FINAL

ENVIRONMENTAL ASSESSMENT

Proposal to Implement Candidate Conservation Agreements and Conservation Measures for Eastern Massasaugas in States within Region 3 of the U.S. Fish and Wildlife Service
including
Illinois, Iowa, Michigan, Missouri, Ohio, and Wisconsin

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1.0 PURPOSE AND NEED FOR TAKING ACTION

1.1 PURPOSE

Region 3 (R3) of the U.S. Fish and Wildlife Service (Service or FWS) has a responsibility for protecting and improving the long-term conservation status of the eastern massasauga (*Sistrurus catenatus catenatus*, hereafter massasauga), a Federal candidate species[1] for listing under the Endangered Species Act (ESA) of 1973, as amended. To fulfill this responsibility, R3 has considered different ways of managing for the conservation of massasaugas. The purpose of this Environmental Assessment (EA) is to evaluate the environmental consequences of implementing different strategies for conserving the remaining massasauga populations within R3 States (Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, and Wisconsin). The ultimate goal of the FWS' actions is to minimize threats to remaining populations thereby reversing declines possibly precluding the need to federally list the subspecies.

1.2 NEED

Because the massasauga currently lacks ESA protection and is still subject to ongoing threats, there is a need to implement conservation measures. The FWS believes that adequate conservation efforts implemented during the candidate stage may be sufficient to preclude the need to list the massasauga as a federally threatened or endangered subspecies.

However, before conservation measures can be fully developed and implemented, additional baseline information is needed for some areas. Such information includes identifying core populations/areas, determining habitat extent, threat assessment, spatial and temporal habitat use, public and private landowner receptivity, etc. To best manage limited human and financial resources, massasauga conservation efforts need to be: (1) focused on populations occurring on protected properties (i.e., publicly owned land or land purposely set aside by non-governmental entities for long-term preservation), (2) recognized as priority components of whole suites of land management practices at sites where massasaugas occur, (3) coordinated and consistently applied across the species' range, and (4) founded on sufficient baseline data.

1.3 DECISIONS THAT NEED TO BE MADE

The Service's Regional Director will select one of the alternatives analyzed in detail and will determine, based on the facts and recommendations contained herein, whether this

[1] Candidate species are plants and animals for which the Service has sufficient information on their biological status and threats to propose them as endangered or threatened under the Endangered Species Act, but for which development of a listing regulation is precluded by other higher priority listing activities.

EA is adequate to support a Finding of No Significant Impact (FONSI) decision, or whether an Environmental Impact Statement (EIS) will need to be prepared.

1.4 BACKGROUND

The range of the eastern massasauga extends from western New York and southern Ontario to Iowa and southward to Missouri (Conant and Collins 1991; Figure 1, Appendix A), but because of range-wide population declines, the species is given some level of protective status throughout its range. The decline of the eastern massasauga is primarily attributed to habitat loss and persecution. After conducting a status assessment (Szymanski 1998), the Service elevated the eastern massasauga (i.e., the eastern distinct population segment) to the Federal candidate status in October 1999. Although ongoing, the magnitude of threats was considered moderate; thus, a listing priority of '9' was assigned for the species. This listing priority ranking is resulting in an unavoidable delay in commencing proposed listing procedures while the FWS addresses higher priority listing actions. Nonetheless, because massasauga populations continue to be threatened during this interim period, the R3 States (Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, and Wisconsin) and the FWS developed a conservation strategy for conserving eastern massasaugas throughout their range.

Because the majority of remaining eastern massasauga populations occur on protected lands (i.e., publicly owned properties or lands specifically set aside for conservation purposes), the FWS' conservation strategy focused on removing threats and potential management conflicts from these populations by pursuing formal agreements, namely Candidate Conservation Agreements (CCAs) and Candidate Conservation Agreements with Assurances (CCAAs[2]) with States, public land managers, and private landowners. A few of these areas are being specifically managed – at least in part – for massasaugas. For many protected areas, however, suitable habitat is being fortuitously maintained (i.e., the managers are unaware of massasauga biology and could alter the management regime at some future point and unknowingly destroy the habitat). Other populations are subject to deteriorating or, in some instances, total destruction of habitat conditions as a result of management practices that are either lacking or incompatible with the needs of this species. State and Federal agencies often lack sufficient funding for large-scale, proactive efforts to conserve Federal candidate species because their budgets are concentrated on listed and game species. Therefore, efforts to conserve massasaugas on public lands have been few, under funded, poorly coordinated, and have often lacked sufficient baseline population data to determine the effectiveness of the efforts. The Service will use this EA to decide whether to implement the CCAs that are currently being developed or to select another conservation alternative.

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[2] Unless otherwise noted, the terms CCA and CCAA are often used synonymously throughout this EA. Note: CCAAs are different from CCAs in that they provide non-Federal property owners, who voluntarily agree to manage their lands or waters to remove threats to candidate or proposed species assurances that their conservation efforts will not result in future regulatory obligations in excess of those they agree to at the time they enter into the Agreement.

In 2001, the Service funded a region-wide massasauga conservation initiative. As part of the initiative, R3 States were given funds for the investigation and development of

FIGURE 1. Approximate range of the eastern massasauga (*Sistrurus c. catenatus*).

CCAs and CCAAs with pertinent Region 3 States, local land-management agencies, and private land owners. The overarching goal of developing these agreements is to facilitate the perpetual preservation of massasaugas.

Six of the eight Region 3 States are in various stages of CCA development and the CCA form will vary by State and site. The State of Indiana has decided not to pursue CCAs at this time because most of its remaining massasauga populations occur on state-owned conservation properties. The State of Minnesota is still conducting surveys to determine the locations of any remaining populations. For those completing CCAs, the primary steps being taken to develop the agreements are as follows:

1. Identify core populations/areas on protected properties.

2. Collect baseline information to determine eastern massasauga status and to elucidate spatial and temporal habitat use on protected properties.

3. Contact adjacent private landowners, with essential habitat components, to determine receptivity to CCAAs.

4. Develop CCA/CCAA document(s).

5. Identify other important massasauga populations on non-protected lands.

6. Contact pertinent landowners and pursue CCAAs.

The following, is a brief listing of ongoing actions being taken as part of the region-wide massasauga conservation initiative.

