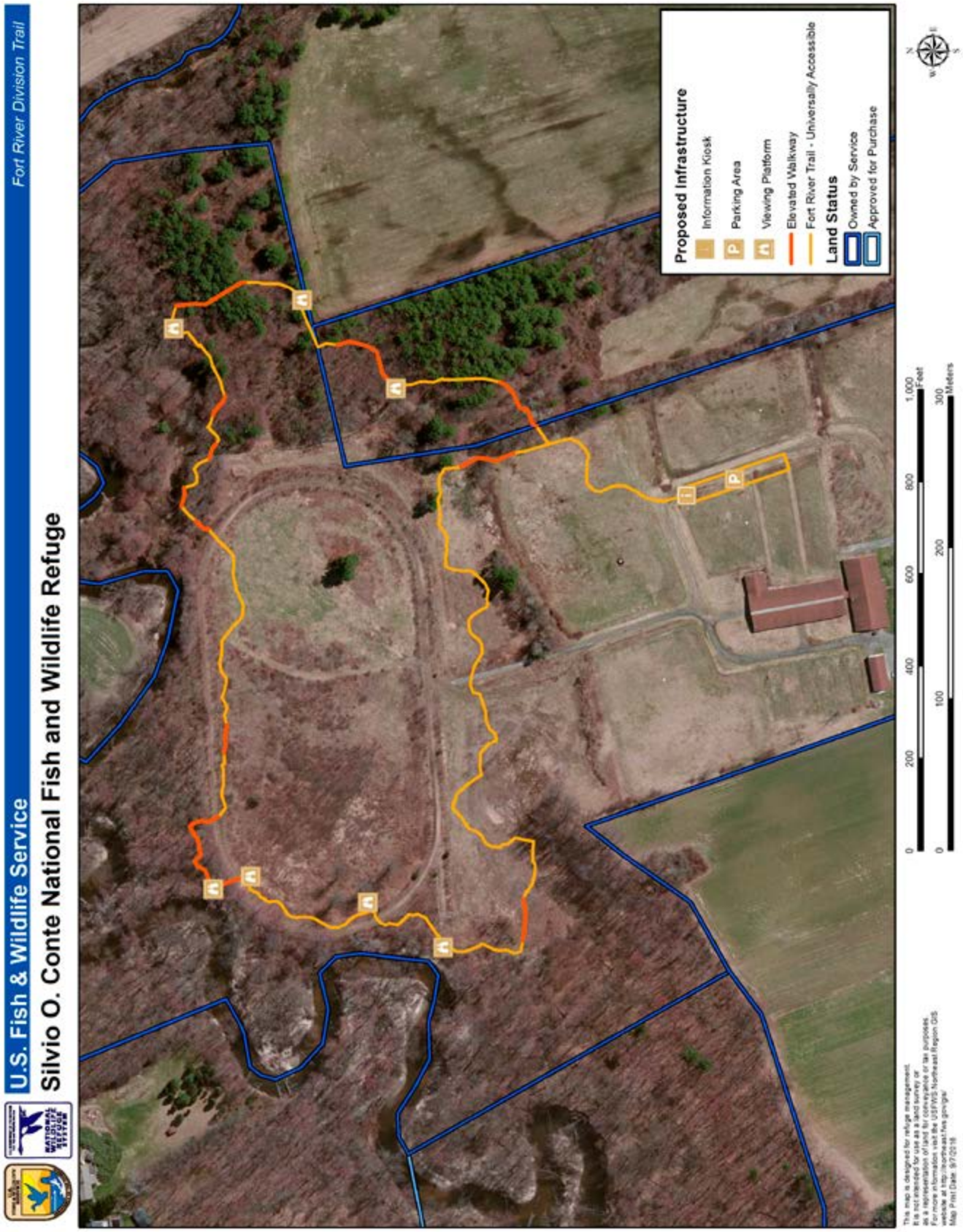
What public use opportunities would likely be a priority on refuge lands within the proposed CFA?

Our priority would be to continue offering the six, priority public uses: wildlife observation and photography, environmental education, interpretation, fishing, and hunting. Hunting and fishing are allowed through pre-acquisition compatibility determinations. We will complete all administrative procedures to officially open the refuge to these activities. We recently completed a 1.1 mile ADA-accessible trail on the division (map A.25). It is very popular and is used regularly as a site to host conservation events and programs.

Map A.24. Fort River CFA – Location.



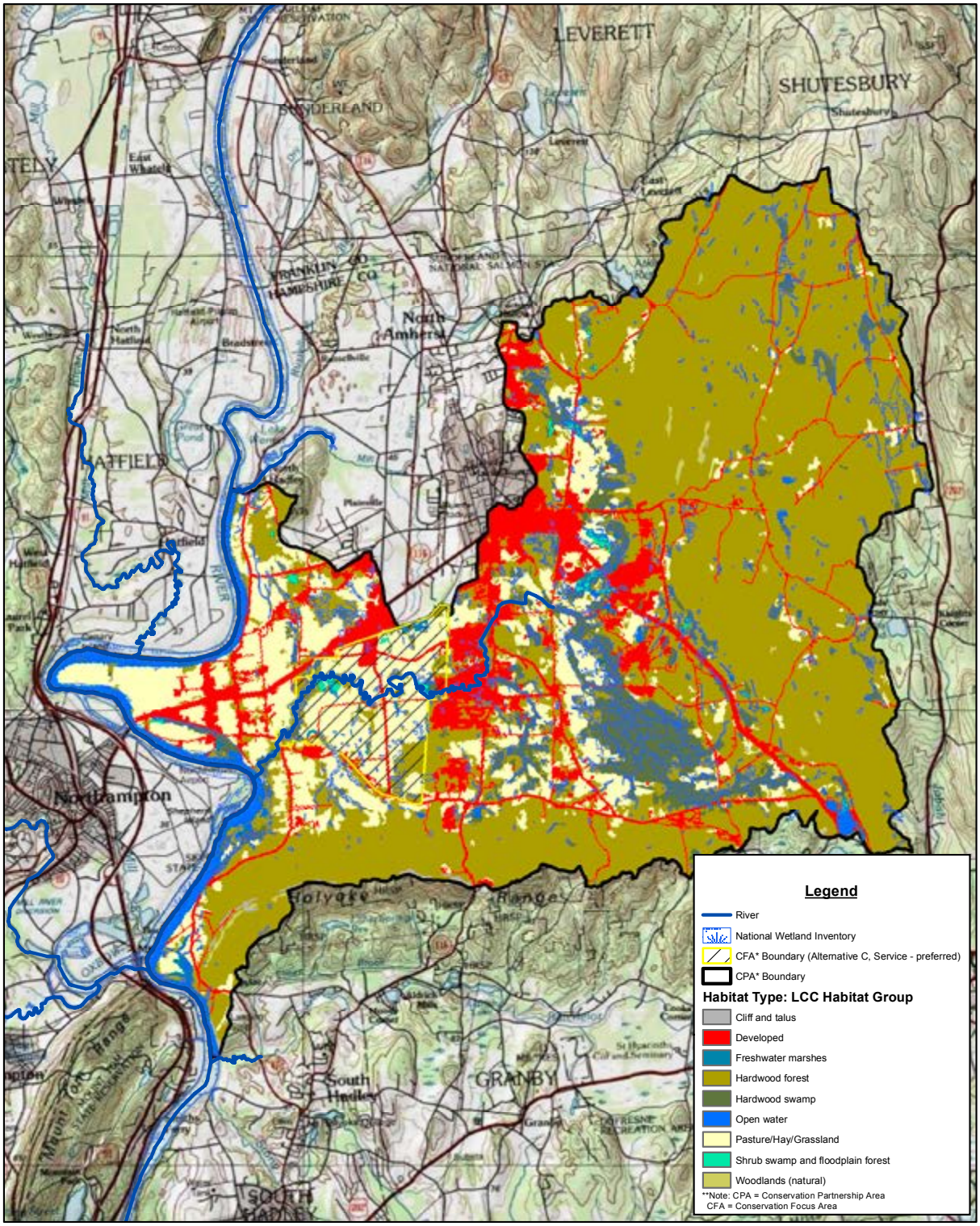
Map A.25. Fort River CFA – Fort River Trail.



Map A.26. Fort River CFA/CPA – Habitat Types.

U.S. Fish & Wildlife Service *Fort River CPA*

Silvio O. Conte National Fish and Wildlife Refuge



This map is designed to convey a generalization of habitat types across a large landscape. It is not intended for site-specific analysis or management, nor for use as a land survey or for tax purposes. For more information contact the Silvio O. Conte National Fish & Wildlife Refuge Office at: 413-548-8002
Date: 9/16/2016

0 1 2 3 4 Miles

0 1.5 3 4.5 6 Kilometers

N W E S

Table A.20. Fort River CFA/CPA – Habitat Types.

LCC General Habitat Type[1]	CPA[2]		CFA[3]				
	Total Acres	Percent of CPA[4]	Total Acres	Conserved by Others[5]	USFWS Owned[6]	Percent CFA[7]	Percent Habitat[8]
Forested Uplands and Wetlands[9]							
Hardwood forest	25,145	59.7%	510	81	58	22.5%	2.0%
Hardwood swamp	3,092	7.3%	79	30	13	3.5%	2.5%
Shrub swamp and floodplain forest	184	0.4%	53	16	30	2.3%	28.9%
Woodlands (natural)	108	0.3%	-	-	-	0.0%	0.0%
Forested uplands and wetlands subtotal	*28,528*	*67.7%*	*642*	*127*	*101*	*28.3%*	*2.3%*
Non-forested Uplands and Wetlands[9]							
Cliff and talus	75	0.2%	-	-	-	0.0%	0.0%
Freshwater marshes	85	0.2%	19	0	0	0.8%	22.3%
Pasture/hay/grassland	6,972	16.5%	1,374	446	149	60.5%	19.7%
Non-forested uplands and wetlands subtotal	*7,132*	*16.9%*	*1,393*	*447*	*149*	*61.3%*	*19.5%*
Inland aquatic habitats[9]							
Open Water	1,061	2.5%	-	-	-	0.0%	0.0%
Inland aquatic habitats subtotal	*1,061*	*2.5%*	-	-	-	*0.0%*	*0.0%*

LCC General Habitat Type[1]	CPA[2]		CFA[3]				
	Total Acres	Percent of CPA[4]	Total Acres	Conserved by Others[5]	USFWS Owned[6]	Percent CFA[7]	Percent Habitat[8]
Other							
Developed	5,412	12.8%	236	42	8	10.4%	4.4%
Other subtotal	*5,412*	*12.8%*	*236*	*42*	*8*	*10.4%*	*4.4%*
TOTAL[10]	**42,133**	**100.0%**	**2,271**	**615**	**258**	**100.0%**	**5.4%**

Notes:

1 - North Atlantic Landscape Conservation Collaborative general habitat typings for USFWS representative species; linked to the National Vegetation Classification System (NVCS). See table A.52 at the end of this appendix for a comparison of these generalized habitat types with the more specific The Nature Conservancy's Northeastern Terrestrial Habitat Classification System. More detailed habitat tables that include the Northeastern Terrestrial Habitat Classification System habitat types are available for each CFA and refuge unit online at: *http://www.fws.gov/refuge/Silvio_O_Conte/what_we_do/conservation.html.*

2 - Conservation Partnership Area

3 - Conservation Focus Area; representing Service-preferred Alternative C

4 - Percentage of the CPA represented by the habitat type

5- Acres in the CFA currently conserved by others (TNC 2014)

6 - Acres in the CFA currently owned by the Service

7 - Percentage of the CFA represented by the habitat type

8 - Percentage of a given habitat within the CPA protected within the CFA under Service-preferred Alternative C

9 - CCP Objective from Conte Refuge final CCP/EIS, Chapter 4, Service-preferred Alternative C

10 – Acreages in this table may differ slightly from the acreages presented in the Overview summary. This table's values were calculated using raster data (an array of pixels, as in a digital photo), while the values in the Overview, and used throughout the final CCP/EIS were calculated using vector data (created from shapes). For the purposes of CFA analysis, the acreages presented in the Overview are more accurate because they better reflect boundaries like parcel lines.

Table A.21. Fort River CFA – Preliminary Priority Refuge Resources of Concern

Priority Refuge Resources of Concern[1]	Habitat Structure[2]	Associated Species[3]
Forested Uplands and Wetlands[4]		
Hardwood Forest[5] - 509 acres		
Northern Long-eared Bat[D] Tricolored Bat[E]	Winter habitat includes high humidity underground caves or cave like structures; summer habitat includes roost trees that are typically $\geq$ 3 inches dbh, are alive, dead or dying, exhibits exfoliating bark, cavities, crevices, or cracks and located within a variety of forest types interspersed with non-forested habitats (USFWS 2014, MADFW 2015).	Migratory Species Little Brown Bat[I]
Hardwood Swamp[5] - 78 acres		
Rusty Blackbird[A, C]	Migrating and wintering habitat includes floodplain forests, hardwood swamps, and shrub wetlands (C. Foss, Audubon New Hampshire, personal communication 2016).	Migratory species
Forested Uplands and Wetlands[4]		
Shrub Swamp and Floodplain Forest[5] - 53 acres		
Rusty Blackbird[A, C]	Migrating and wintering habitat includes floodplain forests, hardwood swamps, and shrub wetlands (C. Foss, Audubon New Hampshire, personal communication 2016).	Migratory species
Non-Forested Uplands and Wetlands[4]		
Freshwater Marshes[5] - 19 acres		
Laurentian-Acadian freshwater marsh[H]	These freshwater emergent and/or submergent marshes are dominated by herbaceous vegetation. They occur in closed or open basins that are generally flat and shallow. They are associated with lakes, ponds, slow-moving streams, and/or impoundments or ditches. The herbaceous vegetation does not persist through the winter. Scattered shrubs are often present and usually total less than 25% cover. Trees are generally absent and, if present, are scattered. The substrate is typically muck over mineral soil. Vegetation includes common bulrush, narrow-leaf cattail, marsh fern, common jewelweed and sedges (Gawler 2008).	Migratory species

Priority Refuge Resources of Concern[1]	Habitat Structure[2]	Associated Species[3]
Non-Forested Uplands and Wetlands[4]		
Pasture/Hay/Grassland[5] – 1,373 acres		
Where appropriate, maintain as contiguous block of grassland habitat	Grasslands include fields managed for warm season grasses, such as switch grass, Indian grass, and blue stem, hayfields/pastures that are intensively managed for cool season grasses and active pastures.	American Woodcock[A, I, J] **Bobolink[A,I]** **Upland Sandpiper[A, I]** Northern Harrier[I, J] **Grasshopper Sparrow[I]** **Eastern Meadowlark[I]** Wood Turtle[I, E,J] Field Sparrow[A,I] American Kestrel[I] Eastern Kingbird[A] Yellow Banded Bumble Bee[E] Monarch Butterfly[E] Regal Fritillary[E]
Inland Aquatic Habitats[4]		
Open Water[5] – *GIS data did not capture acreage due to dense forest cover along small stream and river corridors*		
American Eel[F]	Migrating and feeding habitat includes lakes, streams and large rivers (USFWS 1996)	Sea Lamprey[I] Longnose Dace[I] Fallfish[I] Harpoon Clubtail[I] Rapids Clubtail[I] Wood Turtle[I]

Notes:

1 - These species of conservation concern and associated habitats, as well as under-represented and sensitive ecological systems constitute the management focus for the CFA, and recommended for the CPA. They were identified based on specific criteria, and are included in the following plans, databases and/or have Federal status.

A: 2008 Bird Conservation Region 30.
B: 2009 North Atlantic Landscape Conservation Cooperative Development and Operations Plan.
C: 2008 USFWS Birds of Conservation Concern.
D: Federal Threatened and Endangered status as of 2016, including Candidate Species
E: Federal Elevated Concern species or species petitioned for threatened and endangered listing as of 2016
F: 2009-2013 USFWS Northeast Region Fisheries Program Strategic Plan
G: Silvio O Conte Refuge Purpose Species.
H: 2008 Northeastern Terrestrial Habitat Classification System.

2 - This habitat structure will benefit the listed priority refuge resources of concern, and is based on the most recent literature.

3 - These species are a compilation from the following plans, and are associated with the habitat type and/or will benefit from all or a portion of the habitat structure associated with the priority species. This is not a comprehensive list of species.

A:2008 Bird Conservation Region 30.
I: 2015 Massachusetts Comprehensive Wildlife Conservation Strategy
J: 2012 Terrestrial and Wetland Representative Species of the North Atlantic: Species Selected, Considered, and Associated Habitats (Ecological Systems). These species were LCC candidate species and are represented by the selected LCC Representative Species.

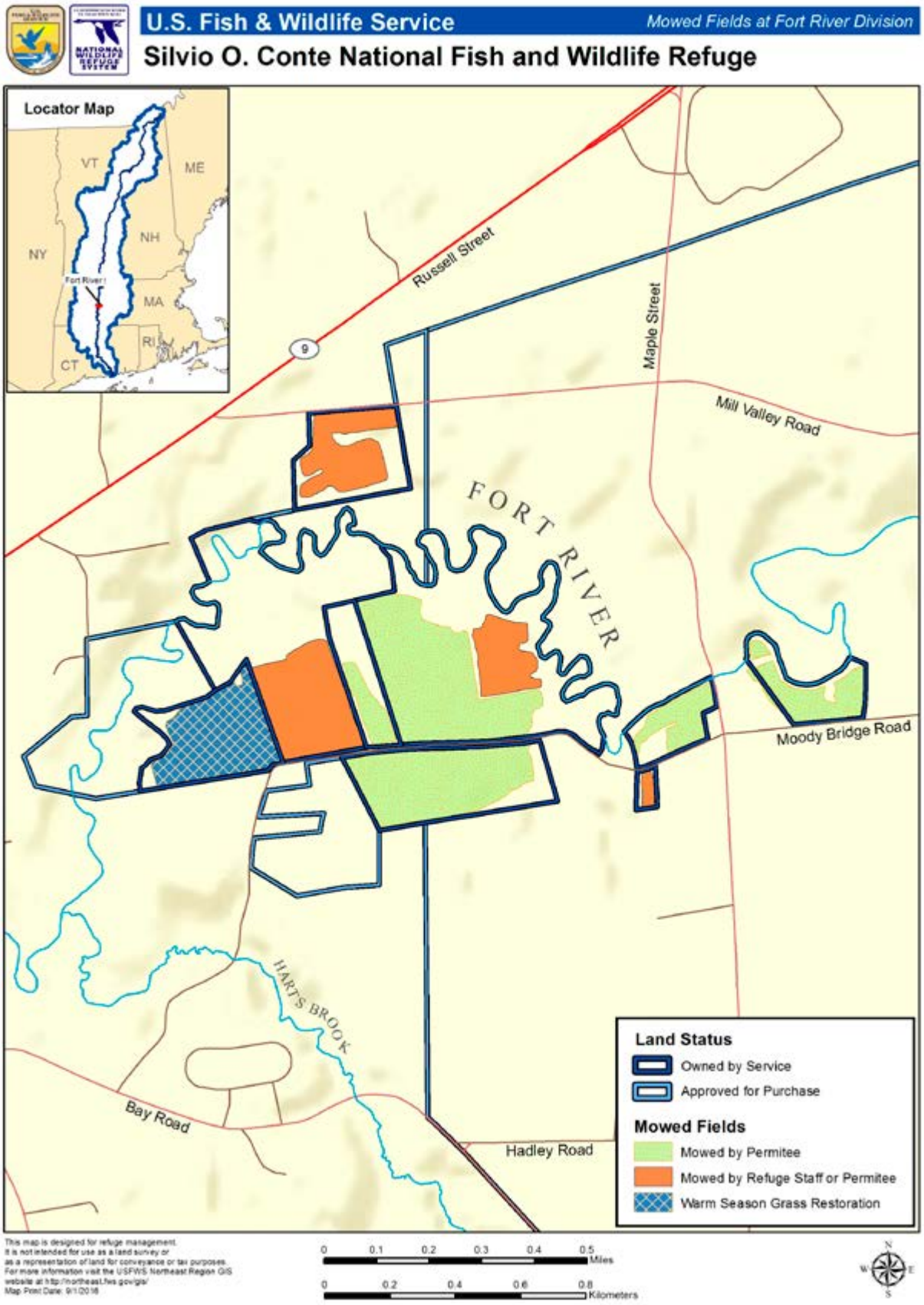
4 - CCP Objectives from Silvio O. Conte NFWR Comprehensive Conservation Plan, Chapter 4, Service - preferred Alternative.

5 - These habitat types are based on the North Atlantic Landscape Conservation Cooperative (NALCC) habitat groupings for associated Representative Species, which were derived from The Northeastern Terrestrial Habitat Classification System (NETHCS). See table A.52 for a comparison of the NALCC habitat groupings and NETHCS.

BOLD - These species are LCC Representative Species, which is a species that, because of its habitat use, ecosystem function, or management response, typifies lifecycle or habitat requirements for a larger group of species.

* The Refuge Improvement Act directs the US Fish and Wildlife Service to maintain Biological Integrity, Diversity, and Environmental Health (BIDEH). Elements of BIDEH are represented by native fish, wildlife, plants and their habitats as well as those ecological processes that support them.

Map A.27. Fort River CFA – Fields Mowed and Hayed.



Goals, Objectives, and Strategies for Refuge Lands in the Fort River CFA under Alternative C

Goal 1: Wildlife and Habitat Conservation: Promote the biological diversity, integrity, and resiliency of terrestrial and aquatic ecosystems within the Connecticut River watershed in an amount and distribution that sustains ecological function and supports healthy populations of native fish, wildlife, and plants, especially Federal trust species of conservation concern, in anticipation of the effects of climate, land use, and demographic changes.

Objective 1.1: Forested Uplands and Wetlands

Sub-objective 1.1a. (Hardwood Forest)
Improve the diversity of seral stages and (where and when possible) restore historic composition and structure, and improve landscape connectivity of hardwood forest habitat to support species of conservation concern and aid in climate change adaptation. Management will provide stopover habitat for spring and fall migrants, and potential roosting and foraging areas for the northern long-eared bat and tricolored bat.

Rationale:
We envision healthy forests within the Fort River CFA where a diverse seral structure provides suitable habitat conditions for a suite of Massachusetts wildlife. Our long-term vision for the CFA includes hardwood forests characterized by complex horizontal and vertical structure, a generally closed canopy, large-diameter trees, dead woody material, snags and cavity trees, native species diversity, softwood inclusions, and a diversity of wildlife (Foster et al. 1996, Goodburn and Lorimer 1998, Keeton 2006, D'Amato et al. 2009, Curzon and Keeton 2010, Fraver et al. 2011).

Fort River CFA hardwood forests provide a diversity of habitats for wildlife. To date our review of the Fort River CFA habitats and wildlife species—and their condition—has been limited to coarse-scale information: the careful analysis of spatially-explicit habitat data using GIS, the consultation of local, state, and regional species conservation plans, and an understanding of forest disturbance and land-use history in New England. This allowed identification of broad habitat types, and species of conservation concern known to use characteristics common to these habitats. Our understanding of the forest structure within Fort River comes exclusively from a reading of forest history in New England—a legacy of intensive past-use that altered the vegetation structure and composition, landscape patterns, and ongoing ecological dynamics (Cronon 1983, Foster et al. 1997, Bellemare et al. 2002, Hall et al. 2002). Our sub-objective assumes the forests of the Fort River are more homogeneous than those of three centuries earlier, and include more sprouting and shade-intolerant species and fewer long-lived mature forest tree species (Goodburn and Lorimer 1998, Foster et al. 1998, Foster 2000, Bellemare et al. 2002, Cogbill et al. 2002, Abrams 2003). Completing a comprehensive forest and habitat inventory post-acquisition will test these assumptions, and aid in identifying stands where a forest management approach that combines passive management and the application of silvicultural treatments designed to emulate gap dynamics, will promote compositional and structural diversity, and where appropriate, move succession forward to emulate later seral stage characteristics.

Migrating landbirds are typically unable to deposit sufficient fat stores to fly nonstop between breeding and nonbreeding areas (Blem 1980) and must use stopover habitats for feeding and resting before continuing migration. Studies have shown migrating birds exhibit selective use of some habitats over others (Moore et al. 1990, Petit 2000, Rodewald et al. 2004). In general, taller, more structurally diverse vegetation types within an area appear to support greater numbers of migrating birds than do habitats of lower stature and complexity (Moore et al. 1990, Noss 1991). Clearly, structurally complex habitats will not be suitable for all migratory species, but our conservation goal is to provide those habitat characteristics used most frequently by migrating birds, suggesting relatively tall, structurally diverse habitats may best serve this purpose. The plasticity in habitat use exhibited by most species during migration (Moore et al. 1990, Petit 2000) suggests that many species are able to effectively use the food resources and cover afforded by structurally complex habitats. While our management goals may create a relatively old forest, hardwood forests within Fort River will contain a variety of patches

in different age classes and developmental stages; it is not uniform throughout. This diversity of age classes provides a variety of bird species with a range of foraging opportunities. Patches of mature edge-dominated (i.e., forest-agricultural edge and suburban forest of the type within Fort River) and shrub-sapling stage forests were used most frequently by fall stopover migrants in a Pennsylvania study (Rodewald et al. 2004).

Efforts to maintain or improve seral stage diversity within the CFA will include the retention of large-diameter (24 inches of greater dbh) trees where appropriate. Such larger trees are either absent or are very few in younger forests, and that has implications for the habitat of wildlife species and for nutrient cycling. Live, dead or dying trees that are >3 inches in dbh with crevices, cavities, cracks or exfoliating bark are used as summer roosting sites for the federally listed northern long-eared bat. These roosting habitats also provide maternity sites where females will raise their young (USFWS 2014). Tricolored bats will also roost in trees, though they tend to roost in the foliage of live or dead trees within a mature stand (MADFW 2015). Snags and cavity trees also provide nesting and foraging sites for bird species such as nuthatches, owls, and woodpeckers, like the northern flicker.

In a mature forest, many migrating bird species tend to remain within specific vegetation layers: on or near the ground, in the middle layer, or up in the canopy. Fort River's hardwood forests should have all forest layers present in moderate to high amounts distributed throughout a stand and across the landscape. Enhanced vertical structure will provide the greatest number of bird species with the greatest number of foraging opportunities. Our active forest management efforts will aim to create or maintain a canopy that is generally closed (>75-80% closure) with small gap openings scattered throughout a stand and the CFA. These openings will be caused by or mimic small, single- to few-tree disturbances and create opportunities for regenerating intermediate- and shade-tolerant species. Regeneration in these openings will provide a continual supply of ephemeral shrub-sapling habitat rich in fruits and insects important to migrating birds (Noss 1991, DeGraaf et al. 2006). Efforts to regenerate a diversity of species must contend with evidence of reduced diversity or damage to tree seedlings and herbaceous plants attributed to white-tailed deer (Hough 1965, Anderson and Loucks 1979, Tilghman 1989, Rooney and Waller 2003, Côté et al. 2004, see also Rawinski 2008).

Implementation of refuge strategies will begin with a comprehensive, multi-scale forest and wildlife habitat inventory. Forest wildlife species survival and breeding success is dependent not only on the habitat at the stand level, but also the surrounding landscape, making it necessary to consider the proportions and sizes of stand types and successional stages within the CFA and the associated landscape. Baseline information on the condition of hardwood forests at the time of acquisition will further inform more detailed, stand-level habitat prescriptions within a required step-down Habitat Management Plan.

Management Strategies:

Within 5 years of CCP approval:

- Identify forest stands with late successional characteristics for passive management, and those where active management is necessary to improve forest structure, species composition, and/or ecological function.
- Work with partners, including the State of Massachusetts, in support of the State Wildlife Action Plan, to ensure management on Service lands complements adjacent land management objectives.

Within 10 years of land acquisition and CCP approval:

- Implement identified active forest management opportunities using accepted silvicultural practices.
- Protect hard and soft mast producing species such as American beech inclusions, oak and hickory species, and apple and cherry trees, through the use of best management practices.
- Ensure a diversity of native species is present and non-native species are excluded or managed to keep population levels as low as possible. Management priorities include oriental bittersweet, glossy buckthorn, garlic mustard, and multi-flora rose.
- Explore research opportunities with academic partners to address efficacy of forest management in meeting wildlife objectives.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Conduct forest and wildlife inventories.
- Conduct bat acoustic surveys to obtain baseline bat inventory data. Conduct additional surveys, if appropriate, to identify active bat roosting sites and hibernacula.
- Map natural communities; protect rare or exemplary examples.
- Map vernal pools and seeps.

Sub-objective 1.1b. (Hardwood swamp)
Improve the diversity of seral stages, (where and when possible) restore historic composition and structure, and improve the natural hydrology to support natural and rare ecological communities. Management will provide stopover habitat for spring and fall migrant birds, as well as wintering habitat for rusty blackbirds.

Rationale:
Occurrences of hardwood swamps within the Fort River Conservation Focus Area (CFA) have undergone significant alteration and have great potential for restoration. This habitat type is often found in small patches where soils have an impermeable or nearly impermeable clay layer that can create a shallow, perched water table. Saturation can vary, with ponding of water common during wetter seasons and drought during the summer or autumn months. The dynamic nature of the watertable drives complexes of forest upland and wetland species including pin oak, red maple, sweetgum, and black gum. The examples identified within the Fort River CFA are limited and largely occur within the floodplain of the Fort River. Agricultural practices, development pressures, and selective logging have largely removed this habitat from the landscape, or greatly simplified its historic species composition. Changes in hydrology, water pollution, invasive species introductions, and soil compaction remain as threats.

Successional trends in hardwood swamps are not well understood. One possibility in the north-central Appalachian acidic swamps is that these areas once had a higher proportion of softwoods such as hemlock. Heavy cutting and clearing for agriculture often eliminated softwood species. Our conservation efforts within the Fort River will focus on promoting the ecological integrity of these stands through restoration of degraded floodplains, and (where and when possible) restoring composition and structure to accepted historical conditions. Where appropriate, restoration of the primary natural disturbance mechanism (seasonal flooding) will aide in the restoration of historical species mixtures.

Restoration of forest habitats, natural levees, backwater sloughs, and oxbow lakes will create high-quality habitat for spring and fall migrant birds in an otherwise agricultural landscape where small, disturbed forest fragments are the rule. Closed canopy deciduous forests that include pin oak and other hardwoods provide mast and other foraging sites shown to be important during the energy-intensive migration (Petit 2000). This CFA also may provide important wintering habitat for rusty blackbirds, a species that has been experiencing drastic population declines since the mid-1900's (IRBWG 2016). This species is a refuge resource of concern. It breeds in the northern reaches of the Connecticut River watershed, winters in the southern reaches of the watershed, and migrates through the Connecticut River corridor. Wintering and migrating habitat for this species includes floodplain forests and scrub-shrub wetlands (C. Foss, Audubon New Hampshire, personal communication 2016).

Implementation of refuge strategies will begin with a comprehensive, multi-scale forest and wildlife habitat inventory. Forest wildlife species survival and breeding success is dependent not only on the habitat at the stand level, but also the surrounding landscape, making it necessary to consider the proportions and sizes of stand types and successional stages within the CFA and the associated landscape. Baseline information on the condition of hardwood swamps at the time of acquisition will further inform more detailed, stand-level habitat prescriptions within a required step-down Habitat Management Plan (HMP).

Management Strategies:
Within 5 years of CCP approval:

- Work with partners, including the State of Massachusetts in support of the State Wildlife Action Plan, to ensure management on Service lands complement adjacent land management.
- Evaluate hydrologic regime to inform restoration efforts.

- Identify forest stands where management is necessary to improve species composition.

Within 10 years of CCP approval:

- Implement identified forest management opportunities to improve species composition.
- Explore research opportunities with academic partners to address efficacy of forest management in meeting wildlife objectives.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Conduct forest and wildlife inventories including surveys for rusty blackbirds during the migration and wintering periods.
- Map natural communities; protect rare or exemplary examples.
- Map vernal pools and seeps.

Sub-objective 1.1c. (Shrub Swamps and Floodplain Forest)
Restore native species composition and structure, and improve the natural hydrology, as needed, to support natural and rare shrub swamp and floodplain forest ecological communities. Management will provide stopover habitat for spring and fall migrant birds, as well as wintering habitat for rusty blackbirds and breeding habitat for wood turtle.

Rationale:
The shrub swamps in the Fort River CFA are restricted to poorly drained areas and small seepage zones along the Fort River and within the hardwood swamp communities in the CFA. These shrub swamp systems usually have a patchwork of shrub and grass dominance, and may include willow, silky dogwood, speckled alder, white meadowsweet, bluejoint, tall sedge, and common rush (Gawler 2008). Based on our coarse-scale habitat analysis, the shrub swamps are also adjacent to agricultural land, and impacts to the wetland hydrology may be factor. Water pollution and invasive species introductions are also threats for shrub swamp communities.

Restoration of shrub swamp communities, as well as the surrounding forested habitat, will create high-quality habitat for neotropical migratory birds in an otherwise agricultural landscape where small, disturbed forest fragments are the rule. The Connecticut River watershed is a major migration corridor. The lower portion of the watershed (CT and MA) receives higher use by migrants, with use concentrated in habitats along the Connecticut River main stem (Smith College 2006). The Fort River CFA is situated on the Connecticut River, and can provide significant stopover habitat for migrants in the spring and fall. Neo-tropical migrants typically use similar habitats during migration as they do during the breeding season (Petit 2000). Species such as gray catbird, yellow-rumped warbler, white-eyed vireo, eastern phoebe, eastern kingbird and common yellowthroat will use shrubland communities (McCann et al. 1993). Native shrubs will provide migrants with soft mast and abundant insects to replenish fat reserves, and structure to provide rest and adequate cover from predators and inclement weather.

This CFA also may provide important wintering habitat for rusty blackbirds, a species that has been experiencing drastic population declines since the mid-1900's (IRBWG 2016). This species is a refuge resource of concern. It breeds in the northern reaches of the Connecticut River watershed, winters in the southern reaches of the watershed, and migrates through the Connecticut River corridor. Wintering and migrating habitat for this species includes floodplain forests and scrub-shrub wetlands (C. Foss, Audubon New Hampshire, personal communication 2016).

Wood turtle was petitioned for federal protection in 2012. This species uses aquatic and adjacent terrestrial habitats throughout the year. This species has been documented in the river and floodplain habitats of the Fort River CFA. Wood turtles are thought to be experiencing population declines exceeding 50% over the past 100 years. Populations live primarily in and around river habitats which are often heavily impacted by human development. Habitat degradation, fragmentation and destruction are the main causes for population declines (van Dijk and Harding, J. 2016).

We have conducted an invasive plant inventory at the Fort River Division, and there are substantial invasive plant infestations. Invasive multiflora rose is a predominant shrub in both riparian floodplain forests and grassland

fields and some control of this species has been undertaken by the Youth Conservation Corps. Volunteers have helped control efforts for garlic mustard, which is beginning to spread in the floodplain forests, adjacent wetlands and forest edge. Oriental bittersweet threatens the health of floodplain trees. Other invasive species present include Japanese barberry, purple loosestrife, glossy buckthorn, reed canary grass, autumn olive, and black locust, among others.

Implementation of refuge strategies will begin with a comprehensive, multi-scale wildlife habitat inventory. Wildlife species survival and breeding success is dependent not only on the habitat at a fine scale, but also the surrounding landscape, making it necessary to look at the adjacent habitat conditions and land uses within the CFA and associated landscape. Baseline information on the condition of shrub swamps at the time of acquisition will further inform more detailed habitat prescriptions within a required step-down HMP.

Management Strategies:
Continue to:

- Control known invasive plant infestations such as oriental bittersweet, multiflora rose, and garlic mustard.
- Work with TNC to plant American elms on the Fort River Division as part of floodplain restoration.

Within 5 years of CCP approval:

- Minimize refuge activities that disturb wetland communities.
- Coordinate with the Massachusetts Natural Heritage and Endangered Species Program and town Conservation Commission to ensure invasive plant management complies with the Massachusetts Endangered Species Act and the Massachusetts Wetland Protection Act.
- During the development of the Habitat Management and Integrated Pest Management Plans, assess the threats to native plants from invasive plants and develop priority invasive plant management strategies to limit these threats.
- Work with partners, including the State, in support of the State Wildlife Action Plan, to ensure management on Service lands complement adjacent land management objectives.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Survey wildlife utilization of wetlands including surveys for rusty blackbirds during the migration and wintering periods.
- Map natural communities; protect rare or exemplary examples.

Objective 1.2: Non-forested Uplands and Wetlands

Sub-objective 1.2a. (Freshwater Marshes)
Restore native species composition and structure, and improve the natural hydrology, as needed, to support natural and rare ecological freshwater marsh communities. Management will provide stopover habitat for spring and fall migrant birds.

Rationale:
Freshwater marshes are often dominated by emergent and submergent herbaceous vegetation. Scattered shrubs are often present, and trees are generally absent. Herbaceous vegetation typically includes common bulrush, jewelweed, marsh fern, water lily and narrow-leaved cattail (Gawler 2008). Based on our coarse-scale habitat analysis, freshwater marsh communities occur in swales within the agricultural fields of the Fort River CFA. Water pollution, altered hydrology, and invasive species introductions are threats for freshwater marsh communities.

Restoration of freshwater marsh communities, as well as the surrounding forested habitat, will provide a diversity of habitat for neotropical migratory birds in an otherwise agricultural landscape where small, disturbed forest fragments are the rule. The Connecticut River watershed is a major migration corridor. The lower portion of the watershed (CT and MA) receives higher use by migrants, with this use concentrated in habitats along the

Connecticut River main stem (Smith College 2006). The Fort River CFA is situated on the Connecticut River, and can provide significant stopover habitat for migrants in the spring and fall. Neo-tropical migrants typically use similar habitats during migration as they do during the breeding season (Petit 2000). These freshwater marshes are not large, and may not provide adequate stopover habitat for species such as rails, bitterns, and egrets, but add to the diversity in the landscape and foraging opportunities for species using adjacent habitats.

Implementation of refuge strategies will begin with a comprehensive, multi-scale wildlife habitat inventory. Wildlife species survival and breeding success is dependent not only on the habitat at a fine scale, but also the surrounding landscape, making it necessary to look at the adjacent habitat conditions and land uses within the CFA and associated landscape. Baseline information on the condition of freshwater marshes at the time of acquisition will further inform more detailed habitat prescriptions within a required step-down HMP.

Management Strategies:
Within 5 years of CCP approval:

- Minimize refuge activities that disturb wetland communities.
- Work with partners, including the State, in support of the State Wildlife Action Plan, to ensure management on Service lands complement adjacent land management objectives.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Survey wildlife use of wetlands.
- Map natural communities; protect rare or exemplary examples.

Sub-objective 1.2b. (Pasture/Hay/Grassland)
Where appropriate, maintain a contiguous block of grassland habitat for breeding and migrating grassland bird species and pollinators; areas not managed for grassland birds and pollinators will be allowed to revert to natural conditions.

Rationale:
Over 60 percent of the Fort River CFA is typed as pasture, hay and grassland, consisting mostly of large fields between 200 and 400 acres. Management of these fields as grassland habitat would benefit declining grassland bird and pollinator species, and provide a habitat that is increasingly rare in the region.

Native grasslands were once more widespread in North America. A deterioration of rangelands, the conversion of prairies to agriculture, and afforestation of the eastern United States are significant factors to the decline of grassland bird populations. During European settlement, millions of acres of forests were cleared for agriculture in the eastern U.S., creating habitat for grassland dependent birds. As agricultural activities declined, open areas dominated by herbaceous vegetation began to convert back to forests, causing a drastic decline in grassland species in the region (Brennan and Kuvlesky Jr 2005). Habitat loss is also a factor for declining populations of pollinator species, including the yellow banded bumble bee, regal fritillary and monarch butterfly. These species are petitioned for listing under the Endangered Species Act.

In fact, several grassland species are listed as threatened or endangered by the state of Massachusetts, including northern harrier, upland sandpiper, barn owl, and grasshopper sparrow, and four bumble bee species are listed as SGCN. Grasslands are a high priority habitat for the state, and maintaining large, contiguous acres of warm season grasses at the Fort River CFA would benefit these species.

We also support the protection of high-value, productive agricultural lands identified by local communities and the State. It is not the refuge's intention to target these lands for acquisition. Instead, our priority would be to work with individual landowners, states, and other Federal agencies to protect these lands and ensure they continue to be part of the working landscape. There are many State and Federal programs that protect agricultural lands and help promote farming practices that benefit wildlife and help protect water quality. Through our private lands program, we will help direct landowners who are interested in these programs to the proper state and Federal agencies and programs. In rare cases, we may acquire agricultural lands from willing sellers, when other options to keep the land in agricultural production are not available, or if habitats for Federal trust resources are in jeopardy from development or other land use changes.

Due to our unfamiliarity with the habitat conditions in the CFA, a comprehensive, multi-scale habitat and wildlife inventory will be necessary to implement refuge strategies. This inventory will need to encompass all habitats within the CFA and associated landscape. This baseline information will further inform more detailed habitat prescriptions within a required step-down HMP.

Management Strategies:
Within 5 years of land acquisition and CCP approval:

- Work with partners to protect and promote farming practices (e.g. haying and pasture of animals) that benefit wildlife and protect water quality.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Assess the condition of pasture, hay and grassland habitats, as well as the overall size and location in the CFA, and proximity to other forest openings, to inform more detailed management strategies in an HMP.

Objective 1.3: Inland Aquatic Habitats

Sub-objective 1.3a. (Open Water)
In collaboration with partners, manage water resources and riparian areas to provide cold temperature regimes, substrate diversity, and clear aquatic species passage that benefit priority refuge resources of concern including American eel.

Rationale:
The lower reaches of the Fort River meanders through the agricultural lands of the Fort River CFA. The Fort River is the longest free-flowing tributary to the Connecticut River in Massachusetts, and ranks near the top among all New England rivers for overall freshwater mussel diversity. The federally endangered dwarf wedgemussel occurs in a portion of the river between Plum and Hop Brooks, about a mile from the CFA boundary. The Fort River also supports American eel, a species of conservation concern for the Service and an SGCN species. American eel enter the Connecticut River as juveniles, and migrate upstream to inhabit streams, lakes, and ponds. They feed in these aquatic habitats until they reach sexual maturity and begin the long migration to their spawning grounds in the Sargasso Sea (ASMFC 2000).

The Fort River floodplain communities and forested buffers within the Fort River CFA have been cleared for agricultural use or are being threatened by nonnative invasive plant species. Restoration of floodplain communities and forest buffers will improve the water quality of the Fort River by decreasing erosion and siltation, and provide shade for aquatic species. A comprehensive, multi-scale habitat and wildlife inventory will be necessary to understand aquatic and surrounding habitat conditions in the CFA. This baseline information will further inform more detailed habitat prescriptions within a required step-down HMP.

Inventory and Monitoring Strategies:
Within 5 years of land acquisition and CCP approval:

- Work with partners to conduct stream assessments to evaluate the physical, chemical, and biological condition of the fish community structure, productivity, and health.

Objective 1.4: Coastal Non-forested Uplands (coastal beaches and rocky shores)

Not applicable to the Fort River CFA

Objective 1.5: Coastal Wetlands and Aquatic Habitats (tidal salt marsh and estuary)

Not applicable to the Fort River CFA

Goal 2: Education, Interpretation, and Outreach: Inspire residents and visitors to actively participate in the conservation and stewardship of the exceptional natural and cultural resources in the Connecticut River watershed, and promote a greater understanding and appreciation of the role of the Silvio O. Conte National Fish and Wildlife Refuge in conserving those resources.

Objective 2.1: Environmental Education

In collaboration with public and private educators from all four states in the watershed, lead or facilitate the implementation of structured natural and cultural resource curricula, with a focus on guiding educators and students to: develop an awareness of, and concern about, natural and cultural resources and associated challenges; appreciate our conservation history; make informed decisions and work individually or collectively towards solutions; model responsible environmental stewardship in their everyday lives.

Sub-objective 2.1a. (Environmental Education Planning and Training)
Work with communities, school systems, public and non-profit organizations, and private educational organizations to facilitate and develop quality model environmental education curricula, as well as to develop highly trained individuals to conduct quality environmental education. Priority will be given to residents of urban communities as participants and other visitors within a 1-hour commute of the Fort River Division who might not otherwise visit a refuge. Environmental education programs will be designed to:

- Take into account the needs of the target audience, as well as the relevance to the target audience's everyday lives.
- Be student and community-centered.
- Be curriculum-based, with goals and measurable objectives.
- Be inquiry driven and involve direct experiences with nature.
- Involve educators in the development and implementation.
- Be linked to multiple state relevant learning standards.
- Coordinate with state and private environmental educations programs.
- Relate to refuge management goals, objectives, and purposes.
- Have tools for evaluation and measurable outcomes throughout development and execution.
- Involve repeated contact with the same students.
- Be sustainable (i.e., have the resources necessary to continue over the long term).
- Involve interactions that occur in the natural, the built, and the social environment.
- Aim to develop awareness, attitudes, understanding, skills, and feelings of empowerment.

Additionally, the refuge will work with partners to develop and implement quality professional development for educators, to promote the training of refuge staff and volunteers in the knowledge, skills, and abilities of environmental education and to use volunteers, including Friends members, to enhance environmental education opportunities.

Rationale:
The long-term vision for the Fort River Division is that it will house an outdoor environmental education facility. This facility will be used by the refuge for environmental education, by local schools looking to use the division as an outdoor classroom, and by local nature centers and conservation organizations working toward shared conservation goals. The Fort River Division will be actively managed, making it a good outdoor laboratory/active

management demonstration site. Further, an ADA-compliant trail will provide wildlife dependent recreation opportunities for a wide range of visitors.

As stated in the Chapter 4 rational for Goal 2, environmental education is an important aspect of the Conte Refuge that helps the refuge to meet one of its founding purposes to "provide opportunities for scientific research, environmental education, and fish and wildlife-oriented recreation and access." The Fort River Division is located within a 1-hour radius of several population centers including the cities of Springfield, Hartford, Holyoke, Keene, Brattleboro, and their surrounding suburbs. Given this proximity, refuge staff and partners have the ability to work with urban audiences who would not normally visit a refuge on their own. Similarly, the Fort River Division is geographically well situated for the refuge to sustain partnerships with a diversity of local organizations. To name a few, the Fort River Division is located a short distance from facilities and lands owned by: Massachusetts Audubon, the Massachusetts Department of Conservation and Recreation, the Massachusetts Division of Fisheries and Wildlife, the Trustees of Reservation, private nature centers, several colleges and universities, and private science museums. Given its central location within the Connecticut River watershed, the Fort River Division has the potential to be an important dissemination point for visitor services related activities for the refuge. Further, the division is located a short distance from Interstate 91 and Route 9, making it an easy commute for schools looking to partake in environmental educations.

This CFA is well suited for an outdoor environmental education facility because of its location near headquarters and population centers, and because of the ability to re-develop sites currently occupied by derelict buildings, resulting in minimal ecological impacts.

Management Strategies:
Within 5 years of EE facility completion:

- Design or adapt curricula for the Fort River Division that focuses on watersheds and local natural and cultural resources. Curricula will:
  - ✓ Incorporate multiple relevant learning standards.
  - ✓ Coordinate with existing state and national environmental educations programs.
  - ✓ Take into account student and teacher needs by researching and analyzing demographics and the geographic area by taking into consideration cultural differences, student life experiences, specific learning needs, assessing what is relevant to student's lives, and by addressing the needs of school systems).
  - ✓ Be refuge/place-based.
  - ✓ Incorporate nationally recognized education initiatives, when appropriate.
  - ✓ Be designed with specific goals and objectives.
  - ✓ Promote refuge purposes.
  - ✓ Contain consistent interpretive messages and themes.
  - ✓ Promote other refuge divisions and units, partner-conserved lands, and facilities such as state parks, science museums, and nature centers as environmental educations resources.
  - ✓ Incorporate nationally recognized initiatives (e.g., North American Association of Environmental Education (NAAEE), and Science, Technology, Engineering, and Math (STEM)).
  - ✓ Incorporate national based curricula (e.g., Project WILD, Project Aquatic WILD, Project WET, Flying Wild, Project Learning Tree.
- Identify and strive to engage non-traditional audiences regarding environmental education opportunities.
- Support the Service's initiatives with regards to environmental education.

- Contribute to professional educator development by hosting and/or instructing at least two educator continuing education trainings.
- Promote the Fort River Division as a destination for field trips and increase the number of students by two percent per year for the 5 five years.
- Develop an outreach program to promote the Fort River Division as a fieldtrip destination.
- Conduct a needs assessment of after school programs, and summer camps to determine community demand for these types of programs at the refuge.
- Be viewed as a valuable environmental education resource within the community that:
  - ✓ Has staff trained in environmental education and natural resources;
  - ✓ Provides educators with state-of-the-art education resources;
- Develop specific environmental education goals and objectives for each program/lesson and identify appropriate educational strategies for environmental education participants.
- Work with after school programs and summer camps to incorporate existing state watershed curricula.
- Provide support for curriculum-based programs such as Scouts, 4H, Boys and Girls Clubs, Road Scholar (former ElderHostel program).
- Support state environmental education programs (e.g., Hunter and Angler Education, Furbearer Education, Becoming an Outdoors Woman).
- Keep current with state-of-the-art technologies and incorporate them into environmental education programming.
- Work with partners to create issue-oriented experiential activities and programs for use at the Fort River Division.

Within 10 years of EE facility completion:

- Coordinate with each state to share environmental education resources.
- Provide the Fort River CFA as an outdoor classroom.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Develop an evaluation system to assess the effectiveness of all environmental education curricula.

Sub-objective 2.1b. (Environmental Education Delivery)
Work with communities, school systems, public and non-profit organizations, private educational organizations, staff, volunteers, and members of friends groups to offer quality environmental education programs at the Fort River Division and at schools and partner facilities within the watershed. Priority will be given to residents of urban communities as participants and other visitors within a 1-hour commute of the Fort River Division who might not otherwise visit a refuge.

The refuge will seek to:

- Formally partner with local schools within a 1-hour commute of the Fort River Division and to conduct environmental education to these audiences multiple times per year.
- Promote partner lands as outdoor classrooms, and to help deliver priority educational programs.
- Facilitate the use of refuge and partner lands by educator-, teacher-, and student-led classes.

Rationale:
See rationale for sub-objective 2.1a.

Management Strategies:
Within 5 years of CCP approval:

- Use staff, volunteers, and members of Friends groups to facilitate teachers and students at the Fort River Division. The intention is to host up to ten classes the first year and increase the number of students by two percent per year for the next 5 years.
- Partner with other education centers, state-sponsored programs and other government agencies to meet environmental education objectives.
- Collaborate with the Recreation and Education committee of the Friends of Conte to identify, package, and promote applications for alternative sources of funding for environmental education partnerships.
- Promote partner lands and facilities as outdoor classrooms; help deliver priority educational programs at those partner facilities.

Within 10 years of CCP approval:

- Formalize cooperative relationships with environmental education providers through development of agreements and MOUs.
- Develop more detailed environmental education objectives and strategies as part of a Visitor Services Plan.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Formally evaluate the quality of existing environmental education programs and as a result of evaluation, plan for the next 5 years.

Objective 2.2: Interpretation

Develop, lead, and facilitate interpretive programs that emotionally and intellectually connect the audience to natural and cultural resources in the watershed.

Sub-objective 2.2a. (Natural and Cultural Resource Interpretive Planning and Training)
Work with communities, public and non-profit organizations, staff, volunteers, and members of Friends groups to offer quality interpretive programming and training at the Fort River Division.

Rationale:
As stated in the Chapter 4 rational for Goal 2, interpretation is an important aspect of the Conte Refuge that helps the refuge to meet one of its founding purposes to "provide opportunities for scientific research, environmental education, and fish and wildlife-oriented recreation and access." The Fort River Division is located a short distance from Interstate 91 and Route 9, and within a one-hour radius of several urban areas including Springfield, Hartford, Holyoke, Keene, Brattleboro, and their surrounding suburbs. The geographic location of the Fort River Division makes it easy for visitors to access the property, to partake in wildlife dependent activities, and to learn about the habitats and wildlife present at the location. As an outdoor classroom developed on the site will orient visitors to the refuge and to the various divisions available to visit in the watershed. Further, the Fort River will include an ADA-compliant trail for both self-guided interpretation as well as guided interpretive experiences.

Management Strategies:
Within 1 year of CCP approval:

- Employ a variety of themed interpretive offerings (e.g., presentations, audio-visual programs, brochures, and exhibits) when creating programming for natural and cultural resource interpretation.
- Collaborate with partners to create meaningful, consistent, thematic statements to be used in the delivery of programming at the Fort River Division.

- Develop more detailed interpretive objectives and strategies as part of a Visitor Services Plan.
- Develop a core set of interpretive programs that can be modified on an as needed basis.
- Provide resources and trainings to refuge staff, Friends, and volunteers in support of interpretive programs.

Within 10 years of CCP approval:

- Develop self-guided interpretive services, such as interpretation for the trail and kiosks, exhibits, and printed media.
- Establish relationships with Tribes and local and watershed historians to incorporate cultural history into interpretive programs.
- Make Certified Interpretive Guide (NAI) training available once every other year for refuge personnel, Friends Group members, and the general public, with priority given to refuge affiliates.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Build an evaluation process that includes formal and informal evaluation to assess the effectiveness of all interpretation programs.

Sub-objective 2.2b. (Natural and Cultural Resource Interpretive Program Delivery)
Collaborate with partners to deliver quality natural and cultural resource interpretive programs.

Rationale:
See rationale for sub-objective 2.2a.

Management Strategies:
Within 5 years of CCP approval:

- Annually provide quality interpretive programs, exhibits, printed media at the Fort River Division.
- Provide roving interpretation at visitor center to initiate discussion and encourage engagement in key refuge messages.
- Incorporate thematic statements, measureable objectives, and evaluation measures into all interpretation efforts.
- Develop self -guided interpretive messages and use state-of-the-art, as well as traditional media such as pamphlets and signs.

Within 10 years of CCP approval:

- Design, fabricate, and install an interpretive Conte Corner at the Fort River Division.