Illinois Carlyle Lake (Clinton County) Project:

- Population mark-recapture/monitoring study to determine baseline population density and track changes in population size (study ongoing).

- Conducted radiotelemetry studies (1999-2003) to determine spatial & temporal habitat use.

- Assessing private landowner attitudes toward massasauga conservation and CCAs.

- Contacting pertinent private landowners adjacent to the Carlyle Lake population.

- Developing a CCA for the Carlyle Lake population.

Northeast Illinois Project:

- Conducting surveys and habitat management assessments at historical sites in Lake, Cook, and Will counties.

- Initiating habitat management actions as needed at the sites in Lake, Cook and Will counties.

- Contacting private landowners with potential habitat adjacent to a known Will County Forest Preserve District site.

- Developing CCAs for three County Forest Preserve Districts.

Indiana

- Developing education/outreach materials (including fact sheets & recommendations of how to approach landowners) for region-wide use.

Iowa Sweet Marsh Project:

- Conducting radio telemetry studies at Sweet Marsh Wildlife Management Area (WMA) in Bremer County.
- Contacting pertinent private landowners adjacent to Sweet Marsh WMA.
- Developing a CCA for Sweet Marsh population.

Michigan

- Conducting ongoing surveys in known and potential massasauga areas to identify "core" protected properties in the following counties: Alcona, Allegan, Alpena, Barry, Benzie, Berrien, Calhoun, Cass, Cheboygan, Clinton, Crawford, Emmet, Huron, Iosco, Jackson, Kalamazoo, Kalkaska, Lapeer, Lenawee, Livingston, Mackinac, Manistee, Missaukee, Montcalm, Montmorency, Muskegon, Newaygo, Oakland, Oceana, Ogemaw, Presque Isle, Roscommon, Sanilac, St. Joseph, Van Buren, and Washtena.
- Conducting a habitat characterization for massasauga in Michigan.
- Developing a state-wide umbrella CCA document.

Minnesota

- Conducting surveys along the Mississippi River floodplains in Houston, Wabasha, and Winona counties, MN to determine eastern massasauga presence in this area.

Missouri

- Contacting pertinent private landowners adjacent to the three core massasauga populations in Missouri; Pershing State Park (Linn County), Swan Lake National Wildlife Refuge (NWR) (Chariton County), and Squaw Creek NWR (Holt County).
- Investigating receptivity of Pershing State Park and pertinent adjacent landowners, and if receptive, developing CCA documents.
- Conducting surveys in other areas in the State to further define massasauga presence in Missouri.
- Developing CCA documents if important populations are discovered and landowners are receptive.

Ohio

- Conducting relative abundance surveys at Rome and Pallister Nature Preserves in Ashtabula County.

- Developing CCA documents for Rome and Pallister Nature Preserves.

Wisconsin

- Conducting a vegetation and hydrological analysis of Chippewa River Bottoms to determine the extent of change that has occurred since 1939.

- Developing CCA documents for Chippewa River Bottoms and Black River populations in Buffalo, LaCrosse, Pepin, and Trempealeau counties.

2.0 ALTERNATIVES, INCLUDING THE PROPOSED ACTION

2.1 ALTERNATIVES NOT CONSIDERED FOR DETAILED ANALYSIS

The FWS briefly considered prioritizing massasauga populations/areas within R3 States according to their need of conservation measures and then only pursuing CCAs to protect those areas deemed to be in greatest peril or most at risk. However, this alternative did not satisfy the purpose and need for which this environmental assessment (EA) is being prepared, because it would not ensure region-wide conservation of massasaugas and it would allow currently stable/healthy populations to become vulnerable to future threats by not having CCAs in place.

The FWS also considered pursuing CCAs within each state as independent actions initiated at the field office (FO) level. However, this alternative would have resulted in CCAs that were not well coordinated having inconsistent conservation measures and highly variable implementation schedules across the species range. This approach also would likely result in long delays in getting CCAs implemented across the region as each FO worked on other pressing issues.

In addition, the FWS considered limiting funding to projects that would fill current data gaps (e.g., surveys and telemetry) and develop educational materials promoting massasauga conservation without pursuing CCAs. While this alternative would have a large cost savings, it was rejected because it was decided that threats to the survival of massasauga populations would probably not be adequately minimized or removed throughout R3 without having signed formal agreements in place such as CCAs.

2.2 ALTERNATIVES CARRIED FORWARD FOR DETAILED ANALYSIS

2.2.1 Alternative A - Implement CCAs on Protected Lands throughout R3 (Proposed Action)

This Alternative would implement CCAs for massasauga populations that occur on protected properties (mostly publicly owned) throughout R3 (Figure 2).

These populations are referred to as core populations or areas. The Service also may need to extend efforts to some private lands because such lands may provide an

essential habitat element for a core population. Efforts on disjunct private lands may also be important if the number and distribution of populations occurring on protected properties are insufficient to halt or reverse the decline of the species.

Under Alternative A, 11 CCAs (and potentially CCAAs with adjacent land owners) would be implemented in R3 States in the following areas:

Illinois:

- One CCA for the Carlyle Lake population in Clinton County
- The Northeast Illinois Project would implement 3 CCAs with County Forest Preserve Districts in three counties: Lake County (Ryerson Forest Preserve), Cook County [Potawatami Woods, Dam Number 1 Woods, including the Willow/Sanders tract), Plumb Creek Forest Preserve, and Jurgenson Woods Forest Preserve], and Will County (Goodenow Grove Forest Preserve),

Iowa:

- One CCA for the Sweet Marsh population in Bremer County,

Michigan:

- One state-wide umbrella CCA document covering areas identified as "core" protected properties within Alcona, Allegan, Alpena, Barry, Benzie, Berrien, Calhoun, Cass, Cheboygan, Clinton, Crawford, Emmet, Huron, Iosco, Jackson, Kalamazoo, Kalkaska, Lapeer, Lenawee, Livingston, Mackinac, Manistee, Missaukee, Montcalm, Montmorency, Muskegon, Newaygo, Oakland, Oceana, Ogemaw, Presque Isle, Roscommon, Sanilac, St. Joseph, Van Buren, and Washtena counties,

Missouri:

- One CCA for Pershing State Park in Linn County,

Ohio:

- Two CCAs for Rome and Pallister Nature Preserves in Ashtabula County, and

Wisconsin:

- Two CCAs for Chippewa River Bottoms and Black River populations in Buffalo, LaCrosse, Pepin, and Trempealeau counties.