Objective 2.3: Public and Community Outreach

Support, promote, and coordinate a wide range of outreach tools and activities to facilitate and improve communications and relationships with the public, especially communities, adjacent landowners, and elected officials in the Connecticut River watershed, and to empower citizens to recognize and resolve local natural resource issues and promote conservation and the responsible use of natural resources.

Sub-objective 2.3a. (Local Residents, Community Leaders, and Elected Officials)
Through effective outreach, the refuge will work to increase public awareness of the benefits of the Fort River Division within the surrounding communities. Individuals will become aware of public offerings, resources, and programs offered at the Fort River Division, and of the interpretive messages of the Silvio O. Conte National Fish and Wildlife Refuge.

Rationale:
The Conte Refuge is unique with its jurisdictional boundaries encompassing the entire Connecticut River watershed. The 2.3 million residents of the Connecticut River watershed live in urban, suburban, and rural areas, and make up a diverse demographic with varying attitudes and interests. When Congressman Silvio O. Conte proposed the creation of the refuge, his desire was to restore and maintain a swimmable, boatable, and fishable Connecticut River for his children and grandchildren. This dream is still a primary guiding factor for management at the refuge; yet, the full dream can only be realized through the cooperation and combined effort of watershed residents, Federal, state, and local agencies, non-profit organizations, and other community organizations. Strategic, quality outreach targeted at specific audiences is vital to communicate with individuals about watershed and refuge concerns, to work toward a shared vision for the Connecticut River watershed and to gain support for refuge activities.

Management Strategies:
Within 5 years of CCP approval:

- Develop outreach messages.
- Maintain good lines of communication with Fort River Division neighbors and local community leaders.
- Create special programming that will draw local residents and media.
- When possible, participate in community events and festivals within a 1-hour commute of the Fort River Division.
- Cooperate with neighboring landowners whenever practical and appropriate to conduct land management activities for mutual benefit.
- In conjunction with the Friends group, conduct open houses that showcase center achievements and key center supporters.
- Work quickly to resolve points of conflict between the refuge and its neighbors over issues such as visitor trespass and other inappropriate public use.
- Attend select board meetings, and visit town clerks, mayors, planners, and other elected officials as needed to keep them apprised of refuge issues and projects.

Within 10 years of CCP approval:

- Proactively meet with elected officials to share and update each other on constituent concerns and opportunities.
- Develop messages and actions that frame refuge units as an asset to the local community. Example benefits that the refuge provides the community include: environmental education and interpretation programming, special events hosted for the community, employment for local youth through Youth Conservation Corps (YCC), mutual aid agreements, etc.
- Develop and implement an outreach plan for communicating with area residents about the importance of this area to the larger watershed and describe how they can contribute to improving watershed quality. Possible components would include demonstration sites, behind-the-scene tours, special open houses, and technical publications.
- Monitor and evaluate the need for future outreach efforts.

Sub-objective 2.3b. (State and National-level Elected Officials)
Through effective outreach to Congress and State officials, as needed, the refuge will work to increase awareness of the benefits of the Fort River Division and the Silvio O. Conte National Fish and Wildlife Refuge.

Rationale:
See rationale for sub-objective 2.3a.

Management Strategies:
Continue to:

- Provide briefings to members of Congress and state officials, or their staff as needed or as requested.

Within 5 years of CCP approval:

- Evaluate and modify outreach efforts, as necessary.

Sub-objective 2.3c. (Media)

Through effective outreach to the media, the refuge will work to increase public awareness of the Fort River Division and the Silvio O. Conte National Fish and Wildlife Refuge within the surrounding communities. Individuals will become aware of public offerings, resources, and programs offered at the Fort River Division, and of the interpretive messages of the refuge.

Management Strategies:

Within 1 year of CCP approval:

- Write press releases detailing large refuge projects and accomplishments, and the joint efforts and accomplishments of the refuge and refuge partners.

Within 5 years of CCP approval:

- Develop and implement an outreach plan that uses state-of-the-art technology to disseminate program information and Fort River Division offerings to the public.
- Host local media representatives at the Fort River Division.
- Create special programming that will draw the media.
- Routinely use community-based outreach methods such as newspapers and local access television to publicize refuge events and run public service programming on environmental issues.

Within 10 years of CCP approval:

- Evaluate media outreach efforts to develop future strategies customized to the division.

Sub-objective 2.3d. (Greater Watershed Community)

Through effective outreach, the refuge will work to increase public awareness of the Fort River Division and the Silvio O. Conte National Fish and Wildlife Refuge within the greater watershed communities. Individuals will become aware of public offerings, resources, and programs offered at the Fort River Division, and of the interpretive messages of the Silvio O. Conte National Fish and Wildlife Refuge.

Management Strategies:

Continue to:

- Coordinate effectively with partners, particularly through the Friends of Conte, to disseminate key messages to their membership.

Within 1 year of CCP approval:

- Encourage landowners to take advantage of cooperative land management programs available through the Service and other agencies such as Natural Resources Conservation Service (NRCS) as a way of enhancing environmental quality on and around the refuge.
- On an ongoing basis, but at least annually, use appropriate media to introduce residents to the refuge, describe refuge accomplishments, detail visitor opportunities, and discuss refuge operations and current and future refuge projects.

Within 5 years of CCP approval:

- Implement an Adopt-a-Habitat program to be used in part as an outreach tool for schools and community residents to learn about and become stewards of their local environment.
- Conduct open houses on refuge divisions and partnership areas to introduce residents and local officials to the refuge.
- Train Friends, and other volunteers to make presentations on topics of mutual interest to community groups such as Chambers of Commerce, Rotary Clubs and other civic and non-profit organizations.

Within 10 years of CCP approval:

- Develop and implement an outreach plan for communicating conservation messages with landowners. Plan would include tools and strategies. Tools could include landowner workshops, behind-the-scene tours, special open houses, and relevant publications.
- Write issue driven outreach plans to keep elected officials informed of refuge and partner accomplishments and of issues within the watershed that have possible impacts to the refuge.
- Develop at least one Conte Corner within the Pioneer Valley.

Objective 2.4: Science and Technical Outreach

Facilitate the collection and exchange of information that increases the knowledge and understanding of natural and cultural resources, addresses climate change and other conservation issues, and provides land managers with better information to make management decisions affecting resources.

Rationale:
One of the six legislative purposes guiding the establishment of the Silvio O. Conte National Fish and Wildlife Refuge was "…to provide opportunities for scientific research, environmental education, and fish and wildlife-oriented recreation and access to the extent compatible with other purposes ..." The Fort River Division is situated in the "Five College" area of western Massachusetts and is within a short commute of the University of Massachusetts. The number of nearby local colleges, as well as the abundance of natural and cultural resources in the local area makes the Fort River Division a key resource for students seeking mentoring experiences, and for students looking to conduct research projects relating to conservation, wildlife management, resource protection, and human dimensions. Similarly, student research will benefit the refuge by answering management questions, and helping to guide management strategies.

Sub-objective 2.4a. (Institutions of Higher Learning and Other Partners)
Develop and/or enhance relationships with institutions of higher learning, particularly those within a 1-hour commute of the Fort River Division.

Management Strategies:
Continue to:

- Collaborate with professors at local institutions of higher learning to use the Fort River Division to perform wildlife-related research of interest to the refuge.
- Work with partners to conduct research relevant to refuge management issues.

Within 5 years of CCP approval:

- Become an active partner in the Five Colleges Consortium.
- Conduct classes, seminars, and workshops at local colleges that deal with refuge purposes and lands.

Sub-objective 2.4b. (Technology and Information Exchange)
Participate, coordinate, and/or host professional conferences, workshops and seminars related to wildlife biology, wildlife management, environmental education and interpretation at the Fort River Division.

Management Strategies:
Within 5 years of CCP approval:

- Encourage staff to participate in relevant environmental education and interpretation conferences to share exemplary practices.
- Promote the Fort River Division as a venue for institutes of higher learning and professional societies to disseminate information on important watershed issues.

Sub-objective 2.4c. (Mentoring)
Provide quality mentoring opportunities for local students and interested individuals.

Management Strategies:
Within 5 years of CCP approval:

- Offer student internships and host field trips.
- Continue to participate periodically in presenting information to classes at local universities, colleges, and high schools.
- Seek opportunities to participate in student workshops, trainings, and events.

Within 10 years of CCP approval:

- Mentor students to help them identify their career goals and introduce career paths within the Service.
- Participate in undergraduate and graduate level classes at local universities and colleges, presenting information on various topics and issues of the refuge.

Goal 3: Recreation: Promote high-quality, public recreational opportunities in the Connecticut River watershed that are complementary between ownerships and provide regional linkages with emphasis on promoting wildlife-dependent activities that connect people with nature.

Objective 3.1: Hunting

Support quality public hunting opportunities in the Connecticut River watershed to promote a unique understanding and appreciation of natural resources and their management on lands and waters, while also protecting a traditional outdoor pastime deeply rooted in America's natural heritage and conservation history.

Sub-objective 3.1a. (Hunting Opportunity, Access, and Infrastructure)
Provide the opportunity for a quality hunting experience following State and refuge division-specific regulations.

Rationale:
Hunting is allowed on national wildlife refuges, as long as it is found to be a compatible use. The Fort River Division has been a popular area with hunters for many years prior to acquisition by the Service. All of the division is currently open to hunting under an interim pre-acquisition compatibility determination, excluding safety zones around buildings. Retaining hunting opportunities at this division, consistent with the final compatibility determination, conforms to historic use on this property and much of the surrounding land in the area. Popular game species include white-tailed deer, Eastern wild turkey, and Eastern cottontail rabbits. Allowing hunters to use public lands helps ensure this wildlife-dependent recreational activity continues and contribute to the state's population management objectives.

Management Strategies:
Continue to:

- Allow hunter access to the refuge outside of the normal division open hours, which are 30 minutes before sunrise and 30 minutes after sunset, as long as they are engaged in lawful hunting activities.
- Post newly acquired properties to ensure refuge boundary lines are clearly marked.
- Allow temporary tree stands and blinds that meet State hunting regulations and do not harm trees or other vegetation. Tree stands and blinds must have the owner's name and phone number clearly displayed, and they must be removed at the end of the hunting season.

Within 1 year of CCP approval:

- Complete all administrative requirements to maintain hunting consistent with State hunting regulations and the following d-specific regulation:
  - ✓ Temporary blinds and tree stands are permitted, but must have the owner's name and address visible on the stand and the stand must be removed at the end of the hunting season.
- Install an informational kiosk to post information on hunting seasons and other notices to visitors.

Within 5 years of CCP approval

- Work with Massachusetts Department of Fish and Game to determine whether opportunities exist for state-recognized disabled hunters.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Work with Massachusetts Department of Fish and Game to evaluate the effectiveness and success of the refuge hunt program in contributing to state population objectives.

Sub-objective 3.1b. (Hunter Education and Outreach)
Provide hunter education classes access to the division and conduct directed outreach to ensure hunters are informed about regulations, hunter ethics, and safety considerations. Develop programs, including brochures, signage, website pages, media releases, etc. to increase interest in hunting at the division.

Rationale:
Hunting is a priority public use that also serves as a population management tool. Providing hunter education instructors the opportunity to use the division with their classes will strengthen connections to the hunting community and student understanding of the role hunting plays in wildlife management. Making relevant information readily available to hunters through a variety of media will improve the quality of the hunting experience.

Management Strategies:
Within 1 year of CCP approval:

- Produce a hunt brochure that includes information on regulations, hunter ethics, safety considerations, etc. and make it available on the refuge website, at Fort River Division kiosks, through a friends group, and in local businesses.

Within 5 years of CCP approval:

- Offer to host hunter education field courses.

- Work with Massachusetts Department of Fish and Game to encourage youth hunting at the division as a means of introducing young people to this traditional recreation activity.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Develop a system to monitor and evaluate the hunting program with hunters and other users to determine if the objective is being met and to allow for adaptive management.

Objective 3.2: Fishing

Support quality, public fishing opportunities in the Connecticut River watershed to promote an understanding and appreciation of natural resources and their management on lands and waters, while also protecting a traditional outdoor pastime deeply rooted in the America's natural heritage and conservation history.

Sub-objective 3.2a. (Fishing Opportunities, Access and Infrastructure)
Provide quality fishing opportunities at the Fort River Division after completing all administrative procedures to officially open refuge lands to fishing, based on Massachusetts Department of Fish and Game regulations, and division-specific conditions, if necessary.

Rationale:
Fishing is a priority public use on national wildlife refuges and a popular outdoor recreational activity. The division has been open to fishing through pre-acquisition compatibility determinations, but no formal opening package or fishing plan has been completed. Although fishing is not as popular as hunting at the Fort River Division, there still are opportunities for visitors to fish the reach of the Fort River that flows through the division.

Management Strategies:
Continue to:

- Post newly acquired properties to ensure refuge boundary lines are clearly marked.

Within 1 year of CCP approval:

- Complete all administrative requirements to maintain fishing consistent with State hunting regulations and, if necessary, additional refuge-specific regulations.
- Install an informational kiosk in a conspicuous location to post information on fishing seasons and other notices to visitors.
- The Fort River Division would be open to visitors actively engaged in fishing during the seasons and times established by the state in their annual fishing regulations.

Within 5 years of CCP approval:

- Work with the Massachusetts Department of Fish and Game to inventory and assess fish populations on the division.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Develop a system to monitor and evaluate the fishing program with anglers and other users to determine whether the objective is being met and to allow for adaptive management.

Sub-objective 3.2b. (Angler Education and Outreach)
Develop programs, including brochures, signage, website pages, media releases, etc. to inform visitors of fishing opportunities at the division.

Rationale:
Although most dedicated anglers will be drawn to the nearby Connecticut River, or other areas better known for fishing, the reaches of the Fort River on the division do offer opportunities.

Management Strategies:
Within 1 year of CCP approval:

- Produce a fishing brochure that includes information on regulations, angler ethics, safety considerations, etc. and make it available on the refuge website, at the division kiosk, through friends groups, and in local businesses.

Objective 3.3: Wildlife Observation and Photography

Support quality, public opportunities to observe and photograph wildlife in the Connecticut River watershed in a variety of natural habitats to connect a broad spectrum of people with nature.

Sub-objective 3.3a. (Infrastructure and Access for Wildlife Observation and Photography)
Provide quality opportunities for wildlife observation and photography at the Fort River Division.

Rationale:
Wildlife viewing and photography is a priority public use on national wildlife refuges and a popular recreational activity in this part of the state. Refuge staff, volunteers, and interns recently completed construction of a one-mile long, fully accessible loop trail. This trail is extremely popular destination trail and attracts people from both within and outside the watershed, thus broaden the visibility and support for the refuge.

Management Strategies:
Continue to:

- Allow wildlife observation and photography at the Fort River Division.
- Allow public access at the Fort River Division daily from 30 minutes before sunrise to 30 minutes after sunset with the exception listed for hunters and anglers.

Within 1 year of CCP approval:

- Construct an informational kiosk to post information and notices for visitors.

Within 5 years of CCP approval:

- Construct an interpreted loop trail meeting ADA guidelines, a new parking lot east of the riding arena, and an informational kiosk at the parking lot.

Within 10 years of CCP approval:

- Develop a public access strategy and required planning (i.e., NEPA, compatibility determination) that includes consideration of developed trails, parking, kiosks, viewing platforms, blinds, interpretation, signage, etc.

Within 15 years of CCP approval:

- Implement the visitor use enhancements identified in the public access strategy and the refuge Visitor Services Plan.

Sub-objective 3.3b. (Wildlife Observation and Photography Aids)
Offer viewing and photography aids that enhance the visitor experience. Use a variety of methods to reach a broad spectrum of people. Work closely with the friends group and other partners who host events designed to view wildlife on the division.

Rationale:
The entire division is available for wildlife observation and photography; however, there are steps the refuge can take to enhance their time on the division. Visitation increases are expected as this division expands and becomes better known. By providing new visitors a quality experience, they are more likely to return and tell friends. One way to accomplish this is to offer sufficient information to attract a variety of visitors through a variety of media.

Management Strategies:
Within 1 year of CCP approval:

- Allow photography blinds that do not negatively impact wildlife behavior or conflict with other visitors. Blinds must be removed each day, unless arrangements have been made via a special use permit.

Within 5 years of CCP approval:

- Develop interpretive panels describing typical wildlife on the refuge, bird migration patterns, and other messages we want to convey to visitors.
- Produce a wildlife and plant species guide for the Fort River Division that will be available on the refuge website, at the refuge headquarters, and at division kiosks.
- Sponsor wildlife observation events such as International Migratory Bird Day, the Big Sit, etc.
- Encourage local schools and groups to offer wildlife-related trips to the division.

Sub-objective 3.3c. (Watershed-based Partner Initiatives)
Not applicable

Objective 3.4: Other Recreational Activities

In order to reach a broader demographic, support non-priority outdoor recreational opportunities and public access to quality, nature-based experiences throughout the Connecticut River watershed that facilitate and improve community relationships, raise awareness and an appreciation for conserving natural resources, and garner support for the National Wildlife Refuge System.

Sub-objective 3.4a. (Regional Water-based Trail Initiatives and Opportunities Including Refuge Lands)
Develop compatible opportunities on the Fort River Division that support regional water-based trail initiatives to connect people with nature, raise the visibility of the Service and the Refuge System, make the refuge more relevant to the local community, and to promote economic activity in the local area.

Not applicable at Fort River Division

Sub-objective 3.4b. (Regional Land-based Trail Initiatives and Opportunities Including Refuge Lands)
Develop compatible opportunities on the Fort River Division that support regional land-based trail initiatives to connect people with nature, raise the visibility of the Service and the Refuge System, make the refuge more relevant to the local community, and to promote economic activity in the local area.

Rationale:
Regional land-based trails give individuals opportunities to engage in outdoor recreational opportunities in the Connecticut River watershed, such as hiking, wildlife observation, and interpretation. Where appropriate, we will work with these partners to promote and distribute information about these opportunities.

Management Strategies:
Within 5 years of acquiring new lands:

- As lands are acquired, evaluate any existing trails (e.g., hiking trails, snowmobile trails, horseback riding trails) that part of an established regional or State network to determine if they are appropriate and compatible uses for the refuge.

Sub-objective 3.4c. (Other Appropriate and Compatible Recreational Opportunities That Enhance Visitor Use and Enjoyment of Refuge Lands)
Allow compatible outdoor recreational opportunities on the Fort River Division that connect people with nature, raise the visibility of the Service and the Refuge System, make the refuge more relevant to the local community, and promote economic activity in the local area.

Rationale:
In addition to the priority public uses, there are other wildlife-dependent, appropriate, and compatible recreational activities that can broaden the visitor base, giving people alternative ways to enjoy the natural resources at the division. Each of these must be found to be both appropriate and compatible to be an authorized use of the refuge.

Management Strategies:
Continue to:

- Allow dispersed hiking, snowshoeing, and cross-country skiing.
- Allow pet walking. In order to minimize conflicts with wildlife and other visitors, pets must be on leashes not longer than 10 feet in length.

Within 1 year of CCP approval:

- Work with users to delineate winter cross-country trail opportunities and determine whether a special use permit to manage winter trails is warranted.
- Allow recreational gathering of blueberries, blackberries, strawberries, raspberries, mushrooms, fiddleheads, and antler sheds.
- When compatible, allow commercial guiding in support of the priority public uses by special use permit.

Within 5 years of CCP approval

- Work with Friends groups and partners to design and market a virtual geocache course at the division. The course should integrate orienteering with refuge interpretive messages that include linking this division to other refuge divisions and units.

Overview
Mill River Conservation Focus Area (Existing Refuge Division)

Northampton and Easthampton, Massachusetts

Conservation Focus Area (CFA)—Acreage Profile	Acres	Percentage of CFA
Total CFA Acres to be Conserved by Service	2,300	71%
■ *Existing Refuge Ownership in CFA*[1]	*249*	
■ *Additional Acres in CFA proposed for Refuge Acquisition*[2]	2,051	
Existing Acres in CFA Permanently Conserved by Others[2,3]	931	29%
Total Acres in CFA[2, 4]	3,231	100 %

[1] Acres from Service's Realty program (surveyed acres).

[2] Acres calculated using GIS.

[3] The Service does not plan to acquire existing conserved lands, except under extenuating circumstances (conserved acres from TNC 2014 data).

[4] The Service would conserve up to this number of acres. The Service only acquires lands from willing sellers.

What specific criteria and/or considerations drove the selection of this CFA?

The Mill River area was a SFA in the 1995 Conte FEIS and the refuge's Mill River Division was established in 2007. It lies within the Mill River CPA. The proposed Mill River CFA offers the opportunity to restore a functioning floodplain wetland complex along the westbank of the Connecticut River. Most of the Mill River CFA overlaps terrestrial Tier 1 Core and Connector lands identified through the *Connect the Connecticut* landscape conservation design. Additional protection in this CFA by the Service will help better connect existing conserved lands, including MassAudubon's Arcardia Wildlife Sanctuary and Mt. Tom State Reservation.

What are the priority habitat types within the proposed CFA? What percentage of the total CFA acreage do they represent?

- Hardwood Swamp – 19.8%
- Freshwater Marsh – 2.4%
- Pasture/Hay/Grassland – 43.8%

For more information on the habitats in the unit, see map A.29 and table A.22.

What are the resources of conservation concern for the proposed CFA?

As noted in table A.23 below, there are seven priority refuge resources of concern (PRRC) terrestrial and aquatic species that may rely upon the diverse habitats in this CFA. There are also habitat types that are not being managed for a particular PRRC species, but are important for their contribution to Biological Integrity Diversity and Environmental Health (BIDEH) of the landscape. The refuge will seek to protect and restore (if necessary) these habitat types. Additionally, we recognize the value of this area to State Species of Greatest Conservation Need (SGCN) and migratory landbirds. These species and others are discussed further below

1. **Federal Threatened and Endangered Species**
   The Puritan tiger beetle, a federally listed species, occupies beach habitat in the northeast portion of the CFA along the Connecticut River. The river flow dynamics of the Connecticut River restricts woody plant growth, provides sparsely vegetated and open sandy beaches required by these beetles. This beach habitat is owned by Massachusetts Division of Fisheries and Wildlife and the city of Northampton. The recovery criteria in the USFWS Puritan Beetle Recovery Plan specifies that a minimum of three metapopulations, at least two of which are large (500 to 1000 or more adults) are maintained or established (i.e., self-maintained for at least 10 years) within the species historical range along the Connecticut River, and habitat they occupy is permanently protected (Hill and Knisley 1993). The 2007 5-year review recommended that a high priority be given to identifying private landowners that would be willing to enter into conservation easements for the protection and management of Connecticut River shoreline habitat supporting beetles (USFWS 2007). The current tiger beetle population in the CFA is below 100 individuals, and population levels seem to be declining (Davis 2012). This single population is isolated from the metapopulation in Connecticut.

   There is a historic location of dwarf wedgemussel, a federally listed species, in the Mill River Division near Pynchon Meadows located west of the CFA. This species requires stable bank conditions afforded by gravel or sandy substrates, and good water quality (Hill and Knisley 1993, Nedeau et al. 2000). An inventory of this area will be necessary to determine dwarf wedgemussel presence, and to assess current habitat suitability.

   This CFA is within the range of the federally listed northern long-eared bat and tricolored bat, a species petitioned for listing under the ESA. During summer nights, these bats forage on insects within wetlands and forested habitats. Northern long-eared bats roost under the bark or within cavities of large (> 3 dbh) diameter trees during the day (USFWS 2014). Tricolored bats will also roost in trees, though they tend to roost in the foliage of live or dead trees within a mature stand (MADFW 2015). These roosting habitats also provide maternity sites where females will raise their young. In the winter, these bats will hibernate in underground caves or cave like structures, often within close proximity to their summer roosting and feeding areas. Areas within the CFA may contain important maternity and summer roosting sites, as well as foraging areas for this species.

   Small whorled pogonia occurs about three miles from the CFA boundary within adjacent forested lands. This plant inhabits upland sites in maturing stands of deciduous or mixed deciduous and coniferous forests with sparseto-moderate ground cover (due to nutrient poor soils), a relatively open understory, and proximity to persistent openings in the forest canopy, such as logging roads and streams. This listed species has not been documented in the CFA, and will be added as PRRC species if it is documented in the CFA in the future.

   This section of the Connecticut River is important migratory habitat for shortnose sturgeon. This species prefers large rivers and estuaries where there is an abundance of crustaceans, mollusks and insects to feed on. They are a long-lived fish that are threatened by pollution, habitat alterations and overfishing.

2. **Migratory Birds**
   The Connecticut River watershed is a major migration corridor. The lower portion of the watershed (CT and MA) receives higher use by migrants, with this use concentrated in habitats along the Connecticut River main stem (Smith College 2006).The Mill River CFA is situated on the Connecticut River, and the hardwood swamps and upland forested acres provide stopover habitat for migrants in the spring and fall such as wood thrush, Canada warbler, black-throated blue warbler, black-throated green warbler, red-eyed vireo, American redstart, and yellow-bellied sapsucker. Restoration and connectivity of floodplain communities in the CFA will provide additional quality migratory and breeding habitat.

   This CFA also may provide important wintering habitat for rusty blackbirds, a species that has been experiencing drastic population declines since the mid-1900's (IRBWG 2016). This species is a refuge resource of concern. It breeds in the northern reaches of the Connecticut River watershed, winters in the southern reaches of the watershed, and migrates through the Connecticut River corridor. Wintering and migrating habitat for this species includes floodplain forests and scrub-shrub wetlands (C. Foss, Audubon New Hampshire, personal communication 2016).

3. **Waterfowl**
   The freshwater marshes, hardwood swamps, and open water habitats provide important stop-over areas for migrating and wintering waterfowl. Large concentrations of American black ducks, green-wing teal, mallard, and American wigeon use habitats in this CFA. Other species include Canada geese, bufflehead, canvasback, wood duck, northern pintail, gadwall, and mergansers.

4. **Diadromous fish and other aquatic species**
   The Mill River CFA is located along the Connecticut River which provides important habitat for PRRC species including American shad, shortnose sturgeon, American eel, blueback herring, and Atlantic salmon. The lower portion of the Mill River also supports river herring. Sea lamprey, another species of conservation concern, also occurs in this CFA providing important ecological benefits to aquatic systems.

5. **Wetlands**
   There are approximately 2,000 acres of floodplain habitat in the Mill River CFA. This floodplain is adjacent to the city of Northampton, and due to the rich soils, has mostly been converted to agriculture land. Six hundred and thirty-seven acres of hardwood swamp, 31 acres of shrub swamp and floodplain forest, and 76 acres of freshwater marsh are the current wetland habitats in the floodplain. The Nature Conservancy considers the floodplain forest that occurs in this CFA, and in other areas along this section of the Connecticut River, as ecologically important. These remnant floodplain forests contain some of the largest floodplain trees, and likely the most fertile soils in the watershed (Marks et al 2011).

What habitat management activities would likely be a priority on refuge lands within the proposed CFA?

We will conduct a comprehensive, multi-scale wildlife habitat inventory following acquisition. Baseline information on the condition of habitats (e.g., forested, non-forested, and open water habitats) will further inform more detailed, habitat prescriptions within a required step-down Habitat Management Plan (HMP). Once inventory has been completed, then management will focus on maintaining the following conditions:

- Forest management activities will focus on restoration of degraded floodplains, including where appropriate restoring the primary natural disturbance mechanism (seasonal flooding) and species composition and structure to accepted historical conditions. Management of upland forests will improve structural diversity and species composition will be appropriate for site conditions and location. Appendix J provides general forest management guidelines, including descriptions of forestry techniques and explanations about how we will determine where and how to conduct active management.

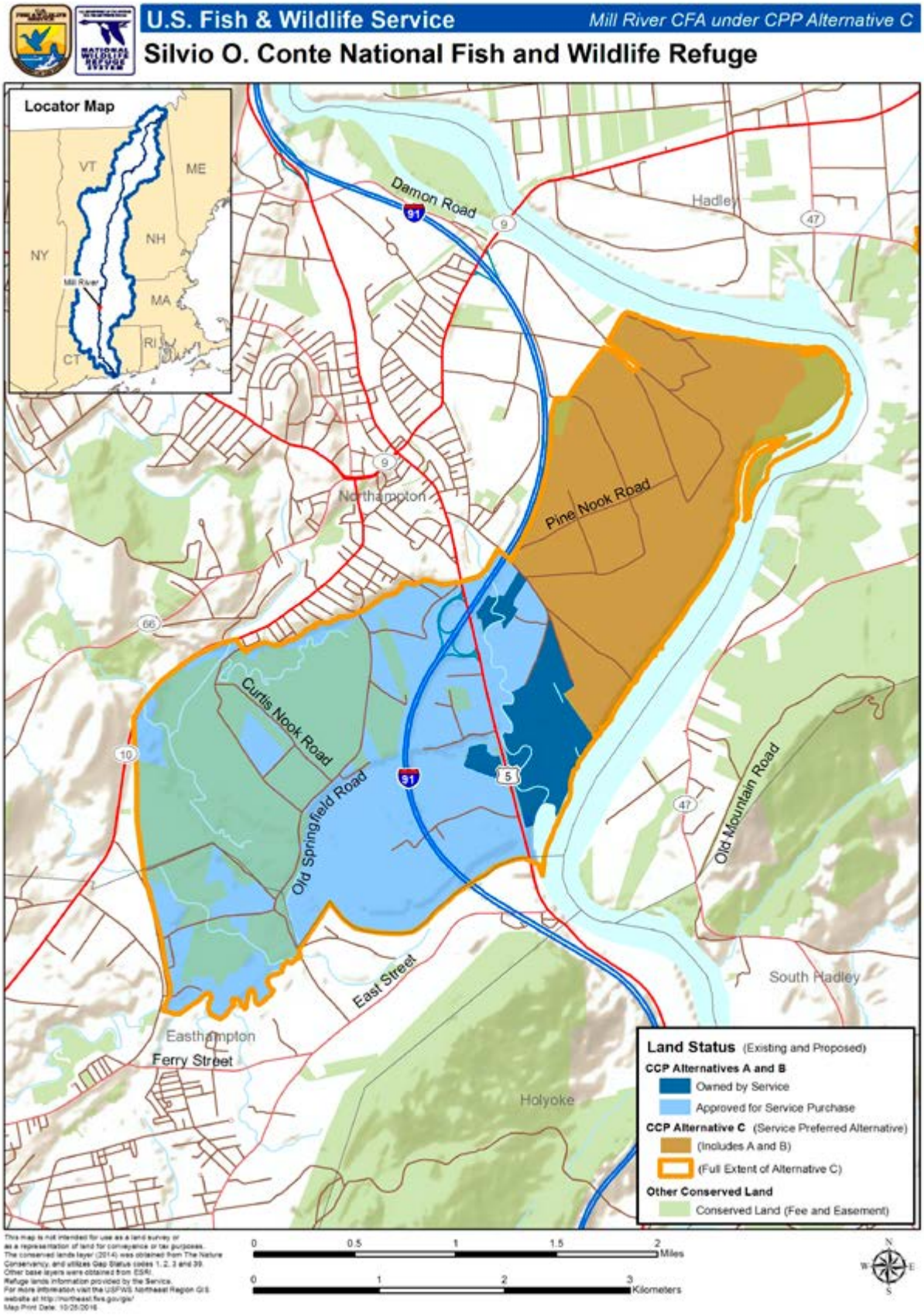
- We will also manage the emergent and shrub wetland habitats, and will focus on maintaining the natural hydrology and native species composition. Invasive plant management will be a priority.

- In open water (stream, rivers, and coves) habitats, we will focus on maintaining stream connectivity, establishing riparian buffers, and reducing run-off from the surrounding landscape. Continue to support research projects, and work with partners, including the Service's Endangered Species Office, to manage and monitor the Federally listed species that occur in the CFA.

What public use opportunities would likely be a priority on refuge lands within the proposed CFA?

We would focus on providing opportunities for the six priority, wildlife-dependent recreational uses: fishing, hunting, wildlife observation and photography, interpretation, and environmental education.

Map A.28. Mill River CFA – Location.



Map A.29. Mill River CFA – Habitat Types.

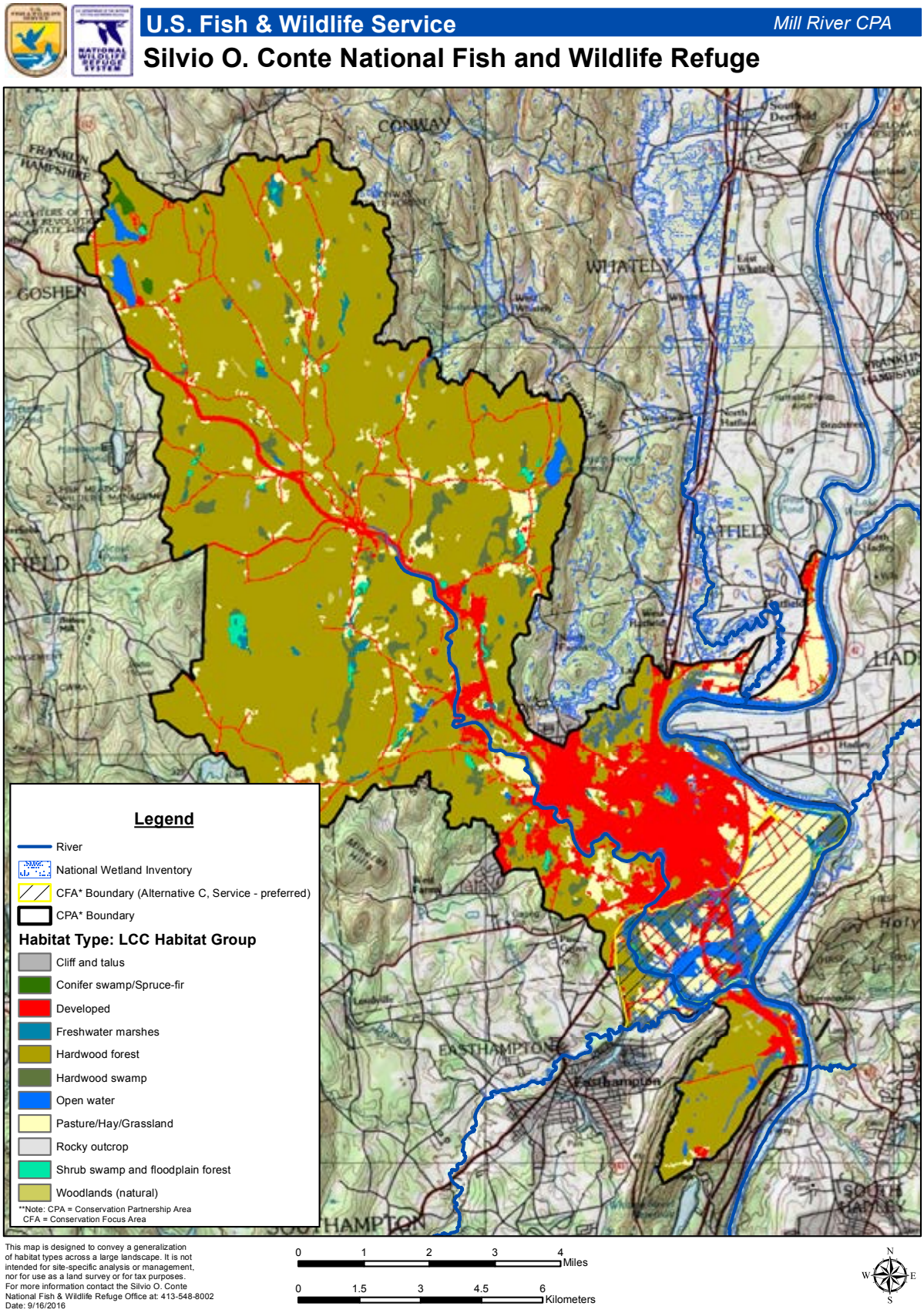


Table A.22. Mill River CFA – Habitat Types.

LCC General Habitat Type[1]	CPA[2]		CFA[3]				
	Total Acres	Percent of CPA[4]	Total Acres	Conserved by Others[5]	USFWS Owned[6]	Percent CFA[7]	Percent Habitat[8]
Forested Uplands and Wetlands[9]							
Conifer swamp/spruce-fir	78	0.2%	-	-	-	0.0%	0.0%
Hardwood forest	29,640	65.6%	285	178	8	8.8%	1.0%
Hardwood swamp	2,209	4.9%	638	345	103	19.8%	28.9%
Shrub swamp and floodplain forest	303	0.7%	31	13	0	1.0%	10.4%
Woodlands (natural)	140	0.3%	-	-	-	0.0%	0.0%
Forested uplands and wetlands subtotal	*32,370*	*71.7%*	*954*	*536*	*112*	*29.6%*	*2.9%*
Non-forested Uplands and Wetlands[9]							
Cliff and talus	62	0.1%	-	-	-	0.0%	0.0%
Freshwater marshes	275	0.6%	76	57	6	2.4%	27.8%
Pasture/hay/grassland	4,282	9.5%	1,412	240	18	43.8%	33.0%
Rocky outcrop	2	0.0%	-	-	-	0.0%	0.0%
Non-forested uplands and wetlands subtotal	*4,621*	*10.2%*	*1,489*	*297*	*24*	*46.1%*	*32.2%*
Inland aquatic habitats[9]							
Open Water	1,504	3.3%	330	24	63	10.2%	22.0%
Inland aquatic habitats subtotal	*1,504*	*3.3%*	*330*	*24*	*63*	*10.2%*	*22.0%*
Other							
Developed	6,661	14.8%	454	65	4	14.1%	6.8%
Other subtotal	*6,661*	*14.8%*	*454*	*65*	*4*	*14.1%*	*6.8%*
TOTAL[10]	**45,156**	**100.0%**	**3,227**	**922**	**203**	**100.0%**	**7.1%**

Notes:

1 - North Atlantic Landscape Conservation Collaborative general habitat typings for USFWS representative species; linked to the National Vegetation Classification System (NVCS). See table A.52 at the end of this appendix for a comparison of these generalized habitat types with the more specific The Nature Conservancy's Northeastern Terrestrial Habitat Classification System. More detailed habitat tables that include the Northeastern Terrestrial Habitat Classification System habitat types are available for each CFA and refuge unit online at: *http://www.fws.gov/refuge/Silvio_O_Conte/what_we_do/conservation.html.*

2 - Conservation Partnership Area

3 - Conservation Focus Area; representing Service-preferred Alternative C

4 - Percentage of the CPA represented by the habitat type

5- Acres in the CFA currently conserved by others (TNC 2014)

6 - Acres in the CFA currently owned by the Service

7 - Percentage of the CFA represented by the habitat type

8 - Percentage of a given habitat within the CPA protected within the CFA under Service-preferred Alternative C

9 - CCP Objective from Conte Refuge final CCP/EIS, Chapter 4, Service-preferred Alternative C

10 – Acreages in this table may differ slightly from the acreages presented in the Overview summary. This table's values were calculated using raster data (an array of pixels, as in a digital photo), while the values in the Overview, and used throughout the final CCP/EIS were calculated using vector data (created from shapes). For the purposes of CFA analysis, the acreages presented in the Overview are more accurate because they better reflect boundaries like parcel lines.

Table A.23. Mill River CFA – Preliminary Priority Refuge Resources of Concern.

Priority Refuge Resources of Concern[1]	Habitat Structure[2]	Associated Species[3]
Forested Uplands and Wetlands[4]		
Hardwood Forest[5] - 286 acres		
Northern Long-eared Bat[D] Tricolored Bat[E]	Winter habitat includes high humidity underground caves or cave like structures; summer habitat includes roost trees that are typically ≥ 3 inches dbh, are alive, dead or dying, exhibits exfoliating bark, cavities, crevices, or cracks and located within a variety of forest types interspersed with non-forested habitats (USFWS 2014, MADFW 2015).	Migratory Species Little Brown Bat[I]
Forested Uplands and Wetlands[4]		
Hardwood Swamp[5] - 637 acres		
Rusty Blackbird[A, C]	Migrat ing and wintering habitat includes floodplain forests, hardwood swamps, and shrub wetlands (C. Foss, Audubon New Hampshire, personal communication 2016).	Migratory Species
Shrub Swamp and Floodplain Forest[5] - 31 acres		
Rusty Blackbird[A, C]	Migrating and wintering habitat includes floodplain forests, hardwood swamps, and shrub wetlands (C. Foss, Audubon New Hampshire, personal communication 2016).	Migratory Species
Non-Forested Uplands and Wetlands[4]		
Freshwater Marshes[5] - 76 acres		
Laurentian-Acadian freshwater marsh[H]	These freshwater emergent and/or submergent marshes are dominated by herbaceous vegetation. They occur in closed or open basins that are generally flat and shallow. They are associated with lakes, ponds, slow-moving streams, and/or impoundments or ditches. The herbaceous vegetation does not persist through the winter. Scattered shrubs are often present and usually total less than 25% cover. Trees are generally absent and, if present, are scattered. The substrate is typically muck over mineral soil. Vegetation includes common bulrush, narrow-leaf cattail, marsh fern, common jewelweed and sedges (Gawler 2008).	Migratory species

Priority Refuge Resources of Concern[1]	Habitat Structure[2]	Associated Species[3]
Non-Forested Uplands and Wetlands[4]		
Pasture/Hay/Grassland[5] – 1,412 acres		
Where appropriate and supported by the local community, restore to floodplain forest	*Laurentian-Acadian floodplain forest* occur along medium to large rivers, and include a matrix of upland and wetland habitats. Floodplain forests, with silver maple are characteristic, as well as herbaceous sloughs and shrub wetlands. Most areas are underwater each spring; micro-topography determines how long the various habitats are inundated. Associated trees include red maple and American hornbeam, the latter frequent but never abundant. On terraces or in more calcium rich areas, sugar maple or red oak may be locally prominent, with yellow birch and ash, black willow is characteristic of the levees adjacent to the channel. Common shrubs include silky dogwood and viburnum. The herb layer in the forested portions often features abundant spring ephemerals, giving way to a fern-dominated understory in many areas by mid-summer. Non-forested wetlands associated with these systems include shrub-dominated and grass-non-woody vegetation (Gawler 2008).	Migratory species

Priority Refuge Resources of Concern[1]	Habitat Structure[2]	Associated Species[3]
Inland Aquatic Habitats[4]		
Water, including River Shoreline Habitat[5] – 321 acres		
Puritan Tiger Beetle[B, D]	Breeding and wintering habitat includes sparsely vegetated or open sandy beaches along large rivers where river flow dynamics restrict woody plant growth (USFWS 1993).	Sea Lamprey[I] Eastern Silvery Minnow[I] Burbot[I] Black Dace[I] Longnose Sucker[I] **Slimy Sculpin**[I] Creek Chubsucker[I] Longnose Dace[I] Brook Snaketail[I]
Dwarf Wedgemussel[B, D, F]	Inhabits creeks and small rivers, prefers the stable bank conditions afforded by gravel or sandy substrates, and good water quality (Nedeau et al. 2000, USFWS 1993).	
American Eel [F]	Migrating and feeding habitat includes lakes, streams and large rivers (USFWS 1996)	
Shortnose Sturgeon[B, D, F, G]	Spawn in slow-moving, 48 F water of large rivers, and feed in fresh and brackish water along the river bottom (USFWS 1996).	
Blueback Herring[F, G]	Spawn in fast moving, shallow water when the river temperature is about 58 F (USFWS 1996).	
American Shad[B, F, G]	Spawn when the water temperature is above 60° F in shoal area of river and lower reaches of larger tributaries (USFWS 1996).	
Atlantic Salmon[B, F, G]	Spawn in cold freshwater moving streams w/ coarse clean gravel and adequate food/cover. Migrate in large rivers (VTWAP 2005).	

Notes:

1 - These species of conservation concern and associated habitats, as well as under-represented and sensitive ecological systems constitute the management focus for the CFA, and recommended for the CPA. They were identified based on specific criteria, and are included in the following plans, databases and/or have Federal status.

A: 2008 Bird Conservation Region 30.
B: 2009 North Atlantic Landscape Conservation Cooperative Development and Operations Plan.
C: 2008 USFWS Birds of Conservation Concern.
D: Federal Threatened and Endangered status as of 2016, including Candidate Species
E: Federal Elevated Concern species or species petitioned for threatened and endangered listing as of 2016
F: 2009-2013 USFWS Northeast Region Fisheries Program Strategic Plan
G: Silvio O Conte Refuge Purpose Species.
H: 2008 Northeastern Terrestrial Habitat Classification System.

2 - This habitat structure will benefit the listed priority refuge resources of concern, and is based on the most recent literature.

3 - These species are a compilation from the following plans, and are associated with the habitat type and/or will benefit from all or a portion of the habitat structure associated with the priority species. This is not a comprehensive list of species.

A:2008 Bird Conservation Region 30.
I: 2015 Massachusetts Comprehensive Wildlife Conservation Strategy
J: 2012 Terrestrial and Wetland Representative Species of the North Atlantic: Species Selected, Considered, and Associated Habitats (Ecological Systems). These species were LCC candidate species and are represented by the selected LCC Representative Species.

4 - CCP Objectives from Silvio O. Conte NFWR Comprehensive Conservation Plan, Chapter 4, Service - preferred Alternative.

5 - These habitat types are based on the North Atlantic Landscape Conservation Cooperative (NALCC) habitat groupings for associated Representative Species, which were derived from The Northeastern Terrestrial Habitat Classification System (NETHCS). See table A.52 for a comparison of the NALCC habitat groupings and NETHCS.

BOLD - These species are LCC Representative Species, which is a species that, because of its habitat use, ecosystem function, or management response, typifies lifecycle or habitat requirements for a larger group of species.

* The Refuge Improvement Act directs the US Fish and Wildlife Service to maintain Biological Integrity, Diversity, and Environmental Health (BIDEH). Elements of BIDEH are represented by native fish, wildlife, plants and their habitats as well as those ecological processes that support them.

Objectives and Strategies for Refuge Lands in the Mill River CFA under Alternative C

Goal 1: Wildlife and Habitat Conservation: Promote the biological diversity, integrity, and resiliency of terrestrial and aquatic ecosystems within the Connecticut River watershed in an amount and distribution that sustains ecological function and supports healthy populations of native fish, wildlife, and plants, especially Federal trust species of conservation concern, in anticipation of the effects of climate, land use, and demographic changes.

Objective 1.1: Forested Uplands and Wetlands

Sub-objective 1.1a. (Hardwood Forest)
Improve the diversity of seral stages and (where and when possible) restore historic composition and structure, and improve landscape connectivity of hardwood forest habitat to support species of conservation concern and aid in climate change adaptation. Management will provide stopover habitat for spring and fall migrants, and potential roosting and foraging areas for the northern long-eared bat and tricolored bat.

Rationale:
We envision healthy forests within the Mill River CFA where a diverse seral structure provides suitable habitat conditions for a suite of Massachusetts wildlife. Our long-term vision for the CFA includes hardwood forests characterized by complex horizontal and vertical structure, a generally closed canopy, large-diameter trees, dead woody material, snags and cavity trees, native species diversity, softwood inclusions, and a diversity of wildlife (Foster et al. 1996, Goodburn and Lorimer 1998, Keeton 2006, D'Amato et al. 2009, Curzon and Keeton 2010, Fraver et al. 2011)

Mill River CFA hardwood forests provide a diversity of habitats for wildlife. To date our review of the Mill River CFA habitats and wildlife species—and their condition—has been limited to coarse-scale information: the careful analysis of spatially-explicit habitat data using GIS, the consultation of local, state, and regional species conservation plans, and an understanding of forest disturbance and land-use history in New England. This allowed identification of broad habitat types, and species of conservation concern known to utilize characteristics common to these habitats. Our understanding of the forest structure within Mill River comes exclusively from a reading of forest history in New England—a legacy of intensive past-use that altered the vegetation structure and composition, landscape patterns, and ongoing ecological dynamics (Cronon 1983, Whitney 1996, Foster et al. 1997, Bellemare et al. 2002, Hall et al. 2002). Our sub-objective assumes the forests of the Mill River are more homogeneous than those of three centuries earlier, and include more sprouting and shade-intolerant species and fewer long-lived mature forest tree species (Goodburn and Lorimer 1998, Foster et al. 1998, Foster 2000, Bellemare et al. 2002, Cogbill et al. 2002, Abrams 2003). Completing a comprehensive forest and habitat inventory post-acquisition will test these assumptions, and aid in identifying stands where a forest management approach that combines passive management and the application of silvicultural treatments designed to emulate gap dynamics, will promote compositional and structural diversity, and where appropriate, move succession forward to emulate later seral stage characteristics.

Migrating landbirds are typically unable to deposit sufficient fat stores to fly nonstop between breeding and nonbreeding areas (Blem 1980) and must use stopover habitats for feeding and resting before continuing migration. Studies have shown migrating birds exhibit selective use of some habitats over others (Moore et al. 1990, Petit 2000, Rodewald et al. 2004). In general, taller, more structurally diverse vegetation types within an area appear to support greater numbers of migrating birds than do habitats of lower stature and complexity (Moore et al. 1990, Noss 1991). Clearly, structurally complex habitats will not be suitable for all migratory species, but our conservation goal is to provide those areas used most frequently by migrating birds, suggesting relatively tall, structurally diverse habitats may best serve this purpose. The plasticity in habitat use exhibited by most species during migration (Moore et al. 1990, Petit 2000) suggests that many species are able to effectively use the food resources and cover afforded by structurally complex habitats. While our management goals may create a relatively old forest, hardwood forests within Mill River will contain a variety of patches in different age classes and developmental stages; it is not uniform throughout. This diversity of age classes provides a variety of bird species with a range of foraging opportunities. Patches of mature edge-dominated (i.e. forest-agricultural edge and suburban forest of the type within Mill River) and shrub-sapling stage forests were used most frequently by fall stopover migrants in a Pennsylvania study (Rodewald et al. 2004).

Efforts to maintain or improve seral stage diversity within the CFA will include the retention of large-diameter (24 inches of greater dbh) trees where appropriate. Such larger trees are either absent or are very few in younger forests, and that has implications for the habitat of wildlife species and for nutrient cycling. Live, dead or dying trees that are >3 inches in dbh with crevices, cavities, cracks or exfoliating bark are used as summer roosting sites for the federally listed northern long-eared bat. These roosting habitats also provide maternity sites where females will raise their young (USFWS 2014). Tricolored bats will also roost in trees, though they tend to roost in the foliage of live or dead trees within a mature stand (MADFW 2015). Snags and cavity trees also provide nesting and foraging sites for bird species such as nuthatches, owls, and woodpeckers, like the northern flicker.

In a mature forest, many migrating bird species tend to remain within specific vegetation layers: on or near the ground, in the middle layer, or up in the canopy. Mill River's hardwood forests should have all forest layers present in moderate to high amounts distributed throughout a stand and across the landscape. Enhanced vertical structure will provide the greatest number of bird species with the greatest number of foraging opportunities. Our active forest management efforts will aim to create or maintain a canopy that is generally closed (greater than 75 to 80 percent closure) with small gap openings scattered throughout a stand and the CFA. These openings will be caused by or mimic small, single- to few-tree disturbances and create opportunities for regenerating intermediate- and shade-tolerant species. Regeneration in these openings will provide a continual supply of ephemeral shrub-sapling habitat rich in fruits and insects important to migrating birds (Noss 1991, DeGraaf et al. 2006). Efforts to regenerate a diversity of species must contend with evidence of reduced diversity or damage to tree seedlings and herbaceous plants attributed to white-tailed deer (Hough 1965, Anderson and Loucks 1979, Tilghman 1989, Rooney and Waller 2003, Côté et al. 2004, see also Rawinski 2008).

Implementation of refuge strategies will begin with a comprehensive, multi-scale forest and wildlife habitat inventory. Forest wildlife species survival and breeding success is dependent not only on the habitat at the stand level, but also the surrounding landscape, making it necessary to consider the proportions and sizes of stand types and successional stages within the CFA and the associated landscape. Baseline information on the condition of hardwood forests at the time of acquisition will further inform more detailed, stand-level habitat prescriptions within a required step-down HMP.

Management Strategies:

Within 5 years of land acquisition and CCP approval:

- Identify forest stands with late successional characteristics for passive management, and those where active management is necessary to improve forest structure. Appendix J provides general forest management guidelines, including descriptions of forestry techniques and explanations about how we will determine where and how to conduct active management.

- Work with partners, including the State of Massachusetts, in support of the State Wildlife Action Plan, to ensure management on Service lands complement adjacent land management objectives.

Within 10 years of land acquisition and CCP approval:

- Implement identified active forest management opportunities using accepted silvicultural practices. Appendix J provides general forest management guidelines, including descriptions of forestry techniques and explanations about how we will determine where and how to conduct active management.

- Protect hard and soft mast producing species such as American beech inclusions, and apple and cherry trees, through the use of best management practices.

- Ensure a diversity of native species is present and non-native species are excluded or managed to keep population levels as low as possible. In particular, focus on:

  ✓ Managing invasive species that weaken or kill native trees (such as oriental bittersweet) or prevent their regeneration (such as exotic bush honeysuckle).

  ✓ Removing amur corktree before it reproduces and spreads.

  ✓ Regularly monitoring for Japanese stiltgrass, mile-a-minute vine, and other new invaders.

- Explore research opportunities with academic partners to address efficacy of forest management in meeting wildlife objectives.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Conduct forest and wildlife inventories.
- Conduct bat acoustic surveys to obtain baseline bat inventory data. Conduct additional surveys, if appropriate, to identify active bat roosting sites and hibernacula.
- Map natural communities; protect rare or exemplary examples.
- Map vernal pools and seeps.

Sub-objective 1.1b. (Hardwood swamp)
Improve the diversity of seral stages, (where and when possible) restore historic composition and structure, and improve the natural hydrology to support natural and rare ecological communities. Management will provide stopover habitat for spring and fall migrants, as well as wintering habitat for rusty blackbirds.

Rationale:
Occurrences of hardwood swamps within the Mill River Conservation Focus Area (CFA) represent a number of natural communities. Historically they have undergone significant alteration, and have great potential for restoration. Where this habitat occurs along riparian and floodplain areas it is often found in small patches where soils have an impermeable or nearly impermeable clay layer that can create a shallow, perched water table. Saturation can vary, with ponding of water common during wetter seasons and drought during the summer or autumn months. The dynamic nature of the watertable drives complexes of forest upland and wetland species including pin oak, red maple, swamp white oak, sweetgum, and blackgum. The examples identified within the Mill River CFA largely occur within the floodplain of the Connecticut River. Within the Mill River floodplain, hardwood swamps may be found in basins, or on gently sloping seepage lowlands within small patches where an acidic substrate of mineral soil, often with a component of organic muck, creates a shallow, perched water table. Saturation remains seasonal and unique species mixtures result, including eastern hemlock, red maple, and blackgum.

These two systems do share a common disturbance history; agricultural practices, development pressures, and selective logging have largely removed these habitats from the landscape, or greatly simplified their historic species composition. Changes in hydrology, water pollution, invasive species introductions, and soil compaction remain as threats. Successional trends in hardwood swamps are not well understood. One possibility is that these areas were once in softwoods such as hemlock, fir, cedar, or spruce. Heavy cutting and clearing for agriculture often eliminated softwood species. Our conservation efforts within the Mill River will focus on promoting the ecological integrity of these stands through restoration of degraded floodplains, and (where and when possible) restoring composition and structure to accepted historical conditions. Restoration of the primary natural disturbance mechanism (seasonal flooding) will aide in the restoration of historical species mixtures.

Restoration of forest habitats, natural levees, backwater sloughs, and oxbow lakes will create high-quality habitat for spring and fall migrant birds in an otherwise agricultural landscape where small, disturbed forest fragments are the rule. Closed canopy deciduous forests that include pin oak and other hardwoods provide mast and other foraging sites shown to be important during the energy-intensive migration (Petit 2000). This CFA may also provide important wintering habitat for rusty blackbirds, a species that has been experiencing drastic population declines since the mid-1900's (IRBWG 2016). This species is a refuge resource of concern. It breeds in the northern reaches of the Connecticut River watershed, winters in the southern reaches of the watershed, and migrates through the Connecticut River corridor. Wintering and migrating habitat for this species includes floodplain forests and scrub-shrub wetlands (C. Foss, Audubon New Hampshire, personal communication 2016).

Implementation of refuge strategies will begin with a comprehensive, multi-scale forest and wildlife habitat inventory. Forest wildlife species survival and breeding success is dependent not only on the habitat at the stand level, but also the surrounding landscape, making it necessary to consider the proportions and sizes of stand types and successional stages within the CFA and the associated landscape. Baseline information on the condition of hardwood swamps at the time of acquisition will further inform more detailed, stand-level habitat prescriptions within a required step-down HMP.

Management Strategies:
Within 5 years of land acquisition and CCP approval:

- Work with partners, including the State of Massachusetts, in support of the State Wildlife Action Plan, to ensure management on Service lands complements adjacent land management.
- Evaluate hydrologic regime to inform restoration efforts.
- Identify forest stands where management is necessary to improve species composition. Appendix J provides general forest management guidelines, including descriptions of forestry techniques and explanations about how we will determine where and how to conduct active management.

Within 10 years of land acquisition and CCP approval:

- Implement identified forest management opportunities to improve species composition. Appendix J provides general forest management guidelines, including descriptions of forestry techniques and explanations about how we will determine where and how to conduct active management.
- Explore research opportunities with academic partners to address efficacy of forest management in meeting wildlife objectives.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Conduct forest and wildlife inventories including surveys for rusty blackbirds during the migration and wintering periods.
- Map natural communities; protect rare or exemplary examples.
- Map vernal pools and seeps.

Sub-objective 1.1c. (Shrub Swamps and Floodplain Forest)
Restore native species composition and structure, and improve the natural hydrology, as needed, to support natural and rare shrub swamp and floodplain forest ecological communities. Management will provide stopover habitat for spring and fall migrants, as well as wintering habitat for rusty blackbirds.

Rationale:
The shrub swamps in the Mill River CFA are restricted to poorly drained areas and small seepage zones within the hardwood swamp communities in the CFA. These shrub swamp systems can have a patchwork of shrub and grass dominance, and may include willow, silky dogwood, speckled alder, white meadowsweet, bluejoint, tall sedge, and common rush (Gawler 2008). Based on our coarse-scale habitat analysis, the shrub swamps are also adjacent to development and agricultural land, which may have impacted the hydrology of the wetland. Water pollution and invasive species introductions are also threats for shrub swamp communities.

Restoration of shrub swamp communities, as well as the surrounding forested habitat, will create high-quality habitat for neotropical migratory birds in an otherwise agricultural landscape where small, disturbed forest fragments are the rule. The Connecticut River watershed is a major migration corridor. The lower portion of the watershed (CT and MA) receives higher use by migrants, with this use concentrated in habitats along the Connecticut River main stem (Smith College 2006). The Mill River CFA is situated on the Connecticut River, and can provide significant stopover habitat for migrants in the spring and fall. Neo-tropical migrants typically use similar habitats during migration as they do during the breeding season (Petit 2000). Species such as gray catbird, yellow-rumped warbler, white-eyed vireo, eastern phoebe, eastern kingbird, and common yellowthroat will use shrub habitats during migration (McCann et al. 1993). Native shrubs will provide migrants with soft mast and abundant insects to replenish fat reserves, and structure to provide rest and adequate cover from predators and inclement weather.

This CFA also may provide important wintering habitat for rusty blackbirds, a species that has been experiencing drastic population declines since the mid-1900's (IRBWG 2016). This species is a refuge resource of concern. It breeds in the northern reaches of the Connecticut River watershed, winters in the southern reaches of the watershed, and migrates through the Connecticut River corridor. Wintering and migrating habitat for this species includes floodplain forests and scrub-shrub wetlands (C. Foss, Audubon New Hampshire, personal communication 2016).

In 2003, before this unit was purchased, refuge staff began leading volunteers to control invasive water chestnut in one of the ponds. The patch of forested floodplain between the two ponds is one of the few places on the division devoid of invasive plant species, perhaps due to frequent or long-term inundation. However, along the edge of this patch, Oriental bittersweet is taking hold and could pose a possible threat in the event of a local hydrological alteration. In 2012, refuge staff and Youth Conservation Corps crews began cutting bittersweet that was threatening overstory trees. Success in protecting the mature floodplain forest trees from bittersweet will be a long-term process. Other invasive species on the division include exotic bush honeysuckle, garlic mustard, purple loosestrife, Japanese barberry. One early detection species, Amur corktree, was identified within the floodplain forest.

Implementation of refuge strategies will begin with a comprehensive, multi-scale wildlife habitat inventory. Wildlife species survival and breeding success is dependent not only on the habitat at a fine scale, but also the surrounding landscape, making it necessary to look at the adjacent habitat conditions and land uses within the CFA and associated landscape. Baseline information on the condition of shrub swamps at the time of acquisition will further inform more detailed habitat prescriptions within a required step-down Habitat Management Plan.

Management Strategies:
Within 5 years of land acquisition and CCP approval:

- Continue to control known invasive plant infestations. In particular:
  - ✓ Control oriental bittersweet that threatens canopy trees and young floodplain trees by pulling smaller plants and cutting larger stems of bittersweet. Follow-up cutting by treating cut stems and resprouting foliage with herbicide.
  - ✓ Treat black locust using herbicides and by following best management practices *(http://mnfi.anr.msu.edu/invasive-species/BlackLocustBCP.pdf)*.
  - ✓ Control Amur corktree and other new invasive species that are known to withstand flooding to protect the regeneration of floodplain forest.
- Coordinate with the Massachusetts Natural Heritage and Endangered Species Program and the local Conservation Commission to ensure invasive plant management complies with the Massachusetts Endangered Species Act and the Massachusetts Wetland Protection Act.
- During the development of the Habitat Management and Integrated Pest Management Plans, assess the threats to native plants from invasive plants and develop priority invasive plant management strategies to limit these threats.
- Minimize refuge activities that disturb wetland communities.
- Work with partners, including the State, in support of the State Wildlife Action Plan, to ensure management on Service lands complement adjacent land management objectives.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Survey wildlife utilization of wetlands including surveys for rusty blackbirds during the migration and wintering periods.
- Map natural communities; protect rare or exemplary examples.

Objective 1.2: Non-forested Uplands and Wetlands

Sub-objective 1.1a. (Freshwater Marshes)
Restore native species composition and structure, and improve the natural hydrology, as needed, to support natural and rare ecological freshwater marsh communities. Management will provide stopover habitat for spring and fall migrants.

Rationale:
Freshwater marshes are often dominated by emergent and submergent herbaceous vegetation. Scattered shrubs are often present, and trees are generally absent. Herbaceous vegetation typically includes common bulrush, jewelweed, marsh fern, water lily, and narrow-leaved cattail (Gawler 2008). Based on our coarse-scale habitat analysis, freshwater marsh habitat occurs in the hardwood swamp communities of the Mill River CFA. These wetlands (hardwood swamps and freshwater marshes) are adjacent to development and agricultural land, which may have impacted their hydrology. Water pollution and invasive species introductions are also threats for freshwater marsh communities.

Restoration of freshwater marsh communities, as well as the surrounding forested habitat, will create high-quality habitat for neotropical migratory birds in an otherwise agricultural landscape where small, disturbed forest fragments are the rule. The Connecticut River watershed is a major migration corridor. The lower portion of the watershed (CT and MA) receives higher use by migrants, with this use concentrated in habitats along the Connecticut River main stem (Smith College 2006). The Mill River CFA is situated on the Connecticut River, and can provide significant stopover habitat for migrants in the spring and fall. Neo-tropical migrants typically use similar habitats during migration as they do during the breeding season (Petit 2000). These freshwater marshes may provide stopover habitat for rails, egrets, and bitterns.

Implementation of refuge strategies will begin with a comprehensive, multi-scale wildlife habitat inventory. Wildlife species survival and breeding success is dependent not only on the habitat at a fine scale, but also the surrounding landscape, making it necessary to look at the adjacent habitat conditions and land uses within the CFA and associated landscape. Baseline information on the condition of shrub swamps at the time of acquisition will further inform more detailed habitat prescriptions within a required step-down HMP.

Management Strategies:
Within 5 years of land acquisition and CCP approval:

- Minimize refuge activities that disturb wetland communities.
- Work with partners, including the State, in support of the State Wildlife Action Plan, to ensure management on Service lands complement adjacent land management objectives.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Survey wildlife utilization of wetlands.
- Map natural communities; protect rare or exemplary examples.

Sub-objective 1.2b. (Pasture/Hay/Grassland)
Restore historic composition and structure, and improve the natural hydrology and landscape connectivity to support natural and rare ecological communities. Management will provide stopover habitat for migratory species.

Rationale:
Sixty-four percent of the Mill River CFA is agricultural land, which is grouped in the more practical Pasture/Hay/Grassland habitat type for the CCP. These agricultural fields lay within the active floodplain of the Connecticut River. This floodplain encompasses the lower portion of the Mill River, and is a natural flood storage area for the surrounding communities.

The topography and natural processes of floodplain systems result in the development of complex upland and wetland vegetation on generally flat topography, and soils deposited by the river. The Mill River CFA has this diversity of habitats in areas not cleared for agricultural use. Hardwood forests and swamps, shrub swamps, and freshwater marsh are part of the floodplain. Silver maple is a characteristic species of a floodplain forest, as well as red maple, ash, red oak, and yellow birch. Common shrubs include black willow, silky dogwood, and viburnums. The herbaceous layer within the forested portions of the floodplain, include spring ephemerals and ferns (Gawler 2008).

Restoration of this floodplain will provide a more contiguous and diverse breeding and migratory habitat for a variety of wildlife species. The Mill River CFA is significant migration habitat as it is located along the Connecticut River, an important migratory corridor (Smith College 2006). A restored floodplain will also improve its function to retain and slow flood waters, reducing the extent of damage to the surrounding communities, and thereby improving water quality.

Management Strategies:
Within 5 years of land acquisition and CCP approval:

- Restore agricultural land as it becomes available and with local support, either through tree plantings or natural processes.

Objective 1.3: Inland Aquatic Habitats

Sub-objective 1.3a. (Open Water and River Shore)
In collaboration with partners, identify and implement habitat restoration opportunities within the Mill River CFA and Connecticut River to benefit priority refuge resources of concern including American shad, shortnose sturgeon, American eel, blueback herring, Atlantic salmon, dwarf wedgemussel, and Puritan tiger beetles, as well as other species of conservation concern such as sea lamprey.

Rationale:
The Mill River CFA provides habitat for a diversity of aquatic and river shoreline species. The Connecticut River and associated tributaries provides migration and feeding habitat for American shad, shortnose sturgeon, American eel, blueback herring, and Atlantic salmon. The main stem shoreline within the CFA supports a population of federally listed Puritan tiger beetles. Dwarf wedge mussel, also a federally listed species, occurred historically in the CFA near Pynchon Meadows.

Shortnose sturgeon, a federally listed species, and Atlantic salmon use this section of the Connecticut River during migration. Blueback herring, American shad and American eel use the mainstem and the Mill River which runs through the CFA. American eel feed in these aquatic habitats until they reach sexual maturity and begin the long migration to their spawning grounds in the Sargasso Sea (ASMFC 2000).

Another species of conservation concern that utilize freshwater aquatic habitats in this CFA is sea lamprey. Sea lamprey enter the Connecticut River and tributaries to reproduce, and in the process provide important ecological benefits to aquatic systems. Adults transport nutrients between freshwater and saltwater systems, their nest construction restores and enhances streambed structure, abandoned nests are used by other riverine fish, and lamprey eggs and larvae provide food for a variety of species (Kircheis 2004). As with many riverine fish, sea lamprey movement is impeded by barriers on the main stem and tributaries.

The Puritan tiger beetle, a federally listed species, uses beach habitat in the northeast portion of the CFA along the Connecticut River. The river flow dynamics of the Connecticut River restricts woody plant growth, provides sparsely vegetated and open sandy beaches required by these beetles. This beach habitat is owned by MA Wildlife and the city of Northampton. The recovery criteria in the USFWS Puritan Beetle Recovery Plan specifies that a minimum of three metapopulations, at least two of which are large (500-1000+ adults) are maintained or established (ie. self-maintained for at least 10 years) within the species historical range along the Connecticut River, and habitat they occupy is permanently protected (Hill and Knisley 1993). The current tiger beetle population in the CFA is below 100 individuals, and population levels seem to be declining (Davis 2012). Encroaching vegetation and recreational activities on the beach and Connecticut River are contributing factors toward this instability.

There is a historic location of dwarf wedgemussel, a federally listed species, in the Mill River Division near Pynchon Meadows. This species requires stable bank conditions afforded by gravel or sandy substrates, and good water quality (U.S. Fish and Wildlife Service 1993, Nedeau et al. 2000). An inventory of this area will be necessary to determine dwarf wedgemussel presence, and to assess current habitat suitability.

Restoration of upland and wetland habitats in the Mill River CFA will improve water quality of these river systems by eliminating erosion, and providing forest or wetland buffers to reduce sedimentation and filter out contaminants in riparian areas. We will work with partners to provide clear aquatic species passage to spawning habitat, and assist with fish population research and monitoring. We will also assist with conducting education of the local community to decrease recreational impacts on the Puritan tiger

beetle, and remove vegetation from beach habitat to improve conditions for beetle larvae. Baseline information on the condition of the water resources, and associated upland and wetland habitats in the CFA will further inform more detailed habitat prescriptions within a required step-down Habitat Management Plan (HMP).

Management Strategies:
Within 5 years of land acquisition and CCP approval:

- Work with partners to reduce combined sewer overflow affecting aquatic resources.
- Work with adjacent landowners to eliminate barriers to aquatic species passage.
- Continue to support Puritan tiger beetle research opportunities.
- Hand-pull or apply herbicide to encroaching vegetation in Puritan tiger beetle larval habitat.

Within 10 years of land acquisition and CCP approval:

- Work with partners to protect and increase "hard bottom" (e.g., gravel, cobble, or bedrock) for spawning aquatic species.
- Work with partners to educate the general public about recreational use impacts on Puritan tiger beetle populations using outreach, visitor contact, restricted access and other tools, as warranted.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Work with the USFWS New England Endangered Species Office to inventory area for dwarf wedgemussel, and assess habitat conditions to determine if restoration of aquatic habitat is appropriate.
- Work with partners, to continue to inventory Puritan tiger beetle populations to allow further analysis of population trends.

Within 10 years of CCP approval:

- Monitor recreational use activities to address recurring issues and impacts to Puritan tiger beetle populations

Objective 1.4: Coastal Non-forested Uplands (coastal beaches and rocky shores)

Not applicable

Objective 1.5: Coastal Wetlands and Aquatic Habitats (tidal salt marsh and estuary)

Not applicable

Goal 2: Education, Interpretation, and Outreach: Inspire residents and visitors to actively participate in the conservation and stewardship of the exceptional natural and cultural resources in the Connecticut River watershed, and promote a greater understanding and appreciation of the role of the Silvio O. Conte National Fish and Wildlife Refuge in conserving those resources.

Objective 2.1: Environmental Education

In collaboration with public and private educators from all four states in the watershed, lead or facilitate the implementation of structured natural and cultural resource curricula, with a focus on guiding educators and students to develop an awareness of, and concern about, natural and cultural resources and associated challenges; appreciate our conservation history; make informed decisions and work individually or collectively toward solutions; and model responsible environmental stewardship in their everyday lives.

Sub-objective 2.1a. (Environmental Education Planning and Training)
Encourage schools, scout groups, and summer camps to develop curricula that use the Mill River Division as an outdoor classroom.

Rationale:
See environmental education rationale in chapter 4 detailing the importance of environmental education for the Service. Environmental education is one of the six priority, wildlife-dependent recreational uses of the Refuge System. Environmental education is particularly important at Conte Refuge because one of its founding purposes is to provide opportunities for environmental education. Environmental education is an important tool that can help refuge visitors and local residents, particularly students, appreciate the importance of this area to the larger watershed.

Management Strategies:
Within 1 year of acquiring sufficient land:

- Encourage schools, scout groups, and summer camps to develop curricula that use the Mill River Division as an outdoor classroom.

Sub-objective 2.1b. (Environmental Education Delivery)
Encourage schools, scout groups, and summer camps to use the Mill River Division as an outdoor classroom.

Rationale:
Because this division will be unstaffed, the majority of environmental education opportunities on this division will be led by partners, volunteers, and local school groups and other educational groups (e.g., scout groups and summer camps).

Management Strategies:
Within 1 year of acquiring sufficient land:

- Encourage schools, scout groups, and summer camps to develop curricula that use the Mill River Division as an outdoor classroom.

Objective 2.2: Interpretation

Develop, lead, and facilitate interpretive programs that emotionally and intellectually connect the audience to natural and cultural resources in the watershed.

Sub-objective 2.2a. (Natural and Cultural Resource Interpretive Planning and Training)
With Friends groups, public and non-profit organizations, and volunteers, offer quality interpretive programming at the Mill River Division. The development of highly trained interpreters will be encouraged by offering interpretive training to Friends' members, partners, and volunteers on a regular basis.

Rationale:
See the rationale in chapter 4 detailing the importance of interpretation for the Service. Interpretation is an important tool that can help refuge visitors and local residents appreciate the importance of this area to the larger watershed. With an ADA compliant trail planned for the site, the Mill River Division will be well suited to support both self-guided, wildlife dependent interpretive experiences, as well as guided interpretive programs that convey messages about the refuge and about the Mill River Division's habitats and cultural resources.

Management Strategies:
(These strategies are dependent on land acquisition from willing landowners.)

Within 5 years of acquiring sufficient land:

- Inventory and evaluate each CFA to determine the appropriate interpretive materials to employ.

- Create meaningful, consistent, thematic statements to be used in the delivery of programming at the Mill River Division.

- Provide resources and trainings to Friends, and volunteers in support of interpretive programs.

Within 10 years of acquiring sufficient land:

- Develop standardized self-guided interpretive services, such as interpretive trails and kiosks, exhibits, and printed media.
- Employ a variety of themed interpretive offerings (e.g., presentations, audio-visual programs, brochures, and exhibits) when creating programming for natural and cultural resource interpretation.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Build an evaluation process that includes formal and informal evaluation to assess the effectiveness of all interpretation programs.

Sub-objective 2.2b. (Natural and Cultural Resource Interpretive Program Delivery)
Collaborate with Friends group, partners, and volunteers to deliver quality natural and cultural resource interpretive programs.

Rationale:
See rationale for sub-objective 2.2a.

Management Strategies:
(These strategies are dependent on land acquisition from willing landowners.)

Within 5 years of acquiring sufficient land:

- Through partners, and Friends group, annually provide quality interpretive programs, exhibits, printed media at the Mill River Division.
- Incorporate thematic statements, measureable objectives and evaluation measures into all interpretation efforts.
- Publicize interpretive programs through traditional media, on the refuge web site, and digital social media conduits.
- Maintain a supply of print interpretive brochures, i.e., general brochure and bird checklist that incorporate refuge interpretive messages and themes.
- Work with partners to create issue-oriented experiential activities and programs for use at their facilities.

Within 10 years of acquiring sufficient land:

- Contribute refuge interpretive information for scenic byways and other state publications and signs.
- Develop self -guided interpretive messages and use state of the art as well as traditional media (e.g., brochures).

Objective 2.3: Public and Community Outreach

Support, promote, and coordinate a wide range of outreach tools and activities to facilitate and improve communications and relationships with the American public, especially communities, adjacent landowners, and elected officials in the Connecticut River watershed, and to empower citizens to recognize and resolve local natural resource issues and promote conservation and the responsible use of natural resources.

Because the Mill River Division would be unstaffed and does not have refuge facilities, public and community outreach for this site will occur through regular outreach activities at the headquarters and will not specifically occur at this site.

Objective 2.4: Science and Technical Outreach

Facilitate the collection and exchange of information that increases the knowledge and understanding of natural and cultural resources, addresses climate change and other conservation issues, and provides land managers with better information to make management decisions affecting resources.

Because the Mill River Division would be unstaffed and does not have refuge facilities, science and technical outreach for this site will occur through regular outreach activities at the headquarters and will not specifically occur at this site.

Goal 3: Recreation: Promote high-quality, public recreational opportunities in the Connecticut River watershed that are complementary between ownerships and provide regional linkages with emphasis on promoting wildlife-dependent activities that connect people with nature.

Objective 3.1: Hunting

Support quality public hunting opportunities in the Connecticut River watershed to promote a unique understanding and appreciation of natural resources and their management on lands and waters, while also protecting a traditional outdoor pastime deeply rooted in America's natural heritage and conservation history.

Sub-objective 3.1a. (Hunting Opportunity, Access and Infrastructure)
Provide the opportunity for a quality hunting experience based on state regulations.

Rationale:
Hunting is allowed on national wildlife refuges, as long as it is found to be a compatible use. The Mill River Division has been a popular area with hunters for many years prior to acquisition by the Service and has been open under a pre-acquisition compatibility determination. Retaining hunting opportunities at this division conforms to historic use on this property and much of the surrounding land in the area. Popular game species include white-tailed deer, Eastern wild turkey, waterfowl, and cottontail rabbits. Allowing hunters to use public lands helps ensure this wildlife-dependent recreational activity continues and contribute to the state's population management objectives.

Management Strategies:
Continue to:

- Allow hunter access to the refuge outside of the normal division open hours (i.e. 30 minutes before sunrise and 30 minutes after sunset) as long as they are engaged in lawful hunting activities.
- Post newly acquired properties to ensure refuge boundary lines are clearly marked.
- Allow temporary tree stands and blinds that meet state hunting regulations and do not harm trees or other refuge vegetation. Tree stands and blinds must have the owner's name and phone number clearly displayed, and they must be removed at the end of the hunt season.

Within 1 year of CCP approval:

- Complete all administrative requirements to maintain hunting consistent with State hunting regulations and, if necessary, additional refuge-specific regulations.
- Install an informational kiosk to post information on hunting seasons and other notices to visitors.

Within 5 years of CCP approval:

- Work with Massachusetts Department of Fish and Game to determine whether opportunities exist for state-recognized disabled hunters.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Work with Massachusetts Department of Fish and Game to evaluate the effectiveness and success of the refuge hunt program in contributing to state population objectives.

Sub-objective 3.1b. (Hunter Education and Outreach)
Provide hunter education classes access to the division and conduct directed outreach to ensure hunters are informed about regulations, hunter ethics, and safety considerations. Develop programs, including brochures, signage, website pages, media releases, etc. to increase interest in hunting at the division.

Rationale:
Hunting is a priority public use that also serves as a population management tool. Providing hunter education instructors the opportunity to use the division with their classes will strengthen connections to the hunting community and student understanding of the role hunting plays in wildlife management. Making relevant information readily available to hunters through a variety of media will improve the quality of the hunting experience.

Management Strategies:
Within 1 year of CCP approval:

- Produce a hunt brochure that includes information on regulations, hunter ethics, safety considerations, etc. and make it available on the refuge website, at Mill River Division kiosks, through a friends group, and in local businesses.

- Provide visitors with general information on the hunting program and refuge-specific and State regulations through the refuge website, information signs, and a hunting brochure. In all materials related to the hunting program, promote and encourage the use of lead-free ammunition.

- Work with the State to identify and evaluate the impacts associated with requiring the use of non-toxic ammunition for hunting on refuge lands.

Within 5 years of CCP approval:

- Offer to host hunter education field courses.

- Work with Massachusetts Department of Fish and Game to encourage youth hunting at the division as a means of introducing young people to this traditional recreation activity.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Develop a system to monitor and evaluate the hunting program with hunters and other users to determine if the objective is being met and to allow for adaptive management.

Objective 3.2: Fishing

Support quality, public fishing opportunities in the Connecticut River watershed to promote an understanding and appreciation of natural resources and their management on lands and waters, while also protecting a traditional outdoor pastime deeply rooted in the America's natural heritage and conservation history.

Sub-objective 3.2a. (Fishing Opportunities, Access and Infrastructure)
Provide quality fishing opportunities at the Mill River Division after completing all administrative procedures to officially open refuge lands to fishing, based on Massachusetts Department of Fish and Game regulations, and division-specific conditions, if necessary.

Rationale:
Fishing is a priority public use on national wildlife refuges and a popular outdoor recreational activity. The division has been open to fishing, following acquisitions, through a pre-acquisition compatibility determination, but no formal opening package or fishing plan has been completed. Fishing from the banks of the Connecticut River and Magnolia and Triangle ponds on the division are popular recreational activities.

Management Strategies:
Continue to:

- Post newly acquired properties to ensure refuge boundary lines are clearly marked.

Within 1 year of CCP approval:

- Complete all administrative requirements to maintain fishing consistent with State hunting regulations and, if necessary, additional refuge-specific regulations.
- Install an informational kiosk in a conspicuous location to post information on fishing seasons and other notices to visitors.
- The Mill River Division would be open to visitors actively engaged in fishing during the seasons and times established by the state in their annual fishing regulations.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Develop a system to monitor and evaluate the fishing program with anglers and other users to determine the objective is being met and to allow for adaptive management.

Sub-objective 3.2b. (Angler Education and Outreach)
Develop programs, including brochures, signage, website pages, media releases, etc. to inform visitors of fishing opportunities at the division.

Rationale:
Although most anglers will be drawn to the Connecticut River or other areas better known for fishing, the Mill River offers the opportunity to fish for game fish including sunfish and bullhead. Visitors unaware of this available resource may choose to participate while on the division.

Management Strategies:
Within 5 years of CCP approval:

- Produce a fishing brochure that includes information on regulations, angler ethics, safety considerations, etc. and make it available on the refuge website, at informational kiosks, and in local businesses. In all materials related to the fishing program, promote use of lead-free tackle.

Objective 3.3: Wildlife Observation and Photography

Support quality, public opportunities to observe and photograph wildlife in the Connecticut River watershed in a variety of natural habitats to connect a broad spectrum of people with nature.

Sub-objective 3.3a. (Infrastructure and Access for Wildlife Observation and Photography)
Provide quality opportunities for wildlife observation and photography at the Mill River Division.

Rationale:
Wildlife viewing and photography is a priority public use on national wildlife refuges and a popular recreational activity in this part of the state. Currently, there is no infrastructure in place at the division to support this use, and consequently, visitation for wildlife viewing and photography is limited. Allowing people to engage in wildlife observation and photography is in keeping with the nature of the area.

Management Strategies:
Continue to:

- Allow wildlife observation and photography at the Mill River Division.
- Allow public access at the Mill River Division daily from 30 minutes before sunrise to 30 minutes after sunset with the exception listed for hunters and anglers.

Within 1 year of CCP approval:

- Construct an informational kiosk to post information and notices for visitors.

Within 10 years of CCP approval:

- Develop a public access strategy and required planning (i.e. NEPA, compatibility determination) that includes consideration of developed trails, parking, kiosks, viewing platforms, blinds, interpretation, signage, etc.

Within 15 years of CCP approval:

- Implement the visitor use enhancements identified in the public access strategy and the refuge Visitor Services Plan.

Sub-objective 3.3b. (Wildlife Observation and Photography Aids)
Offer viewing and photography aids that enhance the visitor experience. Use a variety of methods to reach a broad spectrum of people. Work closely with the friends group and other partners who host events designed to view wildlife on the division.

Rationale:
The entire division is available for wildlife observation and photography; however, there are steps the refuge can take to enhance their time on the division. Visitation increases are expected as this division expands and becomes better known. By providing new visitors a quality experience they are more likely to return and tell friends. One way to accomplish this is to offer sufficient information to attract a variety of visitors through a variety of media.

Management Strategies:
Within 1 year of CCP approval:

- Allow photography blinds that do not negatively impact wildlife behavior or conflict with other visitors. Blinds must be removed each day, unless arrangements have been made via a special use permit.

Within 5 years of CCP approval:

- Produce a wildlife and plant species guide for the Mill River Division that will be available on the refuge website, at the refuge headquarters, and at division kiosk.
- Sponsor wildlife observation events such as International Migratory Bird Day, the Big Sit, etc.
- Encourage local schools and groups to offer wildlife-related trips to the division.

Sub-objective 3.3c. (Watershed-based Partner Initiatives)
Not applicable

Objective 3.4: Other Recreational Activities

In order to reach a broader demographic, support non-priority outdoor recreational opportunities and public access to quality, nature-based experiences throughout the Connecticut River watershed that facilitate and improve community relationships, raise awareness and an appreciation for conserving natural resources, and garner support for the National Wildlife Refuge System.

Sub-objective 3.4a. (Regional Water-based Trail Initiatives and Opportunities Including Refuge Lands)
Develop compatible opportunities on the Mill River Division that support regional water-based trail initiatives to connect people with nature, raise the visibility of the Service and the Refuge System, make the refuge more relevant to the local community, and to promote economic activity in the local area.

Rationale:
Regional water-based trails give individuals opportunities to engage in outdoor recreational opportunities in the Connecticut River watershed, such as fishing, boating, and wildlife observation. Examples include the Connecticut River waterway route.

Within 5 years of CCP approval:

- Work with public and private partners to determine whether and what roles this division might contribute to a Connecticut River waterway trail.

- As lands are acquired, evaluate any water trails (e.g., canoe/kayak trails) that part of a regional or State network for their compatibility.

Sub-objective 3.4b. (Regional Land-based Trail Initiatives and Opportunities Including Refuge Lands)
Develop compatible opportunities on the Mill River Division that support regional land-based trail initiatives to connect people with nature, raise the visibility of the Service and the Refuge System, make the refuge more relevant to the local community, and to promote economic activity in the local area.

Rationale:
Regional land-based trails give individuals opportunities to engage in outdoor recreational opportunities in the Connecticut River watershed, such as hiking, wildlife observation, and interpretation. Where appropriate, we will work with these partners to promote, and distribute information about, these opportunities.

Management Strategies:
Within 5 years of acquiring land:

- As lands are acquired, evaluate any existing trails (e.g., hiking trails, snowmobile trails, horseback riding trails) that part of an established regional or State network to determine if they are appropriate and compatible uses for the refuge.

Sub-objective 3.4c. (Other Appropriate and Compatible Recreational Opportunities That Enhance Visitor Use and Enjoyment of Refuge Lands)
Allow compatible outdoor recreational opportunities on the Mill River Division that connect people with nature, raise the visibility of the Service and the Refuge System, make the refuge more relevant to the local community, and promote economic activity in the local area.

Rationale:
In addition to the priority public uses, there are other wildlife-dependent, appropriate, and compatible recreational activities that can broaden the visitor base, giving people alternative ways to enjoy the natural resources at the division. Each of these must be found to be both appropriate and compatible to be an authorized use of the refuge.

Management Strategies:
Continue to:

- Allow dispersed hiking, snowshoeing, and cross-country skiing.

- Allow pet walking. In order to minimize conflicts with wildlife and other visitors, pets must be on leashes not longer than 10 feet in length.

Within 1 year of CCP approval:

- Allow recreational gathering of blueberries, blackberries, strawberries, raspberries, mushrooms, fiddleheads, and antler sheds.

- When compatible, allow commercial guiding in support of priority public uses by special use permit.

Within 5 years of CCP approval:

- Work with Friends groups and partners to design and market a virtual geocache course at the division. The course should integrate orienteering with refuge interpretive messages that include linking this division to other refuge divisions and units.

Overview
Westfield River Conservation Focus Area (Existing Refuge Division)

Washington, Middlefield, and Becket, Massachusetts

Conservation Focus Area (CFA)—Acreage Profile	Acres	Percentage of CFA
Total CFA Acres to be Conserved by Service	6,177	84 %
■ *Existing Refuge Ownership in CFA*[1]	*125*	
■ *Additional Acres in CFA proposed for Refuge Acquisition*[2]	*6,052*	
Existing Acres in CFA Permanently Conserved by Others[2,3]	1,162	16%
Total Acres in CFA[2, 4]	7,339	100 %

[1] Acres from Service's Realty program (surveyed acres).

[2] Acres calculated using GIS.

[3] The Service does not plan to acquire existing conserved lands, except under extenuating circumstances (conserved acres from TNC 2014 data).

[4] The Service would conserve up to this number of acres. The Service only acquires lands from willing sellers.

What specific criteria and/or considerations drove the selection of this CFA?

The refuge's existing Westfield River Division was established in 2013. It lies within the Westfield CPA. The Westfield River CFA is part of an area identified by the State of Massachusetts as a priority for conservation. It would offer the opportunity to conserve lands along a high-quality segment of the Westfield River that supports a cold-water fisheries, such as eastern brook trout. The proposed CFA is located in an area with an extensive conserved lands network, including the Gilbert A. Bliss and Dead Branch State Forests, the Chesterfield Gorge Reservation (Trustees of Reservations, the Hiram H. Fox, Brewer Brook, and Fisk Meadows Wildlife Management Areas, and U.S. Army Corps of Engineers Land (Knightville Dam and Indian Hollow). Virtually all of the Westfield River CFA overlaps terrestrial Tier 1 Core and Connector lands identified through the *Connect the Connecticut* landscape conservation design. Additional land protection by the Service in this area will help better connect these conserved lands.

What are the priority habitat types within the proposed CFA? What percentage of the total CFA acreage do they represent?

- Hardwood Forest – 90.4%
- Shrub swamp and floodplain forest – 0.8%
- Conifer Swamp/Spruce-Fir – 2.1%

For more information on the habitats in the CFA, see map A.31 and table A.24.

What are the resources of conservation concern for the proposed CFA?

As noted in table A.25 below, there are nine priority refuge resources of concern (PRRC) terrestrial and aquatic species that may rely upon the diverse habitats in this CFA. There are also habitat types that are not being managed for a particular PRRC species, but are important for their contribution to Biological Integrity Diversity and Environmental Health (BIDEH) of the landscape. The refuge will seek to protect and restore (if necessary) these habitat types. Additionally, we recognize the value of this area to State Species of Greatest Conservation Need (SGCN) and species that require large contiguous forest tracts including forest interior dwelling bird species. These species and others are discussed further below.

1. **Federal Threatened and Endangered Species**
2. This CFA is within the range of the federally listed northern long-eared bat and tricolored bat, a species petitioned for listing under the ESA. During summer nights, these bats forage on insects within wetlands and forested habitats. Northern long-eared bats roost under the bark or within cavities of large (> 3 dbh) diameter trees during the day (USFWS 2014). Tricolored bats will also roost in trees, though they tend to roost in the foliage of live or dead trees within a mature stand (MADFW 2015). These roosting habitats also provide maternity sites where females will raise their young. In the winter, these bats will hibernate in underground caves or cave like structures, often within close proximity to their summer roosting and feeding areas. Areas within the CFA may contain important maternity and summer roosting sites, as well as foraging areas for this species.
3.
4. **Migratory Birds**
   The Connecticut River watershed is a major migration corridor. The lower portion of the watershed (CT and MA) receives higher use by migrants, with this use concentrated in habitats along the Connecticut River main stem. Migrants become more evenly distributed in watershed habitats beyond the Connecticut River main stem (Smith College 2006). The Westfield River CFA not only provides important stopover habitat for migrating landbirds, but breeding habitat as well.

   The Westfield River CFA is within the West Branch of the Westfield River Watershed which provides a contiguous core of mostly undeveloped forested acres. The mosaic of habitat types and undeveloped contiguous forested acres in the Westfield River CFA supports a diversity of breeding landbirds, including species of conservation concern and forest interior dwelling species. These include PRRC species such as wood thrush, blackburnian warbler, chestnut-sided warbler, American woodcock, and Canada warbler. This CFA is in the core range for many other species of conservation concern including black-throated blue warbler, black-throated green warbler, ruffed grouse, ovenbird, veery and purple finch.

5. **Waterfowl**
   Potential breeding and foraging habitat for American black duck, a PRRC species, wood duck, Canada geese, and other waterfowl species within wetlands adjacent to slow moving streams and open water habitats.

6. **Diadromous fish and other aquatic species**
   The West Branch of the Westfield River flows through the town of Becket along the southwest portion of the CFA. This branch is a free-flowing river with very few aquatic barriers along its tributaries. The West Branch, and two of its tributaries, Coles Brook and Factory Brook provide important cold water habitat for PRRC including brook trout and Atlantic salmon. Other cold aquatic species that occur within this watershed include slimy sculpin, lake chub, and many species of invertebrates such as mayflies, stoneflies, caddisflies. American eel, species of conservation concern for the Service and state SGCN, also occurs in the Westfield River CFA.

7. **Wetlands**
   The Westfield River CFA contains 19 acres of hardwood swamp, 157 acres of conifer swamp, 63 acres shrub-swamp, and floodplain forest, and 10 acres of freshwater marsh. Many of these wetlands occur along slow moving streams or small ponds. Habitat patches range from 2 acres to 57 acres in size.

What habitat management activities would likely be a priority on refuge lands within the proposed CFA?

We will conduct a comprehensive, multi-scale wildlife habitat inventory following acquisition. Baseline information on the condition of habitats (i.e., forested, non-forested and open water habitats) will further inform more detailed, habitat prescriptions within a required step-down Habitat Management Plan (HMP). Once inventory has been completed, then management will focus on maintaining the following conditions:

- Forest management activities will provide a diversity of seral stages including early successional and mature forested habitats. The forests in the CFA will be structurally diverse and species composition will be appropriate for site conditions and location. Appendix J provides general forest management guidelines, including descriptions of forestry techniques and explanations about how we will determine where and how to conduct active management.
- We will also manage wetland habitats, and pasture, hay, grassland habitats. Wetland management will focus on maintaining the natural hydrology and native species composition. Invasive plant management will be a priority.
- In open water (stream, rivers, ponds) habitat, we will focus on maintaining forested stream buffers, a structurally diverse instream habitat, and clear aquatic species passage to spawning and wintering habitat.

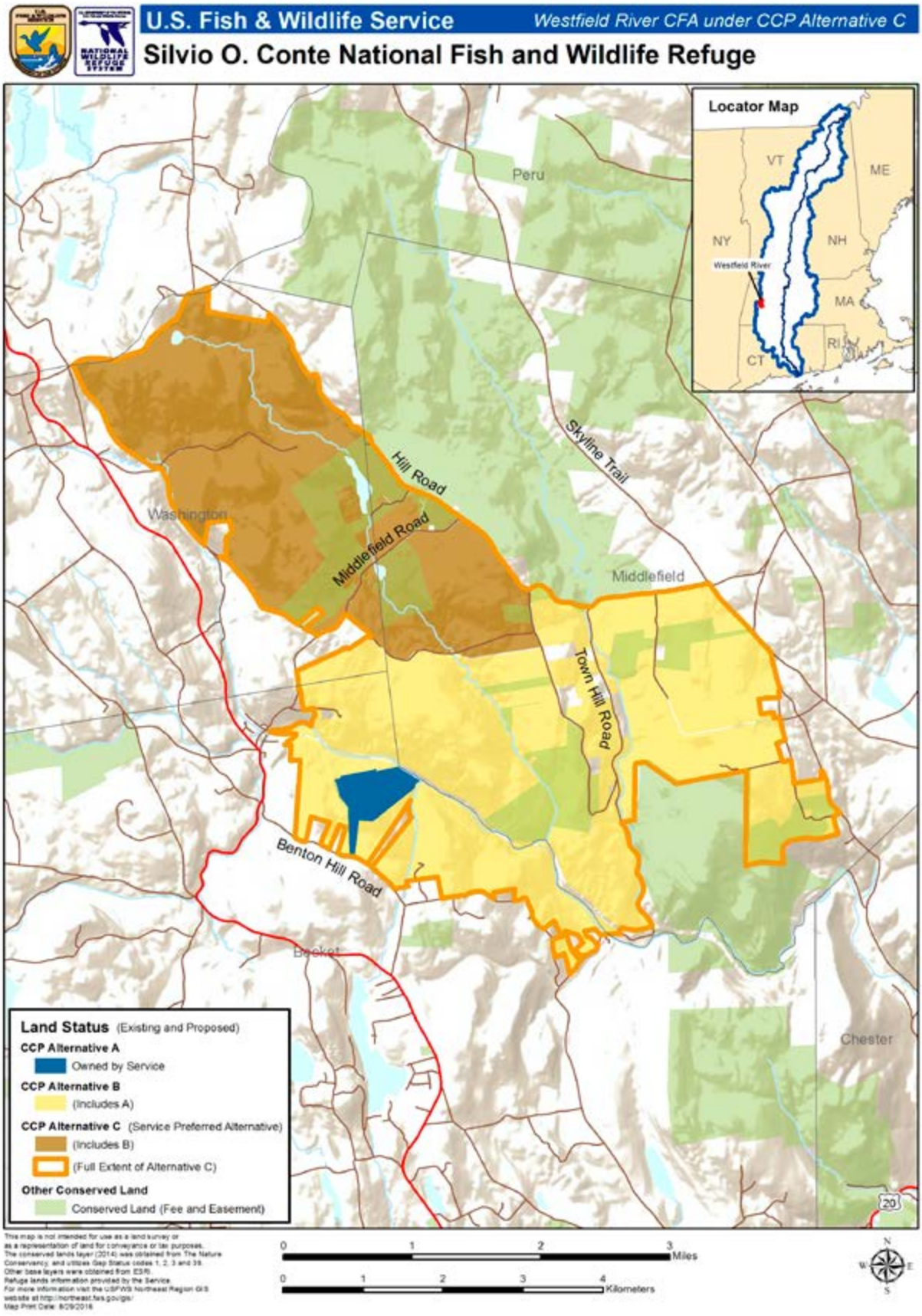
What public use opportunities would likely be a priority on refuge lands within the proposed CFA?

We would focus on providing opportunities for the six priority, wildlife-dependent recreational uses: hunting, fishing, wildlife observation and photography, interpretation, and environmental education.

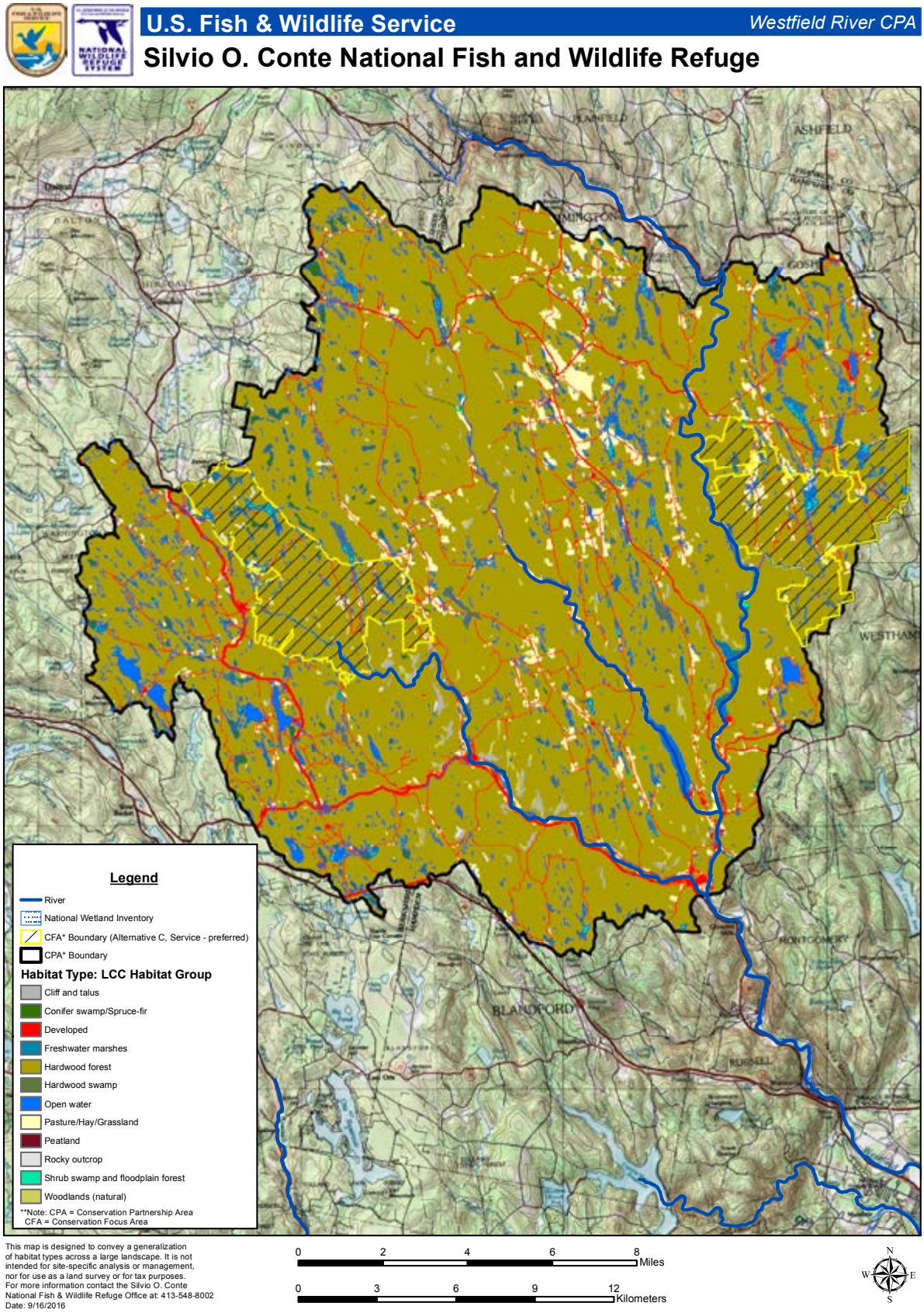
Were there other special considerations in delineating the CFA boundary?

The Westfield River Watershed has been recognized by The Nature Conservancy, the State of Massachusetts and the National Wild and Scenic Rivers program as one of the most intact river systems in Massachusetts and one of the healthiest tributaries to the Connecticut River. The watershed is currently over 80 percent forested and only 4 percent developed, remarkable for southern New England. The West Branch within the Westfield River CFA is 91 percent forested, 6 percent in wetlands and other natural cover, and only 3 percent developed.

Map A.30. Westfield River CFA – Location.



Map A.31. Westfield River CPA – Habitat Types.



This map is designed to convey a generalization of habitat types across a large landscape. It is not intended for site-specific analysis or management, nor for use as a land survey or for tax purposes. For more information contact the Silvio O. Conte National Fish & Wildlife Refuge Office at: 413-548-8002
Date: 9/16/2016

Table A.24. Westfield River CPA/CFA – Habitat Types.

LCC General Habitat Type[1]	CPA[2]		CFA[3]				
	Total Acres	Percent of CPA[4]	Total Acres	Conserved by Others[5]	USFWS Owned[6]	Percent CFA[7]	Percent Habitat[8]
Forested Uplands and Wetlands[9]							
Conifer swamp/spruce-fir	1,710	1.1%	157	34	-	2.1%	9.2%
Hardwood forest	127,135	85.3%	6816	1,060	125	90.5%	5.4%
Hardwood swamp	2,445	1.6%	19	-	-	0.3%	0.8%
Shrub swamp and floodplain forest	1,018	0.7%	63	6	-	0.8%	6.2%
Woodlands (natural)	562	0.4%	32	16	-	0.4%	5.8%
Forested uplands and wetlands subtotal	*132,871*	*89.1%*	*7087*	*1,116*	*125*	*94.1%*	*5.3%*
Non-forested Uplands and Wetlands[9]							
Cliff and talus	775	0.5%	14	4	-	0.2%	1.9%
Freshwater marshes	676	0.5%	10	2	-	0.1%	1.5%
Pasture/hay/grassland	6,224	4.2%	169	23	-	2.2%	2.7%
Peatland	4	0.0%	0	-	-	0.0%	0.0%
Rocky outcrop	256	0.2%	39	-	-	0.5%	15.3%
Non-forested uplands and wetlands subtotal	*7,935*	*5.3%*	*233*	*28*	-	*3.1%*	*2.9%*
Inland aquatic habitats[9]							
Open Water	1,547	1.0%	60	27	-	0.8%	3.9%
Inland aquatic habitats subtotal	*1,547*	*1.0%*	*60*	*27*	-	*0.8%*	*3.9%*

LCC General Habitat Type[1]	CPA[2]		CFA[3]				
	Total Acres	Percent of CPA[4]	Total Acres	Conserved by Others[5]	USFWS Owned[6]	Percent CFA[7]	Percent Habitat[8]
Other							
Developed	6,751	4.5%	155	16	-	2.1%	2.3%
Other subtotal	*6,751*	*4.5%*	*155*	*16*	-	*2.1%*	*2.3%*
TOTAL10	**149,103**	**100.0%**	**7534**	**1,187**	**125**	**100.0%**	**5.1%**

Notes:

1 - North Atlantic Landscape Conservation Collaborative general habitat typings for USFWS representative species; linked to the National Vegetation Classification System (NVCS). See table A.52 at the end of this appendix for a comparison of these generalized habitat types with the more specific The Nature Conservancy's Northeastern Terrestrial Habitat Classification System. More detailed habitat tables that include the Northeastern Terrestrial Habitat Classification System habitat types are available for each CFA and refuge unit online at: *http://www.fws.gov/refuge/Silvio_O_Conte/what_we_do/conservation.html.*

2 - Conservation Partnership Area

3 - Conservation Focus Area; representing Service-preferred Alternative C

4 - Percentage of the CPA represented by the habitat type

5- Acres in the CFA currently conserved by others (TNC 2014)

6 - Acres in the CFA currently owned by the Service

7 - Percentage of the CFA represented by the habitat type

8 - Percentage of a given habitat within the CPA protected within the CFA under Service-preferred Alternative C

9 - CCP Objective from Conte Refuge final CCP/EIS, Chapter 4, Service-preferred Alternative C

10 – Acreages in this table may differ slightly from the acreages presented in the Overview summary. This table's values were calculated using raster data (an array of pixels, as in a digital photo), while the values in the Overview, and used throughout the final CCP/EIS were calculated using vector data (created from shapes). For the purposes of CFA analysis, the acreages presented in the Overview are more accurate because they better reflect boundaries like parcel lines.

Table A.25. Westfield River CFA – Preliminary Priority Refuge Resources of Concern.