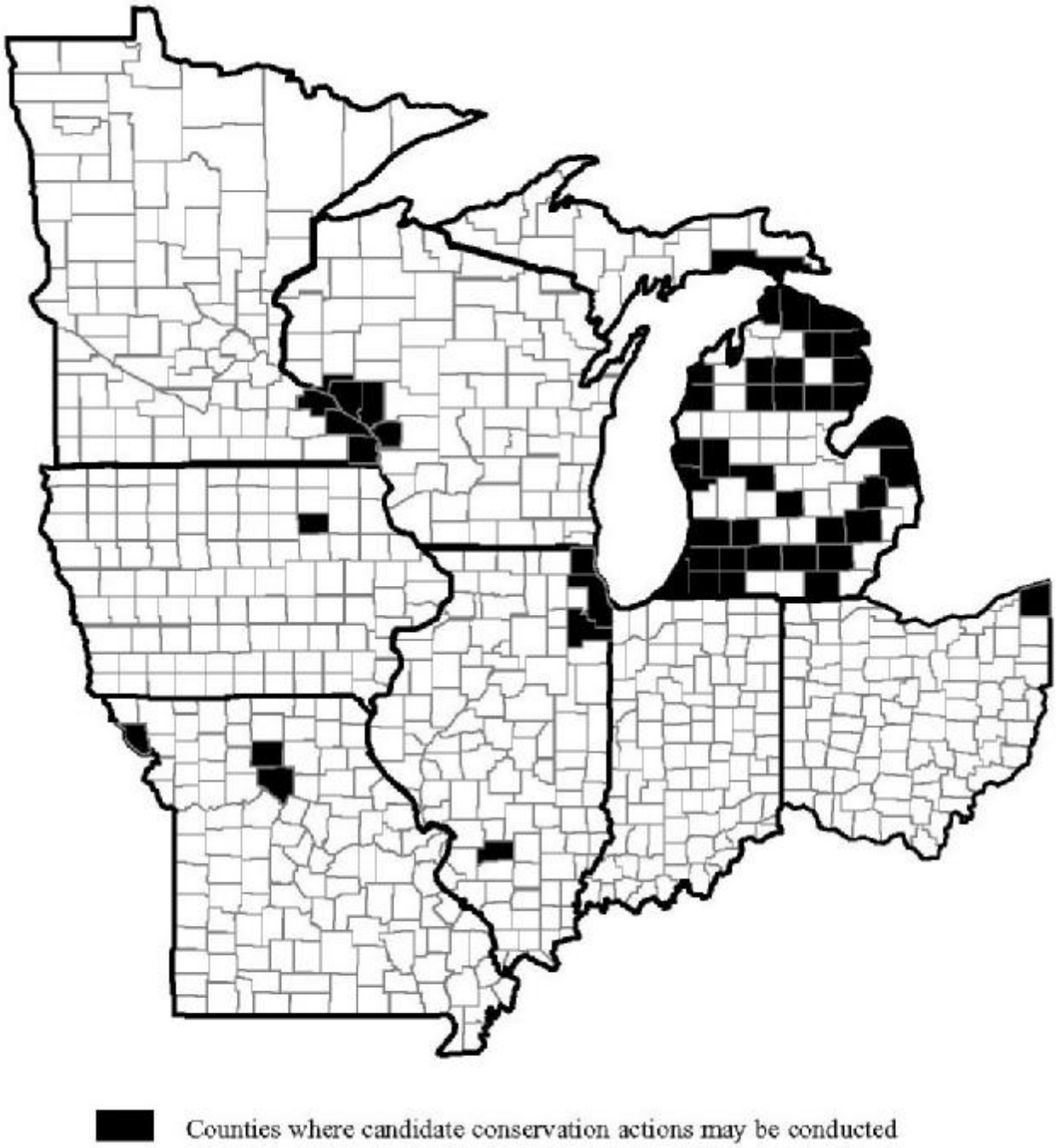

FIGURE 2. Actions to conserve the eastern massasauga are expected to be conducted on core sites in a 7-state area.

Each CCA implemented under this Alternative would contain site-specific management plans designed to conserve massasaugas and their habitat. Because massasaugas in R3 all use similar wetland habitats, most of the CCAs would contain similar management activities. Management activities that would likely be implemented as part of a CCA include (but are not limited to):

- Maintenance and/or creation of areas with early-successional (i.e., relatively open) vegetation. This task typically requires periodic removal of woody vegetation. Tools available to managers include, but are not limited to: 1) prescribed fire, in the form of controlled burns, 2) mechanical treatments, including cutting, brush-hogging, and mowing, 3) altering water tables, 4) treatment with herbicides, and 5) some combination of the preceding four practices. Managers will be encouraged to use a combination of these techniques to allow a site-specific evaluation of alternatives to better guide subsequent management efforts. Each of these methods would require managers to take steps to reduce the likelihood of killing eastern massasaugas.

- Prescribed fires would only be used in pre-determined areas, within preplanned conditions, to accomplish specific resource management objectives. Any fire hazards around property boundaries would be reduced. Every effort would be made to insure the safety of neighboring properties and to limit the likelihood of smoke/fire damage to private property. Each State DNR or local land-management agency would follow its internal procedures for conducting prescribed burns. Local fire departments would be notified and coordinated with prior to conducting any burns. To minimize potential adverse effects to snakes on the ground surface, controlled burns should only be conducted during the period when eastern massasaugas are inactive (this would vary year-to-year according to latitude and local weather conditions) generally between 15 Nov. and 15 March depending on soil temperature). Land management agencies entering into CCA's should establish site-specific burn windows that are protective of massasaugas by analyzing appropriate factors such as local/regional soil temperatures and snake activity patterns. To further minimize the potential for incidentally harming or killing massasaugas, pre-burn visual searches should be conducted for properties where annual spring emergence dates or weather conditions that influence massasaugas to remain in hibernacula have not been adequately defined. If any massasaugas are found during these searches, then the burns will be postponed or cancelled until the next inactive season. Alternatively, prescribed burns may be able to proceed if someone having the proper training/expertise, equipment, and required permits is available to capture and temporarily hold any massasaugas found during the pre-burn searches. Lastly, attempts would be made to plan and conduct prescribed burns in a manner that would create a mosaic burn pattern that retains some unburned patches/cover and thus reduces the potential for predation and poaching of massasaugas in recently burned areas.