Priority Refuge Resources of Concern[1]	Habitat Structure[2]	Associated Species[3]
Forested Uplands and Wetlands[4]		
Hardwood Forest[5] - 6,815 acres		
Wood Thrush[A, B, C]	Breeding habitat includes contiguous mature forests (80+ years old) dominated by deciduous tree species, moist soils, a moderate to dense sub-canopy and shrub density, open forest floor and closed canopy (Roth et al. 1996, Rosenberg et al. 2003).	Black-throated Blue Warbler[A] Broad-winged hawk[I,J] Black-billed Cuckoo[A, J] Black-throated Green Warbler[A] Ruffed Grouse[A, I] Whip-poor-will[A, I, J] **Louisiana Waterthrush**[I] Brown Thrasher[I] **Ovenbird**[A] **Eastern Red Bat**[I] Veery[A] American Redstart[A, J] Eastern Box Turtle[I] Four-toed Salamander[I] Sharp-shinned Hawk[J] Little Brown Bat[I] Purple Finch[A] Yellow-bellied Sapsucker[A,J] Black Racer[I] Bobcat[I] Moose[I] Black Bear[I] Rose-breasted Grosbeak[A]
American Woodcock[A, B, C]	Breeding and roosting habitat includes young deciduous and mixed forests (1-20 years old) dominated by aspen and birch, and 3+ acre forest openings with 60% shrub cover, in proximity to alder wetlands and herbaceous openings (Kelley et al. 2008, Sepik et al. 1994).	
Chestnut-sided Warbler[A, B, I]	Early successional deciduous forested upland and wetland habitat (Dunn et al, 1997, Richardson et al, 1995)	
Canada Warbler[A, B, C]	Breeding habitat includes contiguous deciduous, mixedwood and coniferous forests interspersed with openings that provide an average overstory tree height of 55 ft within >30% canopy closure, a dense foliar mid-story and well developed shrub layer 7-20' in height, and moist soils (Chace et al. 2009, Lambert et al. 2005, Dunn et al. 1997).	
Northern Long-eared Bat[D] Tricolored Bat[E]	Winter habitat includes high humidity underground caves or cave like structures; summer habitat includes roost trees that are typically $\geq$ 3 inches dbh, are alive, dead or dying, exhibits exfoliating bark, cavities, crevices, or cracks and located within a variety of forest types interspersed with non-forested habitats (USFWS 2014, MADFW 2015).	
Blackburnian Warbler[A]	Breeding habitat includes mature conifer, and conifer-deciduous forests (80+ years old) (DeGraaf et al. 2001, Dunn et al. 1997, Morse 2004).	
Hardwood Swamp[5] - 19 acres		
North-Central Appalachian acidic swamp[H] North Central Interior and Appalachian rich swamp[H]	*North-Central Appalachian acidic swamps* are found in basins or on gently sloping seepage lowlands. Eastern hemlock is usually present and may be dominant. It is often mixed with deciduous wetland trees such as red maple or black tupelo. Species of the genus Sphagnum are an important component of the moss layer. *North Central Interior and Appalachian rich swamps* are found in basins where higher p[H] and/or nutrient levels are associated with a rich flora. Species include red maple, black ash, as well as calcium loving herbs. Conifers include American larch, but typically not northern white cedar, which is characteristic of more northern wetland systems. There may be shrubby or herbaceous openings within the primarily wooded cover. The substrate is primarily mineral soil, but there may be some peat development (Gawler 2008).	Uncommon plant community within the landscape that contributes to BIDEH*

Priority Refuge Resources of Concern[1]	Habitat Structure[2]	Associated Species[3]
Forested Uplands and Wetlands[4]		
Conifer Swamp[5] - 157 acres		
Canada Warbler[A, B, C]	Breeding habitat includes contiguous deciduous, mixedwood and coniferous forests interspersed with openings that provide an average overstory tree height of 55 ft within >30% canopy closure, a dense foliar mid-story and well developed shrub layer 7-20' in height, and moist soils (Chace et al. 2009, Lambert et al. 2005, Dunn et al. 1997).	Purple Finch[A,I] Northern Parula[A,I]
Shrub Swamp and Floodplain Forest[5] - 63 acres		
American Woodcock[A, B, C]	Foraging habitat includes alder dominated wetlands in proximity to early successional forests, shrublands, and herbaceous openings (Kelley et al. 2008, Sepik et al. 1994).	Chestnut-sided Warbler[A] Ruffed Grouse[A, I] **Warbling Vireo** **Spotted Turtle**[I] American Redstart[A, J] Eastern Kingbird[J] Gray Catbird[J] Wood Duck[J] Eastern Towhee[I] White-throated Sparrow[I] **Willow Flycatcher** Canada Goose[A]
American Black Duck[A, B, C, G]	Breeding and migrating habitat includes herbaceous wetlands, fens, and flooded meadows and shrub-swamps (Longcore et al. 2000, De[G]raaf et al. 2001).	
Woodlands (natural)[5] - 32 acres		
Central Applachian pine-oak rocky woodland[H]	This system of the central Appalachians encompasses open or sparsely wooded hilltops and outcrops or rocky slopes. The substrate rock is granitic or of other acidic lithology. The vegetation is patchy, with woodland as well as open portions. Pine species are indicative and often are mixed with oak species. Some areas have a fairly well-developed heath shrub layer, others a grass layer. Conditions are dry and nutrient-poor, and many, if not most, sites have a history of fire (Gawler 2008).	Uncommon plant community within the landscape that contributes to BIDEH*
Non-Forested Uplands and Wetlands[4]		
Cliff and Talus[5] - 14 acres		
Laurentian-Acadian acidic cliff and talus[H] North-central Appalachian circumneutral cliff and talus[H]	These cliff systems occur at low to mid elevations, well below treeline. The vegetation within the *Laurentian-Acadian acidic cliff and talus system* is patchy and often sparse, punctuated with patches of small trees such as birches and spruce species. Species that prefer calcium rich soils are absent. In north-facing or other sheltered settings where cold air accumulates at the bottom of slopes, a shrubland of heaths and reindeer lichens can develop. Eastern red cedar is a characteristic tree species, poison ivy a characteristic woody vine, and common polypody a characteristic fern. Substrates within the *circumnuetral cliff and talus system* include limestone, dolomite and other rocks. The vegetation varies from sparse to patches of small trees, in places forming woodland or even forest vegetation. Ash, basswood, and American bladdernut are woody indicators of the enriched setting. The herb layer includes at least some species that are indicators of enriched conditions, e.g., yellow jewelweed, purple cliffbrake, ebony spleenwort, or bluntlobe cliff fern (Gawler 2008).	Uncommon plant community within the landscape that contributes to BIDEH*

Priority Refuge Resources of Concern[1]	Habitat Structure[2]	Associated Species[3]
Non-Forested Uplands and Wetlands[4]		
Freshwater Marshes[5] - 10 acres		
American Black Duck[A, B, C, G]	Breeding and migrating habitat includes herbaceous wetlands, fens, and flooded meadows and shrub-swamps (Longcore et al. 2000, De[G]raaf et al. 2001).	**Marsh Wren** **American Bittern**[A,I] Northern Harrier[A,I,J] Spotted Turtle[I] Northern Leopard Frog[I] Canada Goose[A,J] Eastern Ribbon Snake[I] Wood Duck[J]
Non-Forested Uplands and Wetlands[4]		
Pasture/Hay/Grassland[5] – 168 acres		
American Woodcock[A, B, C]	Roosting habitat includes old fields with scattered tall herbaceous vegetation and/or shrubs. Herbaceous openings such as log landings and pasture used for singing grounds (Kelley et al. 2008, Sepik et al. 1994).	Field Sparrow[I,J] Northern Harrier[A,I,J] **Bobolink**[A,I] **Eastern Meadowlark**[I] **Grasshopper Sparrow**[I] Black Racer[I] White-throated Sparrow[I] American Kestrel[I] Northern Leopard Frog[I] Prairie Warbler[I] Chestnut-sided Warbler[A, B, I]
Rocky Outcrop[5] – 39 acres		
Northern Appalachian-Acadian rocky heath outcrop[H]	*The Northern Appalachian-Acadian rocky heath outcrop system* occurs on ridges or summits of erosion-resistant acidic bedrock. The vegetation is patchy, often a mosaic of woodlands and open glades. Red oak and various conifers, including White pine and Red spruce, are characteristic trees. Low heath shrubs, including Sheep laurel, Low-bush blueberry, Black huckleberry, and Black chokeberry are typically present. Exposure and occasional fire are the major factors in keeping the vegetation relatively open (Gawler 2008).	Uncommon plant community within the landscape that contributes to BI-DEH*

Priority Refuge Resources of Concern[1]	Habitat Structure[2]	Associated Species[3]
Inland Aquatic Habitats[4]		
Open Water[5] – 60 acres		
American Eel[E, F]	Migrating and feeding habitat includes lakes, streams and large rivers (USFWS 1996)	Longnose Sucker[I] Black Dace[I] **Slimy Sculpin**[I] Creek Chubsucker[I] Longnose Dace[I] Lake Chub[I] Arrow Clubetail[I] Riffle Snaketail[I]
Brook Trout[B, F]	Spawning habitat includes clear, well oxygenated cold water lakes/ponds/streams with silt-free rocky substrate, abundant cover, vegetated banks, stable temperatures and stream flow (VTWAP 2005).	
Atlantic Salmon[B, F, G]	Spawn in cold freshwater moving streams w/coarse clean gravel and adequate food/cover. Migrate in large rivers (VTWAP 2005).	

Notes:

1 - These species of conservation concern and associated habitats, as well as under-represented and sensitive ecological systems constitute the management focus for the CFA, and recommended for the CPA. They were identified based on specific criteria, and are included in the following plans, databases and/or have Federal status.

A: 2008 Bird Conservation Region 14.
B: 2009 North Atlantic Landscape Conservation Cooperative Development and Operations Plan.
C: 2008 USFWS Birds of Conservation Concern.
D: Federal Threatened and Endangered status as of 2016, including Candidate Species
E: Federal Elevated Concern species or species petitioned for threatened and endangered listing as of 2016
F: 2009-2013 USFWS Northeast Region Fisheries Program Strategic Plan
G: Silvio O Conte Refuge Purpose Species.
H: 2008 Northeastern Terrestrial Habitat Classification System.

2 - This habitat structure will benefit the listed priority refuge resources of concern, and is based on the most recent literature.

3 - These species are a compilation from the following plans, and are associated with the habitat type and/or will benefit from all or a portion of the habitat structure associated with the priority species. This is not a comprehensive list of species.

A: 2008 Bird Conservation Region 14.
I: 2015 Massachusetts Comprehensive Wildlife Conservation Strategy
J: 2012 Terrestrial and Wetland Representative Species of the North Atlantic: Species Selected, Considered, and Associated Habitats (Ecological Systems). These species were LCC candidate species and are represented by the selected LCC Representative Species.

4 - CCP Objectives from Silvio O. Conte NFWR Comprehensive Conservation Plan, Chapter 4, Service-preferred Alternative.

5 - These habitat types are based on the North Atlantic Landscape Conservation Cooperative (NALCC) habitat groupings for associated Representative Species, which were derived from The Northeastern Terrestrial Habitat Classification System (NETHCS). See table A.52 for a comparison of the NALCC habitat groupings and NETHCS.

BOLD - These species are LCC Representative Species, which is a species that, because of its habitat use, ecosystem function, or management response, typifies lifecycle or habitat requirements for a larger group of species.

* The Refuge Improvement Act directs the US Fish and Wildlife Service to maintain Biological Integrity, Diversity, and Environmental Health (BIDEH). Elements of BIDEH are represented by native fish, wildlife, plants and their habitats as well as those ecological processes that support them.

Goals, Objectives, and Strategies for Refuge Lands in the Westfield River CFA under Alternative C

Goal 1: Wildlife and Habitat Conservation: Promote the biological diversity, integrity, and resiliency of terrestrial and aquatic ecosystems within the Connecticut River watershed in an amount and distribution that sustains ecological function and supports healthy populations of native fish, wildlife, and plants, especially Federal trust species of conservation concern, in anticipation of the effects of climate, land use, and demographic changes.

Objective 1.1: Forested Uplands and Wetlands

Sub-objective 1.1a. (Hardwood Forest)
Improve the diversity of seral stages and (where and when possible) restore historic composition and structure, and improve landscape connectivity of hardwood forest habitat to support species of conservation concern and aid in climate change adaptation. Management will provide breeding and foraging habitat for priority refuge resources of concern, including wood thrush, chestnut-sided warbler, American woodcock, Canada warbler, blackburnian warbler, and northern long-eared bat and tricolored bat (if appropriate).

Rationale:
We envision healthy forests within the Westfield River CFA where a diverse seral structure provides suitable breeding and post-breeding habitat conditions for a suite of Massachusetts wildlife. Our long-term vision for the CFA includes hardwood forests characterized by complex horizontal and vertical structure, a generally closed canopy, large-diameter trees, dead woody material, snags and cavity trees, native species diversity, softwood inclusions, and a diversity of wildlife (Foster et al. 1996, Goodburn and Lorimer 1998, Keeton 2006, D'Amato et al. 2009, Curzon and Keeton 2010, Fraver et al. 2011).

Forests of the Westfield River CFA blanket a watershed recognized by The Nature Conservancy, the State of Massachusetts, and the National Wild and Scenic Rivers program as one of the most intact river systems in Massachusetts. This intact mosaic of habitats is among the most diverse and productive for wildlife in the Connecticut River watershed, and abundant, high-quality habitat is certainly available within the CFA. To date our review of the Westfield River CFA habitats and wildlife species—and their condition—has been limited to coarse-scale information: the careful analysis of spatially-explicit habitat data using GIS, the consultation of local, state, and regional species conservation plans, and an understanding of forest disturbance and land-use history in New England. This allowed identification of broad habitat types, and species of conservation concern known to utilize characteristics common to these habitats. Our understanding of the forest structure within Westfield River comes exclusively from a reading of forest history in New England—a legacy of intensive past-use that altered the vegetation structure and composition, landscape patterns, and ongoing ecological dynamics (Cronon 1983, Whitney 1996, Foster et al. 1997, Bellemare et al. 2002, Hall et al. 2002). Our sub-objective assumes the forests of the Westfield River are more homogeneous than those of three centuries earlier, and include more sprouting and shade-intolerant species and fewer long-lived mature forest tree species (Goodburn and Lorimer 1998, Foster et al. 1998, Foster 2000, Bellemare et al. 2002, Cogbill et al. 2002, Abrams 2003). Completing a comprehensive forest and habitat inventory post-acquisition will test these assumptions, and aid in identifying stands where a forest management approach that combines passive management and the application of silvicultural treatments designed to emulate gap dynamics, will promote compositional and structural diversity, and move succession forward to emulate later seral stage characteristics.

For forest birds, the ability to survive and breed is often related to the presence of specific forest structural conditions or attributes, such as those that provide nest sites, food and foraging substrates, singing perches, and cover from predators. While our management goals may create a relatively old forest, hardwood forests within Westfield River will contain a variety of patches in different age classes and developmental stages; it is not uniform throughout. This diversity of age classes provides a variety of bird species with a range of nesting and foraging opportunities. Further, finer-scale investigation of forest conditions may identify opportunities to improve age class diversity through the creation of early-successional forests—a habitat in decline in portions of the watershed. Species dependent upon disturbances that create early successional forested habitats, like refuge priority species of concern American woodcock, are declining as remaining patches of young forest mature(Sepik

et al. 1994, Kelley et al. 2008). Across the CFA, enhanced horizontal structure should support other species of conservation concern like chestnut-sided warbler, ruffed grouse, eastern red bat, and—if wetlands and riparian areas are present—Canada warbler (Lambert et al. 2005, Reitsma et al. 2008, Chace et al. 2009).

In a mature forest, many nesting bird species tend to remain within specific vegetation layers: on or near the ground, in the middle layer, or up in the canopy. Hardwood forests within the Westfield River CFA should have all forest layers present in moderate to high amounts distributed throughout a stand and across the landscape. Enhanced vertical structure will provide the greatest number of bird species with the greatest number of nesting and foraging opportunities. Patches of very dense native shrub and understory layers (0-5 feet in height) are of particular importance to species like Canada warbler. These habitat elements may have importance to declining mature forest-interior species identified in regional conservation plans like wood thrush and blackburnian warbler. Wood thrush nest and feed at the ground level; a sub-canopy layer of shrubs, moist soils and leaf litter are important habitat features (Roth et al. 1996, Rosenberg et al. 2003). And wood thrush has significance as a NALCC representative species for hardwood forests in the NALCC southern sub-region. Improving vertical diversity by preserving softwood inclusions during forest management may provide an important habitat component for blackburnian warblers, who dwell in the upper canopies of conifers, and are thought to be strongly associated with the hemlock forests within Westfield River. Blackburnian warblers have been shown to decline in response to removal of hemlock by hemlock wooly adelgid (Tingley et al. 2002).

Our active forest management efforts will aim to create or maintain a canopy that is generally closed (>75-80% closure) with small gap openings scattered throughout a stand and the CFA. These openings will be caused by or mimic small, single- to few-tree disturbances and create opportunities for regenerating intermediate- and shade-tolerant species. Regeneration in these openings will provide a continual supply of ephemeral nesting habitat for species like wood thrush. Efforts to regenerate a diversity of species must contend with evidence of reduced diversity or damage to tree seedlings and herbaceous plants attributed to white-tailed deer (Hough 1965, Anderson and Loucks 1979, Tilghman 1989, Rooney and Waller 2003, Côté et al. 2004, see also Rawinski 2008). The distribution and concentration of these openings will vary, but interior forest conditions will be maintained on the whole. Close canopy conditions favor a suite of interior-nesting bird species that include: ovenbird, black-throated green warbler, and—where softwood inclusions are abundant—blackburnian warbler.

Efforts to maintain or improve seral stage diversity within the CFA will include the retention of large-diameter (24 inches or greater dbh) trees where appropriate. Such larger trees are either absent or are very few in younger forests, and that has implications for the habitat of wildlife species and for nutrient cycling. Structurally-sound, large-diameter trees are important nest sites for woodland raptors, such as the red-shouldered hawk. Emergent white pines—tall, large-diameter trees that extend above the canopy—provide special habitats that are utilized by species like the northern goshawk. Standing trees that are dead and/or contain cavities will be present in all size classes for those species, like black bear, that require large logs or trees for their dens (Wynne and Sherburne 1984, Chapin et al. 1997, DeGraaf and Yamasaki 2001). Live, dead or dying trees that are $\geq$3 inches in dbh with crevices, cavities, cracks or exfoliating bark are used as summer roosting sites for the federally listed northern long-eared bat. These roosting habitats also provide maternity sites where females will raise their young (USFWS 2014). Tricolored bats will also roost in trees, though they tend to roost in the foliage of live or dead trees within a mature stand (MADFW 2015). Snags and cavity trees also provide important nesting and foraging sites for bird species such as nuthatches, owls, and woodpeckers, like the yellow-bellied sapsucker.

Implementation of refuge strategies will begin with a comprehensive, multi-scale forest and wildlife habitat inventory. Forest wildlife species survival and breeding success is dependent not only on the habitat at the stand level, but also the surrounding landscape, making it necessary to consider the proportions and sizes of stand types and successional stages within the CFA and the associated landscape. Baseline information on the condition of hardwood forests at the time of acquisition will further inform more detailed, stand-level habitat prescriptions within a required step-down Habitat Management Plan (HMP).

Management Strategies:
Within 5 years of land acquisition and CCP approval:

- Identify forest stands where soils and species composition will support woodcock management.
- Identify forest stands with late successional characteristics for passive management, and those where active management is necessary to improve forest structure, species composition, and/or ecological function. Appendix J provides general forest management guidelines, including descriptions of forestry techniques and explanations about how we will determine where and how to conduct active management.

- Work with partners, including the State, in support of the State Wildlife Action Plan, to ensure management on Service lands complement adjacent land management objectives.

Within 10 years of land acquisition and CCP approval:

- Implement identified active forest management opportunities using accepted silvicultural practices. Appendix J provides general forest management guidelines, including descriptions of forestry techniques and explanations about how we will determine where and how to conduct active management.
- Protect hard and soft mast producing species such as American beech inclusions, and apple and cherry trees, through the use of best management practices.
- Ensure a diversity of native species is present and non-native species are excluded or managed to keep population levels as low as possible.
- Collaborate with partners within the Westfield River Watershed Invasive Species Partnership to strategically prevent and manage invasive species within the watershed, including on refuge land.
- Explore research opportunities with academic partners to address efficacy of forest management in meeting wildlife objectives.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Conduct forest and wildlife inventories.
- Conduct bat acoustic surveys to obtain baseline bat inventory data. Conduct additional surveys, if appropriate, to identify active bat roosting sites and hibernacula.
- Map natural communities; protect rare or exemplary examples.
- Map vernal pools and seeps.

Sub-objective 1.1b. (Conifer Swamps)
Improve the diversity of seral stages, (where and when possible) restore historic composition and structure, and improve the natural hydrology to support natural and rare ecological communities. Management will provide breeding and foraging habitat for refuge resources of concern including Canada warbler.

Rationale:
To date our review of the softwood swamps within the Westfield River CFA has been limited to coarse-scale information: the careful analysis of spatially-explicit habitat data using GIS, the consultation of local, state, and regional species conservation plans, and an understanding of forest disturbance and land-use history in New England. These forested wetlands are found on mineral soils that are nutrient-poor; there may be an organic layer, but generally not deep peat. These basin wetlands remain saturated for all or nearly all of the growing season, and may have standing water seasonally. Red maple, ash species, red spruce, and balsam fir are often the most typical overstory species present. Where soils tend more to alkaline conditions white cedar is a common tree species, and the shrub layer is generally more diverse. Historically, development pressure and selective logging have removed this habitat from the landscape, or greatly simplified its historic species composition. Changes in hydrology, water pollution, invasive species introductions, and soil compaction remain as threats.

Successional trends in softwood swamps are not well understood. Heavy cutting and clearing for agriculture often eliminated softwood species. Our conservation efforts within Westfield River will focus on promoting the ecological integrity of these stands through restoration of degraded floodplains, and (where and when possible) restoring composition and structure to accepted historical conditions. Restoration of the primary natural disturbance mechanism (seasonal flooding) will aide in the restoration of historical species mixtures where the natural hydrology has been disrupted.

Where needed, restoration of softwood swamp habitats will create high-quality habitat for neotropical migratory birds. Closed canopy softwood forests that include white cedar and other softwoods provide important mast, food, nesting, and cover. Softwood swamp stands with large average stand diameters, a variety of tree conditions

(including large-diameter dead stems, live trees with hollow stems and dead limbs, and small diameter suppressed and dying stems), and nearby water have a high habitat potential for cavity-dwelling wildlife species (DeGraaf et al. 2006).

Canada warbler, a priority refuge resource of concern, occupies this habitat type with high densities occurring in mixed forested swamps (Lambert and Faccio 2005, Reitsma et al. 2008, Chace et al. 2009). The wet soil conditions in swamps limit the canopy closure, and frequent blow downs create canopy gaps. This provides a well developed shrub layer—an important habitat component for foraging and nest cover (Chace et al. 2009). Canada warbler shows area sensitivity in forests fragmented by suburban sprawl (Robbins et al. 1989). Conifer swamps in the Westfield River CFA are within a matrix of contiguous forest, where fragmentation is not a concern. Conifer swamp patches of ten acres or greater are thought to provide suitable breeding habitat for Canada warbler in the Westfield River CFA, and allow monitoring of population response to management actions (R. Dettmers personal communication 2013).

Implementation of refuge strategies will begin with a comprehensive, multi-scale forest and wildlife habitat inventory. Forest wildlife species survival and breeding success is dependent not only on the habitat at the stand level, but also the surrounding landscape, making it necessary to consider the proportions and sizes of stand types and successional stages within the CFA and the associated landscape. Baseline information on the condition of hardwood swamps at the time of acquisition will further inform more detailed, stand-level habitat prescriptions within a required step-down Habitat Management Plan.

Management Strategies:
Within 5 years of land acquisition and CCP approval:

- Evaluate hydrologic regime to inform restoration efforts.
- Identify forest stands with late successional characteristics for passive management, and those where active management is necessary to improve forest structure, species composition, and/or ecological function. Appendix J provides general forest management guidelines, including descriptions of forestry techniques and explanations about how we will determine where and how to conduct active management.
- Work with partners, including the State of Massachusetts, in support of the State Wildlife Action Plan, to ensure management on Service lands complement adjacent land management.

Within 10 years of land acquisition and CCP approval:

- Implement identified forest management opportunities to improve species composition, forest structure, and/or ecological function. Appendix J provides general forest management guidelines, including descriptions of forestry techniques and explanations about how we will determine where and how to conduct active management.
- Explore research opportunities with academic partners to address efficacy of forest management in meeting wildlife objectives.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Conduct forest and wildlife inventories.
- Map vernal pools and seeps.
- Map natural communities; protect rare or exemplary examples.

Sub-objective 1.1c. (Shrub Swamps and Floodplain Forest)
Manage shrub swamp and floodplain forest communities to support natural and rare ecological communities, and provide potential breeding and foraging habitat for priority refuge resources of concern including American woodcock and American black duck.

Rationale:
Shrub swamps are restricted to poorly drained areas, small seepage zones, and wide alluvial stretches of rivers and small streams. Shrubs tend to dominate the wetland, though grasses may be present. Typical species include willow, silky dogwood, speckled alder, white meadowsweet, bluejoint, tall sedge, and common rush (Gawler 2008).

These wetlands are also created through beaver activity, a natural and important disturbance process within the CFA. Our coarse-scale habitat analysis of this CFA identifies a shrub swamp wetland complex along Cole Brook and Depot Brook. The landscape mosaic of flooded areas and ponds in various stages of succession provide a diversity of plant communities, and habitats for a variety of wildlife species, including American woodcock and American black duck, priority refuge resources of concern.

American woodcock are dependent on early-successional forests—a habitat in decline in portions of the watershed. Species dependent upon disturbances that create early successional forested habitats, like American woodcock, are declining as remaining patches of young forest mature. Woodcock require varying habitat conditions that are within close proximity of each other, including clearings for courtship, forest openings with sparse shrub or herbaceous cover for roosting, young deciduous forests of shade intolerant tree species for nesting and brood rearing, and functional foraging areas (Sepik et al. 1994, Kelley et al. 2008). Shrub swamps in the CFA provide moist, rich soils for foraging and the dense shrubs provide cover from predators.

Management of the shrub swamp communities may be required to maintain shrub dominance and stem densities. Tree species, such as red maple, tend to replace mature shrub species and established invasive plants compete for nutrients and space. These invading species require management in order to maintain the native shrub diversity of the community. A high shrub stem density is also important as it provides birds with cover from predators and more leaf surface area for gleaning. Cover for American woodcock, for example, is ideal in a 10-15 year old shrub swamp (USDA 2001). Shrub species, in particular alder, tend to die back as they reach maturity, and as a result stem density decreases. Periodic rejuvenation of shrubs is necessary to maintain required stem densities. Management priority will be given to shrub swamps that are part of a woodcock management area. Management of these shrub swamps will benefit other species that use these communities, including willow flycatcher, American redstart, chestnut-sided warbler, ruffed grouse, black racer, and eastern ribbon snake.

American black ducks also use shrub swamp communities, though black ducks prefer shrub swamps that are flooded or adjacent to open water habitats. Black ducks rely on these wetlands during the breeding season and as stopover habitat during migration. Adults and their broods forage on seeds, aquatic vegetation, and invertebrates in flooded shrub swamp communities, or adjacent open water habitats. Adults place well-concealed nests near foraging habitat in nearby uplands or dry hummocks in the wetland (Longcore et al. 2000, DeGraaf and Yamasaki 2001). American black duck is a species of concern in the North American Waterfowl Management Plan because of historic population declines, and is listed as highest priority for conservation in BCR 14. Protecting and managing these shrub wetland communities from potential threats, including invasive species introduction, altered hydrology, and fragmentation, will contribute to the conservation of this species.

Implementation of refuge strategies will begin with a comprehensive, multi-scale wildlife habitat inventory. Wildlife species survival and breeding success is dependent not only on the habitat at a fine scale, but also the surrounding landscape, making it necessary to look at the adjacent habitat conditions and land uses within the CFA and associated landscape. Baseline information on the condition of shrub swamps at the time of acquisition will further inform more detailed habitat prescriptions within a required step-down HMP.

Management Strategies:
Within 5 years of land acquisition and CCP approval:

- Minimize refuge activities that disturb wetland communities.
- Work with partners, including the State, in support of the State Wildlife Action Plan, to ensure management on Service lands complement adjacent land management objectives.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Survey wildlife utilization of wetlands.
- Map natural communities; protect rare or exemplary examples.

Sub-objective 1.1d. (Biological Integrity, Biological Diversity, and Environmental Health)
Where and when appropriate, protect, or restore habitats absent an identified species of conservation concern, recognizing the importance of all habitats in contributing to the biological integrity, diversity, and environmental health of refuge lands and the Watershed."

Rationale:
Achieving the refuge purposes and the Refuge System mission are the paramount considerations for refuge management. Additionally, the Service has policy for maintaining and restoring, where appropriate, refuges' "biological integrity, diversity, and environmental health" (601 FW 3). This policy provides refuge managers with a process to analyze their refuge and recommend the best management direction to prevent further degradation of environmental conditions; and where appropriate, restore lost or severely degraded components. The policy suggests using historic conditions as a reference for comparing the ecosystem's current composition, structure, and functioning to what it was prior to substantial human related changes to the landscape. This comparison can be used to direct management to maintain or restore those natural conditions, to the extent practicable, without jeopardizing refuge purposes. For example, we consider the natural timing and frequency of disturbances, such as fires and flooding, and mimic those processes. In other words, the policy is intended to induce management for native fish, wildlife, and plants and their habitats in natural conditions, and with natural processes, using historic conditions to help identify such conditions and processes (Paveglio et al. 2010). However, we recognize that it is not always possible or desirable to try to mimic historic conditions, particularly in the face of predicted climate and land use changes and other landscape-scale considerations. Historic conditions are only one of many considerations when making decisions about how to manage refuge resources.

Conservationists often use the metaphor of coarse filters and fine filters to convey two complementary strategies for maintaining biological diversity, biological integrity, and environmental health: the first focuses on conserving ecosystems and the second focuses on species (Noss 1987, Hunter 1991, Groves 2003). The coarse-filter approach seeks to protect a representative array of natural ecosystems and their constituent processes, structures, and species; however, some species fall through its pores, and coarse filters must be complemented by fine filter strategies tailored to fit particular species (priority species of concern). Sub-objectives throughout this plan generally represent a fine-filter approach—identifying species and their habitats that the Service has identified as priorities based upon our establishing legislation, refuge system mission, regional and national conservation plans, and conversations with conservation partners. In contrast, this sub-objective outlines CFA management that will benefit many of its species, the majority of which will not receive the special, tailored attention of fine-filter conservation. The BIDEH policy guidance complements coarse-filter conservation in ways that fine-filter conservation misses.

The key idea of BIDEH conservation is that most ecosystems contain certain features that are critical to the welfare of many species; thus, conserving those features can have a positive effect on a large suite of species (biological diversity). Logs in a forest, hedgerows in an agricultural landscape, and streams and pools in many terrestrial ecosystems are all examples of ecosystem features that support far more species than one would predict based on their size alone. The importance of conserving these features is widely recognized, but in an ad hoc, idiosyncratic fashion that often does not recognize the commonality between maintaining a hedgerow, a rock outcrop, and an herbaceous wetland. BIDEH conservation overlaps with many aspects of matrix management and ecosystem management (Lindenmayer and Franklin 2002). A key difference is its specific focus on ecosystem elements, which explicitly complements coarse-filter and fine-filter conservation.

Habitats that occur within the Westfield River CFA where species-specific management guidelines are not identified will be managed under the umbrella BIDEH policy. These habitats are most often small or isolated occurrences, but are important in maintaining connectivity within the larger forested matrix, and providing additional structural and species diversity to the matrix. Rocky outcrops and upland meadows, for instance, are anomalies in an otherwise forested landscape. They often have a special flora and fauna—providing sunny, dry sites for reptiles to bask, or nectar producing flowers for foraging butterflies. One could make the case that these outcrops are small, independent ecosystems, but they are really too small to be candidates for a classic coarse-filter strategy and thus best considered in a BIDEH context. This approach will allow the conservation of large numbers of species, the majority of which are too poorly known to be conserved individually (e.g., imagine species conservation plans for particular insects or liverworts). Together, the multiple strategies are reasonably comprehensive because all species and habitats known to be in jeopardy will receive needed attention.

The negative consequences of habitat loss and fragmentation to aspects of biological integrity, diversity and health have been shown by a large number of theoretical and empirical studies, in different environments, and for a large array of taxa (Fahrig 2003). Our understanding of the current condition of all the habitats considered under this sub-objective and their contribution to the BIDEH of the CFA is poor. A comprehensive forest and wildlife habitat inventory will be necessary to inform more detailed management strategies that provide the full range of natural processes.

Management Strategies:
Within 5 years of CCP approval:

- Work with partners, including the State, in support of the State Wildlife Action Plan, to ensure management on Service lands complement adjacent land management objectives.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Conduct habitat and wildlife inventories.
- Map natural communities; protect rare or exemplary examples.

Objective 1.2: Non-forested Uplands and Wetlands

Sub-objective 1.2a. (Freshwater Marsh)
Manage freshwater marshes to support natural and rare ecological communities, and provide potential breeding and foraging habitat for priority refuge resources of concern including American black duck.

Rationale:
Freshwater marshes are often dominated by emergent and submergent herbaceous vegetation. Scattered shrubs are often present, and trees are generally absent. Herbaceous vegetation typically includes common bulrush, jewelweed, marsh fern, water lily, and narrow-leaved cattail. This habitat is associated with lakes, ponds, impoundments, and slow-moving rivers and streams (Gawler 2008). These marshes are also maintained over time by beaver activity, an important natural disturbance process within the Westfield River watershed.

Our coarse-scale habitat analysis of this CFA identifies freshwater marsh wetlands along Cole Brook. Cole Brook starts at Benson Pond, where approximately five acres of freshwater marsh occurs. This particular wetland may not be overly large, but being adjacent to open water and a slow moving stream may provide foraging, and potentially breeding habitat for American black duck, and other waterfowl species. A mosaic of freshwater marsh and shrub swamp also occurs near The Cove further downstream on Coles Brook. Black ducks use wetlands such as these for breeding and foraging habitat. Well-concealed nests are placed on the ground in adjacent uplands or hummocks within the wetland. Adults and their broods feed on seeds and herbaceous vegetation, including sedges, rushes, and submerged aquatic vegetation, as well as invertebrates (Longcore et al. 2000, DeGraaf and Yamasaki 2001). An evaluation of the wetlands in the CFA will be necessary to determine their potential as habitat for American black duck.

Implementation of refuge strategies will begin with a comprehensive, multi-scale wildlife habitat inventory. Wildlife species survival and breeding success is dependent not only on the habitat at a fine scale, but also the surrounding landscape, making it necessary to look at the adjacent habitat conditions and land uses within the CFA and associated landscape. Baseline information on the condition of freshwater marshes at the time of acquisition will further inform more detailed habitat prescriptions within a required step-down Habitat Management Plan.

Management Strategies:
Within 5 years of CCP approval:

- Evaluate wetland hydrology for impacts to natural flow regimes.
- Work with partners, including the State, in support of the State Wildlife Action Plan, to ensure management on Service lands complement adjacent land management objectives.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Survey wildlife use of wetlands.
- Map natural communities; protect rare or exemplary examples.
- Inventory wetland plant communities.

Sub-objective 1.2b. (Pasture/Hay/Grassland)
Manage pasture, hay and grasslands (where appropriate) as part of a mosaic of habitat conditions required by American woodcock and other shrub-dependent conservation concern species such as chestnut-sided warbler. Also maintain large contiguous tracts of grassland habitat for grassland birds and pollinators, if present and appropriate.

Rationale:
Over two percent of the Westfield River CFA is typed as pasture, hay, and grassland habitat. These habitat types require active manipulation to inhibit the natural succession of converting to forest. The pasture, hay, and grassland habitats tend to be dominated by grasses. Depending on habitat patch size, continuity of patches and timing of manipulations, this habitat type will support grassland dependent species such as bobolink and grasshopper sparrow, as well as pollinator species. If these habitats are left unmaintained (e.g. not mowed), they will convert to a mixture of shrubs and grasses providing "old field" habitat for shrub dependent species such as chestnut-sided warbler, prairie warbler and field sparrow. American woodcock, a refuge priority resource of concern, will use both habitat conditions when managed in conjunction with their other habitat needs.

Many shrubland bird breeding populations occur in high proportions in the northeast, and therefore, are species of conservation responsibility (Dettmers, Randy 2003). For example, over 12% of the chestnut-sided warbler population breeds in BCR 14 (Dettmers, Randy 2006). While there is evidence that southern New England supported a small but significant grassland bird community before European settlement, only a small proportion of grassland breeding bird populations occurs in the northeast (Dettmers and Rosenburg 2000). Maintaining high quality shrubland habitat in this CFA will provide habitat for a higher percentage of species in decline. However, large and contiguous grasslands are rare in the watershed, and large grassland habitat patches are important to high priority grassland species and overall biological diversity. We will maintain large grassland patches (e.g. 500 acres), or areas where a high proportion of grassland cover is present in the landscape (e.g., a mosaic of many medium to large patches).

Shrubland and grassland habitats will also be used by American woodcock, which require diverse structural habitat conditions within close proximity of each other: clearings for courtship, forest openings with sparse shrub or herbaceous cover for roosting, young hardwood forests of shade intolerant tree species for nesting and brood rearing, and functional foraging areas (Sepik et al. 1994, Kelley et al. 2008). Small clearings with minimal vegetation is required for courtship areas, and shrublands with clumps of tall vegetation or sparse shrubs will provide roosting habitat.

Shrubland dominated habitats in the northeast support many species of conservation concern, many of which are a high conservation responsibility for the region, indicating the importance of shrubland habitats to these species in the CFA. Large, contiguous grassland habitats are also important to a suite of priority grassland bird species. Current pasture, hay, and grassland acres can provide quality habitat, for these species, and American woodcock, if managed appropriately. Baseline information on the condition of these habitats and association with other landscape features will further inform more detailed habitat prescriptions within a required step-down HMP.

Management Strategies:
Within 5 years of land acquisition and CCP approval:
- Work with partners to protect and promote farming practices (e.g. haying and pasture of animals) that benefit wildlife and protect water quality.

Inventory and Monitoring Strategies:
Within 5 years of land acquisition and CCP approval:
- Conduct an inventory of these habitats to determine their condition, size and location, which will inform and prioritize appropriate management strategies in the HMP.

Sub-objective 1.2c. (Biological Integrity, Biological Diversity, and Environmental Health)
Where and when appropriate, protect, or restore habitats absent an identified species of conservation concern, recognizing the importance of all habitats in contributing to the biological integrity, diversity, and environmental health of refuge lands and the Watershed.

Rationale:
See rationale for sub-objective 1.1d.

Habitats that occur within the Westfield River CFA where species-specific management guidelines are not identified will be managed under the umbrella BIDEH policy. These habitats are most often small or isolated occurrences, but are important in maintaining connectivity within the larger forested matrix, and providing additional structural and species diversity to the matrix. Rocky outcrops and upland meadows, for instance, are anomalies in an otherwise forested landscape. They often have a special flora and fauna—providing sunny, dry sites for reptiles to bask, or nectar producing flowers for foraging butterflies. One could make the case that these outcrops are small, independent ecosystems, but they are really too small to be candidates for a classic coarse-filter strategy and thus best considered in a BIDEH context. This approach will allow the conservation of large numbers of species, the majority of which are too poorly known to be conserved individually (e.g., imagine species conservation plans for particular insects or liverworts). Together, the multiple strategies are reasonably comprehensive because all species and habitats known to be in jeopardy will receive needed attention.

The negative consequences of habitat loss and fragmentation to aspects of biological integrity, diversity, and health have been shown by a large number of theoretical and empirical studies, in different environments, and for a large array of taxa (Fahrig 2003). Our understanding of the current condition of all the habitats considered under this sub-objective and their contribution to the BIDEH of the CFA is poor. A comprehensive forest and wildlife habitat inventory will be necessary to inform more detailed management strategies that provide the full range of natural processes.

Management Strategies:
Within 5 years of CCP approval:

- Work with partners, including the State, in support of the State Wildlife Action Plan, to ensure management on Service lands complement adjacent land management objectives.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Conduct habitat and wildlife inventories.
- Map natural communities; protect rare or exemplary examples.

Objective 1.3: Inland Aquatic Habitats

Sub-objective 1.3a. (Open Water)
In collaboration with partners, manage water resources and riparian areas to provide cold temperature regimes, substrate diversity, and clear aquatic species passage that benefit priority refuge resources of concern including Eastern brook trout, American eel, and Atlantic salmon.

Rationale:
The West Branch of the Westfield River flows through the town of Becket along the southwest portion of the CFA. This Branch is a free-flowing river with very few aquatic barriers along its tributaries providing habitat for species of conservation concern such as Eastern brook trout, American eel and Atlantic salmon.

The West Branch, and two of its tributaries, Coles Brook and Factory Brook provide important cold water habitat for brook trout and Atlantic salmon. These species are sensitive to extreme temperature fluctuations, and require water temperatures between 40-70 degrees Fahrenheit for spawning, growth, and survival. Other cold aquatic species that occur within this watershed include slimy sculpin, lake chub, and many species of invertebrates such as mayflies, stoneflies, caddisflies. American eel, a species of conservation concern for the Service and a state species of greatest conservation need, also occurs in Westfield River CFA. American eel enter the Connecticut River as juveniles, and migrate upstream to feed in aquatic habitats until they reach sexual maturity and begin the long migration to their spawning grounds in the Sargasso Sea (ASMFC 2000).

Management of water resources in the Westfield River CFA will provide clear aquatic species passage to spawning and wintering habitat, as well as structurally diverse, cold in-stream habitat. Due to our lack of knowledge regarding habitat conditions in the CFA, implementation of refuge strategies will begin with a

comprehensive, multi-scale wildlife and habitat inventory. We will work with partners to analyze current available data, and conduct assessments, as needed, to inform more detailed management and monitoring strategies within a required step-down HMP.

Management Strategies:
Within 10 years of land acquisition and CCP approval:

- Implement a remediation plan for identified obstacles to aquatic species passage.

Inventory and Monitoring Strategies:
Within 5 years of land acquisition and CCP approval:

- Work with partners to conduct stream assessments to evaluate the physical, chemical, and biological condition of the fish community structure, productivity, and health.
- Work with partners to conduct stream assessments to identify man-made physical barriers (e.g. impassable road crossings, culverts, and dams) to the movement of fish and other aquatic organisms.

Objective 1.4: Coastal Non-forested Uplands (coastal beaches and rocky shores)

Not applicable

Objective 1.5: Coastal Wetlands and Aquatic Habitats (tidal salt marsh and estuary)

Not applicable

Goal 2: Education, Interpretation, and Outreach: Inspire residents and visitors to actively participate in the conservation and stewardship of the exceptional natural and cultural resources in the Connecticut River watershed, and promote a greater understanding and appreciation of the role of the Silvio O. Conte National Fish and Wildlife Refuge in conserving those resources.

Objective 2.1: Environmental Education

In collaboration with public and private educators from all four states in the watershed, lead or facilitate the implementation of structured natural and cultural resource curricula, with a focus on guiding educators and students to develop an awareness of, and concern about, natural and cultural resources and associated challenges; appreciate our conservation history; make informed decisions and work individually or collectively toward solutions; and model responsible environmental stewardship in their everyday lives.

Sub-objective 2.1a. (Environmental Education Planning and Training)
Encourage schools, scout groups, and summer camps to develop curricula that use the Westfield River Division as an outdoor classroom.

Rationale:
See environmental education rationale in chapter 4 detailing the importance of environmental education for the Service. Environmental education is one of the six priority, wildlife-dependent recreational uses of the Refuge System. Environmental education is particularly important at Conte Refuge because one of its founding purposes is to provide opportunities for environmental education. Environmental education is an important tool that can help refuge visitors and local residents, particularly students, appreciate the importance of this area to the larger watershed.

Management Strategies:
Within 1 year of acquiring sufficient land:

- Encourage schools, scout groups, and summer camps to develop curricula that use the Westfield River Division as an outdoor classroom.

Sub-objective 2.1b. (Environmental Education Delivery)
Encourage schools, scout groups, and summer camps to use the Westfield River Division as an outdoor classroom.

Rationale:
Because this division will be unstaffed, the majority of environmental education opportunities on this division will be led by partners, volunteers, and local school groups and other educational groups (e.g., scout groups and summer camps).

Management Strategies:
Within 1 year of acquiring sufficient land:

- Encourage schools, scout groups, and summer camps to develop curricula that use the Westfield River Division as an outdoor classroom.

Objective 2.2: Interpretation

Develop, lead, and facilitate interpretive programs that emotionally and intellectually connect the audience to natural and cultural resources in the watershed.

Sub-objective 2.2a. (Natural and Cultural Resource Interpretive Planning and Training)
With Friends groups, public and non-profit organizations, and volunteers, offer quality interpretive programming at the Westfield River Division. The development of highly trained interpreters will be encouraged by offering interpretive training to Friends' members, partners, and volunteers on a regular basis.

Rationale:
See the rationale in chapter 4 detailing the importance of interpretation for the Service. Interpretation is an important tool that can help refuge visitors and local residents appreciate the importance of this area to the larger watershed. With an ADA compliant trail planned for the site, the Westfield River Division will be well suited to support both self-guided, wildlife dependent interpretive experiences, as well as guided interpretive programs that convey messages about the refuge and about the Westfield River Division's habitats and cultural resources.

Management Strategies:
(These strategies are dependent on land acquisition from willing landowners.)

Within 5 year of acquiring sufficient land:

- Inventory and evaluate each CFA to determine the appropriate interpretive materials to employ.
- Create meaningful, consistent, thematic statements to be used in the delivery of programming at the Westfield River Division.
- Provide resources and trainings to Friends, and volunteers in support of interpretive programs.

Within 10 years of acquiring sufficient land:

- Develop standardized self-guided interpretive services, such as interpretive trails and kiosks, exhibits, and printed media.
- Employ a variety of themed interpretive offerings (e.g., presentations, audio-visual programs, brochures, and exhibits) when creating programming for natural and cultural resource interpretation.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Build an evaluation process that includes formal and informal evaluation to assess the effectiveness of all interpretation programs.

Sub-objective 2.2b. (Natural and Cultural Resource Interpretive Program Delivery)
Collaborate with Friends group, partners, and volunteers to deliver quality natural and cultural resource interpretive programs.

Rationale:
See rationale for sub-objective 2.2a.

Management Strategies:
(These strategies are dependent on land acquisition from willing landowners.)

Within 5 years of acquiring sufficient land:

- Through partners, and Friends group, annually provide quality interpretive programs, exhibits, printed media at the Westfield River Division.
- Incorporate thematic statements, measureable objectives and evaluation measures into all interpretation efforts.
- Publicize interpretive programs through traditional media, on the refuge web site, and digital social media conduits.
- Maintain a supply of print interpretive brochures, i.e., general brochure and bird checklist that incorporate refuge interpretive messages and themes.
- Work with partners to create issue-oriented experiential activities and programs for use at their facilities.

Within 10 years of acquiring sufficient land:

- Contribute refuge interpretive information for scenic byways and other state publications and signs.
- Develop self -guided interpretive messages and use state of the art as well as traditional media (e.g., brochures).

Objective 2.3: Public and Community Outreach

Support, promote, and coordinate a wide range of outreach tools and activities to facilitate and improve communications and relationships with the American public, especially communities, adjacent landowners, and elected officials in the Connecticut River watershed, and to empower citizens to recognize and resolve local natural resource issues and promote conservation and the responsible use of natural resources.

Because the Westfield River Division would be unstaffed and does not have refuge facilities, public and community outreach for this site will occur through regular outreach activities at the headquarters and will not specifically occur at this site.

Objective 2.4: Science and Technical Outreach

Facilitate the collection and exchange of information that increases the knowledge and understanding of natural and cultural resources, addresses climate change and other conservation issues, and provides land managers with better information to make management decisions affecting resources.

Because the Westfield River Division would be unstaffed and does not have refuge facilities, science and technical outreach for this site will occur through regular outreach activities at the headquarters and will not specifically occur at this site.

Goal 3: Recreation: Promote high-quality, public recreational opportunities in the Connecticut River watershed that are complementary between ownerships and provide regional linkages with emphasis on promoting wildlife-dependent activities that connect people with nature.

Objective 3.1: Hunting

Support quality public hunting opportunities in the Connecticut River watershed to promote a unique understanding and appreciation of natural resources and their management on lands and waters, while also protecting a traditional outdoor pastime deeply rooted in America's natural heritage and conservation history.

Sub-objective 3.1a. (Hunting Opportunity, Access, and Infrastructure)
Provide the opportunity for a quality hunting experience based on state regulations, except as noted under Strategies below.

Rationale:
The Westfield River CFA is a popular area to hunt white-tailed deer, moose, Eastern wild turkey, black bear, and small game. Hunting would be allowed on a newly created division as long as it is found to be a compatible use. Hunting, if found to be a compatible use, will be allowed when the Service acquires land that can support hunt seasons. Retaining hunting opportunities on public lands will ensure this wildlife-dependent recreational activity continues and contribute to the state's population management objectives.

Management Strategies:
(These strategies are dependent on land acquisition from willing landowners and determination that hunting is a compatible use at the division.)

Within 1 year of acquiring sufficient land to support hunting seasons:

- Complete all administrative requirements to officially open to hunting consistent with State hunting regulations and, if necessary, additional refuge-specific regulations
- Allow hunter access to the refuge outside of the normal division open hours (i.e. 30 minutes before sunrise and 30 minutes after sunset) as long as they are engaged in lawful hunting activities.
- Post newly acquired properties to ensure refuge boundary lines are discernible.
- Install an informational kiosk in a conspicuous location to post information on hunting seasons and other notices to visitors.
- Allow temporary tree stands and blinds that meet state hunting regulations and do not harm trees or other refuge vegetation. Tree stands and blinds must have the owner's name and phone number clearly displayed, and they must be removed at the end of the hunt season.

Within 5 years of acquiring sufficient land to support hunting seasons:

- Work with Massachusetts Department of Fish and Game to determine whether opportunities exist for state-recognized disabled hunters.

Inventory and Monitoring Strategies:
Within 5 years of acquiring sufficient land to support hunting seasons:

- Work with Massachusetts Department of Fish and Game to evaluate the effectiveness and success of the refuge hunt program in contributing to state population objectives.

Sub-objective 3.1b. (Hunter Education and Outreach)
Provide hunter education classes access to the division and conduct directed outreach to ensure hunters are informed about regulations, hunter ethics, and safety considerations. Develop programs, including brochures, signage, website pages, media releases, etc. to increase interest in hunting at the division.

Rationale:
Hunting is a priority public use that also serves as a population management tool. Providing hunter education instructors the opportunity to use the division with their classes will strengthen connections to the hunting community and student understanding of the role hunting plays in wildlife management. Making relevant information readily available to hunters through a variety of media will improve the quality of the hunting experience.

Management Strategies:
Within 1 year of acquiring sufficient land to support hunting seasons:

- Produce a hunt brochure that includes information on regulations, hunter ethics, safety considerations, etc. and make it available on the refuge website, at Westfield River Division kiosks, through a friends group, and in local businesses.

- Provide visitors with general information on the hunting program and refuge-specific and State regulations through the refuge website, information signs, and a hunting brochure. In all materials related to the hunting program, promote and encourage the use of lead-free ammunition.

- Work with the State to identify and evaluate the impacts associated with requiring the use of non-toxic ammunition for hunting on refuge lands.

Within 5 years of acquiring sufficient land to support hunting seasons:
- Offer to host hunter education field courses.

- Work with Massachusetts Department of Fish and Game to encourage youth hunting at the division as a means of introducing young people to this traditional recreation activity.

Inventory and Monitoring Strategies:
Within 5 years of acquiring sufficient land to support hunting seasons:
- Develop a system to monitor and evaluate the hunting program with hunters and other users to determine if the objective is being met and to allow for adaptive management.

Objective 3.2: Fishing

Support quality, public fishing opportunities in the Connecticut River watershed to promote an understanding and appreciation of natural resources and their management on lands and waters, while also protecting a traditional outdoor pastime deeply rooted in the America's natural heritage and conservation history.

Sub-objective 3.2a. (Fishing Opportunities, Access and Infrastructure)
Provide quality fishing opportunities at the Westfield River Division after completing all administrative procedures to officially open refuge lands to fishing, based on Massachusetts Department of Fish and Game regulations, and division-specific conditions, if necessary.

Rationale:
There are several streams in the proposed CFA including the West Branch Westfield River, Middle Branch Westfield River, Fuller Brook, Coles Brook, Factory Brook, and Tuttle Brook. The included branches of the Westfield River supports a cold water fishery with brook trout, brown trout, and rainbow trout. Fishing is a popular activity throughout this area and would continue under Service ownership. Retaining fishing opportunities conforms to historic use on CFA and much of the surrounding land in the area.

Management Strategies:
Within 1 year of CCP approval:
- Complete all administrative requirements to officially open to fishing consistent with State hunting regulations and, if necessary, additional refuge-specific regulations.

- Post newly acquired properties to ensure refuge boundary lines are clearly marked.

- Install an informational kiosk to post information on fishing seasons and other notices to visitors.

- The Westfield River Division would be open to visitors actively engaged in fishing during the seasons and times established by the state in their annual fishing regulations.

Within 5 years of CCP approval:
- Produce a brochure that highlights fishing opportunities for distribution at a division kiosk and the refuge website.

- Work with the Massachusetts Department of Fish and Game to inventory and assess fish populations on the division.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Develop a system to monitor and evaluate the fishing program with anglers and other users to determine the objective is being met and to allow for adaptive management.

Sub-objective 3.2b. (Angler Education and Outreach)
Develop programs, including brochures, signage, website pages, media releases, etc. to inform visitors of fishing opportunities at the division.

Rationale:
Fishing is a priority public use and a traditional use in the CFA. If land is acquired, the refuge will make information readily available to interested anglers regarding opportunities to fish on Service-owned land, location of fishable waters, and the available game fish.

Management Strategies:
Within 1 year of CCP approval:

- Produce a fishing brochure that includes information on regulations, angler ethics, safety considerations, etc. and make it available on the refuge website, at informational kiosks, and in local businesses. In all materials related to the fishing program, promote use of lead-free tackle.

Objective 3.3: Wildlife Observation and Photography

Support quality, public opportunities to observe and photograph wildlife in the Connecticut River watershed in a variety of natural habitats to connect a broad spectrum of people with nature.

Sub-objective 3.3a. (Infrastructure and Access for Wildlife Observation and Photography)
Provide quality opportunities for wildlife observation and photography at the Westfield River Division.

Rationale:
Wildlife viewing and photography is a priority public use on national wildlife refuges and a popular recreational activity in western Massachusetts. A new division in this area would offer people the chance to see and photograph wildlife and in their native habitats, while learning more about the Service, Refuge System, and the refuge.

Management Strategies:
(These strategies are dependent on land acquisition from willing landowners and determination that wildlife observation and photography are compatible uses at the division.)

Within 1 year of acquiring land:

- Allow public access from 30 minutes before sunrise to 30 minutes after sunset with the exceptions listed for hunters, anglers, and snowmobilers. The refuge manager may issue a special use permit for public uses during the closed hours.

- Install an informational kiosk to post information on wildlife observation and photography opportunities, and other notices to visitors.

Within 5 years of acquiring land:

- Develop a public access strategy and required planning (i.e. NEPA, compatibility determination) that includes consideration of developed trails, parking, kiosks, viewing platforms, blinds, interpretation, signage, etc.

Within 15 years of acquiring land:

- Implement the visitor use enhancements identified in the public access strategy and the refuge Visitor Services Plan.

Sub-objective 3.3b. (Wildlife Observation and Photography Aids)
Offer viewing and photography aids that enhance the visitor experience. Use a variety of methods to reach a broad spectrum of people. Work closely with a friends group and other partners.