- Cutting or harvesting of standing timber that is adjacent to higher quality massasauga habitat. This activity would only be encouraged if it were conducted

in a manner that benefited massasaugas (e.g., during winter dormancy) without greatly reducing biodiversity or negatively impacting other rare species.

- Developing and/or improving suitable habitat between isolated patches of massasauga habitat (i.e., travel corridors) to facilitate snake movements.

- Wetland restoration.

- Altering traditional schedules for burning, mowing, or maintaining/improving dike roads, fire breaks, old fields, and prairies to avoid periods when massasaugas are active and likely to be directly killed by these activities.

- Altering the timing of water level manipulations to seasons when massasaugas would not be adversely affected. For example, not allowing water levels to be lowered in wetlands while snakes are inactive, i.e., during hibernation. Lowering the water table during hibernation can cause mortality by exposing massasaugas to sub-freezing temperatures and by promoting dehydration/desiccation.

- Maintaining, improving, and/or creating soil and hydrological conditions to encourage the persistence and colonization of native crayfish. This activity would insure that massasaugas have an adequate supply of crayfish burrows to hibernate in. Conversely, activities that destroy or diminish crayfish burrows and other structures used as eastern massasauga hibernacula will be avoided.

- If feasible, temporarily closing roads to lessen road mortality during migration periods when massasaugas are most actively moving between habitats. If not feasible, investigate use of road culverts, road barriers, or trained individuals that can watch roadways and escort massasaugas to safety.

- Restrict use of all-terrain vehicles from areas containing massasaugas.

- Establish an internal education program for property managers and staff to learn about the snake's field identification, life history, habitat needs, conservation efforts, public outreach efforts, how to report sightings, how to provide medical assistance in case of snakebite, and how to recognize snake poachers.

- Establish a public outreach and education program regarding eastern massasaugas and local conservation efforts. Efforts would also be made (e.g., using signs or pamphlets) to clearly warn recreational users/visitors that massasaugas are venomous and describe how to minimize the potential for human/snake interactions.

- Periodically (e.g., every 1 to 3 years) monitoring and evaluating the effectiveness of habitat management strategies and adapting accordingly (i.e., adaptive management).

- Prior to conducting activities to benefit the massasauga, property managers will seek advice from the appropriate State Historic Preservation Officer (SHPO) regarding cultural/paleontological resources in their project areas. Any ground-disturbing activity will be reviewed prior to the action according to guidelines provided by the appropriate SHPO.

- Prior to implementing individual CCAs containing actions designed to benefit the massasauga, property managers will coordinate with their respective FWS Ecological Services Field Office to insure that their proposed actions are not likely to adversely affect other federally listed species or adversely modify any proposed or designated Critical Habitat. Some management actions may require additional coordination and or technical assistance from the Service.

2.2.2 Alternative B - Continue Ongoing Conservation Measures (No Action)

Under Alternative B, the Service would continue taking standard actions and providing routine services to conserve massasaugas as a candidate species in R3. Alternative B does not include the action of listing the massasauga under the ESA and no CCAs would be implemented under this alternative. Actions that would occur under this alternative are those that would continue as long as the massasauga remained a candidate species. Currently, the Service routinely promotes the conservation of massasaugas (and other Federal candidate species) by

- recommending conservation measures to project proponents, public land managers, and private landowners when reviewing proposed Federal actions/projects within potential massasauga habitat,

- internally treating candidate species as if they are proposed for listing for purposes of conducting internal FWS conferencing. Although including candidate species is not required by law, it is the Service's policy to consider them when making natural resources decisions. Therefore, candidate species are considered during internal FWS conferencing. FWS units confer with the appropriate FWS Ecological Services Field Office on actions they authorize, fund, or carry out that may affect massasaugas. These Service actions include National Wildlife Refuge operations, public use programs, private lands and Federal Aid activities, as well as promulgating regulations and issuing permits,

- providing land managers with technical assistance. For example the FWS provides interested parties with a handbook (Johnson et al. 2000) containing guidelines to assist in incorporating massasauga biology into land management plans and practices,

- funding small-scale conservation projects (e.g., surveys, radio-tracking studies, and status reviews), with candidate conservation funds in R3, and

- providing free educational materials to interested parties and on the FWS' R3 internet site (go to http://midwest.fws.gov/Endangered/lists/candidat.html).

Even though the Service has already provided funding to R3 States for gathering baseline data and for investigating and developing CCAs, Alternative B (no-action) assumes that CCAs would not be implemented. The Service and/or R3 States may decide not to implement the agreements if:

- upon further investigation, current land management practices and conservation efforts are deemed sufficient, or if
- CCAs would not effectively remove or reduce management conflicts/threats to massasauga populations, or if
- contents (e.g., protective management practices) within CCAs cannot be mutually agreed upon.

2.2.3 Alternative C – Use Regulatory Tools and Recovery Efforts Subsequent to Listing the Massasauga

Under Alternative C, the Service would postpone concerted conservation efforts for massasaugas while the subspecies remained a Federal candidate species. Once federally listed under the ESA, the Service would conserve and attempt to recover massasauga populations by initiating standard actions for listed species including:

Proposing and Designating Critical Habitat (CH) – The Service would consider designating CH for massasaugas. Critical Habitat for listed species consists of:(1) the specific areas within the geographical area occupied by the species, at the time it is listed in accordance with provisions of section 4 of the ESA, on which are found those physical or biological features (constituent elements) (a) essential to the conservation of the species and (b) which may require special management considerations or protection; and (2) specific areas outside the geographic area occupied by the species at the time it is listed in accordance with the provisions of section 4 of the ESA, upon a determination by Secretary of the Interior that such areas are essential for the conservation of the species.

Initiating a Recovery Program – The Service's Recovery Program staff would work with Federal, State, Tribal, non-governmental entities, and private landowners to take necessary measures to prevent extinction of massasaugas; prepare an Eastern Massasauga Recovery Plan to ensure coordinated, effective recovery actions; and implement actions to reverse the decline of massasaugas. A recovery plan is a document prepared for listed species that details specific tasks needed for recovery. It provides a blueprint for private, Federal, and State cooperation in the conservation of threatened and endangered species and their ecosystems.

Conducting Section 7 Consultations with Federal Agencies – The Service would remind Federal agencies of their ESA responsibilities under section 7 of the ESA. Section 7 of the ESA directs all Federal agencies to use their existing authorities to conserve threatened and endangered species and, in consultation with the Service, to ensure that their actions do not jeopardize the continued existence of listed species or destroy or

adversely modify designated critical habitat. Section 7 applies to management of Federal lands as well as other Federal actions that may affect listed species, such as Federal approval of private activities through the issuance of Federal permits, licenses, providing Federal funding, or other actions.

Pursuing Safe Harbor Agreements (SHAs) – SHAs are voluntary arrangements between the Service and cooperating non-Federal landowners (e.g. state natural resource agencies, local governments, conservation organizations, businesses, and private individuals). The Agreements benefit endangered and threatened species while giving the landowners assurances from additional restrictions. Following development of a SHA, the Service will issue an "enhancement of survival" permit, to authorize any necessary future "incidental take" to provide participating landowners with assurances that no additional restrictions will be imposed as a result of their conservation actions. Before entering into a SHA, the Service must make a finding that the covered endangered or threatened species will receive a "net conservation benefit" from the Agreement's management actions.

> **"Take"** – to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct. [ESA §3(19)] Harass is further defined by FWS as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by FWS to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns such as breeding, feeding, or sheltering. [50 CFR §17.3]
>
> **"Incidental take"** – take of listed fish or wildlife species that results from, but is not the purpose of, carrying out an otherwise lawful activity. [50 CFR §402.02]

Approving Habitat Conservation Plans (HCPs) and issuing Incidental Take Permits (ITPs) – Incidental take permits are required when non-Federal activities would result in "take" of threatened or endangered species. An HCP is a planning document that is a mandatory component of an ITP application. The purpose of the habitat conservation planning process associated with the permit is to ensure there is adequate minimizing and mitigating of the effects of the authorized incidental take. The purpose of the ITP is to authorize the incidental take of a listed species, not to authorize the activities that result in take. HCPs must show that applicants have minimized and mitigated take and impacts to the maximum extent practicable and show that the incidental taking will not appreciably reduce the survival and recovery of the species.

HCPs are similar to SHAs in some ways. Both programs help conserve endangered and threatened species on private lands, have a planning and review process, and are a required step in the issuance of permits for the incidental taking of a listed species. However, HCPs differ from SHAs in several respects. First, the ITP issued for an approved HCP is needed if the applicant anticipates an immediate taking of a listed

species (e.g., when development is currently proposed in an area known to be occupied by a listed species). An enhancement of survival permit issued in accordance with an approved SHA allows for the taking of listed species at the end of the agreement for only those individuals (i.e., animals or plants) that the landowner created habitat for after signing the agreement (i.e., returning the land to baseline conditions). Second, HCPs must show that they have minimized and mitigated the take and impacts to the maximum extent practicable and show that the taking will not appreciably reduce the survival and recovery of the species. Therefore, some loss of individuals of a covered species may be allowed with an HCP as long as that loss does not appreciably impact the species. SHAs differ from HCPs in that they must always provide a net conservation benefit to covered species. Although some HCPs may provide a net conservation benefit to a listed species, they are not required to do so.

Offering Grants to States, Territories, and Private Landowners – The Service would offer competitive grants for endangered species conservation and recovery. Working with our partners, the Service typically awards over $100 million in Federal funding across the nation under five types of endangered species grants. The Service offers many grants to our partners; the grant programs described below are specifically for the benefit of endangered, threatened, proposed, or candidate species or other at-risk species. The current grant programs include:

- Private Stewardship – for local, private, and voluntary conservation efforts,
- Conservation Grants – for implementation of conservation projects,
- Recovery Land Acquisition – for acquisition of habitat in support of approved recovery goals or objectives,
- HCP Assistance – to support development of Habitat Conservation Plans (HCPs),
- HCP Land Acquisition – for acquisition of land associated with approved HCPs.

Additional information regarding the Service's grant programs can be accessed via the internet (go to http://endangered.fws.gov/grants/index.html).

Incorporating Massasauga Protection into the Federal Law Enforcement Program – The Service's Law Enforcement program would investigate wildlife crimes involving massasaugas and prosecute law offenders (e.g., poachers). This program would also help to educate people about applicable wildlife protection laws.

Providing Free Technical Assistance and Educational Materials to Interested Parties – The Service would provide technical assistance and free educational materials and publications to support massasauga conservation.

2.3 SUMMARY OF ALTERNATIVE ACTIONS TABLE

Characteristics	Alternative A Implement CCAs on Protected Lands throughout R3 (Proposed Action)	Alternative B Continue Ongoing Conservation Measures (No Action)	Alternative C Use Regulatory Tools and Recovery Efforts Subsequent to Listing the Massasauga
Conservation Strategy	To conserve massasaugas through partnerships with public and private landowners via formal agreements prior to species being listed under ESA.	To encourage, promote, and support conservation of massasaugas by providing technical assistance to permit applicants and others and by making environmental education materials available to the public.	Conserve massasaugas after listing while providing a mechanism to allow economic development to continue (ITP/HCP) and Provide incentives to conserve listed species by providing regulatory assurances (SHA).
Regulatory assurances provided to signatories of agreements	Public and NGO lands – Yes Private lands – Yes	No	If terms are met, will not have to commit more resources (HCP) and signatory can return land to baseline conditions at end of agreement term (SHA).
Coordinated regional effort	Yes	No	Possible, but to date, no HCPs or SHAs have been Regional in scope.
Implementation schedule	As soon as possible: 2005-2007	Ongoing	Delayed until listed
Issuance of ITP with HCP	No	No	Yes

3.0 AFFECTED ENVIRONMENT

3.1 PHYSICAL CHARACTERISTICS

The R3 States have a typical Midwestern continental climate and the weather is quite variable, because of the influx of high and low-pressure systems and warm moist air from the Gulf of Mexico. Summers are generally warm, while the winters are moderately cold in the more southerly states (IL, IN, MO, OH) and often very cold in the northern states (MI, MN, and WI) within the region. Precipitation is fairly uniform throughout the year, averaging 3 to 4 inches per month. Spring and summer thunderstorms push the monthly average over 4 inches for the March - June period, while the fall of the year sees monthly rainfalls close to 3 inches. Measurable snowfall can be experienced throughout the November to March period, and averages between 15 to 36 inches across the region.