Rationale:
The entire division would be available for wildlife observation and photography; however, there are steps the refuge can take to enhance the experience. By providing new visitors a quality experience they are more likely to return and share their experiences with others. One way to accomplish this is to offer sufficient information to attract a variety of visitors through a variety of media.

Management Strategies:
(These strategies are dependent on land acquisition from willing landowners and determination that wildlife observation and photography are compatible uses at the division.)

Within 1 year of acquiring land:
- Allow photography blinds that do not negatively impact wildlife behavior or conflict with other visitors. Blinds must be removed each day, unless arrangements have been made via a special use permit.

Within 5 years of acquiring land:
- Develop interpretive panels describing typical wildlife on the refuge, bird migration patterns, and other messages we want to convey to visitors.
- Sponsor wildlife observation events such as International Migratory Bird Day, the Big Sit, etc.
- Encourage local schools and groups to include wildlife-centered trips to the refuge.
- Produce a list of wildlife species and associated habitats and other conservation information on the division for distribution at informational kiosks, the refuge website, and other popular media.

Within 10 years of acquiring land:
- Develop a public access strategy and required planning (i.e. NEPA, compatibility determination) that includes consideration of developed trails, parking, kiosks, viewing platforms, blinds, interpretation, signage, etc.

Sub-objective 3.3c. (Watershed-based Partner Initiatives)
Not applicable

Objective 3.4: Other Recreational Activities

In order to reach a broader demographic, support non-priority outdoor recreational opportunities and public access to quality, nature-based experiences throughout the Connecticut River watershed that facilitate and improve community relationships, raise awareness and an appreciation for conserving natural resources, and garner support for the National Wildlife Refuge System.

Sub-objective 3.4a. (Regional Water-based Trail Initiatives and Opportunities Including Refuge Lands)
Develop compatible opportunities on the Westfield River Division that support regional water-based trail initiatives to connect people with nature, raise the visibility of the Service and the Refuge System, make the refuge more relevant to the local community, and to promote economic activity in the local area.

Rationale:
Regional water-based trails give individuals opportunities to engage in outdoor recreational opportunities in the Connecticut River watershed, such as fishing, boating, and wildlife observation. Where appropriate, we will work with these partners to promote, and distribute information about, these opportunities.

Management Strategies:
Within 5 years of acquiring land:

- As lands are acquired, evaluate any water trails (e.g., canoe/kayak trails) that part of a regional or State network for their compatibility.

Sub-objective 3.4b. (Regional Land-based Trail Initiatives and Opportunities Including Refuge Lands)
Develop compatible opportunities on the Westfield River Division that support regional land-based trail initiatives to connect people with nature, raise the visibility of the Service and the Refuge System, make the refuge more relevant to the local community, and to promote economic activity in the local area.

Rationale:
Regional land-based trails give individuals opportunities to engage in outdoor recreational opportunities in the Connecticut River watershed, such as hiking, wildlife observation, and interpretation. Where appropriate, we will work with these partners to promote, and distribute information about, these opportunities.

Management Strategies:
Within 5 years of acquiring land:

- As lands are acquired, evaluate any existing trails (e.g., hiking trails, snowmobile trails, horseback riding trails) that part of an established regional or State network to determine if they are appropriate and compatible uses for the refuge.

Sub-objective 3.4c. (Other Appropriate and Compatible Recreational Opportunities That Enhance Visitor Use and Enjoyment of Refuge Lands)
Allow compatible outdoor recreational opportunities on the Westfield River Division that connect people with nature, raise the visibility of the Service and the Refuge System, make the refuge more relevant to the local community, and promote economic activity in the local area.

Rationale:
In addition to the priority public uses, there are other wildlife-dependent, appropriate and compatible recreational activities that can broaden the visitor base, giving people alternative ways to enjoy the natural resources at the division without detrimentally impacting the wildlife resource.

Management Strategies:
(These strategies are dependent on land acquisition from willing landowners and determination that the use is both appropriate and compatible at the division.)

Within 1 year of acquiring land:

- Allow dispersed hiking, snowshoeing, and cross-country skiing.
- Allow pet walking. In order to minimize conflicts with wildlife and other visitors, pets must be on leashes not longer than 10 feet in length.
- Allow recreational gathering of blueberries, blackberries, strawberries, raspberries, mushrooms, fiddleheads, and antler sheds.
- When compatible, allow commercial guiding in support of priority public uses by special use permit.

Within 5 years of CCP approval:

- Work with Friends groups and partners to design and market a virtual geocache course at the division. The course should integrate orienteering with refuge interpretive messages that include linking this division to other refuge properties.

Overview
Fannie Stebbins (Existing Refuge Unit)

Longmeadow, Massachusetts

Total Unit Acres[1]	**98**

[1] Actual surveyed acres.

What specific criteria and/or considerations drove the selection of this Unit?

Beginning more than fifty years ago, members of the Allen Bird Club worked to acquire approximately 330 acres of land between Interstate 91 and the Connecticut River in Longmeadow, Massachusetts. This property became the Fannie Stebbins Memorial Wildlife Refuge, owned and managed by a separate Board of Trustees elected by Allen Bird Club members. Eventually the Town of Longmeadow began acquiring additional property in the area, leading to the protection of over 1000 acres. The Stebbins property and the larger floodplain area known as the "Longmeadow Flats" has been designated a National Natural Landmark by the U.S. Department of the Interior and an Important Bird Area by the Massachusetts Audubon Society (Allen Bird Club 2015).

The area is subject to periodic flooding that is representative of this habitat. It includes bordering swamps, ponded water, vegetated wetlands, meadows that are maintained by mowing, hardwood forest, sandbars, riverbank, and an island. It encompasses one of the largest remaining patches of floodplain forests and wetlands along this heavily human-impacted section of the Connecticut River. The wetlands provide breeding habitat for marsh birds and stop-over habitat for migratory waterfowl. During summer and fall the shoreline offers shallows and sandbars for resting and feeding gulls, raptors, shorebirds, and herons. The woodlands and brushy areas provide important habitat for many species of breeding, migratory, and wintering land birds (Allen Bird Club 2015, Mass Audubon n.d.).

In order to ensure the protection of the Stebbins Refuge lands in perpetuity, the Fannie Stebbins Memorial Wildlife Refuge (a registered nonprofit) initiated negotiations with the Silvio O. Conte National Fish and Wildlife Refuge (Allen Bird Club 2015). Fannie Stebbins was a SFA in the 1995 Conte FEIS. The Fannie Stebbins Unit area is considered important floodplain forest by The Nature Conservancy and would allow for the restoration and conservation of the floodplain forest and associated wetland complex. Habitat conservation in this unit will help allow for the landward migration of the coastal wetland complex (salt-, brackish-, and freshwater tidally influenced wetlands) due to climate change.

What are the priority habitat types within the Unit? What percentage of the total Unit acreage do they represent?

- Hardwood Forest – 54%
- Hardwood Swamp – 15%
- Freshwater Marsh – 25%
- Open Water – 3%
- Developed – 3%

For more information on the habitats in the unit, see map A.14 and table A.12.

What are the resources of conservation concern for the proposed Unit?

As noted in table A.13 below, there are potential for ten priority refuge resources of concern (PRRC) aquatic and terrestrial species that rely upon the open water and wetland habitats in this Unit. Additionally, we recognize the value of this area to State Species of Greatest Conservation Need (SGCN) and migratory birds. These species and habitats are discussed further below.

1. **Federal Threatened and Endangered Species**
   This section of the Connecticut River is important migratory habitat for shortnose sturgeon. This species prefers large rivers and estuaries where there is an abundance of crustaceans, mollusks and insects to feed on. They are a long-lived fish that are threatened by pollution, habitat alterations and overfishing.

   This unit is within the range of the federally listed northern long-eared bat and tricolored bat, a species petitioned for listing under the ESA. During summer nights, these bats forage on insects within wetlands and forested habitats. Northern long-eared bats roost under the bark or within cavities of large (> 3 dbh) diameter trees during the day (USFWS 2014). Tricolored bats will also roost in trees, though they tend to roost in the foliage of live or dead trees within a mature stand (MADFW 2015). These roosting habitats also provide maternity sites where females will raise their young. In the winter, these bats will hibernate in underground caves or cave like structures, often within close proximity to their summer roosting and feeding areas. Areas within the unit may contain important maternity and summer roosting sites, as well as foraging areas for this species.

2. **Migratory Birds**
   The Connecticut River watershed is a major migration corridor. The lower portion of the watershed (CT and MA) receives higher use by migrants, with this use concentrated in habitats along the Connecticut River main stem (Smith College 2006). The Fannie Stebbins Unit is situated on the Connecticut River, and provides important stopover habitat for landbirds, shorebirds, and waterbirds. Eight state endangered, threatened, or special concern species use this site regularly including peregrine falcon, bald eagle, least bittern, blackpoll warbler, northern parula, American bittern and pied-billed grebe. This site also contains a heron rookery, and supports a high diversity of land birds, including 227 regularly occurring species and 49 species that have been recorded at least once.

   This unit also may provide important wintering habitat for rusty blackbirds, a species that has been experiencing drastic population declines since the mid-1900's (IRBWG 2016). This species is a refuge resource of concern. It breeds in the northern reaches of the Connecticut River watershed, winters in the southern reaches of the watershed, and migrates through the Connecticut River corridor. Wintering and migrating habitat for this species includes floodplain forests and scrub-shrub wetlands (C. Foss, Audubon New Hampshire, personal communication 2016).

3. **Waterfowl**
   The freshwater marshes, floodplain forest and open water of the Connecticut River provide important stopover areas for hundreds of migrating and wintering waterfowl including American black duck (a PRRC species), green-wing teal, mallard, Canada geese, bufflehead, northern pintail, gadwall, mergansers and American wigeon. This site also has one of the highest concentrations of breeding wood ducks in western Massachusetts (Mass Audubon n.d.)

4. **Diadromous fish and other aquatic species**
   The Fannie Stebbins Unit borders the Connecticut River, which provides migratory habitat for many species of conservation concern including American shad, shortnose sturgeon, American eel, alewife, blueback herring, and Atlantic salmon. The various brooks and small streams within the unit may support species of conservation concern as well, such as sea lamprey and American eel.

5. **Wetlands**
   The Fannie Stebbins Unit contains a small portion of what is known as "Longmeadow Flats", an ecologically significant floodplain habitat (Marks et al 2011) located along the Connecticut River main stem along much of the western boundary of the town of Longmeadow. It is one of the few remaining natural floodplain habitats in Massachusetts. In addition, several rare or special concern plant species are present on the unit (Mass Audubon). The remnant patches of floodplain habitat in the Fannie Stebbins River Unit are vulnerable to invasive species, especially habitats that flood infrequently. Opportunities may be available for floodplain restoration in areas where these habitats have been altered.

What habitat management activities would likely be a priority on refuge lands within the proposed unit?

We will conduct a comprehensive, multi-scale wildlife habitat inventory following acquisition. Baseline information on the condition of habitats (i.e. forested, non-forested, and open water habitats) will further inform more detailed, habitat prescriptions within a required step-down Habitat Management Plan (HMP). Once the inventory has been completed, then management will focus on maintaining the following conditions:

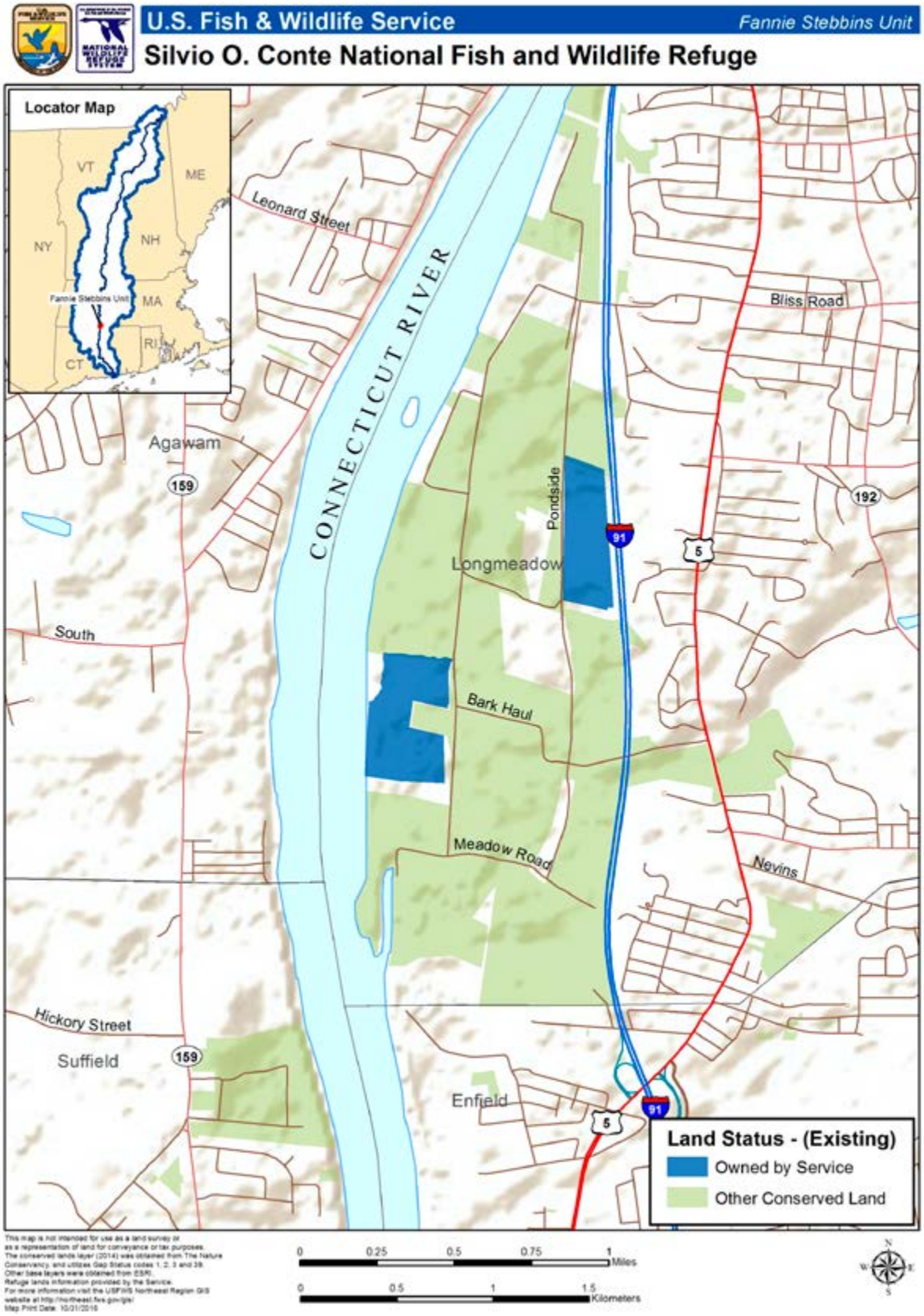
- Forest management activities will focus on restoration of degraded floodplains, including restoring the primary natural disturbance mechanism (seasonal flooding) and species composition and structure to accepted historical conditions. Management of upland forests will also provide structurally diverse habitat dominated by species appropriate to site conditions and location. Appendix J provides general forest management guidelines, including descriptions of forestry techniques and explanations about how we will determine where and how to conduct active management.We will also manage emergent and shrub wetland habitats, and will focus on maintaining the natural hydrology and native species composition. Invasive plant management will be a priority.

- In open water (stream, rivers, and coves) habitats, we will focus on maintaining stream connectivity, establishing riparian buffers, and reducing run-off from the surrounding landscape.

What public use opportunities would likely be a priority on refuge lands within the proposed unit?

When compatible, we would seek to provide recreational access to the river for priority public uses (hunting, fishing, wildlife observation and photography, interpretation, and environmental education) and for boating.

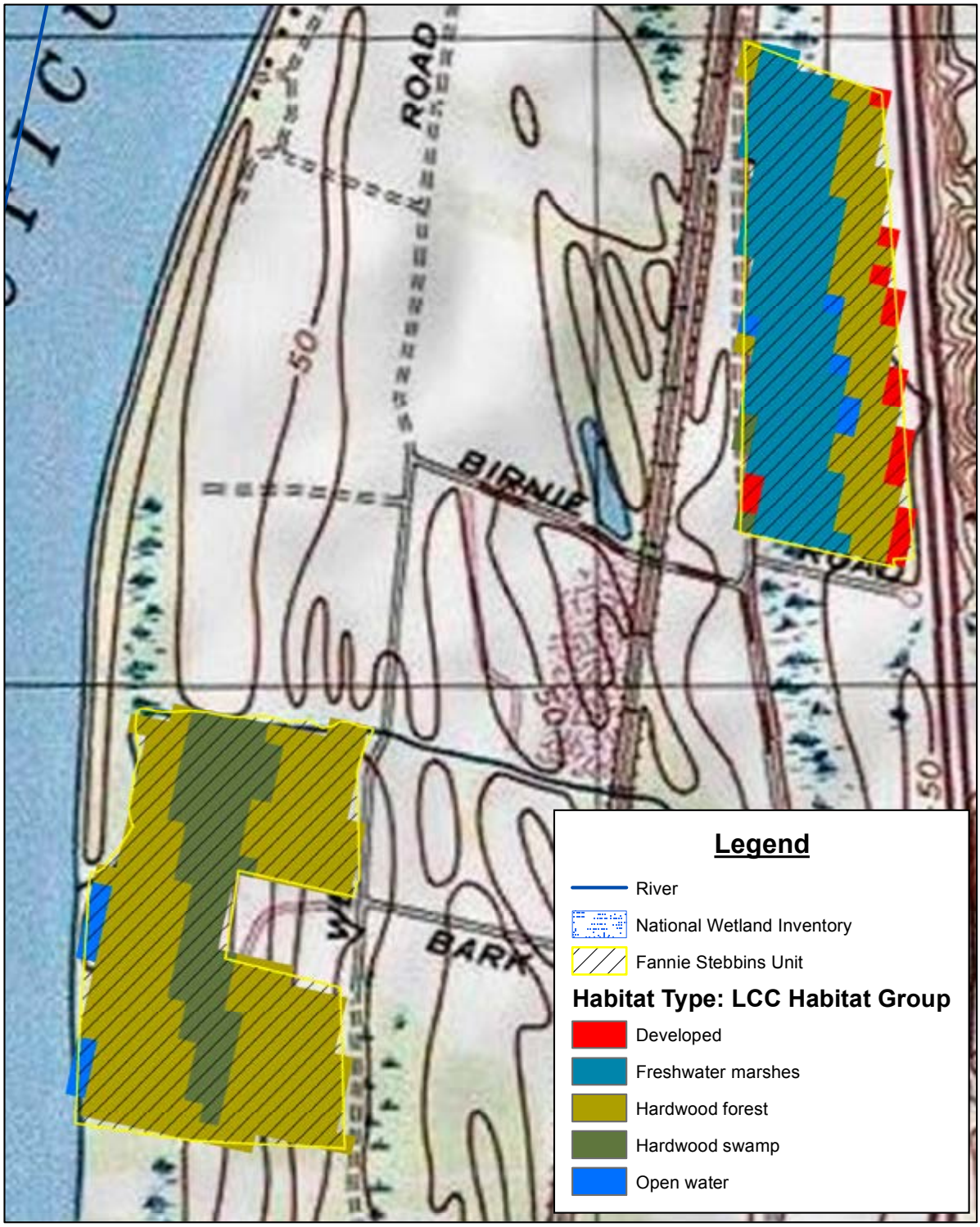
Map A.32. Fannie Stebbins Unit – Location.



Map A.33. Fannie Stebbins Unit – Habitat Types.

U.S. Fish & Wildlife Service *Fannie Stebbins Unit*

Silvio O. Conte National Fish and Wildlife Refuge



This map is designed to convey a generalization of habitat types across a large landscape. It is not intended for site-specific analysis or management, nor for use as a land survey or for tax purposes. For more information contact the Silvio O. Conte National Fish & Wildlife Refuge Office at: 413-548-8002
Date: 9/16/2016

0 0.085 0.17 0.255 0.34 Miles

0 0.1 0.2 0.3 0.4 Kilometers

N W E S

Table A.26. Fannie Stebbins Unit–Habitat Types.

LCC General Habitat Type[1]	Unit	
	Total Acres	Percent Unit
Forested uplands and wetlands[2]		
Hardwood forest	53	54%
Hardwood swamp	15	15%
Freshwater marsh	24	25%
Forested uplands and wetlands subtotal	*92*	*94%*
Other		
Open Water	3	3%
Developed	3	3%
Other subtotal	*6*	*6%*
TOTAL	**98**	**100.0%**

**All acreages are based upon GIS analysis and should be considered estimates

1 - North Atlantic Landscape Conservation Collaborative general habitat typings for USFWS representative species; linked to the National Vegetation Classification System (NVCS). See table A.52 at the end of this appendix for a comparison of these generalized habitat types with the more specific The Nature Conservancy's Northeastern Terrestrial Habitat Classification System. More detailed habitat tables that include the Northeastern Terrestrial Habitat Classification System habitat types are available for each CFA and refuge unit online at: *http://www.fws.gov/refuge/Silvio_O_Conte/what_we_do/conservation.html.*

2 – Unit acres; representing Service - preferred Alternative C

Table A.27. Fannie Stebbins Unit – Preliminary Priority Refuge Resources of Concern

Priority Refuge Resources of Concern[1]	Habitat Structure[2]	Associated Species[3]
Forested Uplands and Wetlands[4]		
Hardwood Forest[5] - 53 acres		
Northern Long-eared Bat[D] Tricolored Bat[E]	Winter habitat includes high humidity underground caves or cave like structures; summer habitat includes roost trees that are typically ≥ 3 inches dbh, are alive, dead or dying, exhibits exfoliating bark, cavities, crevices, or cracks and located within a variety of forest types interspersed with non-forested habitats (USFWS 2014, MADFW 2015).	Migratory Species Little Brown Bat[I]
Forested Uplands and Wetlands[4]		
Hardwood Swamp[5] - 15 acres		
Rusty Blackbird[A, C]	Migrating and wintering habitat includes floodplain forests, hardwood swamps, and shrub wetlands (C. Foss, Audubon New Hampshire, personal communication 2016).	Migratory species
American Black Duck[A, B, C, G]	Migrating habitat includes herbaceous wetlands, fens, and flooded meadows, floodplain forests and shrub-swamps (Longcore et al. 2000, DeGraaf et al. 2001).	Northern Harrier[A,I,J] Wood Duck[A,J] Green-winged Teal[A, J] Snowy Egret[A,I,J] **American Bittern[A,I]** Bufflehead[A] Canada Goose, NAP[A,J] Canada Goose, AP[A,J] **Virginia Rail** **Marsh Wren[A]** Gray Catbird[A,J] **Willow Flycatcher[A]** **Warbling Vireo** **Spotted Turtle[I]** Eastern Kingbird[A,J]
Non-Forested Uplands and Wetlands[4]		
Freshwater Marshes[5] - 24 acres		
American Black Duck[A, B, C, G]	Migrating habitat includes herbaceous wetlands, fens, and flooded meadows and shrub-swamps (Longcore et al. 2000, DeGraaf et al. 2001).	Northern Harrier[A,I,J] Wood Duck[A,J] Green-winged Teal[A, J] Snowy Egret[A,I,J] **American Bittern[A,I]** Bufflehead[A] Canada Goose, NAP[A,J] Canada Goose, AP[A,J] **Virginia Rail** **Marsh Wren[A]** Gray Catbird[A,J] **Willow Flycatcher[A]** **Warbling Vireo** **Spotted Turtle[I]** Eastern Kingbird[A,J]

Priority Refuge Resources of Concern[1]	Habitat Structure[2]	Associated Species[3]
Inland Aquatic Habitats[4]		
Water[5] – 3 acres		
American Eel[F]	Migrating and feeding habitat includes lakes, streams and large rivers (USFWS 1996)	Smallmouth Bass[I] Burbot[I] Striped Bass[I] Longnose Dace[I] Yellow Perch[I]
Shortnose Sturgeon[B, D, F, G]	Spawn in slow-moving, 48 F water of large rivers, and feed in fresh and brackish water along the river bottom (USFWS 1996).	
Alewife[B, F, G]	Spawn in ponds and slow-moving streams (USFWS 1996).	
Atlantic Salmon[B, F, G]	Spawn in cold freshwater moving streams w/coarse clean gravel and adequate food/cover. Migrate in large rivers (VTWAP 2005).	
Blueback Herring[F, G]	Spawn in fast moving, shallow water when the river temperature is about 58 F (USFWS 1996).	
American Shad[B, F, G]	Spawn when the water temperature is above 60° F in shoal area of river and lower reaches of larger tributaries (USFWS 1996).	

Notes:

1 - These species of conservation concern and associated habitats, as well as under-represented and sensitive ecological systems constitute the management focus for the Unit. They were identified based on specific criteria, and are included in the following plans, databases and/or have Federal status.

A: 2008 Bird Conservation Region 30.
B: 2009 North Atlantic Landscape Conservation Cooperative Development and Operations Plan.
C: 2008 USFWS Birds of Conservation Concern.
D: Federal Threatened and Endangered status as of 2016, including Candidate Species
E: Federal Elevated Concern species or species petitioned for threatened and endangered listing as of 2016
F: 2009-2013 USFWS Northeast Region Fisheries Program Strategic Plan
G: Silvio O Conte Refuge Purpose Species.
H: 2008 Northeastern Terrestrial Habitat Classification System.

2 - This habitat structure will benefit the listed priority refuge resources of concern, and is based on the most recent literature.

3 - These species are a compilation from the following plans, and are associated with the habitat type and/or will benefit from all or a portion of the habitat structure associated with the priority species. This is not a comprehensive list of species.

A:2008 Bird Conservation Region 30.
I: 2015 Massachusetts Comprehensive Wildlife Conservation Strategy
J: 2012 Terrestrial and Wetland Representative Species of the North Atlantic: Species Selected, Considered, and Associated Habitats (Ecological Systems). These species were LCC candidate species and are represented by the selected LCC Representative Species.

4 - CCP Objectives from Silvio O. Conte NFWR Comprehensive Conservation Plan, Chapter 4, Service - preferred Alternative.

5 - These habitat types are based on the North Atlantic Landscape Conservation Cooperative (NALCC) habitat groupings for associated Representative Species, which were derived from The Northeastern Terrestrial Habitat Classification System (NETHCS). See table A.52 for a comparison of the NALCC habitat groupings and NETHCS.

BOLD - These species are LCC Representative Species, which is a species that, because of its habitat use, ecosystem function, or management response, typifies lifecycle or habitat requirements for a larger group of species.

* The Refuge Improvement Act directs the US Fish and Wildlife Service to maintain Biological Integrity, Diversity, and Environmental Health (BIDEH). Elements of BIDEH are represented by native fish, wildlife, plants and their habitats as well as those ecological processes that support them.

Goals, Objectives, and Strategies for Refuge Lands in the Fannie Stebbins Unit under Alternative C

Goal 1: Wildlife and Habitat Conservation: Promote the biological diversity, integrity, and resiliency of terrestrial and aquatic ecosystems within the Connecticut River watershed in an amount and distribution that sustains ecological function and supports healthy populations of native fish, wildlife, and plants, especially Federal trust species of conservation concern, in anticipation of the effects of climate, land use, and demographic changes.

Objective 1.1: Forested Uplands and Wetlands

Sub-objective 1.1a. (Hardwood Forest)
Improve the diversity of seral stages and (where and when possible) restore historic composition and structure, and improve landscape connectivity of hardwood forest habitat to support species of conservation concern and aid in climate change adaptation. Management will provide stopover habitat for spring and fall migrants, as well as potential roosting and foraging habitat for the northern long-eared bat and tricolored bat.

Rationale:
We envision healthy forests within the Fannie Stebbins Unit where a diverse seral structure provides suitable habitat conditions for a suite of Connecticut wildlife. Our long-term vision for the unit includes hardwood forests characterized by complex horizontal and vertical structure, a generally closed canopy, large-diameter trees, dead woody material, snags and cavity trees, native species diversity, softwood inclusions, and a diversity of wildlife (Foster et al. 1996, Goodburn and Lorimer 1998, Keeton 2006, D'Amato et al. 2009, Curzon and Keeton 2010).

Fannie Stebbins Unit hardwood forests are diverse and productive for wildlife, and abundant, high-quality habitat is certainly available within the unit. To date our review of the Fannie Stebbins Unit habitats and wildlife species —and their condition—has been limited to coarse-scale information: the careful analysis of spatially-explicit habitat data using GIS, the consultation of local, state, and regional species conservation plans, and an understanding of forest disturbance and land-use history in New England. This allowed identification of broad habitat types, and species of conservation concern known to utilize characteristics common to these habitats. Our understanding of the forest structure within Fannie Stebbins comes exclusively from a reading of forest history in New England—a legacy of intensive past-use that altered the vegetation structure and composition, landscape patterns, and ongoing ecological dynamics (Cronon 1983, Whitney 1996, Foster et al. 1997, 2002, Bellemare et al. 2002). Our sub-objective assumes the forests of the Fannie Stebbins are more homogeneous than those of three centuries earlier, and include more sprouting and shade-intolerant species and fewer long-lived mature forest tree species (Goodburn and Lorimer 1998, Foster et al. 1998, Foster 2000, Bellemare et al. 2002, Cogbill et al. 2002, Abrams 2003). Completing a comprehensive forest and habitat inventory post-acquisition will test these assumptions, and aid in identifying stands where a forest management approach that combines passive management and the application of silvicultural treatments designed to emulate gap dynamics, will promote compositional and structural diversity, and where appropriate, move succession forward to emulate later seral stage characteristics.

Migrating landbirds are typically unable to deposit sufficient fat stores to fly nonstop between breeding and nonbreeding areas (Blem 1980) and must use stopover habitats for feeding and resting before continuing migration. Studies have shown migrating birds exhibit selective use of some habitats over others (Moore et al.

1990, Petit 2000, Rodewald et al. 2004). In general, taller, more structurally diverse vegetation types within an area appear to support greater numbers of migrating birds than do habitats of lower stature and complexity (Moore et al. 1990, Noss 1991). Clearly, structurally complex habitats will not be suitable for all migratory species, but our conservation goal is to provide those areas used most frequently by migrating birds, suggesting relatively tall, structurally diverse habitats may best serve this purpose. The plasticity in habitat use exhibited by most species during migration (Moore et al. 1990, Petit 2000) suggests that many species are able to effectively use the food resources and cover afforded by structurally complex habitats. While our management goals may create a relatively old forest, hardwood forests within Fannie Stebbins will contain a variety of patches in different age classes and developmental stages; it is not uniform throughout. This diversity of age classes provides a variety of bird species with a range of foraging opportunities. Patches of mature edge-dominated (i.e. forest-agricultural edge and suburban forest of the type within Fannie Stebbins) and shrub-sapling stage forests were used most frequently by fall stopover migrants in a Pennsylvania study (Rodewald et al. 2004).

In a mature forest, many migrating bird species tend to remain within specific vegetation layers: on or near the ground, in the middle layer, or up in the canopy. Hardwood forests within Fannie Stebbins should have all forest layers present in moderate to high amounts distributed throughout a stand and across the landscape. Enhanced vertical structure will provide the greatest number of bird species with the greatest number of foraging opportunities. Our active forest management efforts will aim to create or maintain a canopy that is generally closed (greater than 75 to 80 percent closure) with small gap openings scattered throughout a stand and the unit. These openings will be caused by or mimic small, single- to few-tree disturbances and create opportunities for regenerating intermediate- and shade-tolerant species. Regeneration in these openings will provide a continual supply of ephemeral shrub-sapling habitat rich in fruits and insects important to migrating birds (Noss 1991, DeGraaf et al. 2006). Efforts to regenerate any portion of forest within the unit must account for the abundance of invasive understory species and risk of regeneration failure from white-tailed deer overbrowsing (Hochholzer 2010)

Implementation of refuge strategies will begin with a comprehensive, multi-scale forest and wildlife habitat inventory. Forest wildlife species survival and breeding success is dependent not only on the habitat at the stand level, but also the surrounding landscape, making it necessary to consider the proportions and sizes of stand types and successional stages within the unit and the associated landscape. Baseline information on the condition of hardwood forests at the time of acquisition will further inform more detailed, stand-level habitat prescriptions within a required step-down HMP.

Management Strategies:

Within 5 years of land acquisition and CCP approval:

- Identify forest stands with late successional characteristics for passive management, and those where active management is necessary to improve forest structure. Appendix J provides general forest management guidelines, including descriptions of forestry techniques and explanations about how we will determine where and how to conduct active management.

- Work with partners, including the State of Connecticut, in support of the State Wildlife Action Plan, to ensure management on Service lands complement adjacent land management objectives.

- Reach out to established local and regional conservation partnerships with action plans in place to identify opportunities to compliment and cooperate in planning and implementation.

Within 10 years of land acquisition and CCP approval:

- Implement identified active forest management opportunities using accepted silvicultural practices. Appendix J provides general forest management guidelines, including descriptions of forestry techniques and explanations about how we will determine where and how to conduct active management.

- Protect hard and soft mast producing species such as American beech inclusions, and apple and cherry trees, through the use of best management practices.

- Ensure a diversity of native species is present and non-native species are excluded or managed to keep population levels as low as possible.

- Explore research opportunities with academic partners to address efficacy of forest management in meeting wildlife objectives.

Inventory and Monitoring Strategies:
Within 5 years of land acquisition and CCP approval:

- Conduct forest and wildlife inventories.
- Conduct bat acoustic surveys to obtain baseline bat inventory data. Conduct additional surveys, if appropriate, to identify active bat roosting sites and hibernacula.
- Map natural communities; protect rare or exemplary examples.
- Map vernal pools and seeps.

Sub-objective 1.1a. (Hardwood swamp)
Improve the diversity of seral stages, (where and when possible) restore historic composition and structure, and improve the natural hydrology to support natural and rare ecological communities. Management will provide stopover habitat for spring and fall migrants and potential winter habitat for rusty blackbirds.

Rationale:
Occurrences of hardwood swamps within the Fannie Stebbins Unit represent an acidic swamp natural community. Historically this community has undergone significant alteration, and has great potential for restoration. Acidic hardwood swamps may be found in basins, or on gently sloping seepage lowlands within small patches where an acidic substrate of mineral soil, often with a component of organic muck, creates a shallow, perched water table. Eastern hemlock is often the dominant overstory species, and the organic substrate supports an important sphagnum (moss) layer. The example identified within the Fannie Stebbins Unit occurs within the floodplain of the Connecticut River, and experiences periodic flooding.

This systems disturbance history, agricultural practices, development pressures, and selective logging, have largely removed these habitats from the landscape, or greatly simplified their historic species composition. Changes in hydrology, water pollution, invasive species introductions, and soil compaction remain as threats. Successional trends in hardwood swamps are not well understood. One possibility is that these areas were once in softwoods such as hemlock, fir, cedar, or spruce. Heavy cutting and clearing for agriculture often eliminated softwood species. Our conservation efforts within the Fannie Stebbins will focus on promoting the ecological integrity of these stands through restoration of degraded floodplains, and (where and when possible) restoring composition and structure to accepted historical conditions. Restoration of the primary natural disturbance mechanism (seasonal flooding) will aide in the restoration of historical species mixtures.

Restoration of forest habitats, natural levees, and backwater sloughs will create high-quality habitat for spring and fall migrant birds in an otherwise agricultural landscape where small, disturbed forest fragments are the rule. Closed canopy deciduous forests that include pin oak and other hardwoods provide mast and other foraging sites shown to be important during the energy-intensive migration (Petit 2000). This unit also may provide important wintering habitat for rusty blackbirds, a species that has been experiencing drastic population declines since the mid-1900's (IRBWG 2016). This species is a refuge resource of concern. It breeds in the northern reaches of the Connecticut River watershed, winters in the southern reaches of the watershed, and migrates through the Connecticut River corridor. Wintering and migrating habitat for this species includes floodplain forests and scrub-shrub wetlands (C. Foss, Audubon New Hampshire, personal communication 2016).

Implementation of refuge strategies will begin with a comprehensive, multi-scale forest and wildlife habitat inventory. Forest wildlife species survival and breeding success is dependent not only on the habitat at the stand level, but also the surrounding landscape, making it necessary to consider the proportions and sizes of stand types and successional stages within the unit and the associated landscape. Baseline information on the condition of hardwood swamps at the time of acquisition will further inform more detailed, stand-level habitat prescriptions within a required step-down HMP.

Management Strategies:
Within 5 years of land acquisition and CCP approval:

- Work with partners, including the State of Connecticut in support of the State Wildlife Action Plan, to ensure management on Service lands complement adjacent land management.

- Reach out to established local and regional conservation partnerships with action plans in place to identify opportunities to compliment and cooperate in planning and implementation.
- Evaluate hydrologic regime to inform restoration efforts.
- Identify forest stands where management is necessary to improve species composition. Appendix J provides general forest management guidelines, including descriptions of forestry techniques and explanations about how we will determine where and how to conduct active management.

Within 10 years of land acquisition and CCP approval:

- Implement identified forest management opportunities to improve species composition. Appendix J provides general forest management guidelines, including descriptions of forestry techniques and explanations about how we will determine where and how to conduct active management.
- Explore research opportunities with academic partners to address efficacy of forest management in meeting wildlife objectives.

Inventory and Monitoring Strategies:
Within 5 years of land acquisition and CCP approval:

- Conduct forest inventories.
- Survey wildlife utilization of wetlands including surveys for rusty blackbirds during the migration and wintering periods, and use by waterfowl and migrating landbirds.
- Map natural communities; protect rare or exemplary examples.
- Map vernal pools and seeps.

Objective 1.2: Non-forested Uplands and Wetlands

Sub-objective 1.2a. (Freshwater Marsh)
Manage freshwater marsh communities to support natural and rare ecological communities, and provide breeding, wintering and stopover habitat for American black duck and other waterfowl species.

Rationale:
Freshwater marshes are often dominated by emergent and submergent herbaceous vegetation. Scattered shrubs are often present, and trees are generally absent. Herbaceous vegetation typically includes common bulrush, jewelweed, marsh fern, water lily and narrow-leaved cattail (Gawler 2008). The freshwater marsh habitat within the Fannie Stebbins Unit is part of a larger wetland complex situated between the railroad tracks and interstate 91. This area is under intense development pressure, threatening state listed and refuge priority resources of concern.

The freshwater marshes provide breeding habitat for marsh birds and stop-over habitat for hundreds of migratory waterfowl. Canada geese, bufflehead, northern pintail, gadwall, and mergansers utilize these wetlands during migration. This area is known to have one of the highest concentrations of breeding wood ducks in western Massachusetts. American black duck, a refuge priority resource of concern, also occurs in the Fannie Stebbins Unit. Black ducks forage on aquatic vegetation in wetlands during the winter and on invertebrates and vegetation during migration.

Threats to this wetland complex are altered hydrology, contamination, and non-native invasive plant species. A multi-scale wildlife habitat inventory will be necessary to determine the condition of all habitats in the unit. This baseline information will further inform more detailed habitat prescriptions within a required step-down HMP.

Management Strategies:
Within 5 years of land acquisition and CCP approval:

- Minimize refuge activities that disturb wetland communities.
- Reach out to established local and regional conservation partnerships with action plans in place to identify opportunities to compliment and cooperate in planning and implementation.

Inventory and Monitoring Strategies:
Within 5 years of land acquisition and CCP approval:

- Map natural communities; protect rare or exemplary examples.
- Survey wildlife use of wetlands.
- Inventory wetland plant communities, and evaluate wetland hydrology for potential impacts to the natural flow regimes.

Objective 1.3: Inland Aquatic Habitats

Sub-objective 1.3a. (Open Water)
In collaboration with partners, identify and implement habitat restoration opportunities within the Fannie Stebbins Unit and Connecticut River to benefit priority refuge resources of concern including American shad, shortnose sturgeon, American eel, alewife, blueback herring, and Atlantic salmon, as well as other species of conservation concern such as sea lamprey.

Rationale:
A portion of the Fannie Stebbins Unit is adjacent to the Connecticut River which provides important migrating habitat for many species of conservation concern including American shad, shortnose sturgeon, American eel, alewife, blueback herring, and Atlantic salmon.

Shortnose sturgeon, a federal listed species prefers large rivers and estuaries during migration and for spawning where there is an abundance of crustaceans, mollusks and insects to feed on. They are a long-lived fish that are threatened by pollution, habitat alterations and overfishing. American shad, blueback herring and alewife spend the majority of their adult lives in the sea, and migrate to the Connecticut River to spawn in the spring. This portion of the Connecticut River may provide spawning habitat for these species.

American eel also occupy the main stem and potentially small streams within the Fannie Stebbins Unit. American eel are long lived, and spend the majority of their young life in these freshwater systems. American eel enter the Connecticut River as juveniles, and migrate upstream to inhabit bays, estuaries, streams, lakes, and ponds. Eels feed in these aquatic habitats until they reach sexual maturity and begin the long migration to their spawning grounds in the Sargasso Sea (ASMFC 2000).

Another species of conservation concern that may utilize freshwater aquatic habitats in this unit is sea lamprey. Sea lamprey enter the Connecticut River and tributaries to reproduce, and in the process provide important ecological benefits to aquatic systems. Adults transport nutrients between freshwater and saltwater systems, their nest construction restores and enhances streambed structure, abandoned nests are used by other riverine fish, and lamprey eggs and larvae provide food for a variety of species (Kircheis 2004). As with many riverine fish, sea lamprey movement is impeded by barriers on the main stem and tributaries.

The aquatic habitats in the Fannie Stebbins Unit provide habitat for many species of conservation concern, and is especially important for the federally listed shortnose sturgeon. We will work with partners to analyze current available data, and conduct additional assessments, as needed, to inform more detailed management and monitoring strategies within a required step-down HMP.

Management Strategies:
Within 5 years of land acquisition and CCP approval:

- Work with partners to maintain open channels from the Connecticut River to open water coves.

- Work with adjacent landowners to eliminate barriers to aquatic species passage.
- Reach out to established local and regional conservation partnerships with action plans in place to identify opportunities to compliment and cooperate in planning and implementation.

Within 10 years of land acquisition and CCP approval:

- Work with partners to protect and increase "hard bottom" (e.g., gravel, cobble, or bedrock) for spawning aquatic species.
- Work with partners to reduce combined sewer overflow.

Inventory and Monitoring Strategies:
Within 5 years of land acquisition and CCP approval:

- Work with partners to conduct stream assessments to evaluate stream and fish community health.

Objective 1.4: Coastal Non-forested Uplands (coastal beaches and rocky shores)

Not applicable

Objective 1.5: Coastal Wetlands and Aquatic Habitats (tidal salt marsh and estuary)

Not applicable

Goal 2: Education, Interpretation, and Outreach: Inspire residents and visitors to actively participate in the conservation and stewardship of the exceptional natural and cultural resources in the Connecticut River watershed, and promote a greater understanding and appreciation of the role of the Silvio O. Conte National Fish and Wildlife Refuge in conserving those resources.

Objective 2.1: Environmental Education

In collaboration with public and private educators from all four states in the watershed, lead or facilitate the implementation of structured natural and cultural resource curricula, with a focus on guiding educators and students to develop an awareness of, and concern about, natural and cultural resources and associated challenges; appreciate our conservation history; make informed decisions and work individually or collectively toward solutions; and model responsible environmental stewardship in their everyday lives.

Sub-objective 2.1a. (Environmental Education Planning and Training)
Encourage schools, scout groups, and summer camps to develop curricula that use the Fannie Stebbins Division as an outdoor classroom.

Rationale:
See environmental education rationale in chapter 4 detailing the importance of environmental education for the Service. Environmental education is one of the six priority, wildlife-dependent recreational uses of the Refuge System. Environmental education is particularly important at Conte Refuge because one of its founding purposes is to provide opportunities for environmental education. Environmental education is an important tool that can help refuge visitors and local residents, particularly students, appreciate the importance of this area to the larger watershed.

Management Strategies:
Within 1 year of acquiring sufficient land:

- Encourage schools, scout groups, and summer camps to develop curricula that use the Fannie Stebbins Division as an outdoor classroom.

Sub-objective 2.1b. (Environmental Education Delivery)
Encourage schools, scout groups, and summer camps to use the Fannie Stebbins Division as an outdoor classroom.

Rationale:
Because this division will be unstaffed, the majority of environmental education opportunities on this division will be led by partners, volunteers, and local school groups and other educational groups (e.g., scout groups and summer camps).

Management Strategies:
Within 1 year of acquiring sufficient land:

- Encourage schools, scout groups, and summer camps to develop curricula that use the Fannie Stebbins Division as an outdoor classroom.

Objective 2.2: Interpretation

Develop, lead, and facilitate interpretive programs that emotionally and intellectually connect the audience to natural and cultural resources in the watershed.

Sub-objective 2.2a. (Natural and Cultural Resource Interpretive Planning and Training)
With Friends groups, public and non-profit organizations, and volunteers, offer quality interpretive programming at the Fannie Stebbins Division. The development of highly trained interpreters will be encouraged by offering interpretive training to Friends' members, partners, and volunteers on a regular basis.

***Rationale*:**
See the rationale in chapter 4 detailing the importance of interpretation for the Service. Interpretation is an important tool that can help refuge visitors and local residents appreciate the importance of this area to the larger watershed. With an ADA-compliant trail planned for the site, the Fannie Stebbins Division will be well suited to support both self-guided, wildlife dependent interpretive experiences, as well as guided interpretive programs that convey messages about the refuge and about the Fannie Stebbins Division's habitats and cultural resources.

Management Strategies:
(These strategies are dependent on land acquisition from willing landowners.)

Within 5 years of acquiring sufficient land:

- Inventory and evaluate each unit to determine the appropriate interpretive materials to employ.
- Create meaningful, consistent, thematic statements to be used in the delivery of programming at the Fannie Stebbins Division.
- Provide resources and trainings to Friends, and volunteers in support of interpretive programs.

Within 10 years of acquiring sufficient land:

- Develop standardized self-guided interpretive services, such as interpretive trails and kiosks, exhibits, and printed media.
- Employ a variety of themed interpretive offerings (e.g., presentations, audio-visual programs, brochures, and exhibits) when creating programming for natural and cultural resource interpretation.

Inventory and Monitoring Strategies:
Within 5 years of land acquisition and CCP approval:

- Build an evaluation process that includes formal and informal evaluation to assess the effectiveness of all interpretation programs.

Sub-objective 2.2b. (Natural and Cultural Resource Interpretive Program Delivery)
Collaborate with Friends group, partners, and volunteers to deliver quality natural and cultural resource interpretive programs.

Rationale:
See rationale for sub-objective 2.2a.

Management Strategies:
(These strategies are dependent on land acquisition from willing landowners.)

Within 5 years of acquiring sufficient land:

- Through partners, and Friends group, annually provide quality interpretive programs, exhibits, printed media at the Fannie Stebbins Division.
- Incorporate thematic statements, measureable objectives, and evaluation measures into all interpretation efforts.
- Publicize interpretive programs through traditional media, on the refuge web site, and digital social media conduits.
- Maintain a supply of print interpretive brochures, i.e., general brochure and bird checklist that incorporate refuge interpretive messages and themes.
- Work with partners to create issue-oriented experiential activities and programs for use at their facilities.

Within 10 years of acquiring sufficient land:

- Contribute refuge interpretive information for scenic byways and other state publications and signs.
- Develop self -guided interpretive messages and use state of the art as well as traditional media (e.g., brochures).

Objective 2.3: Public and Community Outreach

Support, promote, and coordinate a wide range of outreach tools and activities to facilitate and improve communications and relationships with the American public, especially communities, adjacent landowners, and elected officials in the Connecticut River watershed, and to empower citizens to recognize and resolve local natural resource issues and promote conservation and the responsible use of natural resources.

Because the Fannie Stebbins Division would be unstaffed and does not have refuge facilities, public and community outreach for this site will occur through regular outreach activities at the headquarters and will not specifically occur at this site.

Objective 2.4: Science and Technical Outreach

Facilitate the collection and exchange of information that increases the knowledge and understanding of natural and cultural resources, addresses climate change and other conservation issues, and provides land managers with better information to make management decisions affecting resources.

Because the Fannie Stebbins Division would be unstaffed and does not have refuge facilities, science and technical outreach for this site will occur through regular outreach activities at the headquarters and will not specifically occur at this site.

Goal 3: Recreation: Promote high-quality, public recreational opportunities in the Connecticut River watershed that are complementary between ownerships and provide regional linkages with emphasis on promoting wildlife-dependent activities that connect people with nature.

Objective 3.1: Hunting

Support quality public hunting opportunities in the Connecticut River watershed to promote a unique understanding and appreciation of natural resources and their management on lands and waters, while also protecting a traditional outdoor pastime deeply rooted in America's natural heritage and conservation history.

Sub-objective 3.1a. (Hunting Opportunity, Access, and Infrastructure)
Provide the opportunity for a quality hunting experience based on state regulations.

Rationale:
The Fannie Stebbins Unit is comprised of floodplain forests and wetlands adjacent to the Connecticut River. Existing public hunting in the area is limited to the Connecticut River proper for waterfowl and Kings Island Coop Wildlife Management Area which offers waterfowl hunting under a state permit. Much of the Fannie Stebbins Unit is adjacent to municipal Hartford which limits hunting opportunities. We will coordinate with Connecticut Department of Energy and Environmental Protection, Hunting Review Team following acquisition of land where hunting is feasible and has been found to be a compatible use. Retaining hunting opportunities on public lands will ensure this wildlife-dependent recreational activity continues and contributes to the state's population management objectives.

Management Strategies:
(These strategies are dependent on land acquisition from willing landowners.)

Within 1 year of acquiring sufficient land to support hunting seasons:

- Complete all administrative requirements to officially open to hunting consistent with State hunting regulations and, if necessary, additional refuge-specific regulations.
- Consult with Connecticut Department of Energy and Environmental Protection, Hunting Review Team in evaluating the suitability of new acquisitions to support a safe, manageable hunt program, consistent with the final compatibility determination.
- Allow hunters access to the refuge outside of the normal division open hours (i.e. 30 minutes before sunrise and 30 minutes after sunset) as long as they are engaged in lawful hunting activities.
- Post newly acquired properties to ensure refuge boundary lines are clearly marked.
- Install an informational kiosk in a conspicuous location to post information on hunting seasons and other notices to visitors.
- Allow temporary tree stands and blinds that meet state hunting regulations and do not harm trees or other refuge vegetation. Tree stands and blinds must have the owner's name and phone number clearly displayed, and they must be removed at the end of the hunt season.

Within 5 years of acquiring land sufficient land to support hunting seasons:

- Work with Connecticut Department of Energy and Environmental Protection to determine whether opportunities exist for state-recognized disable hunters.

Inventory and Monitoring Strategies:
Within 5 years of land acquisition and CCP approval:

- Work with Connecticut Department of Energy and Environmental Protection to evaluate the effectiveness and success of a refuge hunt program in contributing to state population objectives.

Sub-objective 3.1b. (Hunter Education and Outreach)
Provide hunter education classes access to the division and conduct directed outreach to ensure hunters are informed about regulations, hunter ethics, and safety considerations. Develop programs, including brochures, signage, website pages, media releases, etc. to increase interest in hunting at the division.

Rationale:
Hunting is a priority public use that also serves as a population management tool. Providing hunter education instructors the opportunity to use the division with their classes will strengthen connections to the hunting community and student understanding of the role hunting plays in wildlife management. Making relevant information readily available to hunters through a variety of media will improve the quality of the hunting experience.

Management Strategies:
(These strategies are dependent on land acquisition from willing landowners.)

Within 1 year of acquiring sufficient land to support hunting seasons:

- Produce a hunt brochure that includes a hunt map and information on regulations, hunter ethics, safety considerations, etc. and make it available on the refuge website, at Fannie Stebbins Division kiosks, through a friends group, and in local businesses.

- Provide visitors with general information on the hunting program and refuge-specific and State regulations through the refuge website, information signs, and a hunting brochure. In all materials related to the hunting program, promote and encourage the use of lead-free ammunition.

- Work with the State to identify and evaluate the impacts associated with requiring the use of non-toxic ammunition for hunting on refuge lands.

Within 5 years of acquiring land sufficient land to support hunting seasons:

- Work with Connecticut Department of Energy and Environmental Protection to encourage youth hunting at the division as a means of introducing young people to this traditional recreation activity.

- Offer to host hunter education field courses.

Inventory and Monitoring Strategies:
Within 5 years of land acquisition and CCP approval:

- Develop a system to monitor and evaluate the hunting program with hunters and other users to determine if the objective is being met and to allow for adaptive management.

Objective 3.2: Fishing

Support quality, public fishing opportunities in the Connecticut River watershed to promote an understanding and appreciation of natural resources and their management on lands and waters, while also protecting a traditional outdoor pastime deeply rooted in the America's natural heritage and conservation history.

Sub-objective 3.2a. (Fishing Opportunities, Access, and Infrastructure)
Provide quality fishing opportunities at the Fannie Stebbins Division after completing all administrative procedures to officially open refuge lands to fishing, based on Connecticut Department of Energy and Environmental Protection regulations and division-specific regulations, if necessary.

Rationale:
The principal fishing resources on this unit are the Connecticut River and the lower reaches of the Fannie Stebbins and Farmington rivers. The Podunk River, Newberry and Stoughton brooks are also within the unit. Most people fish the Connecticut River from boats, but allowing bank fishing on a Fannie Stebbins unit would provide the public with another recreational opportunity. Fishing is a popular activity in this area and would continue under Service ownership. Retaining fishing opportunities conforms to historic uses on the unit and much of the surrounding land in the area.

Management Strategies:
(These strategies are dependent on land acquisition from willing landowners.)

Within 1 year of acquiring land with fishable waters:

- Complete all administrative requirements to officially open to fishing consistent with State hunting regulations and, if necessary, additional refuge-specific regulations.
- Post newly acquired properties to ensure refuge boundary lines are clearly marked.
- Install an informational kiosk in a conspicuous location to post information on fishing seasons and other notices to visitors.
- The Fannie Stebbins River Division would be open to visitors actively engaged in fishing during the seasons and times established by the state in their annual fishing regulations.