3.2 BIOLOGICAL ENVIRONMENT

3.2.1 Habitat / Vegetation

Habitats that may be affected by the proposed action are those used by massasaugas. Habitat use by massasaugas varies over their range, but is generally associated with shallow wetland systems, such as sedge fens, wet meadows, peatlands, forested bottomlands and adjacent uplands. Preferred habitats are generally open (less than 50% canopy cover). The habit matrix is course with trees and shrubs in clusters rather than dispersed throughout the area. The ground cover of preferred habitats is predominated by grasses and sedges, but sphagnum may also be a large component of the substrate cover. Massasaugas may prefer drier, more open habitat in the summer. Gravid (i.e., pregnant) females typically show a greater tendency to make this selection. Populations exhibiting such a use pattern need adjacent suitable habitat in both uplands and lowlands. Hibernation typically occurs in areas with saturated soils and an abundance of crayfish burrows that are used as hibernacula (i.e., hibernation sites). Identifying and protecting hibernacula will be critical to protecting massasauga populations.

3.2.2 Threatened, Endangered, and Candidate Species

In R3, some protected properties containing eastern massasaugas (Federal candidate species) are also within the range of other federally listed species including the Indiana bat (*Myotis sodalis*), bald eagle (*Haliaeetus leucocephalus*), copperbelly water snake (*Nerodia erythrogaster neglecta),* Mitchell's satyr butterfly (*Neonympha mitchellii mitchellii*), and the eastern prairie fringed orchid (*Platanthera leucophaea*). Potential impacts to these species and their habitats would vary depending upon where and how management actions are implemented. No critical habitat has been designated for these species within the affected environment.

3.2.3 Other Wildlife Species

The protected wetland areas that provide habitat for massasaugas also support an abundance of other reptiles, amphibians, mammals, birds, crustaceans, insects, and plants. Massasaugas are predatory and feed primarily on small mammals. Other wetland and upland species often benefit from conservation measures prescribed for massasaugas.

3.3 LAND USE

Many of the remaining eastern massasauga populations occur on protected lands (i.e., publicly owned land or land purposely set aside by non-governmental entities for long-term preservation) such as parks, nature preserves, and wildlife management areas. Because massasaugas inhabit shallow wetland systems, such as sedge fens, wet meadows, peatlands, or forested bottomlands and adjacent uplands, these are the primary habitat types that may be affected by the proposed action. Other common land uses around protected massasauga properties include agriculture, forest and residential areas. It is unlikely that any prime or unique farmlands would be impacted by the proposed action. Wild and scenic rivers and ecologically critical areas may be located within or near some of the proposed project areas, but would not be negatively affected.

3.4 CULTURAL RESOURCES

People have occupied the upper Midwest since the last glaciers moved farther north approximately 11,000 years ago. The record of these people exists only in prehistoric archeological sites that today are hardly visible on the landscape.

During the early historic period the Native American tribes in the upper Midwest were in great turmoil and most if not all tribes left their ancestral lands. Either voluntarily or through coercion from the Federal government, these tribes consolidated, split apart, disappeared, and generally resettled west and south of their prehistoric homelands. Furthermore, archeologists have seldom been able to connect, through the archeological data, prehistoric cultures with modern tribes.

Nevertheless, some tribes make aboriginal claims to lands, and some tribes retain traditional cultural practices and concern for human remains and sacred sites on lands they no longer occupy.

French, Spanish, and English people began exploring the upper Midwest in the early 17th century. Following the explorers, trappers moved into the area, establishing relationships with the Native Americans and constructing trading posts. Governments laying claim to the area often established military posts and forts. Miners and loggers often entered the area about the same time, and in some cases continued to operate into the 20th century. Euro-American farmers settled the area in the early 19th century, and correspondingly established towns, transportation systems, and small industries. The record of these people exists in many forms including historic archeological sites, buildings, and structures that may or may not be visible on the modern landscape.

Each of the 47 counties listed in this environmental assessment have at least one property listed on the National Register of Historic Places, and all the counties together have hundreds of properties listed. Because of the tremendously large number of National Register properties in such a large land area, it is not practical to identify individual properties at this level of planning.

3.5 PUBLIC HEALTH AND SAFETY

The massasauga is a venomous snake whose bite can be of medical concern. Although its venom has been found to be highly toxic, it has little capacity to produce volumes of venom great enough to be lethal to humans. Thus, there are few records of human deaths caused by this small rattlesnake over its entire range. Nonetheless, it is considered a health and safety concern to some of those who visit, work, or live in areas inhabited by massasaugas. Because it is a rare species (few in number), inhabits undeveloped areas (primarily wetlands), and is shy and non-aggressive in nature, human/snake interactions are rare and snakebites are even rarer. Massasaugas are known to be present (or presumed present) on various protected lands within R3 States, so people living in these areas have some inherent level of risk for being bitten by a massasauga based solely on their geographical proximity. However, risk is most likely highest for individuals who pursue outdoor recreational activities within massasauga habitat.

3.6 LOCAL SOCIO-ECONOMIC CONDITIONS

Because, the scope of the proposed action encompasses dispersed activities across many counties in seven states, a detailed analysis of existing socio-economic conditions was not feasible for each property where activities are proposed. However, given the nature of the proposed action (implementing CCAs), no adverse effects to local socio-economic conditions are anticipated.

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 ELEMENTS COMMON TO ALL ALTERNATIVES

4.1.1 Biological Resources

Overall, massasauga conservation is compatible with sport hunting and fishing management. In fact, instituting massasauga-friendly management often improves the quality and quantity of habitat for many game and non-game species. Many of the current wildlife management objectives and techniques are compatible with massasauga conservation. In many situations, the frequency or timing of a particular action is the only modification needed to eliminate detrimental effects to massasaugas.