Within 5 years of acquiring land with fishable waters:

- Work with the Connecticut Department of Energy and Environmental Protection to inventory and assess fish populations on the division.

Inventory and Monitoring Strategies:
Within 5 years of land acquisition and CCP approval:

- Develop a system to monitor and evaluate the fishing program with anglers and other users to determine the objective is being met and to allow for adaptive management.

Sub-objective 3.2b. (Angler Education and Outreach)
Develop programs, including brochures, signage, website pages, media releases, etc. to inform visitors of fishing opportunities at the division.

Rationale:
Fishing is a priority public use and a traditional use in the unit. If land is acquired, the refuge will make information readily available to interested anglers regarding opportunities to fish on Service-owned land, location of fishable waters, and the available game fish.

Management Strategies:
(These strategies are dependent on land acquisition from willing landowners.)

Within 1 year of acquiring land with fishable waters:

- Produce a fishing brochure that includes information on regulations, angler ethics, safety considerations, etc. and make it available on the refuge website, at informational kiosks, and in local businesses. In all materials related to the fishing program, promote use of lead-free tackle.

Objective 3.3: Wildlife Observation and Photography

Support quality, public opportunities to observe and photograph wildlife in the Connecticut River watershed in a variety of natural habitats to connect a broad spectrum of people with nature.

Sub-objective 3.3a. (Infrastructure and Access for Wildlife Observation and Photography)
Provide quality opportunities for wildlife observation and photography for people of all physical abilities.

Rationale:
Wildlife viewing and photography is a priority public use on national wildlife refuges and a popular recreational activity. Opening acquired land in this new division to wildlife observation and photography will provide visitors a chance to see and photography a variety of wildlife species in their native habitats, while learning more about the Service, Refuge System, and the refuge.

Management Strategies:
(These strategies are dependent on land acquisition from willing landowners.)

Within 1 year of acquiring land:

- Allow public access from 30 minutes before sunrise to 30 minutes after sunset with the exception listed for hunters and anglers.

- Install an informational kiosk in a conspicuous location to post information on wildlife observation and photography opportunities, and other notices to visitors.

Within 5 years of acquiring land:

- Develop a public access strategy and required planning (i.e. NEPA, compatibility determination) that includes consideration of developed trails, parking, kiosks, viewing platforms, blinds, interpretation, signage, etc.

Within 15 years of acquiring land:

- Implement the visitor use enhancements identified in the public access strategy and the refuge Visitor Services Plan.

Sub-objective 3.3b. (Wildlife Observation and Photography Aids)
Offer viewing and photography aids that enhance the visitor experience. Use a variety of methods to reach a broad spectrum of people. Work closely with a friends group and other partners that host events designed to view wildlife on the division.

Rationale:
The entire division would be available for wildlife observation and photography; however, there are steps the refuge can take to enhance the experience. By providing new visitors a quality experience they are more likely to return and share their experiences with others. One way to accomplish this is to offer sufficient information to attract a variety of visitors through a variety of media.

Management Strategies:
(These strategies are dependent on land acquisition from willing landowners and determination that wildlife observation and photography are compatible uses.)

Within 1 year of acquiring land:

- Allow photography blinds that do not negatively impact wildlife behavior or conflict with other visitors. Blinds must be removed each day, unless arrangements have been made via a special use permit.

Within 5 years of acquiring land:

- Develop interpretive panels describing typical wildlife on the refuge, bird migration patterns, and other messages we want to convey to visitors.
- Sponsor wildlife observation events such as International Migratory Bird Day, the Big Sit, etc.
- Encourage local schools and environmental organizations to offer wildlife-centered trips to the refuge.
- Produce a list of wildlife species and associated habitats and other conservation information on the division for distribution at informational kiosks, the refuge website, and other popular media.

Within 10 years of acquiring land:

- Develop a public access strategy and required NEPA documentation that includes consideration of developed trails, parking, kiosks, viewing platforms, blinds, interpretation, signage, etc.

Within 15 years of acquiring land:

- Implement the visitor use enhancements identified in the public access strategy and the refuge visitor services plan.

Sub-objective 3.3c. (Watershed-based Partner Initiatives)
Not applicable

Objective 3.4: Other Recreational Activities

In order to reach a broader demographic, support non-priority outdoor recreational opportunities and public access to quality, nature-based experiences throughout the Connecticut River watershed that facilitate and improve community relationships, raise awareness and an appreciation for conserving natural resources, and garner support for the National Wildlife Refuge System.

Sub-objective 3.4a. (Regional Water-based Trail Initiatives and Opportunities Including Refuge Lands)
Develop compatible opportunities on the Fannie Stebbins Division that support regional water-based trail initiatives to connect people with nature, raise the visibility of the Service and the Refuge System, make the refuge more relevant to the local community, and to promote economic activity in the local area.

Rationale:
Regional water-based trails give individuals opportunities to engage in outdoor recreational opportunities in the Connecticut River watershed, such as fishing, boating, and wildlife observation. Examples include the Connecticut River waterway route.

Management Strategies:
Within 5 years of acquiring land:

- Work with public and private partners to determine whether and what roles this division might contribute to a Connecticut River waterway route.
- As lands are acquired, evaluate any water trails (e.g., canoe/kayak trails) that part of a regional or State network for their compatibility.

Sub-objective 3.4b. (Regional Land-based Trail Initiatives and Opportunities Including Refuge Lands)
Develop compatible opportunities on the Fannie Stebbins Division that support regional land-based trail initiatives to connect people with nature, raise the visibility of the Service and the Refuge System, make the refuge more relevant to the local community, and to promote economic activity in the local area.

Rationale:
Regional land-based trails give individuals opportunities to engage in outdoor recreational opportunities in the Connecticut River watershed, such as hiking, wildlife observation, and interpretation. Where appropriate, we will work with these partners to promote, and distribute information about, these opportunities.

Management Strategies:
Within 5 years of acquiring land:

- As lands are acquired, evaluate any existing trails (e.g., hiking trails, snowmobile trails, horseback riding trails) that part of an established regional or State network to determine if they are appropriate and compatible uses for the refuge.

Sub-objective 3.4c. (Other Appropriate and Compatible Recreational Opportunities That Enhance Visitor Use and Enjoyment of Refuge Lands)
Allow compatible outdoor recreational opportunities on the Fannie Stebbins Division that connect people with nature, raise the visibility of the Service and the Refuge System, make the refuge more relevant to the local community, and promote economic activity in the local area.

Rationale:
In addition to the priority public uses, there are other wildlife-dependent, appropriate and compatible recreational activities that can broaden the visitor base, giving people alternative ways to enjoy the natural resources at the division without detrimentally impacting the wildlife resource.

Management Strategies:
(These strategies are dependent on land acquisition from willing landowners.)

Within 1 year of acquiring land:

- Allow dispersed hiking, snowshoeing, and cross country skiing.
- Allow pet walking. In order to minimize conflicts with wildlife and other visitors, pets must be on leashes not longer than 10 feet in length.
- Allow recreational gathering of blueberries, blackberries, strawberries, raspberries, mushrooms, fiddleheads, and antler sheds.
- When compatible, allow commercial guiding in support of priority public uses by special use permit.
- Allow canoeing and kayaking in acquired coves and waterways.

Within 5 years of CCP approval:

- Work with Friends groups and partners to design and market a virtual geocache course at the division. The course should integrate orienteering with refuge interpretive messages that include linking this division to other refuge divisions and units.

Overview
Hatfield Unit (Existing Refuge Unit)

Hatfield, Massachusetts

Total Unit Acres[1]	19

[1] Actual acres

What are the priority habitat types within the unit? What percentage of the total unit acreage do they represent?

- Hardwood forest - 17%
- Freshwater marsh – 48%

For more information on this unit's habitats, see map A.39 and table A.29.

What are the Federal trust and other natural resource values in the unit?

1. **Migratory Birds**
   The Connecticut River watershed is a major migration corridor. The lower portion of the watershed (CT and MA) receives higher use by migrants, with use concentrated in habitats along the Connecticut River main stem (Smith College 2006). The Hatfield Unit is along an oxbow of the Connecticut River mainstem, comprised primarily of riparian forest and wetlands, providing stopover habitat for landbirds and waterfowl such as wood duck, mallard, alder flycatcher, swamp sparrow, veery, yellow warbler, red-tailed hawk, downy and hairy woodpecker, common yellowthroat and tufted titmouse.

2. **Wetlands**
   The Hatfield Unit includes a portion of the Connecticut River floodplain and forested upland approximately 150 to 200 feet above the floodplain. The western third of the unit, along Cronin Hill Road is primarily deciduous forest comprised of white ash (Fraxinus americana), red maple (Acer rubrum), beech (Fagus grandifolia), and black cherry (Prunus serotina) with some white pine (Pinus strobus). There is a steep drop east to the floodplain adjacent to Great Pond. Historically, this pond was part of the Connecticut River mainstem that was cutoff, forming an oxbow. Today this wetland complex is listed as Core Habitat and a Priority Wetland and Aquatic Core by the Massachusetts Natural Heritage and Endangered Species Program. Floodplain forests were at one time quite common in the state, particularly on the extensive alluvial silt deposits of the Connecticut River Valley, but they have been largely converted to agricultural land due to their high fertility (Paveglio and Taylor 2010; UMass 2012).

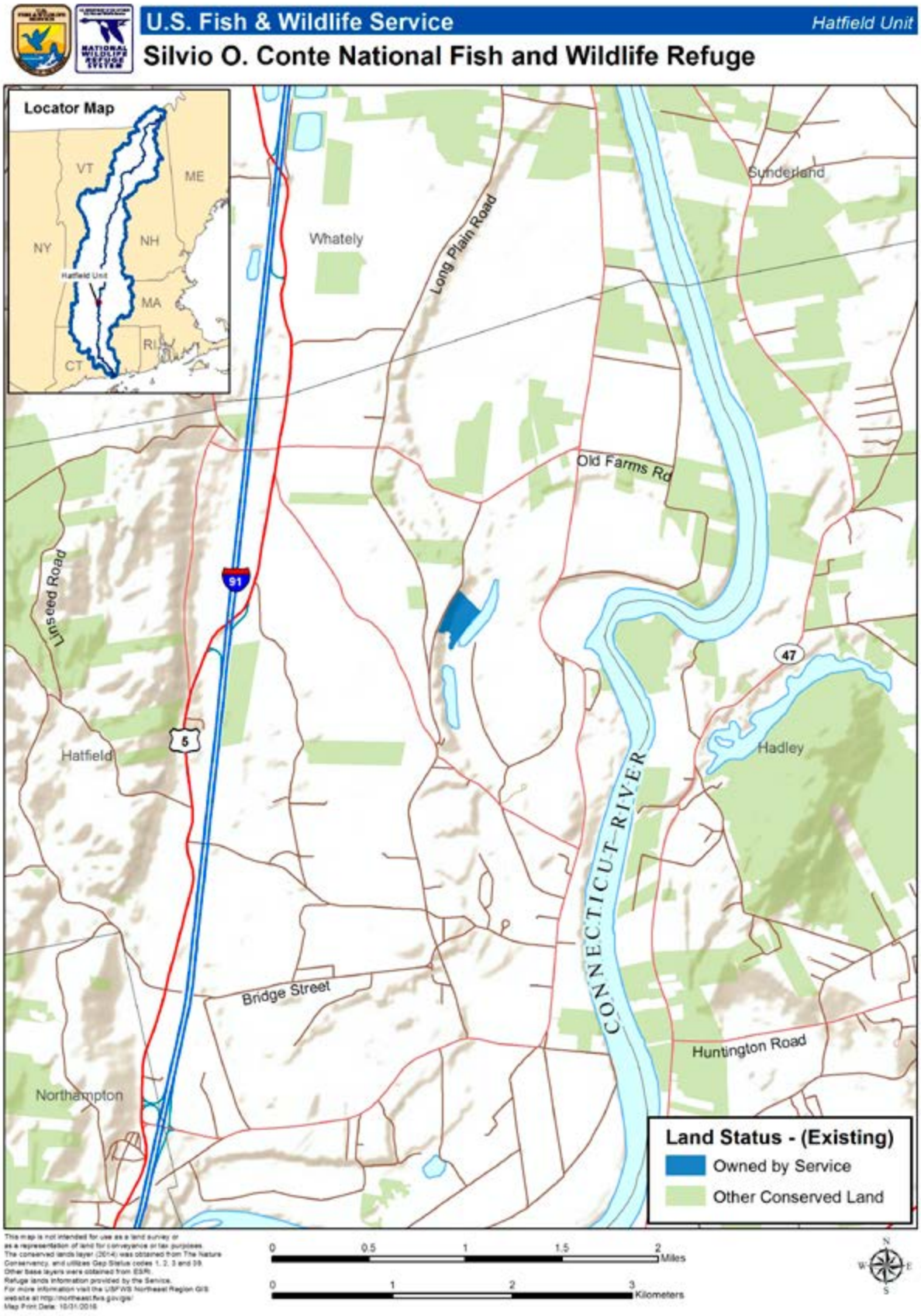
What habitat management activities would likely be a priority on the unit?

We will conduct a comprehensive, multi-scale wildlife habitat inventory. Baseline information on the condition of habitats (ie. forested, non-forested and open water habitats) will further inform more detailed, habitat prescriptions within a required step-down Habitat Management Plan. Once inventory has been completed, then management will focus on managing invasive plants to maintain native diversity.

What public use opportunities would likely be a priority on the unit?

This unit is not presently open to public access, but will be evaluated for compatible recreational opportunities when a visitor services step-down plan is undertaken

Map A.34. Hatfield Unit – Location.



Map A.35. Hatfield Unit – Habitat Types.

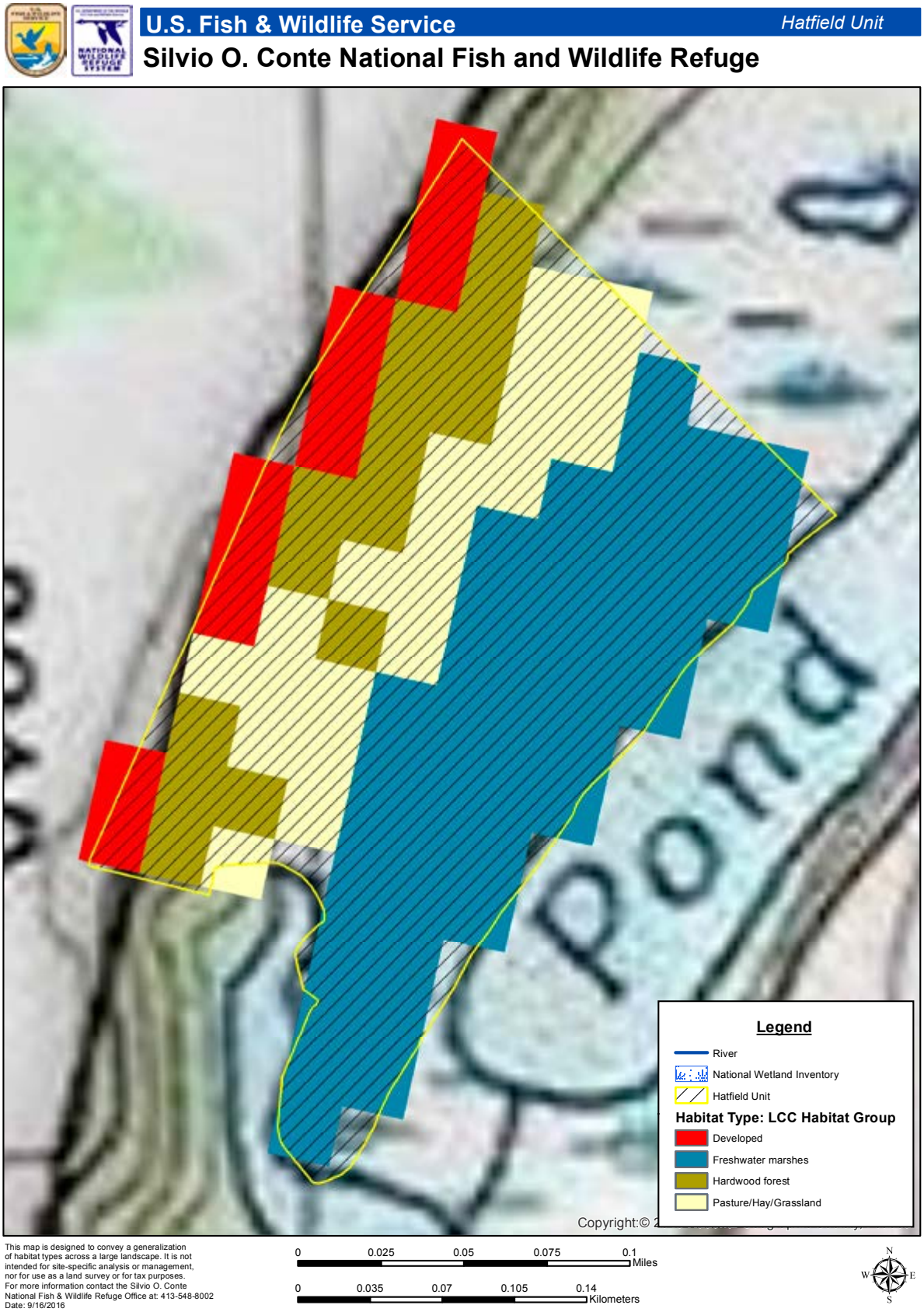


Table A.28. Hatfield Unit – Habitat Types.

LCC General Habitat Type[1]	Unit	
	Total Acres	Percent Unit
Forested Uplands and Wetlands[2]		
Hardwood forest	.5	17%
Freshwater marsh	2	48%
Forested uplands and wetlands subtotal	*2.5*	*35.0%*
Other[2]		
Pasture/Hay/Grassland	1	23%
Developed	.5	12%
Other subtotal	*1.5*	*65.0%*
TOTAL	**4**	**100.0%**

**All acreages are based upon GIS analysis and should be considered estimates

1 - North Atlantic Landscape Conservation Collaborative general habitat typings for USFWS representative species; linked to the National Vegetation Classification System (NVCS). See table A.52 at the end of this appendix for a comparison of these generalized habitat types with the more specific The Nature Conservancy's Northeastern Terrestrial Habitat Classification System. More detailed habitat tables that include the Northeastern Terrestrial Habitat Classification System habitat types are available for each CFA and refuge unit online at: *http://www.fws.gov/refuge/Silvio_O_Conte/what_we_do/conservation.html.*

2 - CCP Objective from Silvio O. Conte NFWR Draft CCP/EIS, Chapter 4, Alternative C-Service's Preferred Alternative

Goals, Objectives, and Strategies for the Hatfield Unit under Alternative C

Goal 1: Wildlife and Habitat Conservation: Promote the biological diversity, integrity, and resiliency of terrestrial and aquatic ecosystems within the Connecticut River watershed in an amount and distribution that sustains ecological function and supports healthy populations of native fish, wildlife, and plants, especially Federal trust species of conservation concern, in anticipation of the effects of climate, land use, and demographic changes.

Objective 1.1: Forested Uplands and Wetlands

Sub-objective 1.1a. (Biological Integrity, Biological Diversity, and Environmental Health)
Where and when appropriate, protect, or restore habitats absent an identified species of conservation concern, recognizing the importance of all habitats in contributing to the biological integrity, diversity, and environmental health of refuge lands and the Watershed.

Rationale:
The Hatfield Unit's small size and isolation from other refuge units, has led us to group our objectives and discussion under a single sub-objective that addresses the unit's contribution to the biological integrity, biological diversity, and environmental health of the wider Connecticut River watershed. While achieving the refuge purposes and the Refuge System mission are the paramount considerations for refuge management, the Service also has policy for maintaining and restoring, where appropriate, refuges' "biological integrity, diversity, and environmental health" (601 FW 3). This policy provides refuge managers with a process to analyze their refuge and recommend the best management direction to prevent further degradation of environmental conditions; and where appropriate, restore lost or severely degraded components. The policy suggests using historic conditions as a reference for comparing the ecosystem's current composition, structure, and functioning to what it was prior to substantial human related changes to the landscape. This comparison can be used to direct management to maintain or restore those natural conditions, to the extent practicable, without jeopardizing refuge purposes. For example, we consider the natural timing and frequency of disturbances, such as fires and flooding, and mimic those processes. In other words, the policy is intended to induce management for native fish, wildlife, and plants and their habitats in natural conditions, and with natural processes, using historic conditions to help identify such conditions and processes (Paveglio et al. 2010). However, we recognize that it is not always possible or desirable to try to mimic historic conditions, particularly in the face of predicted climate and land use changes and other landscape-scale considerations. Historic conditions are only one of many considerations when making decisions about how to manage refuge resources.

Conservationists often use the metaphor of coarse filters and fine filters to convey two complementary strategies for maintaining biological diversity, biological integrity, and environmental health: the first focuses on conserving ecosystems and the second focuses on species (Noss 1987, Hunter 1991, Groves 2003). The coarse-filter approach seeks to protect a representative array of natural ecosystems and their constituent processes, structures, and species (the refuge); however, some species fall through its pores, and coarse filters must be complemented by fine filter strategies tailored to fit particular species (priority species of concern). Sub-objectives throughout this plan generally represent a fine-filter approach—identifying species and their habitats that the USFWS has identified as priorities based upon our establishing legislation, refuge system mission, regional and national conservation plans, and conversations with conservation partners. In contrast, this sub-objective outlines unit management that will benefit many species, the majority of which will not receive the special, tailored attention of fine-filter conservation. The BIDEH policy guidance complements coarse-filter conservation in ways that fine-filter conservation misses.

The key idea of BIDEH conservation is that most ecosystems contain certain features that are critical to the welfare of many species; thus, conserving those features can have a positive effect on a large suite of species (biological diversity). Downed logs in a forest, a vernal pool, and a rocky outcrop in many terrestrial ecosystems are all examples of ecosystem features that support far more species than one would predict based on their size alone. The importance of conserving these features is widely recognized, but in an ad hoc, idiosyncratic fashion that often does not recognize the commonality between maintaining a dead and downed logs, a vernal pool, and an herbaceous wetland. BIDEH conservation overlaps with many aspects of matrix management and ecosystem management (Lindenmayer and Franklin 2002). A key difference is its specific focus on ecosystem elements, which explicitly complements coarse-filter and fine-filter conservation.

Habitats within the Hatfield Unit will be managed under the umbrella BIDEH policy. The wetland and upland habitats within this Unit provide a riparian buffer along the western edge of Great Pond, and are listed as BioMap2 Core Habitat by the Massachusetts Natural Heritage and Endangered Species Program. These habitats were identified as critical to maintaining Massachusetts biodiversity, specifically for state-listed species and exemplary natural communities. The Great Pond wetland complex was identified as important habitat for various state species of greatest conservation need including potential habitat for northern leopard frog.

The negative consequences of habitat loss and fragmentation to aspects of biological integrity, diversity and health have been shown by a large number of theoretical and empirical studies, in different environments, and for a large array of taxa (Fahrig 2003). Fragmentation is of particular concern in the area around the Hatfield unit—parcelization by land ownership is extensive. The large number and variety of landowners—each with their own objectives, resources, and constraints—means that the future of the Hatfield landscape is far from certain. Our understanding of the current condition of all the habitats considered under this sub-objective and their contribution to the BIDEH of the unit is poor. A comprehensive forest and wildlife habitat inventory will be necessary to inform more detailed management strategies that provide the full range of natural processes.

Management Strategies:
Within 5 years of CCP approval:

- Ensure a diversity of native species is present and non-native species are excluded or managed to keep population levels as low as possible. Management priority should be given to Japanese knotweed, barberry, honeysuckle and honeysuckle which threaten the wetlands within the Unit.

- Work with partners, including the State of Massachusetts, in support of the State Wildlife Action Plan, to ensure management on Service lands complement adjacent land management objectives.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Conduct habitat and wildlife inventories.

- Map natural communities; protect rare or exemplary examples.

Goal 2: Education, Interpretation, and Outreach: Inspire residents and visitors to actively participate in the conservation and stewardship of the exceptional natural and cultural resources in the Connecticut River watershed, and promote a greater understanding and appreciation of the role of the Silvio O. Conte National Fish and Wildlife Refuge in conserving those resources.

Objective 2.1: Environmental Education

This unit is not presently open to public access, but will be evaluated for compatible educational opportunities when a visitor services step-down plan is undertaken, or will be considered on a request basis.

Objective 2.2: Interpretation

This unit is not presently open to public access, but will be evaluated for compatible recreational opportunities when a visitor services step-down plan is undertaken , or will be considered on a request basis.

Objective 2.3: Public and Community Outreach

Because the Hatfield Unit would be unstaffed and does not have refuge facilities, public and community outreach for this site will occur through regular outreach activities at the headquarters and will not specifically occur at this site.

Objective 2.4: Science and Technical Outreach

Because the Hatfield Unit would be unstaffed and does not have refuge facilities, science and technical outreach for this site will occur through regular outreach activities at the headquarters and will not specifically occur at this site.

Goal 3: Recreation: Promote high-quality, public recreational opportunities in the Connecticut River watershed that are complementary between ownerships and which provide regional linkages with emphasis on promoting wildlife-dependent activities that connect people with nature.

Objective 3.1: Hunting

This unit is not presently open to hunting, but will be evaluated for compatible hunting opportunities when a visitor services step-down plan is undertaken

Objective 3.2: Fishing

This unit is not presently open to fishing, but will be evaluated for compatible fishing opportunities when a visitor services step-down plan is undertaken

Objective 3.3: Wildlife Observation and Photography

- This unit is not presently open to public access, but will be evaluated for compatible recreational opportunities when a visitor services step-down plan is undertaken, or will be considered on a request basis.

Overview
Honeypot Road Wetlands Unit (Existing Refuge Unit)

Westfield, Massachusetts

Total Unit Acres[1]	21

[1] Actual surveyed acres.

What are the priority habitat types within the unit? What percentage of the total unit acreage do they represent?

- Hardwood forest - 74%
- Hardwood Swamp – 22%
- Pasture/Hay/Grassland – 3%

For more information on the habitats in the unit, see map A.33 and table A.26.

What are the Federal trust and other natural resource values in the unit?

1. **Migratory Birds**
   The Connecticut River watershed is a major migration corridor. The lower portion of the watershed (CT and MA) receives higher use by migrants, with use concentrated in habitats along the Connecticut River main stem. Migrants become more evenly distributed in habitats in the watershed beyond the Connecticut River main stem (Smith College 2006). The Honeypot Wetland Unit's hardwood forests and swamps provide stopover habitat for landbirds.

2. **Wetlands**
   The State of Massachusetts considers the American clam shrimp to be a "species of concern" under its State endangered species act. The shrimp inhabit ephemeral (vernal) pools. Small numbers of clam shrimp have been recorded at three Massachusetts habitats: a flooded depression in an old pasture field, a flooded hay field depression, and at Honeypot Wetlands along the weedy shoreline of an Atlantic white cedar swamp. We will work with the State to monitor and protect this species, and the vernal pool habitats they occupy.

What habitat management activities would likely be a priority on the unit?

We will conduct a comprehensive, multi-scale wildlife habitat inventory. Baseline information on the condition of habitats (ie. forested, non-forested and open water habitats) will further inform more detailed, habitat prescriptions within a required step-down Habitat Management Plan. Once inventory has been completed, then management will focus on managing invasive plants to maintain native diversity.

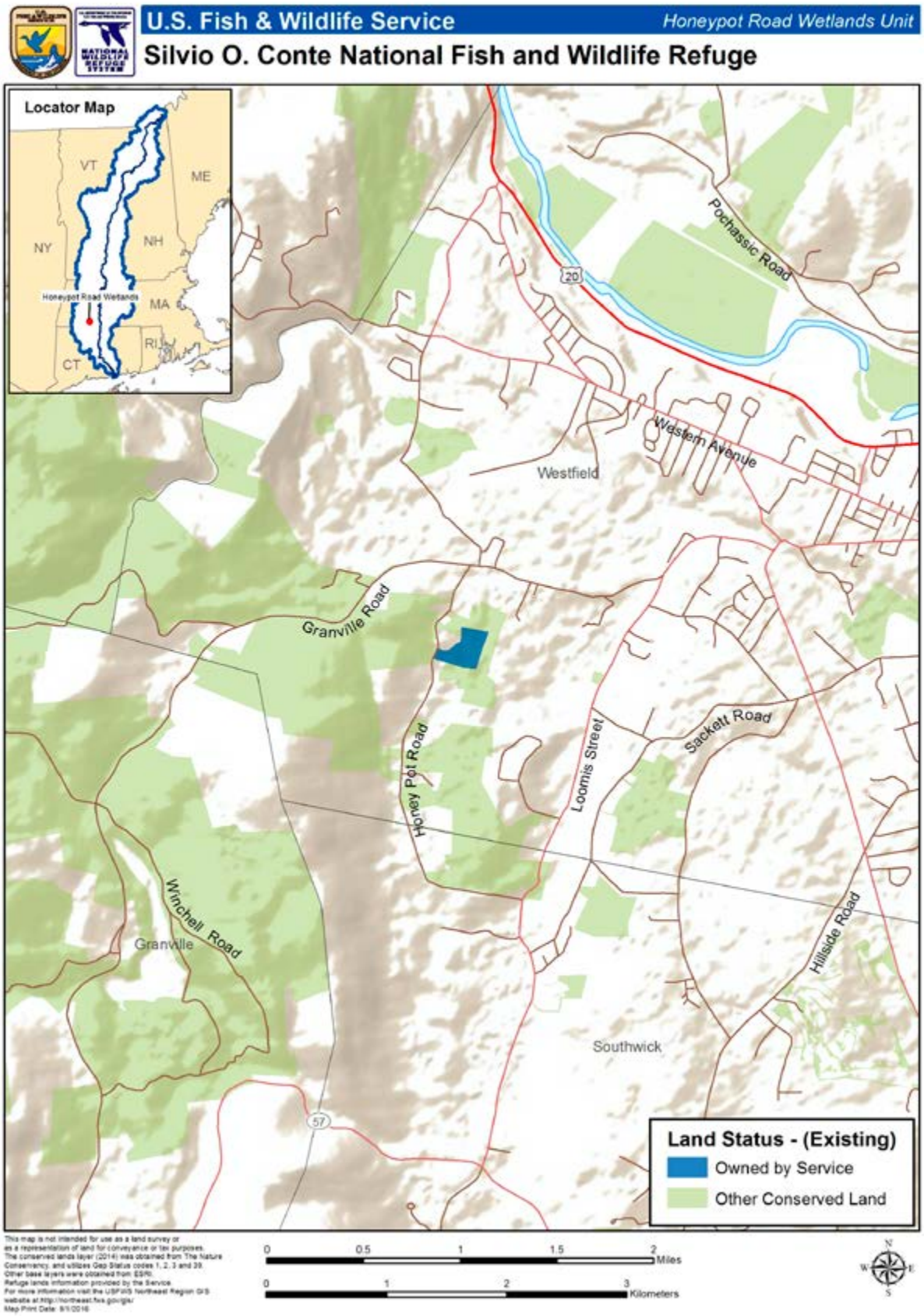
What public use opportunities would likely be a priority on the unit?

We would focus on providing opportunities for hunting and wildlife observation and photography.

Does the unit have special ecological, cultural, or recreational features or designations of regional, State, or local importance?

The State-listed American clam shrimp lives within an Atlantic white cedar swamp on the unit.

Map A.36. Honeypot Road Wetlands Unit – Location.



Map A.37. Honeypot Road Wetlands Unit – Habitat Types.

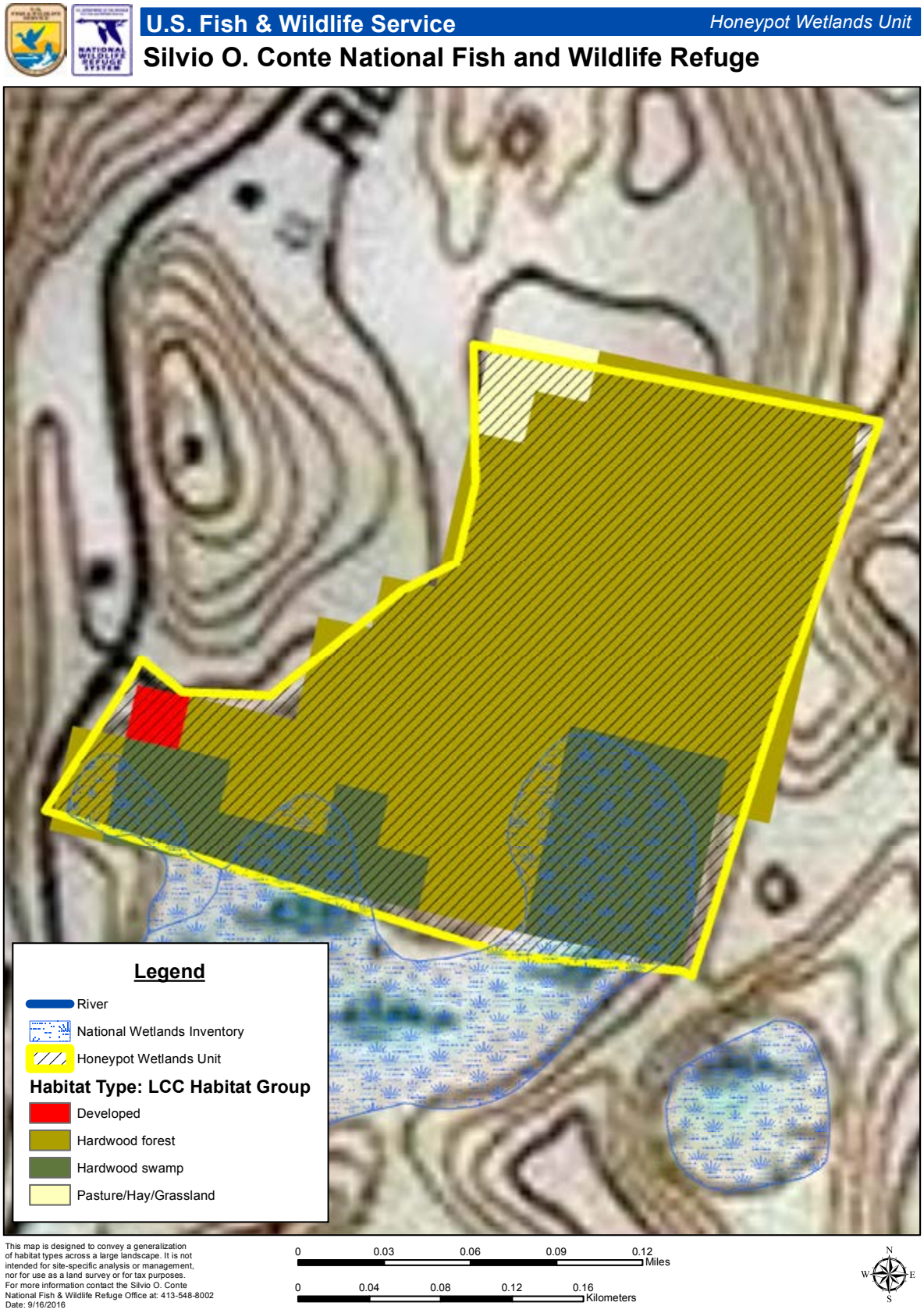


Table A.29. Honeypot Road Wetlands Unit – Habitat Types.

LCC General Habitat Type[1]	Unit	
	Total Acres	Percent Unit
Forested Uplands and Wetlands[2]		
Hardwood forest	16	74.0%
Hardwood swamp	5	21.9%
Forested uplands and wetlands subtotal	*20*	*95.8%*
Non-forested Uplands and Wetlands[2]		
Pasture/hay/grassland	1	3.1%
Non-forested uplands and wetlands subtotal	*1*	*3.1%*
Other		
Developed	0	1.0%
Other subtotal	*0*	*1.0%*
TOTAL	**21**	**100.0%**

**All acreages are based upon GIS analysis and should be considered estimates

1 - North Atlantic Landscape Conservation Collaborative general habitat typings for USFWS representative species; linked to the National Vegetation Classification System (NVCS). See table A.52 at the end of this appendix for a comparison of these generalized habitat types with the more specific The Nature Conservancy's Northeastern Terrestrial Habitat Classification System. More detailed habitat tables that include the Northeastern Terrestrial Habitat Classification System habitat types are available for each CFA and refuge unit online at: *http://www.fws.gov/refuge/Silvio_O_Conte/what_we_do/conservation.html.*

2 - CCP Objective from Silvio O. Conte NFWR Draft CCP/EIS, Chapter 4, Alternative C-Service's Preferred Alternative

Goals, Objectives, and Strategies for the Honeypot Road Wetlands Unit under Alternative C

Goal 1: Wildlife and Habitat Conservation: Promote the biological diversity, integrity, and resiliency of terrestrial and aquatic ecosystems within the Connecticut River watershed in an amount and distribution that sustains ecological function and supports healthy populations of native fish, wildlife, and plants, especially Federal trust species of conservation concern, in anticipation of the effects of climate, land use, and demographic changes.

Objective 1.1: Forested Uplands and Wetlands

Sub-objective 1.1a (Biological Integrity, Biological Diversity, and Environmental Health)
Where and when appropriate, protect, or restore habitats absent an identified species of conservation concern, recognizing the importance of all habitats in contributing to the biological integrity, diversity, and environmental health of refuge lands and the Watershed.

Rationale:
The Honeypot Wetlands Unit's small size and isolation from other refuge units, has led us to aggregate our objectives and discussion under a single sub-objective that addresses the unit's contribution to the biological integrity, biological diversity, and environmental health of the wider Connecticut River watershed. While achieving the refuge purposes and the Refuge System mission are the paramount considerations for refuge management, the Service also has policy for maintaining and restoring, where appropriate, refuges' "biological integrity, diversity, and environmental health" (601 FW 3). This policy provides refuge managers with a process to analyze their refuge and recommend the best management direction to prevent further degradation of environmental conditions; and where appropriate, restore lost or severely degraded components. The policy suggests using historic conditions as a reference for comparing the ecosystem's current composition, structure, and functioning to what it was prior to substantial human related changes to the landscape. This comparison can be used to direct management to maintain or restore those natural conditions, to the extent practicable, without jeopardizing refuge purposes. For example, we consider the natural timing and frequency of disturbances, such as fires and flooding, and mimic those processes. In other words, the policy is intended to induce management for native fish, wildlife, and plants and their habitats in natural conditions, and with natural processes, using historic conditions to help identify such conditions and processes (Paveglio et al. 2010). However, we recognize that it is not always possible or desirable to try to mimic historic conditions, particularly in the face of predicted climate and land use changes and other landscape-scale considerations. Historic conditions are only one of many considerations when making decisions about how to manage refuge resources.

Conservationists often use the metaphor of coarse filters and fine filters to convey two complementary strategies for maintaining biological diversity, biological integrity, and environmental health: the first focuses on conserving ecosystems and the second focuses on species (Noss 1987, Hunter 1991, Groves 2003). The coarse-filter approach seeks to protect a representative array of natural ecosystems and their constituent processes, structures, and species (the refuge); however, some species fall through its pores, and coarse filters must be complemented by fine filter strategies tailored to fit particular species (priority species of concern). Sub-objectives throughout this plan generally represent a fine-filter approach—identifying species and their habitats that the USFWS has identified as priorities based upon our establishing legislation, refuge system mission, regional and national conservation plans, and conversations with conservation partners. In contrast, this sub-objective outlines unit management that will benefit many species, the majority of which will not receive the special, tailored attention of fine-filter conservation. The BIDEH policy guidance complements coarse-filter conservation in ways that fine-filter conservation misses.

The key idea of BIDEH conservation is that most ecosystems contain certain features that are critical to the welfare of many species; thus, conserving those features can have a positive effect on a large suite of species (biological diversity). Downed logs in a forest, streams and vernal pools in many terrestrial ecosystems are all examples of ecosystem features that support far more species than one would predict based on their size alone. The importance of conserving these features is widely recognized, but in an ad hoc, idiosyncratic fashion that often does not recognize the commonality between maintaining a dead and downed logs, a vernal pool, and an

herbaceous wetland. BIDEH conservation overlaps with many aspects of matrix management and ecosystem management (Lindenmayer and Franklin 2002). A key difference is its specific focus on ecosystem elements, which explicitly complements coarse-filter and fine-filter conservation.

Habitats that occur within the Honeypot Wetlands Unit where species-specific management guidelines are not identified will be managed under the umbrella BIDEH policy. These habitats, by virtue of refuge land ownership, represent small or isolated occurrences, but are important in maintaining connectivity within the larger forested matrix, and provide additional structural and species diversity to the matrix. A vernal pool or an herbaceous wetland, for instance, are anomalies in an otherwise forested landscape. They often have a special flora and fauna – providing ephemeral freshwater habitats for clam shrimp, or herbaceous wetlands for secretive bird species. One could make the case that these ephemeral freshwater habitats are small, independent ecosystems, but they are really too small to be candidates for a classic coarse-filter strategy and thus best considered in a BIDEH context.

Some habitats within the unit will be managed under a more classic coarse-filter approach—primarily those areas where the American clam shrimp has been documented. The State of Massachusetts considers the clam shrimp to be a "species of concern" under its State endangered species act. The shrimp inhabit ephemeral (vernal) pools. Small numbers of clam shrimp have been recorded at three Massachusetts habitats: a flooded depression in an old pasture field, a flooded hay field depression, and at Honeypot Wetlands along the weedy shoreline of an Atlantic white cedar swamp. The refuge will continue to monitor this known population for impacts from planned refuge activities.

Combining coarse and fine-scale conservation efforts under the rubric of BIDEH will allow the conservation of large numbers of species, the majority of which are too poorly known to be conserved individually, and more targeted strategies for those rare, threatened, or endangered species like the American clam shrimp. Together, the multiple strategies are reasonably comprehensive because all species and habitats known to be in jeopardy will receive needed attention.

The negative consequences of habitat loss and fragmentation to aspects of biological integrity, diversity and health have been shown by a large number of theoretical and empirical studies, in different environments, and for a large array of taxa (Fahrig 2003). Our understanding of the current condition of all the habitats considered under this sub-objective and their contribution to the BIDEH of the unit is poor. A comprehensive forest and wildlife habitat inventory will be necessary to inform more detailed management strategies that provide the full range of natural processes.

Management Strategies:
Within 5 years of CCP approval:

- Work with partners, including the State of Massachusetts, in support of the State Wildlife Action Plan, to ensure management on Service lands complement adjacent land management objectives.
- Ensure a diversity of native species is present and non-native species are excluded or managed to keep population levels as low as possible.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Conduct habitat and wildlife inventories.
- Map natural communities; protect rare or exemplary examples.
- Monitor impacts to sensitive habitats from public use.
- Work with partners to monitor known American clam shrimp populations.

Goal 2: Education, Interpretation, and Outreach: Inspire residents and visitors to actively participate in the conservation and stewardship of the exceptional natural and cultural resources in the Connecticut River watershed, and promote a greater understanding and appreciation of the role of the Silvio O. Conte National Fish and Wildlife Refuge in conserving those resources.

Objective 2.1: Environmental Education

In collaboration with public and private educators from all four states in the watershed, lead or facilitate the implementation of structured natural and cultural resource curricula, with a focus on guiding educators and students to develop an awareness of, and concern about, natural and cultural resources and associated challenges; appreciate our conservation history; make informed decisions and work individually or collectively toward solutions; and model responsible environmental stewardship in their everyday lives.

Sub-objective 2.1a. (Environmental Education Planning and Training)
Encourage schools, scout groups, and summer camps to develop curricula that use the Honeypot Road Wetlands Unit as an outdoor classroom.

Rationale:
See environmental education rationale in chapter 4 detailing the importance of environmental education for the Service. Environmental education is one of the six priority, wildlife-dependent recreational uses of the Refuge System. Environmental education is particularly important at Conte Refuge because one of its founding purposes is to provide opportunities for environmental education. Environmental education is an important tool that can help refuge visitors and local residents, particularly students, appreciate the importance of this area to the larger watershed.

Management Strategies:
Within 1 year of CCP approval:

- Encourage schools, scout groups, and summer camps to develop curricula that use the Honeypot Road Wetlands Unit as an outdoor classroom.

Sub-objective 2.1b. (Environmental Education Delivery)
Encourage schools, scout groups, and summer camps to use the Honeypot Road Wetlands Unit as an outdoor classroom.

Rationale:
Because this unit will be unstaffed, the majority of environmental education opportunities on this unit will be led by partners, volunteers, and local school groups and other educational groups (e.g., scout groups and summer camps).

Management Strategies:
Within 1 year of CCP approval:

- Encourage schools, scout groups, and summer camps to develop curricula that use the Honeypot Road Wetlands Unit as an outdoor classroom.

Objective 2.2: Interpretation

Develop, lead, and facilitate interpretive programs that emotionally and intellectually connect the audience to natural and cultural resources in the watershed.

Sub-objective 2.2a. (Natural and Cultural Resource Interpretive Planning and Training)
With Friends groups, public and non-profit organizations, and volunteers, offer quality interpretive programming at the Honeypot Road Wetlands Unit. The development of highly trained interpreters will be encouraged by offering interpretive training to Friends' members, partners, and volunteers on a regular basis.

Rationale:
See the rationale in chapter 4 detailing the importance of interpretation for the Service. Interpretation is an important tool that can help refuge visitors and local residents appreciate the importance of this area to the larger watershed. Interpretation is an important tool that can be used to spread the refuge message to private residents and visitors to the refuge. We will develop interpretive materials with information on the unit's habitats and cultural resources.

Management Strategies:
Within 5 years of CCP approval:

- Inventory and evaluate each unit to determine the appropriate interpretive materials to employ.
- Create meaningful, consistent, thematic statements to be used in the delivery of programming at the Honeypot Road Wetlands Unit.
- Provide resources and trainings to Friends, and volunteers in support of interpretive programs.

Within 10 years of CCP approval:

- Develop standardized self-guided interpretive services, such as kiosks, exhibits, and printed media.
- Employ a variety of themed interpretive offerings (e.g., presentations, audio-visual programs, brochures, and exhibits) when creating programming for natural and cultural resource interpretation.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Build an evaluation process that includes formal and informal evaluation to assess the effectiveness of all interpretation programs.

Sub-objective 2.2b. (Natural and Cultural Resource Interpretive Program Delivery)
Collaborate with Friends group, partners, and volunteers to deliver quality natural and cultural resource interpretive programs.

Rationale:
See rationale for sub-objective 2.2a.

Management Strategies:
Within 5 years of CCP approval:

- Through partners, and Friends group, annually provide quality interpretive programs, exhibits, printed media at the Honeypot Road Wetlands Unit.
- Incorporate thematic statements, measureable objectives, and evaluation measures into all interpretation efforts.
- Publicize interpretive programs through traditional media, on the refuge web site, and digital social media conduits.
- Maintain a supply of print interpretive brochures, i.e., general brochure and bird checklist that incorporate refuge interpretive messages and themes.
- Work with partners to create issue-oriented experiential activities and programs for use at their facilities.

Within 10 years of CCP approval:

- Contribute refuge interpretive information for scenic byways and other state publications and signs.
- Develop self -guided interpretive messages and use state of the art as well as traditional media (e.g., brochures).

Objective 2.3: Public and Community Outreach

Support, promote, and coordinate a wide range of outreach tools and activities to facilitate and improve communications and relationships with the American public, especially communities, adjacent landowners, and elected officials in the Connecticut River watershed, and to empower citizens to recognize and resolve local natural resource issues and promote conservation and the responsible use of natural resources.

Because the Honeypot Road Wetlands Unit would be unstaffed and does not have refuge facilities, public and community outreach for this site will occur through regular outreach activities at the headquarters and will not specifically occur at this site.

Objective 2.4: Science and Technical Outreach

Facilitate the collection and exchange of information that increases the knowledge and understanding of natural and cultural resources, addresses climate change and other conservation issues, and provides land managers with better information to make management decisions affecting resources.

Because the Honeypot Road Wetlands Unit would be unstaffed and does not have refuge facilities, science and technical outreach for this site will occur through regular outreach activities at the headquarters and will not specifically occur at this site.

Goal 3: Recreation: Promote high-quality, public recreational opportunities in the Connecticut River watershed that are complementary between ownerships and which provide regional linkages with emphasis on promoting wildlife-dependent activities that connect people with nature.

Objective 3.1: Hunting

Support quality public hunting opportunities in the Connecticut River watershed to promote a unique understanding and appreciation of natural resources and their management on lands and waters, while also protecting a traditional outdoor pastime deeply rooted in America's natural heritage and conservation history.

Sub-objective 3.1a. (Hunting Opportunity, Access and Infrastructure)
Provide the opportunity for a quality hunting experience based on state regulations.

Rationale:
Hunting is allowed on national wildlife refuges, as long as it is found to be a compatible use. The Honey Pot Wetlands Unit (Unit) abuts the state Honey Pot Wildlife Management Area (Honey Pot WMA) which is open to hunting under state regulations. A larger unit of the Honey Pot WMA is close by to the south and the Westfield Wildlife Management Area is across Honey Pot Road, west of the unit. This area has been a popular area with hunters for many years. Allowing hunting opportunities at this unit conforms to historic use on the nearby state wildlife management areas. Popular game species include white-tailed deer, turkey, and cottontail rabbits. Allowing hunters to use public lands helps ensure this wildlife-dependent recreational activity continues and contribute to the state's population management objectives.

Management Strategies:
Within 1 year of CCP approval:

- Complete all administrative requirements to officially open to hunting consistent with State hunting regulations and, if necessary, additional refuge-specific regulations.
- Allow hunters access to the refuge outside of the normal unit open hours (i.e. 30 minutes before sunrise and 30 minutes after sunset) as long as they are engaged in lawful hunting activities.
- Install an informational kiosk in a conspicuous location to post information on hunting seasons and other notices to visitors.
- Allow temporary tree stands and blinds that meet state hunting regulations and do not harm trees or other refuge vegetation. Tree stands and blinds must have the owner's name and phone number clearly displayed, and they must be removed at the end of the hunt season.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Work with Massachusetts Department of Fish and Game to evaluate the effectiveness and success of the refuge hunt program in contributing to state population objectives.

Sub-objective 3.1b. (Hunter Education and Outreach)
Provide hunter education classes access to the unit and conduct directed outreach to ensure hunters are informed about regulations, hunter ethics, and safety considerations. Develop programs, including brochures, signage, website pages, media releases, etc. to increase interest in hunting at the unit.

Rationale:
Hunting is a priority public use that also serves as a population management tool. Providing hunter education instructors the opportunity to use the unit with their classes will strengthen connections to the hunting community and student understanding of the role hunting plays in wildlife management. Making relevant information readily available to hunters through a variety of media will improve the quality of the hunting experience.

Management Strategies:
Within 1 year of CCP approval:

- Produce a hunt brochure that includes a hunt map and information on regulations, hunter ethics, safety considerations, etc. and make it available on the refuge website, at Massachusetts Department of Fish and Game facilities, and in local businesses.
- Provide visitors with general information on the hunting program and refuge-specific and State regulations through the refuge website, information signs, and a hunting brochure. In all materials related to the hunting program, promote and encourage the use of lead-free ammunition.
- Work with the State to identify and evaluate the impacts associated with requiring the use of non-toxic ammunition for hunting on refuge lands.

Within 5 years of CCP approval:

- Work with Massachusetts Department of Fish and Game to encourage youth hunting at the unit as a means of introducing young people to this traditional recreation activity.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Develop a system to monitor and evaluate the hunting program with hunters and other users to determine if the objective is being met and to allow for adaptive management.

Sub-objective 3.1b. (Hunter Education and Outreach)
Not applicable

Objective 3.2: Fishing

Support quality, public fishing opportunities in the Connecticut River watershed to promote an understanding and appreciation of natural resources and their management on lands and waters, while also protecting a traditional outdoor pastime deeply rooted in the America's natural heritage and conservation history.

This objective is not applicable because there is no permanent surface water on this unit.

Objective 3.3: Wildlife Observation and Photography

Support quality, public opportunities to observe and photograph wildlife in the Connecticut River watershed in a variety of natural habitats to connect a broad spectrum of people with nature.

Sub-objective 3.3a. (Infrastructure and Access for Wildlife Observation and Photography)
Provide quality opportunities for wildlife observation and photography at the Honey Pot Wetlands Unit.

Rationale:
Wildlife viewing and photography is a priority public use on national wildlife refuges and a popular recreational activity in this part of the state. Currently, there is no infrastructure in place at this unit to support this use, and consequently, visitation for wildlife viewing and photography is limited. Allowing people to engage in wildlife observation and photography is in keeping with the nature of the area.

Management Strategies:
Continue to:

- Allow wildlife observation and photography at the Honey Pot Wetlands Unit.
- Allow public access daily from 30 minutes before sunrise to 30 minutes after sunset with the exception listed for hunters.

Within 1 year of CCP approval:

- Add information on the Honey Pot Wetlands Unit to the refuge Web site.

Within 5 years of CCP approval:

- Determine whether an informational kiosk adjacent to Honey Pot Road is warranted, to provide information about the unit and refuge to visitors.

Sub-objective 3.3b. (Wildlife Observation and Photography Aids)
Offer viewing and photography aids that enhance the visitor experience. Use a variety of methods to reach a broad spectrum of people. Work closely with the friends group and other partners who host events designed to view wildlife on the unit.

Rationale:
The entire unit would be available for wildlife observation and photography; however, since this is a small landholding adjacent to a large area of state-conserved land that is popular with recreationists, no viewing aids would be developed.

Management Strategies:
Within 1 year of CCP approval:

- Allow photography blinds that do not negatively impact wildlife behavior or conflict with other visitors. Blinds must be removed each day, unless arrangements have been made via a special use permit.

Within 10 years of CCP approval:

- Produce a wildlife and plant species guide for the Honey Pot Wetlands Unit that will be available on the refuge website and at the refuge headquarters.

Sub objective 3.3c Watershed-based Partner Initiatives
Not applicable

Objective 3.4: Other Recreational Activities

In order to reach a broader demographic, support non-priority outdoor recreational opportunities and public access to quality, nature-based experiences throughout the Connecticut River watershed that facilitate and improve community relationships, raise awareness and an appreciation for conserving natural resources, and garner support for the National Wildlife Refuge System.

Sub-objective 3.4a. (Regional Water-based Trail Initiatives and Opportunities Including Refuge Lands)
Not applicable

Sub-objective 3.4b. (Regional Land-based Trail Initiatives and Opportunities Including Refuge Lands)
Not applicable

Sub-objective 3.4c. (Other Appropriate and Compatible Recreational Opportunities That Enhance Visitor Use and Enjoyment of Refuge Lands)
Allow compatible outdoor recreational opportunities on the Honeypot Road Wetlands Unit that connect people with nature, raise the visibility of the Service and the Refuge System, make the refuge more relevant to the local community, and promote economic activity in the local area.

Rationale:
In addition to the priority public uses, there are other wildlife-dependent, appropriate, and compatible recreational activities that can broaden the visitor base, giving people alternative ways to enjoy the natural resources at the unit. Each of these must be found to be both appropriate and compatible to be an authorized use of the refuge.

Management Strategies:
Within 1 year of CCP approval:

- Allow dispersed hiking and snowshoeing.
- Allow pet walking. In order to minimize conflicts with wildlife and other visitors, pets must be on leashes not longer than 10 feet in length.
- Allow recreational gathering of blueberries, blackberries, strawberries, raspberries, mushrooms, fiddleheads, and antler sheds.
- When compatible, allow commercial guiding in support of priority public uses by special use permit.

Within 5 years of CCP approval:

- If interest exists, work with partners to design and market a virtual geocache course at the unit. The course should integrate orienteering with refuge interpretive messages that include linking this unit to other refuge divisions and units.

Overview
Mount Toby Unit (Existing Refuge Unit)

Sunderland, Massachusetts

Total Unit Acres[1]	30

[1] Actual surveyed acres

What are the priority habitat types within the unit? What percentage of the total unit acreage do they represent?

- Hardwood forest - 98%
- Pasture/Hay/Grassland – 2%

For more information on the unit's habitats, see map A.35 and table A.27.

What are the Federal trust and other natural resource values in the proposed CFA?

1. **Migratory Birds**
   The Connecticut River watershed is a major migration corridor. The lower portion of the watershed (CT and MA) receives higher use by migrants, with use concentrated in habitats along the Connecticut River main stem. Migrants become more evenly distributed in habitats in the watershed beyond the Connecticut River main stem (Smith College 2006). The Mount Toby Unit's hardwood forest is situated within a larger conserved landscape and serves as important stopover habitat for landbirds.

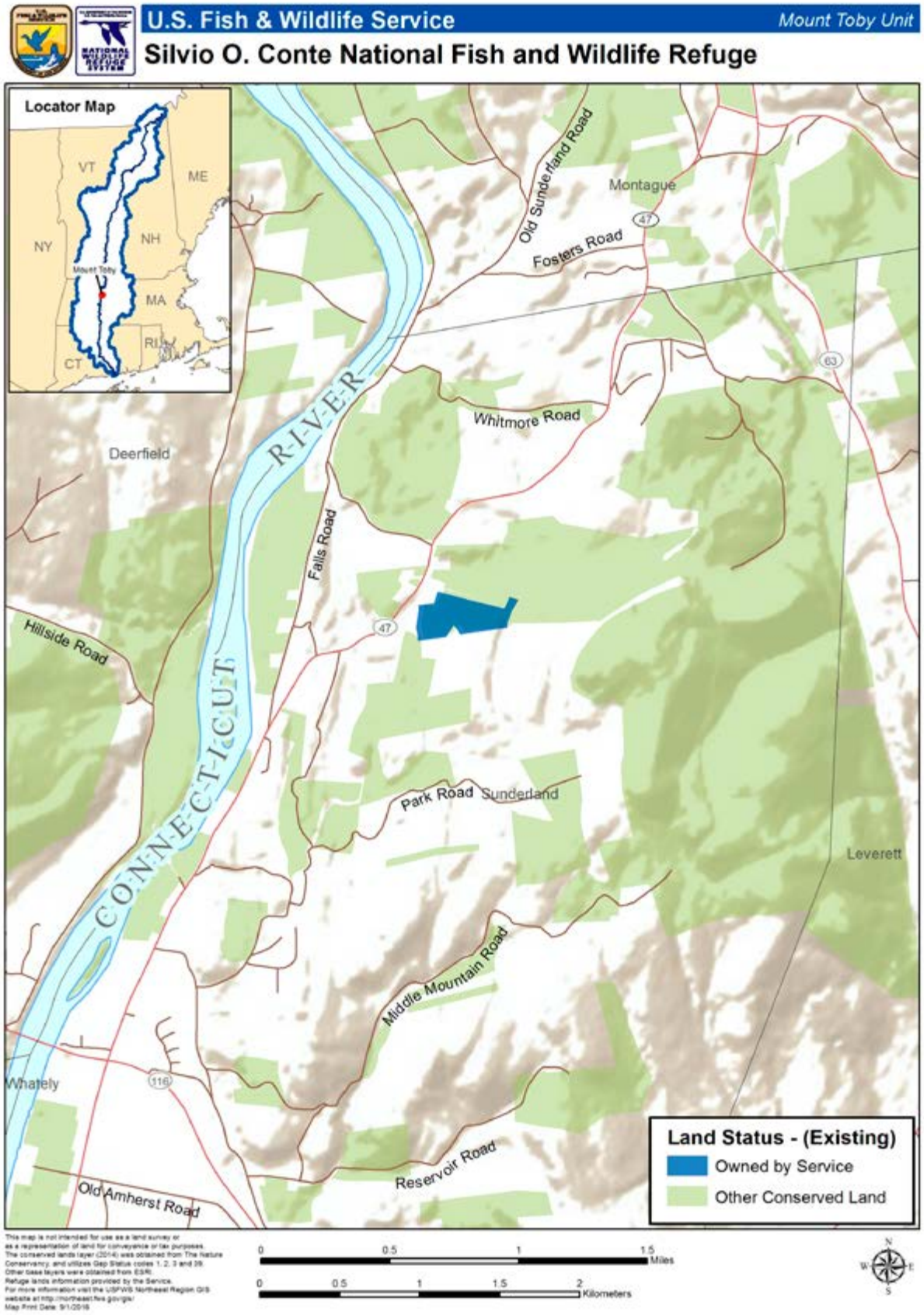
What habitat management activities would likely be a priority on refuge lands within the proposed CFA?

We will conduct a comprehensive, multi-scale wildlife habitat inventory. Baseline information on the condition of habitats (ie. forested, non-forested and open water habitats) will further inform more detailed, habitat prescriptions within a required step-down Habitat Management Plan (HMP). Once inventory has been completed, then management will focus on managing invasive plants to maintain native diversity.

What public use opportunities would likely be a priority on refuge lands within the proposed CFA?

We would focus on providing opportunities for hunting, interpretation, and wildlife observation and photography.

Map A.38. Mount Toby – Location.



Map A.39. Mount Toby – Habitat Types.

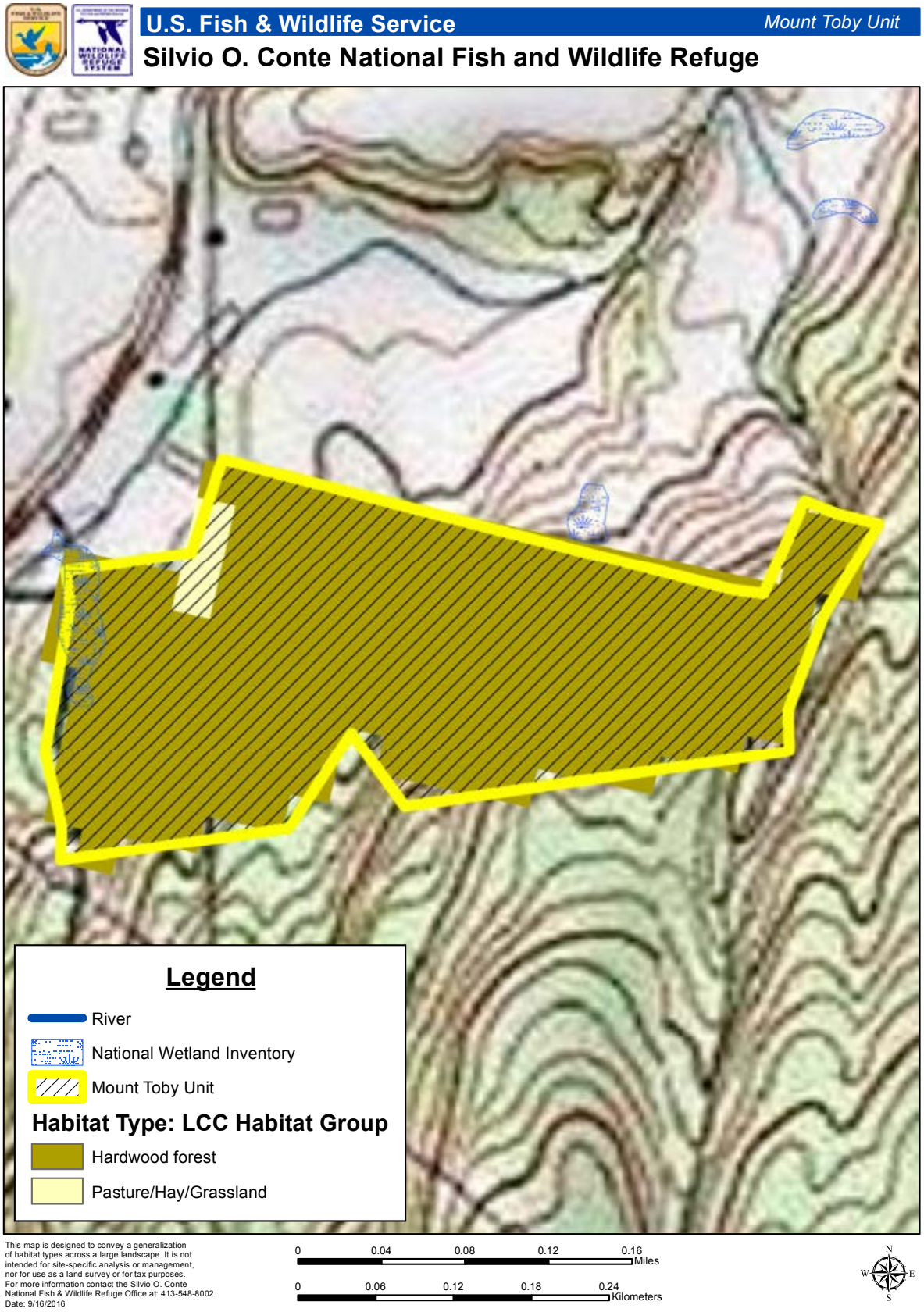


Table A.30. Mount Toby – Habitat Types.

LCC General Habitat Type[1]	Unit	
	Total Acres	Percent Unit
Forested Uplands and Wetlands[2]		
Hardwood forest	29	97.8%
Forested uplands and wetlands subtotal	*29*	*97.8%*
Non-forested Uplands and Wetlands[2]		
Pasture/hay/grassland	1	2.2%
Non-forested uplands and wetlands subtotal	*1*	*2.2%*
TOTAL	**30**	**100.0%**

**All acreages are based upon GIS analysis and should be considered estimates

1 - North Atlantic Landscape Conservation Collaborative general habitat typings for USFWS representative species; linked to the National Vegetation Classification System (NVCS). See table A.52 at the end of this appendix for a comparison of these generalized habitat types with the more specific The Nature Conservancy's Northeastern Terrestrial Habitat Classification System. More detailed habitat tables that include the Northeastern Terrestrial Habitat Classification System habitat types are available for each CFA and refuge unit online at: *http://www.fws.gov/refuge/Silvio_O_Conte/what_we_do/conservation.html.*

2 - CCP Objective from Silvio O. Conte NFWR Draft CCP/EIS, Chapter 4, Alternative C-Service's Preferred Alternative

Goals, Objectives, and Strategies for the Mount Toby Unit under Alternative C

Goal 1: Wildlife and Habitat Conservation: Promote the biological diversity, integrity, and resiliency of terrestrial and aquatic ecosystems within the Connecticut River watershed in an amount and distribution that sustains ecological function and supports healthy populations of native fish, wildlife, and plants, especially Federal trust species of conservation concern, in anticipation of the effects of climate, land use, and demographic changes.

Objective 1.1: Forested Uplands and Wetlands

Sub-objective 1.1a. (Biological Integrity, Biological Diversity, and Environmental Health)
Where a focal species has not been identified, protect and restore habitats that contribute to the biological integrity, diversity, and environmental health of refuge lands and the Connecticut River watershed.

Rationale:
The Mount Toby Unit's small size and isolation from other refuge units, has led us to aggregate our objectives and discussion under a single sub-objective that addresses the unit's contribution to the biological integrity, biological diversity, and environmental health of the wider Connecticut River watershed. While achieving the refuge purposes and the Refuge System mission are the paramount considerations for refuge management, the Service also has policy for maintaining and restoring, where appropriate, refuges' "biological integrity, diversity, and environmental health" (601 FW 3). This policy provides refuge managers with a process to analyze their refuge and recommend the best management direction to prevent further degradation of environmental conditions; and where appropriate, restore lost or severely degraded components. The policy suggests using historic conditions as a reference for comparing the ecosystem's current composition, structure, and functioning to what it was prior to substantial human related changes to the landscape. This comparison can be used to direct management to maintain or restore those natural conditions, to the extent practicable, without jeopardizing refuge purposes. For example, we consider the natural timing and frequency of disturbances, such as fires and flooding, and mimic those processes. In other words, the policy is intended to induce management for native fish, wildlife, and plants and their habitats in natural conditions, and with natural processes, using historic conditions to help identify such conditions and processes (Paveglio et al. 2010). However, we recognize that it is not always possible or desirable to try to mimic historic conditions, particularly in the face of predicted climate and land use changes and other landscape-scale considerations. Historic conditions are only one of many considerations when making decisions about how to manage refuge resources.

Conservationists often use the metaphor of coarse filters and fine filters to convey two complementary strategies for maintaining biological diversity, biological integrity, and environmental health: the first focuses on conserving ecosystems and the second focuses on species (Noss 1987, Hunter 1991, Groves 2003). The coarse-filter approach seeks to protect a representative array of natural ecosystems and their constituent processes, structures, and species (the refuge); however, some species fall through its pores, and coarse filters must be complemented by fine filter strategies tailored to fit particular species (priority species of concern). Sub-objectives throughout this plan generally represent a fine-filter approach—identifying species and their habitats that the Service has identified as priorities based upon our establishing legislation, refuge system mission, regional and national conservation plans, and conversations with conservation partners. In contrast, this sub-objective outlines unit management that will benefit many species, the majority of which will not receive the special, tailored attention of fine-filter conservation. The BIDEH policy guidance complements coarse-filter conservation in ways that fine-filter conservation misses.

The key idea of BIDEH conservation is that most ecosystems contain certain features that are critical to the welfare of many species; thus, conserving those features can have a positive effect on a large suite of species (biological diversity). Downed logs in a forest, streams and vernal pools in many terrestrial ecosystems are all examples of ecosystem features that support far more species than one would predict based on their size alone. The importance of conserving these features is widely recognized, but in an ad hoc, idiosyncratic fashion that often does not recognize the commonality between maintaining a dead and downed logs, a vernal pool, and an herbaceous wetland. BIDEH conservation overlaps with many aspects of matrix management and ecosystem management (Lindenmayer and Franklin 2002). A key difference is its specific focus on ecosystem elements, which explicitly complements coarse-filter and fine-filter conservation.

Habitats that occur within the Mount Toby Unit where species-specific management guidelines are not identified will be managed under the umbrella BIDEH policy. These habitats are most often small or isolated occurrences, but are important in maintaining connectivity within the larger forested matrix, and providing additional structural and species diversity to the matrix. Rocky outcrops and upland meadows, for instance, are anomalies in an otherwise forested landscape. They often have a special flora and fauna—providing sunny, dry sites for reptiles to bask, or nectar producing flowers for foraging butterflies. One could make the case that these outcrops are small, independent ecosystems, but they are really too small to be candidates for a classic coarse-filter strategy and thus best considered in a BIDEH context. This approach will allow the conservation of large numbers of species, the majority of which are too poorly known to be conserved individually (e.g., imagine species conservation plans for particular insects or liverworts). Together, the multiple strategies are reasonably comprehensive because all species and habitats known to be in jeopardy will receive needed attention.

The negative consequences of habitat loss and fragmentation to aspects of biological integrity, diversity, and health have been shown by a large number of theoretical and empirical studies, in different environments, and for a large array of taxa (Fahrig 2003). Fragmentation is of particular concern within the Mt Toby ecosystem—parcelization by land ownership is extensive. The large number and variety of landowners—each with their own objectives, resources, and constraints—means that the future of the Mount Toby landscape is far from certain. Our understanding of the current condition of all the habitats on refuge-owned lands and their contribution to the BIDEH of the unit and the broader landscape is poor. A comprehensive forest and wildlife habitat inventory will be necessary to inform more detailed management strategies that provide the full range of natural processes.

Management Strategies:
Within 5 years of CCP approval:

- Work with partners, including the State of Massachusetts and the University of Massachusetts, in support of the State Wildlife Action Plan and the Mount Toby Demonstration Forest plan, to ensure management on Service lands complement adjacent land management objectives.
- Ensure a diversity of native species is present and non-native species are excluded or managed to keep population levels as low as possible.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Conduct habitat and wildlife inventories.
- Map natural communities; protect rare or exemplary examples.
- Monitor impacts to sensitive habitats from the introduction of trail users.

Goal 2: Education, Interpretation, and Outreach: Inspire residents and visitors to actively participate in the conservation and stewardship of the exceptional natural and cultural resources in the Connecticut River watershed, and promote a greater understanding and appreciation of the role of the Silvio O. Conte National Fish and Wildlife Refuge in conserving those resources.

Objective 2.1: Environmental Education

In collaboration with public and private educators from all four states in the watershed, lead or facilitate the implementation of structured natural and cultural resource curricula, with a focus on guiding educators and students to develop an awareness of, and concern about, natural and cultural resources and associated challenges; appreciate our conservation history; make informed decisions and work individually or collectively toward solutions; and model responsible environmental stewardship in their everyday lives.

Sub-objective 2.1a. (Environmental Education Planning and Training)
Encourage schools, scout groups, and summer camps to develop curricula that use the Mount Toby Unit as an outdoor classroom.

Rationale:
Environmental education is one of the six priority, wildlife-dependent recreational uses of the Refuge System. Environmental education is particularly important at Conte Refuge because one of its founding purposes is to "provide opportunities for scientific research, environmental education, and fish and wildlife-oriented recreation and access."

Management Strategies:
Within 1 year of CCP approval:

- Encourage schools, scout groups, and summer camps to develop curricula that use the Mount Toby Unit as an outdoor classroom.

Sub-objective 2.1b. (Environmental Education Delivery)
Encourage schools, scout groups, and summer camps to use the Mount Toby Unit as an outdoor classroom.

Rationale:
Because this unit will be unstaffed, the majority of environmental education opportunities on this unit will be led by partners, volunteers, and local school groups and other educational groups (e.g., scout groups and summer camps).

Management Strategies:
Within 1 year of CCP approval:

- Encourage schools, scout groups, and summer camps to develop curricula that use the Mount Toby Unit as an outdoor classroom.

Objective 2.2: Interpretation

Develop, lead, and facilitate interpretive programs that emotionally and intellectually connect the audience to natural and cultural resources in the watershed.

Sub-objective 2.2a. (Natural and Cultural Resource Interpretive Planning and Training)
With Friends groups, public and non-profit organizations, and volunteers, offer quality interpretive programming at the Mount Toby Unit. The development of highly trained interpreters will be encouraged by offering interpretive training to Friends' members, partners, and volunteers on a regular basis.

Rationale:
See the rationale in chapter 4 detailing the importance of interpretation for the Service. Interpretation is an important tool that can help refuge visitors and local residents appreciate the importance of this area to the larger watershed. With an ADA compliant trail planned for the site, the Mount Toby Unit will be well suited to support both self-guided, wildlife dependent interpretive experiences, as well as guided interpretive programs that convey messages about the refuge and about the Mount Toby Unit's habitats and cultural resources.

Management Strategies:
Within 5 years of CCP approval:

- Inventory and evaluate each CFA to determine the appropriate interpretive materials to employ.
- Create meaningful, consistent, thematic statements to be used in the delivery of programming at the Mount Toby Unit.
- Provide resources and trainings to Friends, and volunteers in support of interpretive programs.

Within 10 years of CCP approval:

- Develop standardized self-guided interpretive services, such as interpretive trails and kiosks, exhibits, and printed media.
- Employ a variety of themed interpretive offerings (e.g., presentations, audio-visual programs, brochures, and exhibits) when creating programming for natural and cultural resource interpretation.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Build an evaluation process that includes formal and informal evaluation to assess the effectiveness of all interpretation programs.

Sub-objective 2.2b. (Natural and Cultural Resource Interpretive Program Delivery)
Collaborate with Friends group, partners, and volunteers to deliver quality natural and cultural resource interpretive programs.

Rationale:
See rationale for sub-objective 2.2a.

Management Strategies:
Within 5 years of CCP approval:

- Through partners, and Friends group, annually provide quality interpretive programs, exhibits, printed media at the Mount Toby Unit.
- Incorporate thematic statements, measureable objectives and evaluation measures into all interpretation efforts.
- Publicize interpretive programs through traditional media, on the refuge web site, and digital social media conduits.
- Maintain a supply of print interpretive brochures, i.e., general brochure and bird checklist that incorporate refuge interpretive messages and themes.
- Work with partners to create issue-oriented experiential activities and programs for use at their facilities.

Within 10 years of CCP approval:

- Contribute refuge interpretive information for scenic byways and other state publications and signs.
- Develop self -guided interpretive messages and use state of the art as well as traditional media (e.g., brochures).

Objective 2.3: Public and Community Outreach

Support, promote, and coordinate a wide range of outreach tools and activities to facilitate and improve communications and relationships with the American public, especially communities, adjacent landowners, and elected officials in the Connecticut River watershed, and to empower citizens to recognize and resolve local natural resource issues and promote conservation and the responsible use of natural resources.

Because the Mount Toby Unit would be unstaffed and does not have refuge facilities, public and community outreach for this site will occur through regular outreach activities at the headquarters and will not specifically occur at this site.

Objective 2.4: Science and Technical Outreach

Facilitate the collection and exchange of information that increases the knowledge and understanding of natural and cultural resources, addresses climate change and other conservation issues, and provides land managers with better information to make management decisions affecting resources.

Because the Mount Toby Unit would be unstaffed and does not have refuge facilities, science and technical outreach for this site will occur through regular outreach activities at the headquarters and will not specifically occur at this site.

Goal 3: Recreation: Promote high-quality, public recreational opportunities in the Connecticut River watershed that are complementary between ownerships and which provide regional linkages with emphasis on promoting wildlife-dependent activities that connect people with nature.

Objective 3.1: Hunting

Support quality public hunting opportunities in the Connecticut River watershed to promote a unique understanding and appreciation of natural resources and their management on lands and waters, while also protecting a traditional outdoor pastime deeply rooted in America's natural heritage and conservation history.

Sub-objective 3.1a. (Hunting Opportunity, Access, and Infrastructure)
Provide the opportunity for a quality hunting experience based state regulations.

Rationale:
The Mount Toby Unit is part of a partnership conservation effort with the University of Massachusetts, Massachusetts Department of Conservation and Recreation, The Nature Conservancy, and The Trustees of Reservations. Hunting is allowed on adjacent and nearby conservation lands and has been a popular area with hunters for many years. Popular game species include white-tailed deer, turkey, and cottontail rabbits. Allowing hunters to use public lands helps ensure this wildlife-dependent recreational activity continues and contribute to the state's population management objectives.

Within 1 year of CCP approval:

- Complete all administrative requirements to officially open to hunting consistent with State hunting regulations and, if necessary, additional refuge-specific regulations.
- Allow hunters access to the refuge outside of the normal unit open hours (i.e. 30 minutes before sunrise and 30 minutes after sunset) as long as they are engaged in lawful hunting activities.
- Post newly acquired properties to ensure refuge boundary lines are clearly marked.
- Allow temporary tree stands and blinds that meet state hunting regulations and do not harm trees or other refuge vegetation. Tree stands and blinds must have the owner's name and phone number clearly displayed, and they must be removed at the end of the hunt season.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Work with Massachusetts Department of Fish and Game to evaluate the effectiveness and success of the refuge hunt program in contributing to state population objectives.

Sub-objective 3.1b. (Hunter Education and Outreach)
Provide hunter education classes access to the unit and conduct directed outreach to ensure hunters are informed about regulations, hunter ethics, and safety considerations. Develop programs, including brochures, signage, website pages, media releases, etc. to increase interest in hunting at the unit.

Rationale:
Hunting is a priority public use that also serves as a population management tool. Providing hunter education instructors the opportunity to use the unit with their classes will strengthen connections to the hunting community and student understanding of the role hunting plays in wildlife management. Making relevant information readily available to hunters through a variety of media will improve the quality of the hunting experience.

Management Strategies:
Within 1 year of CCP approval:

- Produce a hunt brochure that includes a hunt map and information on regulations, hunter ethics, safety considerations, etc. and make it available on the refuge website, at Massachusetts Department of Fish and Game facilities, through a friends group, and in local businesses.

- Provide visitors with general information on the hunting program and refuge-specific and State regulations through the refuge website, information signs, and a hunting brochure. In all materials related to the hunting program, promote and encourage the use of lead-free ammunition.

- Work with the State to identify and evaluate the impacts associated with requiring the use of non-toxic ammunition for hunting on refuge lands.

Within 5 years of CCP approval:
- Work with Massachusetts Department of Fish and Game to encourage youth hunting at the unit as a means of introducing young people to this traditional recreation activity.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:
- Develop a system to monitor and evaluate the hunting program with hunters and other users to determine if the objective is being met and to allow for adaptive management.

Objective 3.2: Fishing

Support quality, public fishing opportunities in the Connecticut River watershed to promote an understanding and appreciation of natural resources and their management on lands and waters, while also protecting a traditional outdoor pastime deeply rooted in the America's natural heritage and conservation history.

This objective is not applicable because there is no surface water on this unit.

Objective 3.3: Wildlife Observation and Photography

Support quality, public opportunities to observe and photograph wildlife in the Connecticut River watershed in a variety of natural habitats to connect a broad spectrum of people with nature.

Sub-objective 3.3a. (Infrastructure and Access for Wildlife Observation and Photography)
Provide quality opportunities for wildlife observation and photography at the Mount Toby Unit.

Rationale:
Wildlife viewing and photography is a priority public use on national wildlife refuges and a popular recreational activity in this part of the state. Currently, there is no infrastructure in place at this unit to support this use, and consequently, visitation for wildlife viewing and photography is limited. Allowing people to engage in wildlife observation and photography is in keeping with the other conservation landowners at Mount Toby.

Management Strategies:
Within 1 year of CCP approval:
- Allow wildlife observation and photography at the Mount Toby Unit.

- Allow public access at the Mount Toby Unit daily from 30 minutes before sunrise to 30 minutes after sunset, with the exceptions listed for hunters.

- Add information on the Mount Toby Unit to the refuge website.

Sub-objective 3.3b. (Wildlife Observation and Photography Aids)
Not applicable

Sub-objective 3.3c. (Watershed-based Partner Initiatives)
Not applicable

Objective 3.4: Other Recreational Activities

In order to reach a broader demographic, support non-priority outdoor recreational opportunities and public access to quality, nature-based experiences throughout the Connecticut River watershed that facilitate and improve community relationships, raise awareness and an appreciation for conserving natural resources, and garner support for the National Wildlife Refuge System.

Sub-objective 3.4a. (Regional Water-based Trail Initiatives and Opportunities Including Refuge Lands)
Not applicable

Sub-objective 3.4b. (Regional Land-based Trail Initiatives and Opportunities Including Refuge Lands)
Not applicable

Sub-objective 3.4c. (Other Appropriate and Compatible Recreational Opportunities That Enhance Visitor Use and Enjoyment of Refuge Lands)
Allow compatible outdoor recreational opportunities on the Mount Toby Unit that connect people with nature, raise the visibility of the Service and the Refuge System, make the refuge more relevant to the local community, and promote economic activity in the local area.

Rationale:
In addition to the priority public uses, there are other wildlife-dependent, appropriate, and compatible recreational activities that can broaden the visitor base, giving people alternative ways to enjoy the natural resources at the unit. Each of these must be found to be both appropriate and compatible to be an authorized use of the refuge.

Management Strategies:
Within 1 year of CCP approval:

- Allow dispersed hiking and snowshoeing.
- Allow pet walking. In order to minimize conflicts with wildlife and other visitors, pets must be on leashes not longer than 10 feet in length.
- Allow recreational gathering of blueberries, blackberries, strawberries, raspberries, mushrooms, fiddleheads, and antler sheds.
- When compatible, allow commercial guiding in support of priority public uses by special use permit.

Within 5 years of CCP approval:

- If interest exists, work with partners to design and market a virtual geocache course at the unit. The course should integrate orienteering with refuge interpretive messages that include linking this unit to other refuge divisions and units.

Overview
Mount Tom Unit (Existing Refuge Unit)

Holyoke, Massachusetts

Total Unit Acres[1]	141

[1] Actual surveyed acres.

What are the priority habitat types within the unit? What percentage of the total unit acreage do they represent?

- Hardwood forest - 85%
- Woodlands (natural) - 0.2%
- Pasture/Hay/Grassland – 12%
- Open water –3%

For more information on the habitats in the unit, see map A.37 and table A.28.

What are the Federal trust and other natural resource values in the unit?

1. **Migratory Birds**
   The Connecticut River watershed is a major migration corridor. The lower portion of the watershed (CT and MA) receives higher use by migrants, with use concentrated in habitats along the Connecticut River main stem (Smith College 2006). The Mount Tom Unit's hardwood forests provide stopover habitat for landbirds.

2. **Wetlands**
   A portion of the wetlands were inventoried by a contractor working for an adjacent landowner. Most wetlands are associated with drainages or the abandoned drainage system from the former ski resort.

What habitat management activities would likely be a priority on the unit?

We will conduct a comprehensive, multi-scale wildlife habitat inventory. Baseline information on the condition of habitats (i.e., forested, non-forested and open water habitats) will further inform more detailed, habitat prescriptions within a required step-down Habitat Management Plan. Once inventory has been completed, then management will focus on continuing to treat invasive plant populations to maintain native diversity.

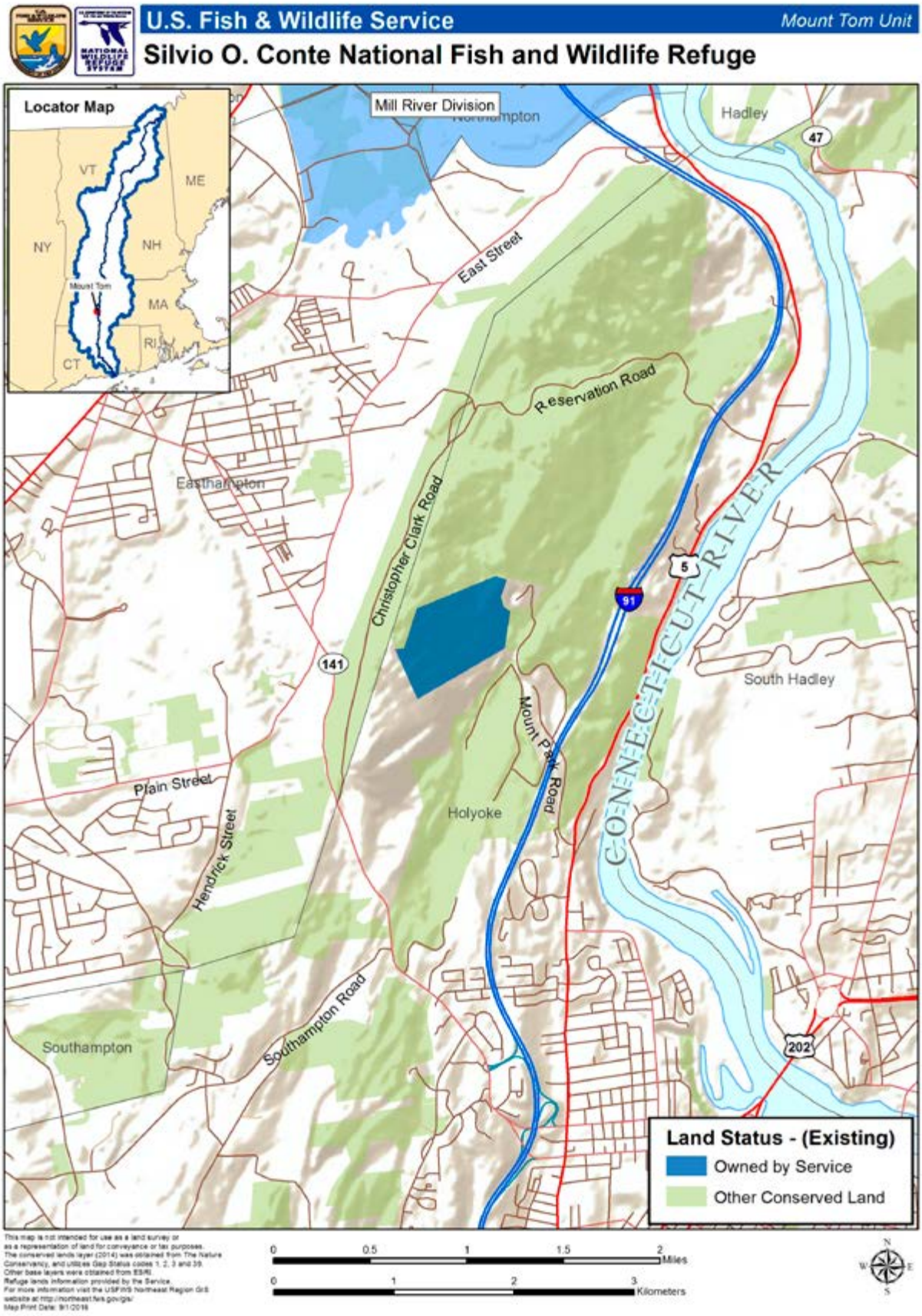
What public use opportunities would likely be a priority on the unit?

The unit is currently closed to the public due to vandalism and safety concerns. Once it is safe to do so, we intend to open the property for wildlife observation, photography, interpretation, and environmental education.

Does the unit have special ecological, cultural, or recreational features or designations of regional, State, or local importance?

There are several State-listed plant and animal species on the unit. The Metacomet-Monandnock Trail passes just to the west of the unit.

Map A.40. Mount Tom Unit – Location.



Map A.41. Mount Tom Unit – Habitat Types.

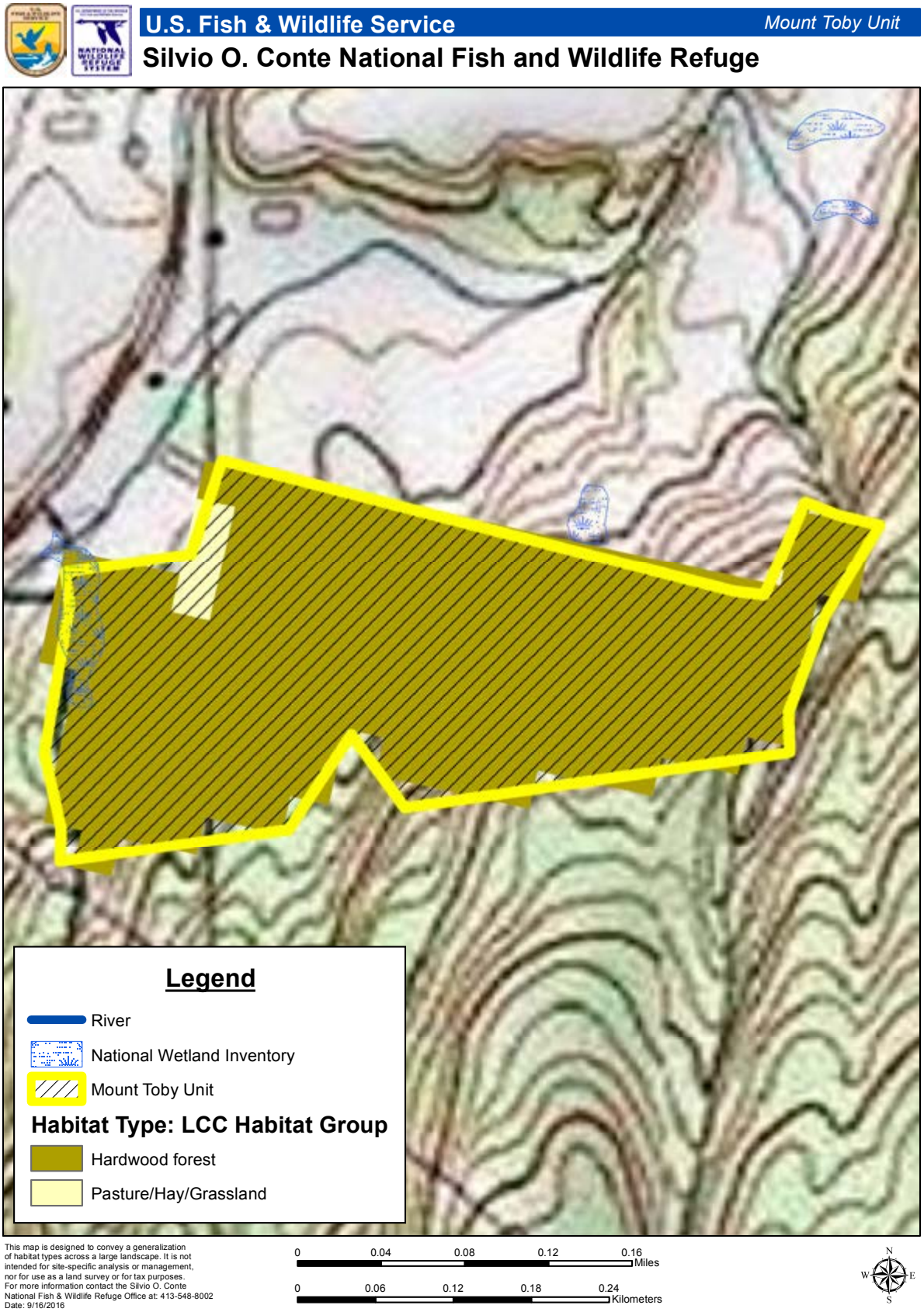


Table A.31. Mount Tom Unit – Habitat Types.

LCC General Habitat Type[1]	Unit	
	Total Acres	Percent Unit
Forested Uplands and Wetlands[2]		
Hardwood forest	120	85.4%
Woodlands (natural)	0.2	0.2%
Forested uplands and wetlands subtotal	*120*	*85.6%*
Non-forested Uplands and Wetlands[2]		
Pasture/hay/grassland	16	11.6%
Non-forested uplands and wetlands subtotal	*16*	*11.6%*
Inland Aquatic Habitats[2]		
Open water	4	2.9%
Inland aquatic habitats subtotal	*4*	*2.9%*
TOTAL	**140**	**100.0%**

**All acreages are based upon GIS analysis and should be considered estimates

1 - North Atlantic Landscape Conservation Collaborative general habitat typings for USFWS representative species; linked to the National Vegetation Classification System (NVCS). See table A.52 at the end of this appendix for a comparison of these generalized habitat types with the more specific The Nature Conservancy's Northeastern Terrestrial Habitat Classification System. More detailed habitat tables that include the Northeastern Terrestrial Habitat Classification System habitat types are available for each CFA and refuge unit online at: *http://www.fws.gov/refuge/Silvio_O_Conte/what_we_do/conservation.html.*

2 - CCP Objective from Silvio O. Conte NFWR Draft CCP/EIS, Chapter 4, Alternative C-Service's Preferred Alternative

Goals, Objectives, and Strategies for the Mount Tom Unit under Alternative C

Goal 1: Wildlife and Habitat Conservation: Promote the biological diversity, integrity, and resiliency of terrestrial and aquatic ecosystems within the Connecticut River watershed in an amount and distribution that sustains ecological function and supports healthy populations of native fish, wildlife, and plants, especially Federal trust species of conservation concern, in anticipation of the effects of climate, land use, and demographic changes.

Objective 1.1: Forested Uplands and Wetlands

Sub-objective 1.1a. (Biological Integrity, Biological Diversity, and Environmental Health)
Where a focal species has not been identified, protect and restore habitats that contribute to the biological integrity, diversity, and environmental health of refuge lands and the Connecticut River watershed.

Rationale:
The Mount Tom Unit's small size and isolation from other refuge units, has led us to aggregate our objectives and discussion under a single sub-objective that addresses the unit's contribution to the biological integrity, biological diversity, and environmental health of the wider Connecticut River watershed. While achieving the refuge purposes and the Refuge System mission are the paramount considerations for refuge management, the Service also has policy for maintaining and restoring, where appropriate, refuges' "biological integrity, diversity, and environmental health" (601 FW 3). This policy provides refuge managers with a process to analyze their refuge and recommend the best management direction to prevent further degradation of environmental conditions; and where appropriate, restore lost or severely degraded components. The policy suggests using historic conditions as a reference for comparing the ecosystem's current composition, structure, and functioning to what it was prior to substantial human related changes to the landscape. This comparison can be used to direct management to maintain or restore those natural conditions, to the extent practicable, without jeopardizing refuge purposes. For example, we consider the natural timing and frequency of disturbances, such as fires and flooding, and mimic those processes. In other words, the policy is intended to induce management for native fish, wildlife, and plants and their habitats in natural conditions, and with natural processes, using historic conditions to help identify such conditions and processes (Paveglio et al. 2010). However, we recognize that it is not always possible or desirable to try to mimic historic conditions, particularly in the face of predicted climate and land use changes and other landscape-scale considerations. Historic conditions are only one of many considerations when making decisions about how to manage refuge resources.

Conservationists often use the metaphor of coarse filters and fine filters to convey two complementary strategies for maintaining biological diversity, biological integrity, and environmental health: the first focuses on conserving ecosystems and the second focuses on species (Noss 1987; Hunter 1991; Groves 2003). The coarse-filter approach seeks to protect a representative array of natural ecosystems and their constituent processes, structures, and species (the refuge); however, some species fall through its pores, and coarse filters must be complemented by fine filter strategies tailored to fit particular species (priority species of concern). Sub-objectives throughout this plan generally represent a fine-filter approach—identifying species and their habitats that the USFWS has identified as priorities based upon our establishing legislation, refuge system mission, regional and national conservation plans, and conversations with conservation partners. In contrast, this sub-objective outlines unit management that will benefit many species, the majority of which will not receive the special, tailored attention of fine-filter conservation. The BIDEH policy guidance complements coarse-filter conservation in ways that fine-filter conservation misses.

The key idea of BIDEH conservation is that most ecosystems contain certain features that are critical to the welfare of many species; thus, conserving those features can have a positive effect on a large suite of species (biological diversity). Downed logs in a forest, a vernal pool, and a volcanic basalt ridge in many terrestrial ecosystems are all examples of ecosystem features that support far more species than one would predict based on their size alone. The importance of conserving these features is widely recognized, but in an ad hoc, idiosyncratic fashion that often does not recognize the commonality between maintaining a dead and downed logs, a vernal

pool, and a volcanic basalt ridge. BIDEH conservation overlaps with many aspects of matrix management and ecosystem management (Lindenmayer and Franklin 2002). A key difference is its specific focus on ecosystem elements, which explicitly complements coarse-filter and fine-filter conservation.

Habitats that occur within the Mount Tom Unit where species-specific management guidelines are not identified will be managed under the umbrella BIDEH policy. These habitats are most often small or isolated occurrences, but are important in maintaining connectivity within the larger forested matrix, and providing additional structural and species diversity to the matrix. The unit's exposed volcanic basalt layers for instance, are anomalies in an otherwise forested landscape. They often have unique microclimates and special flora and fauna—dry, hot upper ridges that support oak savannas—often dominated by chestnut oak—and a variety of rare plant species. One could make the case that these habitats are small, independent ecosystems, but they are really too small to be candidates for a classic coarse-filter strategy and thus best considered in a BIDEH context. This approach will allow the conservation of large numbers of species, the majority of which are too poorly known to be conserved individually, and more targeted strategies for those rare, threatened, or endangered species that may be at the northern or southern limit of their range. Together, the multiple strategies are reasonably comprehensive because all species and habitats known to be in jeopardy will receive needed attention.

The negative consequences of habitat loss and fragmentation to aspects of biological integrity, diversity, and health have been shown by a large number of theoretical and empirical studies, in different environments, and for a large array of taxa (Fahrig 2003). Our understanding of the current condition of all the habitats considered under this sub-objective and their contribution to the BIDEH of the unit is poor. A comprehensive forest and wildlife habitat inventory will be necessary to inform more detailed management strategies that provide the full range of natural processes.

Management Strategies:
Within 5 years of CCP approval:

- Ensure a diversity of native species is present and non-native species are excluded or managed to keep population levels as low as possible.
- Continue to control invasive plant species on the refuge, particularly where they threatened State-listed plant species. Priority invasive plant management actions include:
  - ✓ Continuing to collaborate with Mt. Tom Partners and Massachusetts Natural Heritage Program to strategically prevent and manage invasive species.
  - ✓ Preventing the establishment of garlic mustard on the unit, which is prevalent nearby.
  - ✓ Training volunteers to detect and report sightings of regionally significant new invaders, such as Japanese stiltgrass, mile-a-minute vine, and narrow leaf bittercress.
- Work with partners, including the State of Massachusetts, in support of the State Wildlife Action Plan, to ensure management on Service lands complement adjacent land management objectives.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Conduct habitat and wildlife inventories.
- Monitor impacts to sensitive habitats from the introduction of trail users.
- Map natural communities; protect rare or exemplary examples.

Goal 2: Education, Interpretation, and Outreach: Inspire residents and visitors to actively participate in the conservation and stewardship of the exceptional natural and cultural resources in the Connecticut River watershed, and promote a greater understanding and appreciation of the role of the Silvio O. Conte National Fish and Wildlife Refuge in conserving those resources.

Objective 2.1: Environmental Education

In collaboration with public and private educators from all four states in the watershed, lead or facilitate the implementation of structured natural and cultural resource curricula, with a focus on guiding educators and students to develop an awareness of, and concern about, natural and cultural resources and associated challenges; appreciate our conservation history; make informed decisions and work individually or collectively toward solutions; and model responsible environmental stewardship in their everyday lives.

Sub-objective 2.1a. (Environmental Education Planning and Training)
In coordination with the Massachusetts Department of Conservation and Recreation, the Holyoke Boys and Girls Club, The Trustees of Reservations, and the city of Holyoke, act as a resource to communities, school systems, public and non-profit organizations, and private educational organizations in Massachusetts, who want to use the Mount Tom Unit as an outdoor environmental education classroom.

Rationale:
The Mount Tom/Mount Holyoke Range is well known for an abundance of rare plants and animals and for the unique habitats associated with the uncommon trap rock formations. During the establishment of the Conte Refuge in 1995 this area was designated as one of 48 Special Focus Areas in the watershed that warranted protection through either conservation easements or acquisition. Thus, it has been recognized for many years as important land for wildlife conservation. In 2002, the Service acquired 140 acres of the mid and upper slopes of the former Mount Tom Ski Area. Simultaneously, the Massachusetts Department of Conservation and Recreation, The Trustees of Reservations, and the Holyoke Boys and Girls Club acquired other parts of the former resort. Public access has been restricted by all partners since acquisition because of the active rock quarry at the base of the mountain and the threat of vandalism to the former ski lodge buildings. The quarry ceased operations in 2012 and the Holyoke Boys and Girls Club is in the process of developing a site plan for their property which includes the former ski lodge. The intention of the partners is to open the property for compatible public uses, with an emphasis on environmental education and interpretation, particularly for adjacent cities such as Holyoke, once it is safe to do so.

The Mount Tom Unit is located in Holyoke, Massachusetts and has great potential to reach urban audiences who would not normally visit a refuge on their own. The old ski area is a partnership between four partners, The Trustees of Reservation, the Department of Conservation and Recreation, the Holyoke Boys and Girls Club, and the Service. The goal is to support the development of the old ski lodge into an environmental education facility for the Holyoke Boys and Girls Club. If this scenario happens, the facility could be an important means for the refuge to spread the refuge message to under-represented audiences through programs, displays, etc.

Management Strategies:
Within 5 years of CCP approval and opening of the unit to public access:

- Support the Holyoke Boys and Girls Club in the creation of an environmental education facility at the site of the old Mount Tom ski area lodge.
- Provide support for the formation of a Mount Tom Friends group.
- Promote the Mount Tom Unit as a destination for field trips and increase the number of students by two percent per year for the next 5 years.
- Work with Mount Tom partners and Friends group to develop experiential learning programs focusing on the ecology of Mount Tom and migratory birds that contribute to MA curriculum standards.
- Make environmental education training conducted in other parts of the refuge available to volunteers and Friends group members.
- Work with partners to use the Mount Tom Unit as an outdoor classroom.

Sub-objective 2.1b. (Environmental Education Delivery)
Promote other government agencies, non-profit organizations, private educational organizations, staff, volunteers, and members of the Friends of Mount Tom to offer high quality environmental education programs at the Mount Tom Unit.

Rationale:
See rationale for sub-objective 2.1a.

Management Strategies:
Within 5 years of CCP approval and opening of the unit to public access:

- Develop a cadre of volunteers and partners that can lead educational visits by Holyoke Boys and Girls Club members, local schools, and other entities.
- Develop an educational partnership with the Holyoke Boys and Girls Club, Massachusetts Department of Conservation and Recreation, and The Trustees of Reservations to use the unit as an outdoor classroom emphasizing the unique ecological aspects of the unit.
- Encourage Mount Tom partners, volunteers, and members of Friends group to facilitate teachers and students at the Mount Tom Unit.
- Work with local environmental education providers to implement the refuge's Adopt-a-Habitat initiative to help individuals learn about and connect with their local environments;
- Work with Friends of Conte's Recreation and Education sub-committee to support and recruit partners that seek funding for watershed-based environmental education.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Encourage partners to develop an evaluation system to measure the effectiveness of environmental education programs.

Objective 2.2: Interpretation

Develop, lead, and facilitate interpretive programs that emotionally and intellectually connect the audience to natural and cultural resources in the watershed.

Sub-objective 2.2a. (Natural and Cultural Resource Interpretive Planning and Training)
Encourage and support Mount Tom partners, and Friends group to work with communities, public and non-profit organizations, staff, and volunteers to offer quality interpretive programming at the Mount Tom Unit. Encourage development of highly trained interpreters by offering interpretive training to Friends' members, partners, and volunteers on a regular basis.

Rationale:
See the rationale in chapter 4 detailing the importance of interpretation for the Service. Interpretation is an important tool that can help refuge visitors and local residents appreciate the importance of this area to the larger watershed. As mentioned above, the Mount Tom Unit is currently closed to the public. Once the Mount Tom Unit is opened to the public, we would develop an interpretive program. With various old roads, and trail connections to Trustees of Reservation and Department of Conservation and Recreation trails, the Mount Tom Unit is well suited to support both self-guided, wildlife dependent interpretive experiences, as well as guided interpretive programs that convey messages about the refuge and about the habitats and cultural resources found on the Mount Tom property.

Management Strategies:
Within 5 years of CCP approval and opening of the unit to public access:

- Work with Mount Tom partners to employ a variety of themed interpretive offerings (e.g., presentations, audio-visual programs, print and social media, signs, etc.) when creating programming for natural and cultural resource interpretation.
- Collaborate with Mount Tom partners, Friends group, and volunteers to create meaningful, consistent, thematic statements to be used in the delivery of programming at the Mount Tom Unit.
- Develop interpretive goals and objectives and identify appropriate strategies for refuge visitors.
- Provide resources and trainings to Friends, and volunteers in support of interpretive programs.

Within 10 years of CCP approval and opening of the unit to public access:

- Collaborate with Mount Tom partners, Friends group, and volunteers to develop self-guided interpretive services, such as interpretive trails and kiosks, exhibits, and printed media.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Build an evaluation process that includes formal and informal evaluation to assess the effectiveness of all interpretation programs.

Sub-objective 2.2b. (Natural and Cultural Resource Interpretive Program Delivery)
Collaborate with Mount Tom partners, Friends group and volunteers to deliver quality natural and cultural resource interpretive programs.

Rationale:
See rationale for sub-objective 2.2a.

Management Strategies:
Within 5 years of CCP approval and opening of the unit to public access:

- Through Mount Tom partners and Friends group, annually provide quality interpretive programs, exhibits, printed media at the Mount Tom Unit.
- Incorporate thematic statements, measureable objectives, and evaluation measures into all interpretation efforts.
- Publicize interpretive programs through traditional media, on the refuge web site, and digital social media conduits.
- Maintain a supply of print interpretive brochures, i.e., general brochure and bird checklist that incorporate refuge interpretive messages and themes.
- Work with partners to create issue-oriented experiential activities and programs for use at their facilities.
- Work with partners to install an informational kiosk to disseminate information and interpretive resources.

Within 10 years of CCP approval:

- Contribute refuge interpretive information for scenic byways and other state publications and signs.
- Develop self -guided interpretive messages and use state of the art as well as traditional media e.g. pamphlets, signs, etc.

Objective 2.3: Public and Community Outreach

Support, promote, and coordinate a wide range of outreach tools and activities to facilitate and improve communications and relationships with the American public, especially communities, adjacent landowners, and elected officials in the Connecticut River watershed, and to empower citizens to recognize and resolve local natural resource issues and promote conservation and the responsible use of natural resources.

Because Mount Tom is unstaffed and does not have refuge facilities, public and community outreach for this site will occur through regular outreach activities at the headquarters and will not specifically occur at this site.

Objective 2.4: Science and Technical Outreach

Facilitate the collection and exchange of information that increases the knowledge and understanding of natural and cultural resources, addresses climate change and other conservation issues, and provides land managers with better information to make management decisions affecting resources.

Because Mount Tom is unstaffed and does not have refuge facilities, science and technical outreach for this site will occur through regular outreach activities at the headquarters and will not specifically occur at this site.