In contrast, some management actions that would protect massasaugas may at times conflict with or preclude the management of some areas for other wildlife. For example, some land managers traditionally lower or “draw down” water levels in wetlands during

the winter months to encourage vegetation to grow that is attractive to waterfowl. However, drawing down the water levels in winter can cause massasauga mortality by exposing them to freezing temperatures and desiccating air while they are hibernating in subterranean crayfish burrows. Therefore, the Service will encourage land managers not to manipulate water levels in wetlands during the winter. If this change is implemented within core massasauga areas, the number of waterfowl that are typically present in winter may decline in these areas if less food is available prompting them to forage elsewhere. However, potential negative impacts (if any) to winter waterfowl populations would be minimal in scope and probably would not be measurable beyond the local level (i.e., individual management areas).

Some massasauga management activities (e.g., tree clearing) that would restore open-canopy habitat within lowland hardwood forests may also create management conflicts with some forest interior birds or birds, such as red-shouldered hawks, but it is unlikely that habitat restorations would be on a large enough scale to adversely affect forest-dependent bird populations.

4.1.2 Cultural Resources

Cultural resources are "those parts of the physical environment -- natural and built -- that have cultural value to some kind of sociocultural group ... [and] those non-material human social institutions...."(King 1998, p. 9). Cultural resources include historic sites, archeological sites and associated artifacts, sacred sites, traditional cultural properties, cultural items (human remains, funerary objects, sacred objects, and objects of cultural patrimony)(McManamon 1997), and buildings and structures. Most cultural resources concerns can be identified through the Section 106 process of the National Historic Preservation Act. To reduce paperwork, avoid duplication, and expedite decision-making, the Section 106 process as defined in 36 CFR Part 800 will be followed for purposes of the environmental assessment.

The Regional Director, as the responsible Federal agency official (800.2(a)), will ensure identification of cultural resources and historic properties within the areas of potential effect. In states (e.g., Iowa) where the FWS and the State Historic Preservation Office (SHPO) already have implemented a Programmatic Agreement (PA) with National Historic Preservation Act (NHPA) consultation and compliance protocols, the PA will be followed. Otherwise, absent objections from Historic Preservation Officers (HPOs), or from other interested persons who have standing (800.2(c)(3), (4), and (5)), for every project (undertaking) involving land acquisition, ground disturbance, or buildings and structures 50 years and older, the lead FWS Field Office will:

1. Notify the appropriate HPOs that the partner/grantee/permittee is authorized to initiate consultation with the HPO on behalf of the FWS for the specific project (undertaking) for the purpose of identifying cultural resources in the area of potential effects. In consultation with the HPO, the partner/grantee/permittee is authorized to render determinations of no historic properties or no effect on historic properties on behalf of the FWS. Upon the successful conclusion of

consultation in these cases, the partner/grantee/permittee shall obtain written concurrence to their determination from the SHPO.

2. Inform the partner/grantee/permittee of the need to accomplish the Section 106 NHPA process as agent for the FWS. Information includes
    - identifying the appropriate HPO,
    - identifying the kind of information the HPO requires,
    - specifying the need to allow the HPO at least 30 days to respond,
    - requiring appropriate public and local government notification of the project,
    - requiring the FWS receive copies of the HPO letters of no historic properties or no effect on historic properties before the project commences;

3. Notify appropriate Indian tribes about the project;

4. In event the HPO fails to respond appropriately after 30 calendar working days, take over the Section 106 process;

5. If evaluation of cultural resources for being eligible for the National Register of Historic Places is needed, or if properties on or eligible for the National Register could be affected by the project, take over the Section 106 process; and

6. Provide the Regional Historic Preservation Officer with sufficient documentation to determine if the Section 106 process is completed, before the project is implemented.

4.1.3 Environmental Justice

Environmental justice is achieved when everyone, regardless of race, culture or income, enjoys the same degree of protection from environmental and health hazards and equal access to a healthy environment to live, work, and play. None of the alternatives would have any environmental or socio-economic impacts on women, minority, ethnic, religious, or social groups or the civil rights of any citizen of the United States. Potentially affected Native American Tribes will be consulted under Secretarial Order 3206. There are no environmental health risks inherent in any of the alternatives, and no prime farmland or rangeland would be adversely impacted.

4.1.4 Public Health and Safety

All of the considered alternatives have the common goal of removing threats to existing massasauga populations in hopes that their numbers will increase and stabilize. However, because massasaugas are non-aggressive and secretive in behavior, a large increase in their numbers is not likely to lead to a large increase in snakebites. Human/snake interactions will likely remain low unless there is a large increase in human activity that is concentrated within massasauga habitats. Conditions leading to this scenario can not be reasonably foreseen at this time.

Regardless of which alternative is chosen, FWS will support public outreach and education efforts in support of massasauga conservation (see Appendices A, B, and C). The proposed action and each alternative action have an educational outreach component. The FWS will strongly encourage (or require when feasible) and assist land managers in implementing an effective massasauga outreach program. Recreational users visiting protected lands containing massasaugas will be notified of the snakes' presence, its legal status and ecological importance, and local conservation efforts. Likewise, visitors will be informed how to minimize the potential for human/snake interaction and how to respond in case of snakebite. Special efforts will be made to identify and educate any employees or user-groups considered at high-risk for human/snake interaction, as a result of their job duties or recreational pursuits on protected lands (e.g., maintenance workers and waterfowl hunters). The FWS will also request implementation of an internal education program for property managers and staff to learn about the snake's field identification, life history, habitat needs, conservation efforts, public outreach efforts, how to report sightings, how to provide medical assistance in case of snakebite, and how to recognize snake poachers. Armed with massasauga life history, knowledge of visitor use/recreation patterns, and a detailed knowledge of their specific properties, property managers will be able to foresee areas where human/snake interactions may be or become problematic, and therefore, take appropriate measures to minimize conflicts. For example, a property manager is not likely to build a new playground in an area known to be frequently used by massasaugas. Likewise, a property manager is not likely to actively manage/enhance marginal massasauga habitat that is adjacent to or surrounding a busy campground area. Some property managers may choose to relocate a campground or other human focal areas to lessen human/snake interactions. In many cases, only a small portion of a park or preserve's land will be actively managed for massasaugas (e.g., management of a wetland-prairie complex that comprises only 10% of a park's total area). Property managers will need to continually monitor reported human/snake interactions and/or snakebites to evaluate the effectiveness of their avoidance measures and outreach/educational efforts and then make changes as needed (i.e., adaptive management). As outlined above, the FWS is committed to improving public awareness and believes that massasauga conservation can succeed without sacrificing public safety.