Goal 3: Recreation: Promote high-quality, public recreational opportunities in the Connecticut River watershed that are complementary between ownerships and which provide regional linkages with emphasis on promoting wildlife-dependent activities that connect people with nature.

Objective 3.1: Hunting

Support quality public hunting opportunities in the Connecticut River watershed to promote a unique understanding and appreciation of natural resources and their management on lands and waters, while also protecting a traditional outdoor pastime deeply rooted in America's natural heritage and conservation history.

This objective is not applicable because the Mount Tom Unit is part of a partnership conservation effort with the Massachusetts Department of Conservation and Recreation, The Trustees of Reservations, and the Holyoke Boys and Girls Club. None of the adjacent landowners allow hunting on their property. Holyoke Boys and Girls Club is in the process of developing a site plan to construct new youth facilities to replace the old ski lodge and ancillary facilities. Once that is complete, children will be onsite, frequently engaged in outdoor activities. The Mount Tom Unit is upslope from the Holyoke Boys and Girls Club property and does not have separate access or Service-owned parking. Hunting on this unit is not being proposed because it was not previously allowed, adjacent landowners do not intend to allow hunting in the future, and children may be on the unit any time of the year.

Objective 3.2: Fishing

Support quality, public fishing opportunities in the Connecticut River watershed to promote an understanding and appreciation of natural resources and their management on lands and waters, while also protecting a traditional outdoor pastime deeply rooted in the America's natural heritage and conservation history.

This objective is not applicable. The only water body suitable for fishing on the unit is Mountain Park Reservoir, a 1.5-acre, constructed pond that was used for snowmaking by the former ski area. It is located about mid-slope and is only accessible to the public by foot. Runoff and possibly springs feed the pond. Angling could only be sustained with a put-and-take fishery, but this is not economical, nor is it warranted because there are other places to fish in the area.

Objective 3.3: Wildlife Observation and Photography

Support quality, public opportunities to observe and photograph wildlife in the Connecticut River watershed in a variety of natural habitats to connect a broad spectrum of people with nature.

Sub-objective 3.3a. (Infrastructure and Access for Wildlife Observation and Photography)
Provide quality opportunities for wildlife observation and photography at the Mount Tom Unit.

Rationale:
Wildlife viewing and photography is a priority public use on national wildlife refuges and a popular recreational activity in this part of the state. As mentioned above, the Mount Tom Unit is currently closed to the public. Also, there is currently no infrastructure in place at this unit to support this use, and consequently, visitation for wildlife viewing and photography is limited. Once the unit is opened to the public we would offer opportunities for wildlife observation and photography.

Management Strategies:
Within 1 year of CCP approval and opening of the unit to public access:

- Allow wildlife observation and photography at the Mount Tom Unit.
- Allow public access at the unit daily from 30 minutes before sunrise to 30 minutes after sunset.

- Add information on the unit to the refuge website.
- Work with partners to install an informational kiosk in a conspicuous location to post information and notices to visitors.

Within 5 years of CCP approval and opening of the unit to public access:

- Work within the Mount Tom Partnership (i.e. Massachusetts Department of Conservation and Recreation, The Trustees of Reservations, and Holyoke Boys and Girls Club to develop a public access strategy that responds to the demand for access across all ownerships, provides safe trailhead parking, informational kiosk(s), etc.

Within 10 years of CCP approval and opening of the unit to public access:

- Implement the visitor use enhancements identified in the public access strategy and the refuge Visitor Services Plan.

Sub-objective 3.3b. (Wildlife Observation and Photography Aids)
Offer viewing and photography aids that enhance the visitor experience. Use a variety of methods to reach a broad spectrum of people. Work closely with the friends group and other partners who host events designed to view wildlife on the unit.

Rationale:
Once the unit is opened to the public, the entire unit would be available for wildlife observation and photography. However, there are other steps the refuge can take to enhance visitor's experiences on the unit. Visitation increases are expected as this unit becomes better known because it is in close proximity to Holyoke and Easthampton, Massachusetts. By providing new visitors a quality experience they are more likely to return and share their experiences with others. One way to accomplish this is to offer sufficient information to attract a variety of visitors through a variety of media.

Management Strategies:
Within 1 year of CCP approval and opening of the unit to public access:

- Allow photography blinds that do not negatively impact wildlife behavior or conflict with other visitors. Blinds must be removed each day, unless arrangements have been made via a Special Use Permit.

Within 5 years of CCP approval and opening of the unit to public access:

- Develop interpretive panels describing typical wildlife on the refuge, bird migration patterns, and other messages we want to convey to visitors.
- Sponsor wildlife observation events such as International Migratory Bird Day, the Big Sit, etc.
- Encourage local schools and groups and environmental organizations to offer wildlife-centered trips to the refuge.
- Produce a list of wildlife species and associated habitats and other conservation information on the unit for distribution at informational kiosks, the refuge website, and other popular media.

Sub-objective 3.3c. (Watershed-based Partner Initiatives)
Not applicable

Objective 3.4: Other Recreational Activities

In order to reach a broader demographic, support non-priority outdoor recreational opportunities and public access to quality, nature-based experiences throughout the Connecticut River watershed that facilitate and improve community relationships, raise awareness and an appreciation for conserving natural resources, and garner support for the National Wildlife Refuge System.

Sub-objective 3.4a. (Regional Water-based Trail Initiatives and Opportunities Including Refuge Lands)
Not applicable

Sub-objective 3.4b. (Regional Land-based Trail Initiatives and Opportunities Including Refuge Lands)
Develop compatible opportunities on the Mount Tom Unit that support regional water-based trail initiatives to connect people with nature, raise the visibility of the Service and the Refuge System, make the refuge more relevant to the local community, and to promote economic activity in the local area.

Rationale:
Regional land-based trails give individuals opportunities to engage in outdoor recreational opportunities in the Connecticut River watershed, such as hiking and wildlife observation. Examples include the New England Trail, located adjacent to the unit along the Mount Tom ridgeline which is owned and managed by the Massachusetts Department of Conservation and Recreation.

Within 5 years of CCP approval and opening of the unit to public access:

- Once the unit is open to the public, work with partners to determine how best to connect with users on the New England Trail.

Sub-objective 3.4c. (Other Appropriate and Compatible Recreational Opportunities That Enhance Visitor Use and Enjoyment of Refuge Lands)
Allow compatible outdoor recreational opportunities on the Mount Tom Unit that connect people with nature, raise the visibility of the Service and the Refuge System, make the refuge more relevant to the local community, and promote economic activity in the local area.

Rationale:
In addition to the priority public uses, there are other wildlife-dependent, appropriate and compatible recreational activities that can broaden the visitor base, giving people alternative ways to enjoy the natural resources at the unit without detrimentally impacting the wildlife resource. Once the unit is opened to the public, we would allow hiking, snowshoeing, pet walking, and recreational gathering of antler sheds, fruits, plant parts, and mushrooms for personal use.

Management Strategies:
Within 1 year of CCP approval and opening of the unit to public access:

- Allow dispersed hiking and snowshoeing.
- Allow pet walking. In order to minimize conflicts with wildlife and other visitors, pets must be on leashes not longer than 10 feet in length.
- Allow recreational gathering of blueberries, blackberries, strawberries, raspberries, mushrooms, fiddleheads, and antler sheds.
- When compatible, allow commercial guiding in support of the priority public uses by special use permit.

Within 5 years of CCP approval and opening of the unit to public access:

- Work with partners to determine whether a virtual geocache course at the unit is acceptable on the conserved property. The course should integrate orienteering with refuge interpretive messages that include linking this unit to other refuge divisions and units.

Overview
Third Island Unit (Existing Refuge Unit)

Deerfield, Massachusetts

Total Unit Acres[1]	4

[1] Actual surveyed acres.

What are the priority habitat types within the unit? What percentage of the total unit acreage do they represent?

- Hardwood forest - 66%
- High-energy riverbank – 33%

For more information on this unit's habitats, see map A.39 and table A.29.

What are the Federal trust and other natural resource values in the unit?

1. **Migratory Birds**
   The Connecticut River watershed is a major migration corridor. The lower portion of the watershed (CT and MA) receives higher use by migrants, with use concentrated in habitats along the Connecticut River main stem (Smith College 2006). Third Island sits third in a line of four islands within the Connecticut River, and its 2 acres of hardwood forest provide stopover habitat for landbirds, and supracanopy trees for nesting bald eagles.

2. **Other**
   Third Island is part of series of four islands in the Connecticut River. These islands are biologically interesting because of their unique physical environments, habitats, and vegetation. The alluvial deposition of cobbles, sand and silt during high spring flood events created the islands, and annual flooding across the islands have created a gradient of substrate types and therefore unique habitats and vegetation.

   Each island, including Third Island, typically has two vegetation communities: a high-energy riverbank community on the upstream end and floodplain forest on the downstream end. The Massachusetts Natural Heritage and Endangered Species Program designate both community types as priority natural communities due to their rarity in the State. High-energy riverbank communities are rare because they can only form in steep-gradient, high flood areas, and several state-listed herbaceous species occur. Floodplain forests were at one time quite common in the state, particularly on the extensive alluvial silt deposits of the Connecticut River Valley, but they have been largely converted to agricultural land due to their high fertility (Paveglio and Taylor 2010; UMass 2012).

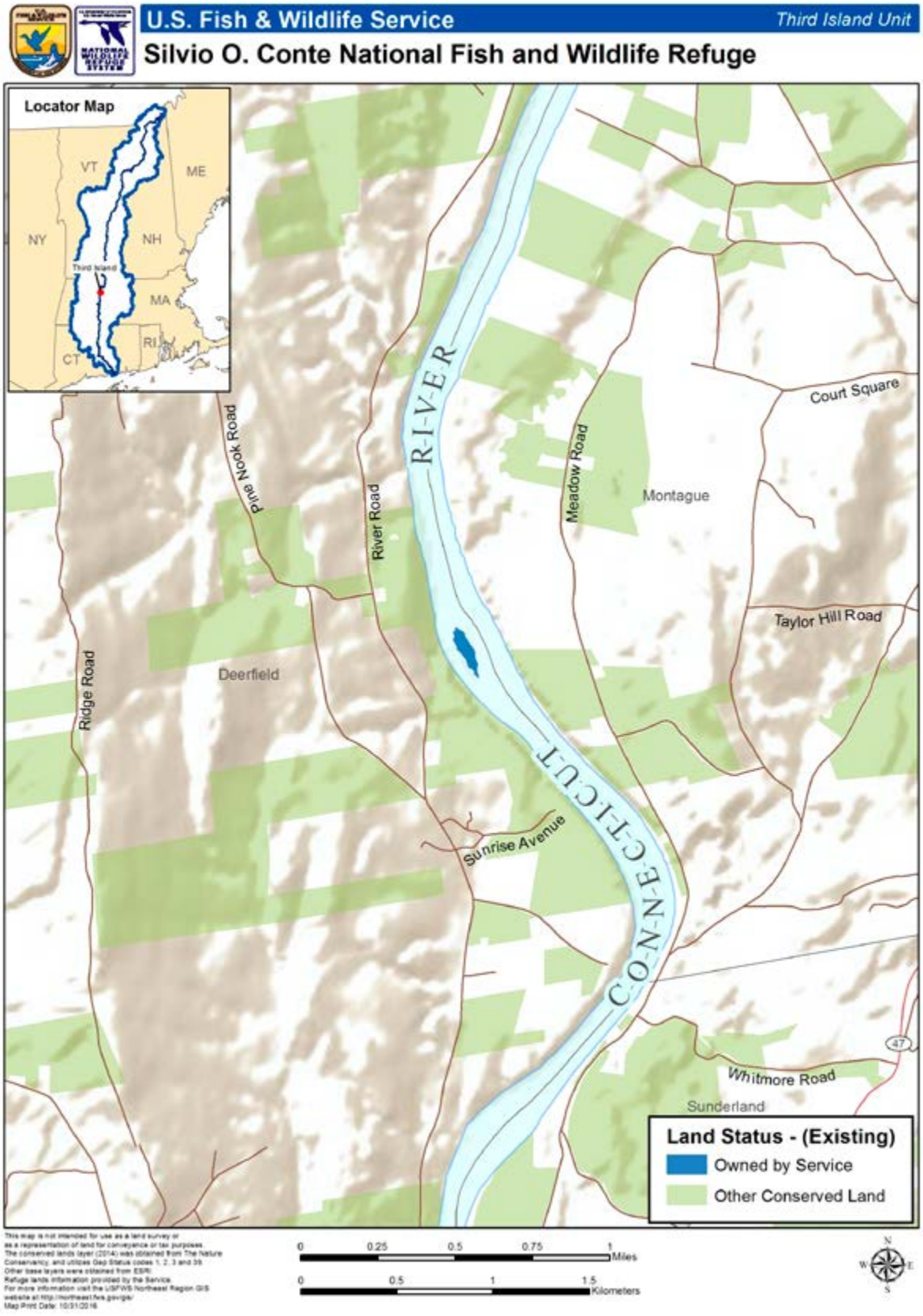
What habitat management activities would likely be a priority on the unit?

We will conduct a comprehensive, multi-scale wildlife habitat inventory. Baseline information on the condition of habitats (ie. forested, non-forested and open water habitats) will further inform more detailed, habitat prescriptions within a required step-down Habitat Management Plan. Once inventory has been completed, then management will focus on managing invasive plants to maintain native diversity.

What public use opportunities would likely be a priority on the unit?

We allow public access to Third Island from August 1 through December 31. The island is closed the remainder of the year to protect nesting bald eagles. Our priority would be to offer the six priority, wildlife-dependent recreational uses: hunting, fishing, wildlife observation and photography, environmental education, and interpretation.

Map A.42. Third Island Unit – Location.



Map A.43. Third Island Unit – Habitat Types.

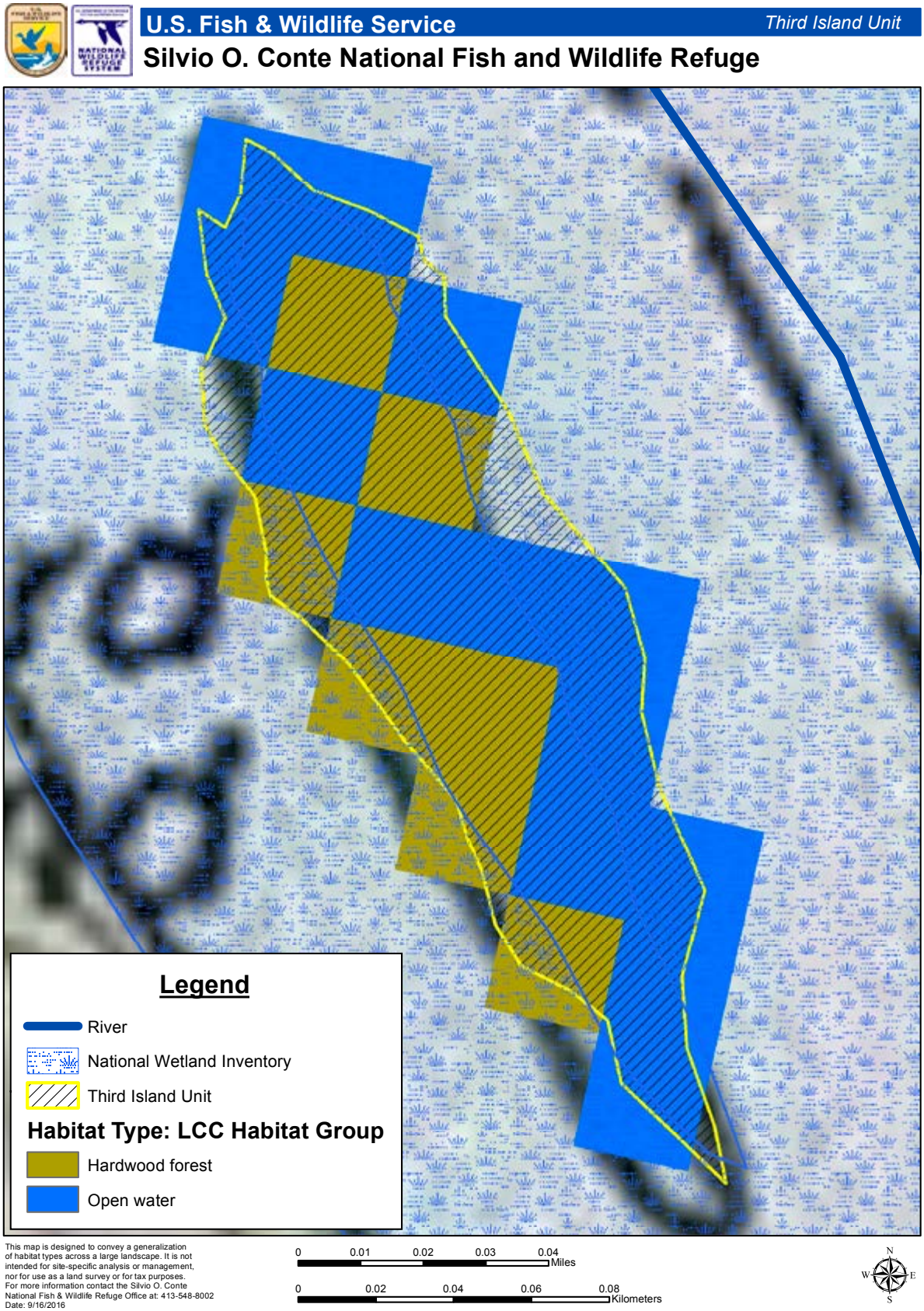


Table A.32. Third Island Unit – Habitat Types.

LCC General Habitat Type[1]	Unit	
	Total Acres	Percent Unit
Forested Uplands and Wetlands[2]		
Hardwood forest	2	35.0%
Forested uplands and wetlands subtotal	*2*	*35.0%*
Inland Aquatic Habitats[2]		
Open water	3	65.0%
Inland aquatic habitats subtotal	*3*	*65.0%*
TOTAL	**5**	**100.0%**

**All acreages are based upon GIS analysis and should be considered estimates

1 - North Atlantic Landscape Conservation Collaborative general habitat typings for USFWS representative species; linked to the National Vegetation Classification System (NVCS). See table A.52 at the end of this appendix for a comparison of these generalized habitat types with the more specific The Nature Conservancy's Northeastern Terrestrial Habitat Classification System. More detailed habitat tables that include the Northeastern Terrestrial Habitat Classification System habitat types are available for each CFA and refuge unit online at: *http://www.fws.gov/refuge/Silvio_O_Conte/what_we_do/conservation.html.*

2 - CCP Objective from Silvio O. Conte NFWR Draft CCP/EIS, Chapter 4, Alternative C-Service's Preferred Alternative

Goals, Objectives, and Strategies for the Third Island Unit under Alternative C

Goal 1: Wildlife and Habitat Conservation: Promote the biological diversity, integrity, and resiliency of terrestrial and aquatic ecosystems within the Connecticut River watershed in an amount and distribution that sustains ecological function and supports healthy populations of native fish, wildlife, and plants, especially Federal trust species of conservation concern, in anticipation of the effects of climate, land use, and demographic changes.

Objective 1.1: Forested Uplands and Wetlands

Sub-objective 1.1a. (Biological Integrity, Biological Diversity, and Environmental Health)
Where a focal species has not been identified, protect and restore habitats that contribute to the biological integrity, diversity, and environmental health of refuge lands and the Connecticut River watershed.

Rationale:
The Third Island Unit's small size and isolation from other refuge units, has led us to group our objectives and discussion under a single sub-objective that addresses the unit's contribution to the biological integrity, biological diversity, and environmental health of the wider Connecticut River watershed. While achieving the refuge purposes and the Refuge System mission are the paramount considerations for refuge management, the Service also has policy for maintaining and restoring, where appropriate, refuges' "biological integrity, diversity, and environmental health" (601 FW 3). This policy provides refuge managers with a process to analyze their refuge and recommend the best management direction to prevent further degradation of environmental conditions; and where appropriate, restore lost or severely degraded components. The policy suggests using historic conditions as a reference for comparing the ecosystem's current composition, structure, and functioning to what it was prior to substantial human related changes to the landscape. This comparison can be used to direct management to maintain or restore those natural conditions, to the extent practicable, without jeopardizing refuge purposes. For example, we consider the natural timing and frequency of disturbances, such as fires and flooding, and mimic those processes. In other words, the policy is intended to induce management for native fish, wildlife, and plants and their habitats in natural conditions, and with natural processes, using historic conditions to help identify such conditions and processes (Paveglio et al. 2010). However, we recognize that it is not always possible or desirable to try to mimic historic conditions, particularly in the face of predicted climate and land use changes and other landscape-scale considerations. Historic conditions are only one of many considerations when making decisions about how to manage refuge resources.

Conservationists often use the metaphor of coarse filters and fine filters to convey two complementary strategies for maintaining biological diversity, biological integrity, and environmental health: the first focuses on conserving ecosystems and the second focuses on species (Noss 1987, Hunter 1991, Groves 2003). The coarse-filter approach seeks to protect a representative array of natural ecosystems and their constituent processes, structures, and species (the refuge); however, some species fall through its pores, and coarse filters must be complemented by fine filter strategies tailored to fit particular species (priority species of concern). Sub-objectives throughout this plan generally represent a fine-filter approach—identifying species and their habitats that the USFWS has identified as priorities based upon our establishing legislation, refuge system mission, regional and national conservation plans, and conversations with conservation partners. In contrast, this sub-objective outlines unit management that will benefit many species, the majority of which will not receive the special, tailored attention of fine-filter conservation. The BIDEH policy guidance complements coarse-filter conservation in ways that fine-filter conservation misses.

The key idea of BIDEH conservation is that most ecosystems contain certain features that are critical to the welfare of many species; thus, conserving those features can have a positive effect on a large suite of species (biological diversity). Downed logs in a forest, a vernal pool, and a rocky outcrop in many terrestrial ecosystems are all examples of ecosystem features that support far more species than one would predict based on their size alone. The importance of conserving these features is widely recognized, but in an ad hoc, idiosyncratic fashion that often does not recognize the commonality between maintaining a dead and downed logs, a vernal pool, and an herbaceous wetland. BIDEH conservation overlaps with many aspects of matrix management and ecosystem management (Lindenmayer and Franklin 2002). A key difference is its specific focus on ecosystem elements, which explicitly complements coarse-filter and fine-filter conservation.

Habitats that occur within the Third Island Unit where species-specific management guidelines are not identified will be managed under the umbrella BIDEH policy. These habitats, by virtue of the unit being an island, represent small or isolated occurrences, but are important in maintaining connectivity within the larger forested matrix, and provide additional structural and species diversity to the matrix. The island's high-energy cobble riverbank community or its downstream floodplain forests, for instance, are anomalies in an otherwise forested landscape. They often have a special flora and fauna—rare grasses that thrive on frequently disturbed sites, or understory herbaceous plants restricted to nutrient rich sites. One could make the case that these habitats are small, independent ecosystems, but they are really too small to be candidates for a classic coarse-filter strategy and thus best considered in a BIDEH context. This approach will allow the conservation of large numbers of species, the majority of which are too poorly known to be conserved individually, and more targeted strategies for those rare, threatened, or endangered species like the several State-listed dragonfly species that utilize the island's cobble shore and coarse woody debris. Together, the multiple strategies are reasonably comprehensive because all species and habitats known to be in jeopardy will receive needed attention.

The negative consequences of habitat loss and fragmentation to aspects of biological integrity, diversity and health have been shown by a large number of theoretical and empirical studies, in different environments, and for a large array of taxa (Fahrig 2003). Our understanding of the current condition of all the habitats considered under this sub-objective and their contribution to the BIDEH of the unit is poor. A comprehensive forest and wildlife habitat inventory will be necessary to inform more detailed management strategies that provide the full range of natural processes.

Management Strategies:
Within 5 years of CCP approval:

- Ensure a diversity of native species is present and non-native species are excluded or managed to keep population levels as low as possible. Management priority should be given to invasive species, such as bittersweet, that threaten supra-canopy trees used by nesting bald eagles.

- Work with partners, including the State of Massachusetts, in support of the State Wildlife Action Plan, to ensure management on Service lands complement adjacent land management objectives.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Conduct habitat and wildlife inventories.

- Map natural communities; protect rare or exemplary examples.

Goal 2: Education, Interpretation, and Outreach: Inspire residents and visitors to actively participate in the conservation and stewardship of the exceptional natural and cultural resources in the Connecticut River watershed, and promote a greater understanding and appreciation of the role of the Silvio O. Conte National Fish and Wildlife Refuge in conserving those resources.

Objective 2.1: Environmental Education

In collaboration with public and private educators from all four states in the watershed, lead or facilitate the implementation of structured natural and cultural resource curricula, with a focus on guiding educators and students to develop an awareness of, and concern about, natural and cultural resources and associated challenges; appreciate our conservation history; make informed decisions and work individually or collectively toward solutions; and model responsible environmental stewardship in their everyday lives.

Sub-objective 2.1a. (Environmental Education Planning and Training)
Encourage schools, scout groups, and summer camps to develop curricula that use the Third Island Unit as an outdoor classroom.

Rationale:
See environmental education rationale in chapter 4 detailing the importance of environmental education for the Service. Environmental education is one of the six priority, wildlife-dependent recreational uses of the Refuge System. Environmental education is particularly important at Conte Refuge because one of its founding purposes is to provide opportunities for environmental education. Environmental education is an important tool that can help refuge visitors and local residents, particularly students, appreciate the importance of this area to the larger watershed.

Management Strategies:
Within 1 year of CCP approval:

- Encourage schools, scout groups, and summer camps to develop curricula that use the Third Island Unit as an outdoor classroom.

Sub-objective 2.1b. (Environmental Education Delivery)

- Encourage schools, scout groups, and summer camps to use the Third Island Unit as an outdoor classroom.

Rationale:
Because this division will be unstaffed, the majority of environmental education opportunities on this division will be led by partners, volunteers, and local school groups and other educational groups (e.g., scout groups and summer camps).

Management Strategies:
Within 1 year of CCP approval:

- Encourage schools, scout groups, and summer camps to develop curricula that use the Third Island Unit as an outdoor classroom.

Objective 2.2: Interpretation

Develop, lead, and facilitate interpretive programs that emotionally and intellectually connect the audience to natural and cultural resources in the watershed.

Sub-objective 2.2a. (Natural and Cultural Resource Interpretive Planning and Training)
With Friends groups, public and non-profit organizations, and volunteers, offer quality interpretive programming at the Third Island Unit. The development of highly trained interpreters will be encouraged by offering interpretive training to Friends' members, partners, and volunteers on a regular basis.

Rationale:
See the rationale in chapter 4 detailing the importance of interpretation for the Service. Interpretation is an important tool that can help refuge visitors and local residents appreciate the importance of this area to the larger watershed. During the period the island is open to the public Third Island Unit is well suited to support both self-guided, wildlife dependent interpretive experiences, as well as guided interpretive programs that convey messages about the refuge and about the Third Island Unit's habitats and cultural resources.

Management Strategies:
Within 5 years of CCP approval:

- Inventory and evaluate each CFA to determine the appropriate interpretive materials to employ.
- Create meaningful, consistent, thematic statements to be used in the delivery of programming at the Third Island Unit.
- Provide resources and trainings to Friends, and volunteers in support of interpretive programs.

Within 10 years of CCP approval:

- Develop standardized self-guided interpretive services, such as interpretive trails and kiosks, exhibits, and printed media.

- Employ a variety of themed interpretive offerings (e.g., presentations, audio-visual programs, brochures, and exhibits) when creating programming for natural and cultural resource interpretation.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Build an evaluation process that includes formal and informal evaluation to assess the effectiveness of all interpretation programs.

Sub-objective 2.2b. (Natural and Cultural Resource Interpretive Program Delivery)
Collaborate with Friends group, partners, and volunteers to deliver quality natural and cultural resource interpretive programs.

Rationale:
See rationale for sub-objective 2.2a.

Management Strategies:
Within 5 years of CCP approval:

- Through partners, and Friends group, annually provide quality interpretive programs,
- Incorporate thematic statements, measureable objectives and evaluation measures into all interpretation efforts.
- Publicize interpretive programs through traditional media, on the refuge web site, and digital social media conduits.
- Maintain a supply of print interpretive brochures, i.e., general brochure and bird checklist that incorporate refuge interpretive messages and themes.
- Work with partners to create issue-oriented experiential activities and programs for use at their facilities.

Within 10 years of CCP approval:

- Contribute refuge interpretive information for scenic byways and other state publications and signs.
- Develop self -guided interpretive messages and use state of the art as well as traditional media (e.g., brochures).

Objective 2.3: Public and Community Outreach

Support, promote, and coordinate a wide range of outreach tools and activities to facilitate and improve communications and relationships with the American public, especially communities, adjacent landowners, and elected officials in the Connecticut River watershed, and to empower citizens to recognize and resolve local natural resource issues and promote conservation and the responsible use of natural resources.

Because the Third Island Unit would be unstaffed and does not have refuge facilities, public and community outreach for this site will occur through regular outreach activities at the headquarters and will not specifically occur at this site.

Objective 2.4: Science and Technical Outreach

Facilitate the collection and exchange of information that increases the knowledge and understanding of natural and cultural resources, addresses climate change and other conservation issues, and provides land managers with better information to make management decisions affecting resources.

Because the Third Island Unit would be unstaffed and does not have refuge facilities, science and technical outreach for this site will occur through regular outreach activities at the headquarters and will not specifically occur at this site.

Goal 3: Recreation: Promote high-quality, public recreational opportunities in the Connecticut River watershed that are complementary between ownerships and which provide regional linkages with emphasis on promoting wildlife-dependent activities that connect people with nature.

Objective 3.1: Hunting

Support quality public hunting opportunities in the Connecticut River watershed to promote a unique understanding and appreciation of natural resources and their management on lands and waters, while also protecting a traditional outdoor pastime deeply rooted in America's natural heritage and conservation history.

Sub-objective 3.1a. (Hunting Opportunity, Access, and Infrastructure)
Provide the opportunity for a quality hunting experience based state regulations.

Rationale:
The Third Island Unit is a 3.8-acre island in the Connecticut River in Deerfield, MA. The island is a popular stop for canoeists and kayakers and has been home to nesting bald eagles for several years. Other similar islands in the vicinity such as Second Island, administered by Massachusetts Department of Conservation and Recreation, are open to hunting. In reality, hunting at these small islands is primarily for waterfowl and often from boats as there is no other access. Hunting seasons can be designed so that bald eagle nesting is not affected.

As mentioned above, we allow public access to Third Island from August 1 through December 31. The island is closed the remainder of the year to protect nesting bald eagles.

Management Strategies:
Within 1 year of CCP approval:

- Complete all administrative requirements to officially open to hunting consistent with State hunting regulations and, if necessary, additional refuge-specific regulations.
- Allow hunters access to the refuge outside of the normal division open hours (i.e. 30 minutes before sunrise and 30 minutes after sunset) as long as they are engaged in lawful hunting activities.
- Provide visitors with general information on the hunting program and refuge-specific and State regulations through the refuge website, information signs, and a hunting brochure. In all materials related to the hunting program, promote and encourage the use of lead-free ammunition.
- Work with the State to identify and evaluate the impacts associated with requiring the use of non-toxic ammunition for hunting on refuge lands.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Work with Massachusetts Department of Fish and Game to evaluate the effectiveness and success of the refuge hunt program in contributing to state population objectives.

Sub-objective 3.1b. (Hunter Education and Outreach)
Not applicable

Objective 3.2: Fishing

Support quality, public fishing opportunities in the Connecticut River watershed to promote an understanding and appreciation of natural resources and their management on lands and waters, while also protecting a traditional outdoor pastime deeply rooted in the America's natural heritage and conservation history.

Sub-objective 3.2a. (Fishing Opportunities, Access, and Infrastructure)
Provide the opportunity for a quality fishing experience generally following state regulations.

Rationale:
Fishing opportunities at Third Island are limited to bank fishing in the Connecticut River. This island is a popular resting area for canoeists and kayakers paddling down the river. By allowing fishing, visitors could enjoy this priority public use while visiting the island.

Management Strategies:
Within 5 years of CCP approval:

- Complete all administrative requirements to officially open to fishing consistent with State hunting regulations and, if necessary, additional refuge-specific regulations.

- The Third Island Unit would be open to visitors actively engaged in fishing during the seasons and times established by the state in their annual fishing regulations, except from January 1 to July 31 each year when the island will be closed to protect nesting bald eagles.

Inventory and Monitoring Strategies:
Within 10 years of CCP approval:

- Develop a system to monitor and evaluate the fishing program with anglers and other users to determine the objective is being met and to allow for adaptive management.

Sub-objective 3.2b. (Angler Education and Outreach)
Develop programs, including brochures, signage, website pages, media releases, etc. to inform visitors of fishing opportunities at the division.

Rationale:
There are limited means of connecting with anglers on this unit because the island is remote and only accessible via boat, canoe, or kayak. The best way to inform visitors will be indirect methods such as the refuge website, social media, and by posting information on the island.

Management Strategies:
Within 5 years of CCP approval:

- Produce a fishing brochure that includes information on regulations, angler ethics, safety considerations, etc. and make it available on the refuge website, at informational kiosks, and in local businesses. In all materials related to the fishing program, promote use of lead-free tackle.

Objective 3.3: Wildlife Observation and Photography

Support quality, public opportunities to observe and photograph wildlife in the Connecticut River watershed in a variety of natural habitats to connect a broad spectrum of people with nature.

Sub-objective 3.3a. (Infrastructure and Access for Wildlife Observation and Photography)
Provide quality opportunities for wildlife observation and photography at the Third Island Unit.

Rationale:
Wildlife viewing and photography is a priority public use on national wildlife refuges and a popular recreational activity for people recreating in this reach of the Connecticut River. During the summer and fall water levels are relatively shallow, limiting access mainly to non-motorized watercraft. These people generally are out to experience the natural river attributes and enjoy viewing and photographing wildlife and their habitats. The Third Island Unit has been closed to all public uses during the bald eagle nest season which extends approximately from January 1 through June, although this may vary.

Management Strategies:
Within 1 year of CCP approval:

- Allow public access at the Third Island Unit daily from 30 minutes before sunrise to 30 minutes after sunset, except from January 1 to July 31 each year when the island will be closed.

Within 5 years of CCP approval:

- Construct a kiosk to post information on wildlife, fish, plants, and river dynamics.

Sub-objective 3.3b. (Wildlife Observation and Photography Aids)
Offer viewing and photography aids that enhance the visitor experience. Use a variety of methods to reach a broad spectrum of people. Work closely with the friends group and other partners who host events designed to view wildlife on the division.

Rationale:
The entire unit would be available for wildlife observation and photography; however, since this is a small island with limited access no viewing aids would be developed.

Management Strategies:
Within 1 year of CCP approval:

- Allow photography blinds that do not negatively impact wildlife behavior or conflict with other visitors. Blinds must be removed each day, unless arrangements have been made via a special use permit.

Within 5 years of CCP approval:

- Produce a wildlife and plant species guide for the Third Island Unit that will be available on the refuge website and at the refuge headquarters.

Sub-objective 3.3c. (Watershed-based Partner Initiatives)
Not applicable

Objective 3.4: Other Recreational Activities

In order to reach a broader demographic, support non-priority outdoor recreational opportunities and public access to quality, nature-based experiences throughout the Connecticut River watershed that facilitate and improve community relationships, raise awareness and an appreciation for conserving natural resources, and garner support for the National Wildlife Refuge System.

Sub-objective 3.4a. (Regional Water-based Trail Initiatives and Opportunities Including Refuge Lands)
Develop compatible opportunities on the Third Island Unit that support regional water-based trail initiatives to connect people with nature, raise the visibility of the Service and the Refuge System, make the refuge more relevant to the local community, and to promote economic activity in the local area.

Rationale:
Regional water-based trails give individuals opportunities to engage in outdoor recreational opportunities in the Connecticut River watershed, such as fishing, boating, and wildlife observation. Examples include the Connecticut River waterway trail. Where appropriate, we will work with these partners to promote, and distribute information about, these opportunities.

Within 5 years of CCP approval:

- Work with public and private partners to determine whether and what roles this division might contribute to a Connecticut River waterway trail.

Sub-objective 3.4b. (Regional Land-based Trail Initiatives and Opportunities Including Refuge Lands)
Not applicable

Sub-objective 3.4c. (Other Appropriate and Compatible Recreational Opportunities That Enhance Visitor Use and Enjoyment of Refuge Lands)
Allow compatible outdoor recreational opportunities on the Third Island Unit that connect people with nature, raise the visibility of the Service and the Refuge System, make the refuge more relevant to the local community, and promote economic activity in the local area.

Rationale:
In addition to the priority public uses, there are other wildlife-dependent, appropriate and compatible recreational activities that can broaden the visitor base, giving people alternative ways to enjoy the natural resources at the division without detrimentally impacting the wildlife resource.

Within 1 year of CCP approval:

- Allow dispersed hiking.
- Allow recreational gathering of blueberries, blackberries, strawberries, raspberries, mushrooms, fiddleheads, and antler sheds.
- When compatible, allow commercial guiding in support of priority public uses by special use permit.

Overview
Wissatinnewag Unit (Existing Refuge Unit)

Greenfield, Massachusetts

Total Unit Acres[1]	21

[1] Actual surveyed acres.

Summary

What are the priority habitat types within the proposed unit?

- Hardwood forest - 48%
- Woodlands (natural) – 34%

For more information on the unit's habitats, see map A.41 and table A.30.

What are the Federal trust and other natural resource values in the unit?

1. **Migratory Birds**
   The Connecticut River watershed is a major migration corridor. The lower portion of the watershed (CT and MA) receives higher use by migrants, with use concentrated in habitats along the Connecticut River main stem (Smith College 2006). Though, small in acreage, the Wissatinnewag Unit's hardwood forests provide stopover habitat for landbirds.

What habitat management activities would likely be a priority on refuge lands in the unit

Conduct an inventory to collect baseline information on the condition of habitats and wildlife to inform more detailed, habitat prescriptions within a required step-down HMP. Once inventory has been completed, then management will focus on managing invasive plants to maintain native diversity.

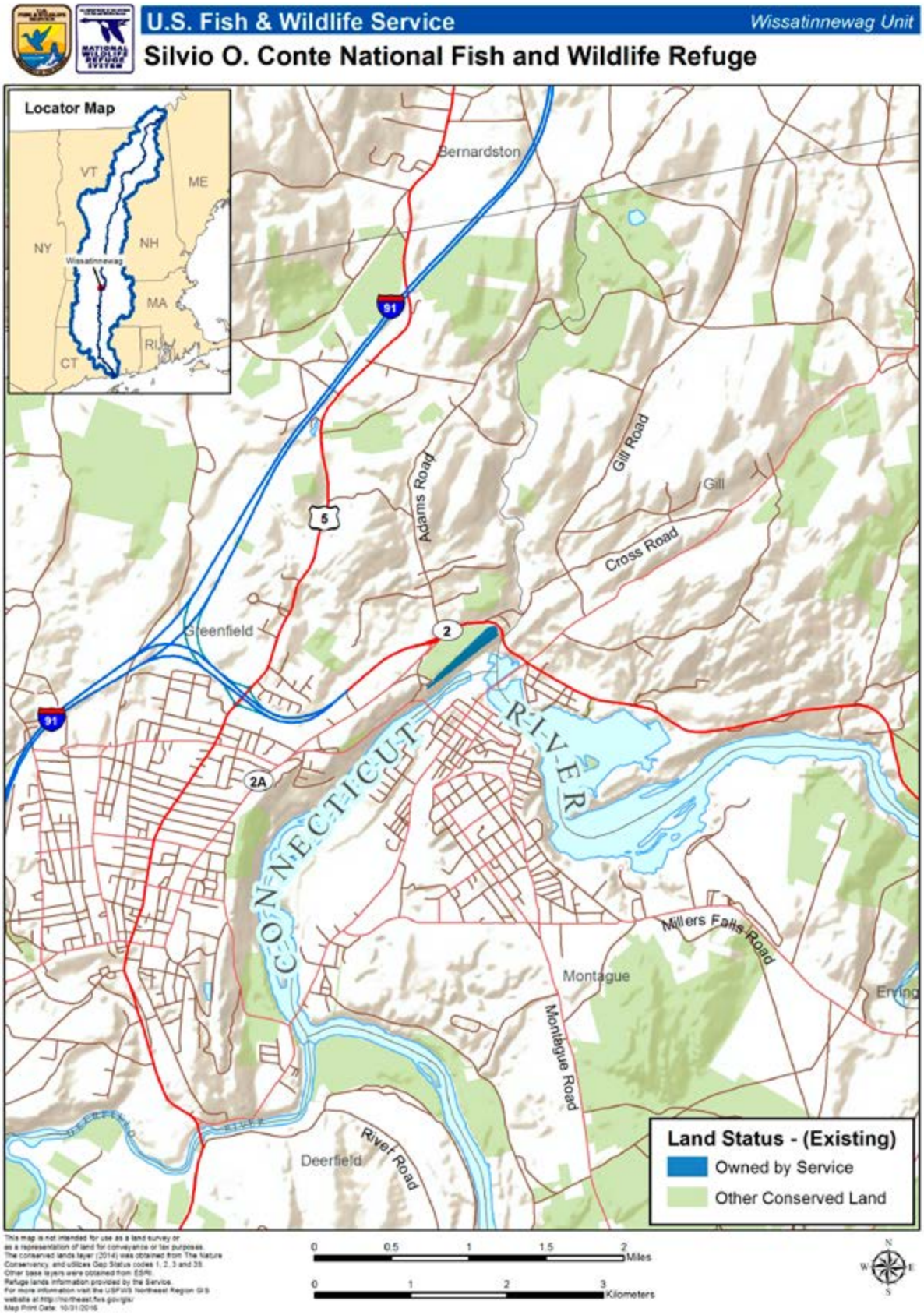
What public use opportunities would likely be a priority on the unit?

The unit is closed to the public to protect resources.

Does the unit have special ecological, cultural, or recreational features or designations of regional, State, or local importance?

The Wissatinnewag Unit contains portions of the extensive, complex Mackin Sand Bank Site, which has produced burials and evidence of Native American settlement starting at least by the Middle Archaic period, more than 7,000 years ago.

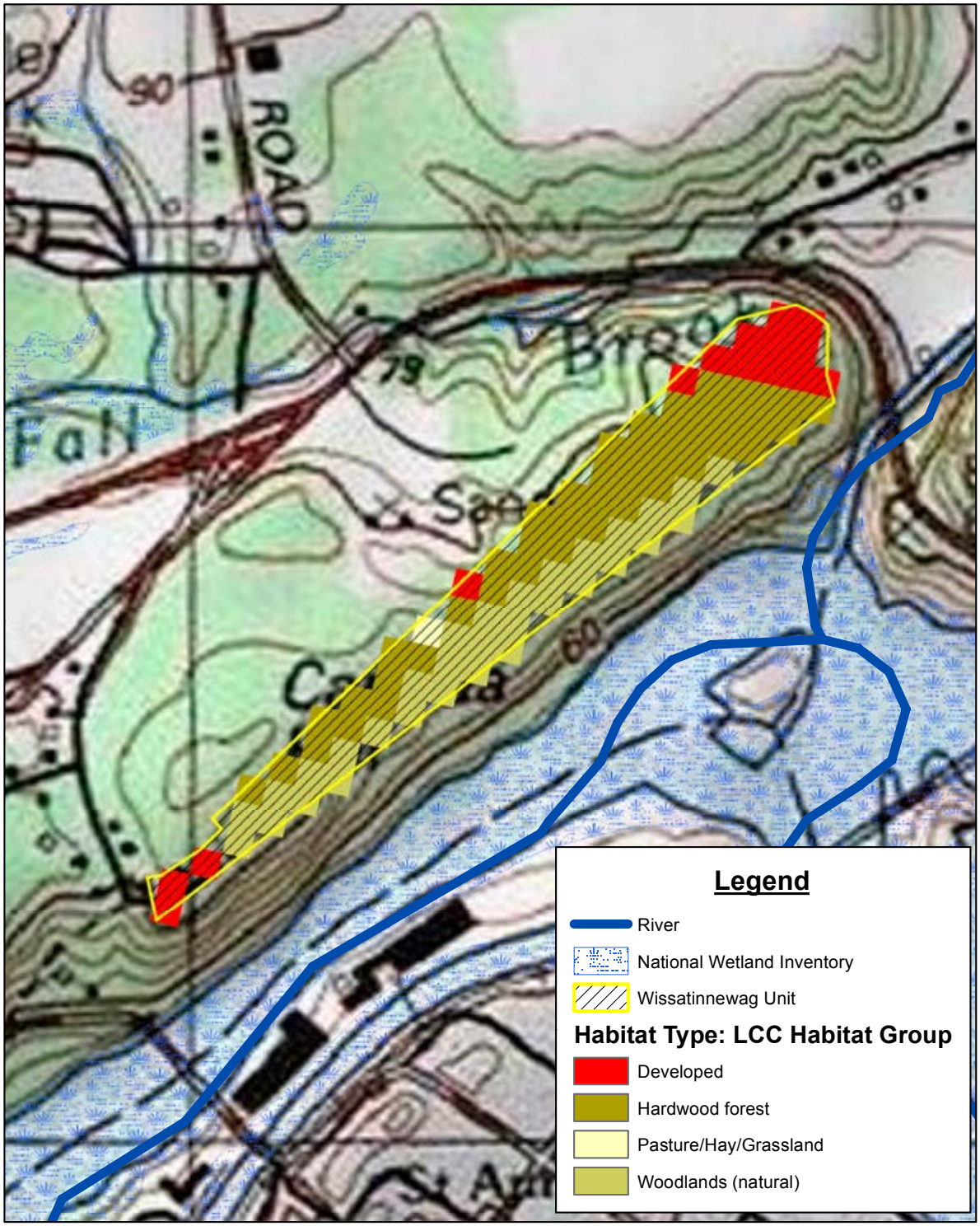
Map A.44. Wissatinnewag Unit – Location.



Map A.45. Wissatinnewag Unit – Habitat Types.

U.S. Fish & Wildlife Service *Wissatinnewag Unit*

Silvio O. Conte National Fish and Wildlife Refuge



This map is designed to convey a generalization of habitat types across a large landscape. It is not intended for site-specific analysis or management, nor for use as a land survey or for tax purposes. For more information contact the Silvio O. Conte National Fish & Wildlife Refuge Office at: 413-548-8002
Date: 9/16/2016

0 0.06 0.12 0.18 0.24 Miles

0 0.09 0.18 0.27 0.36 Kilometers

N W E S

Table A.33. Wissatinnewag Unit – Habitat Types.

LCC General Habitat Type[1]	Unit	
	Total Acres	Percent Unit
Forested Uplands and Wetlands[2]		
Hardwood forest	10	48.4%
Woodlands (natural)	7	34.1%
Forested uplands and wetlands subtotal	*17*	*82.4%*
Non-forested Uplands and Wetlands[2]		
Pasture/hay/grassland	0.2	1.1%
Non-forested uplands and wetlands subtotal	*0.2*	*1.1%*
Other		
Developed	3	16.5%
Other subtotal	*3*	*16.5%*
TOTAL	**20**	**100.0%**

**All acreages are based upon GIS analysis and should be considered estimates

1 - North Atlantic Landscape Conservation Collaborative general habitat typings for USFWS representative species; linked to the National Vegetation Classification System (NVCS). See table A.52 at the end of this appendix for a comparison of these generalized habitat types with the more specific The Nature Conservancy's Northeastern Terrestrial Habitat Classification System. More detailed habitat tables that include the Northeastern Terrestrial Habitat Classification System habitat types are available for each CFA and refuge unit online at: *http://www.fws.gov/refuge/Silvio_O_Conte/what_we_do/conservation.html.*

2 - CCP Objective from Silvio O. Conte NFWR Draft CCP/EIS, Chapter 4, Alternative C-Service's Preferred Alternative

Goals, Objectives, and Strategies for the Wissatinnewag Unit under Alternative C

Goal 1: Wildlife and Habitat Conservation: Promote the biological diversity, integrity, and resiliency of terrestrial and aquatic ecosystems within the Connecticut River watershed in an amount and distribution that sustains ecological function and supports healthy populations of native fish, wildlife, and plants, especially Federal trust species of conservation concern, in anticipation of the effects of climate, land use, and demographic changes.

Objective 1.1: Forested Uplands and Wetlands

Sub-objective 1.1a. (Biological Integrity, Biological Diversity, and Environmental Health)
Where a focal species has not been identified, protect and restore habitats that contribute to the biological integrity, diversity, and environmental health of refuge lands and the Connecticut River watershed.

Rationale:
The Wissatinnewag Unit's small size and isolation from other refuge units, has led us to group our objectives and discussion under a single sub-objective that addresses the unit's contribution to the biological integrity, biological diversity, and environmental health of the wider Connecticut River watershed. While achieving the refuge purposes and the Refuge System mission are the paramount considerations for refuge management, the Service also has policy for maintaining and restoring, where appropriate, refuges' "biological integrity, diversity, and environmental health" (601 FW 3). This policy provides refuge managers with a process to analyze their refuge and recommend the best management direction to prevent further degradation of environmental conditions; and where appropriate, restore lost or severely degraded components. The policy suggests using historic conditions as a reference for comparing the ecosystem's current composition, structure, and functioning to what it was prior to substantial human related changes to the landscape. This comparison can be used to direct management to maintain or restore those natural conditions, to the extent practicable, without jeopardizing refuge purposes. For example, we consider the natural timing and frequency of disturbances, such as fires and flooding, and mimic those processes. In other words, the policy is intended to induce management for native fish, wildlife, and plants and their habitats in natural conditions, and with natural processes, using historic conditions to help identify such conditions and processes (Paveglio et al. 2010). However, we recognize that it is not always possible or desirable to try to mimic historic conditions, particularly in the face of predicted climate and land use changes and other landscape-scale considerations. Historic conditions are only one of many considerations when making decisions about how to manage refuge resources.

Conservationists often use the metaphor of coarse filters and fine filters to convey two complementary strategies for maintaining biological diversity, biological integrity, and environmental health: the first focuses on conserving ecosystems and the second focuses on species (Noss 1987, Hunter 1991, Groves 2003). The coarse-filter approach seeks to protect a representative array of natural ecosystems and their constituent processes, structures, and species (the refuge); however, some species fall through its pores, and coarse filters must be complemented by fine filter strategies tailored to fit particular species (priority species of concern). Sub-objectives throughout this plan generally represent a fine-filter approach—identifying species and their habitats that the Service has identified as priorities based upon our establishing legislation, refuge system mission, regional and national conservation plans, and conversations with conservation partners. In contrast, this sub-objective outlines unit management that will benefit many of its species, the majority of which will not receive the special, tailored attention of fine-filter conservation. The BIDEH policy guidance complements coarse-filter conservation in ways that fine-filter conservation misses.

The key idea of BIDEH conservation is that most ecosystems contain certain features that are critical to the welfare of many species; thus, conserving those features can have a positive effect on a large suite of species (biological diversity). Logs in a forest, hedgerows in an agricultural landscape, and streams and pools in many terrestrial ecosystems are all examples of ecosystem features that support far more species than one would

predict based on their size alone. The importance of conserving these features is widely recognized, but in an ad hoc, idiosyncratic fashion that often does not recognize the commonality between maintaining a hedgerow, a rock outcrop, and an herbaceous wetland. BIDEH conservation overlaps with many aspects of matrix management and ecosystem management (Lindenmayer and Franklin 2002). A key difference is its specific focus on ecosystem elements, which explicitly complements coarse-filter and fine-filter conservation.

Habitats that occur within the Wissatinnewag Unit where species-specific management guidelines are not identified will be managed under the umbrella BIDEH policy. These habitats, by virtue of refuge ownership patterns, are small, isolated occurrences, but are important in maintaining connectivity within the larger forested matrix, and providing additional structural and species diversity to the matrix. Rocky outcrops and upland meadows, for instance, are anomalies in an otherwise forested landscape. They often have a special flora and fauna—providing sunny, dry sites for reptiles to bask, or nectar producing flowers for foraging butterflies. One could make the case that these outcrops are small, independent ecosystems, but they are really too small to be candidates for a classic coarse-filter strategy and thus best considered in a BIDEH context. This approach will allow the conservation of large numbers of species, the majority of which are too poorly known to be conserved individually (e.g., imagine species conservation plans for particular insects or liverworts). Together, the multiple strategies are reasonably comprehensive because all species and habitats known to be in jeopardy will receive needed attention.

The negative consequences of habitat loss and fragmentation to aspects of biological integrity, diversity and health have been shown by a large number of theoretical and empirical studies, in different environments, and for a large array of taxa (Fahrig 2003). Our understanding of the current condition of all the habitats considered under this sub-objective and their contribution to the BIDEH of the unit is poor. A comprehensive forest and wildlife habitat inventory will be necessary to inform more detailed management strategies that provide the full range of natural processes.

Management Strategies:
Within 5 years of CCP approval:

- Work with partners, including the State of Massachusetts, in support of the State Wildlife Action Plan, to ensure management on Service lands complement adjacent land management objectives.
- Ensure a diversity of native species is present and non-native species are excluded or managed to keep population levels as low as possible.

Inventory and Monitoring Strategies:
Within 5 years of CCP approval:

- Conduct habitat and wildlife inventories.
- Map natural communities; protect rare or exemplary examples.

Goal 2: Education, Interpretation, and Outreach: Inspire residents and visitors to actively participate in the conservation and stewardship of the exceptional natural and cultural resources in the Connecticut River watershed, and promote a greater understanding and appreciation of the role of the Silvio O. Conte National Fish and Wildlife Refuge in conserving those resources.

This goal is not applicable to the Wissatinnewag Unit because the unit is closed to all public access, except by special use permit, to protect sensitive resources.

Goal 3: Recreation: Promote high-quality, public recreational opportunities in the Connecticut River watershed that are complementary between ownerships and which provide regional linkages with emphasis on promoting wildlife-dependent activities that connect people with nature.

This goal is not applicable to the Wissatinnewag Unit because the unit is closed to all public access, except by special use permit, to protect sensitive resources.