4.1.5 Cumulative Impacts

The incremental cumulative impacts of Alternatives A, B, and C would differ on the resources discussed below. However, regardless of which alternative in this EA is chosen, the effects of other past, present, and reasonably foreseeable future actions on these resources are the same and are therefore presented in this section. Because each alternative under consideration is regional in scope, cumulative impacts have also been analyzed on a regional scale. The magnitude and significance of incremental cumulative impacts that would result from implementing each alternative are presented in subsequent sections.

<u>Wetlands and Other Habitats, Species Diversity, and Genetic Diversity</u>

At the time of European settlement, the area that is now the conterminous United States contained an estimated 221 million acres of wetlands. Most of those wetlands were in three regions: the Midwestern States (27%), Southeastern States (24%), and the Delta and Gulf States (24%). Over time, wetlands have been drained, dredged, filled, leveled, and flooded to the extent that less than half of the original wetland acreage remains (Dahl 2000). However, in recent decades our society's views about wetlands have changed considerably and interest in the preservation of wetlands has increased as the values of wetlands have become better understood. For example, wetlands are now valued for their ability to improve water quality, store flood waters, recharge groundwater, and provide habitat for an amazingly diverse assemblage of both common and rare plant and animal species. A recent Federal report (Dahl 2000) indicates the rate of wetland loss in the United States has decreased by 80 percent in the past decade. This is the greatest overall decline in the rate of wetland loss since records have been compiled by the Federal government. Even though ongoing conservation programs and an increase in wetland restoration activities have appreciably slowed the rate of wetland loss, a net loss of wetlands continues in the Midwest and other regions, and this trend is likely to continue into the reasonably foreseeable future. Likewise, eastern massasauga populations and other wetland-dependent species in R3 are expected to continue to decline. If threats to massasaugas and their wetland habitats (e.g., shallow wetland systems, such as sedge fens, wet meadows, peatlands, and forested bottomlands) remain at their current levels or increase as is expected, the potential for many remaining massasauga populations to sustain themselves will be greatly reduced and some populations are likely to be eliminated.

Apart from the problem of protecting a dwindling quantity of wetlands, those that remain in the Midwest are often of poor and/or declining quality (e.g., low biodiversity, and degraded by non-native invasive species), small in size, fragmented, and isolated within a human-dominated landscape. In many areas remaining early-successional wetlands and prairies are succeeding into scrub-shrub wetlands and old-field habitats because of a lack of natural disturbances (e.g., wildfire) and thereby are no longer suitable to massasaugas. These conditions have lead to the decline and isolation of most remaining massasauga populations and other wetland-dependent species. As wetlands and massasauga populations have declined in number and become increasingly more isolated, genetic diversity has declined, and genetic exchange among neighboring populations has ceased. If future recovery efforts are to be successful, the genetic diversity among remaining massasauga populations will need to be protected as well as wetlands, adjacent upland habitats and travel corridors.

Apart from wetlands, massasaugas also use surrounding upland habitats such as prairies, savannas, and open woodlands. These habitat types also have been seriously reduced in the Midwest since pre-settlement times and converted to agricultural uses and for more recent urban development. In regards to their value as massasauga habitat, upland habitats face many of the same problems and negative trends as wetlands do, as most remaining upland habitat areas are highly fragmented/isolated, small in size, and of low quality.

4.2 ALTERNATIVE A - IMPLEMENT CCAS ON PROTECTED LANDS THROUGHOUT R3 (PROPOSED ACTION)

4.2.1 Physical Impacts

Implementation of this alternative would result in relatively minor changes to local topographic relief and hydrology. Some massasauga populations may benefit from wetland restoration on protected lands. Wetland restorations often require earthen berms to be constructed. Managers typically use local soil to build berms several feet above the surrounding ground level to create shallow wetland areas and moist-soil units. Once constructed/restored, wetlands will improve local water quality by slowing surface runoff and acting as biological filters, in addition to recharging ground water supplies, and ameliorating the effects of flooding.

Prescribed burning is an important tool that will be contained in some CCAs. Prescribed burning is used to maintain and manage many types of fire dependent habitat such as prairies and wet prairies used by massasaugas. Prescribed burning also is an important tool to reduce buildup of fuels that may lead to large uncontrollable wildfires. Because some CCAs may implement the use of prescribed fire where it previously has not been used, air quality in these areas may periodically be affected by smoke under Alternative A. However, because individual burn units are typically only burned once every four to seven years, disturbance to neighboring land owners from smoke will be minimal and generally only occur for one day. In addition, land managers will attempt to minimize negative impacts to the surrounding population by burning under very narrow prescriptions. Unexpected weather changes (e.g., change in wind direction) may cause some short-term smoke exposure for some neighbors.

As discussed above, physical impacts from implementing the CCA Alternative are of a low magnitude and geographically localized. Because land managers will have to adhere to seasonal burning restrictions (e.g., burning only allowed from 15 Nov. to 15 March) under Alternative A, timing of potential fire/smoke-related impacts will be more predictable and occur at a time of year when fewer people engage in outdoor activities. Conversely, if prescribed burns are conducted under Alternative B, land managers may or may not adhere to seasonal restrictions that are protective of massasaugas (i.e., uncertain timing).

4.2.2 Biological Impacts

Implementing Alternative A will have multiple biological impacts designed to maintain, expand, and/or enhance existing massasauga habitat. Under this alternative, vegetation within wetlands and wet prairie areas will be maintained at an early successional stage by periodically removing trees and other woody plants via mowing, prescribed burning, and/or herbicide use. Diversity and abundance of wildlife species dependent on early successional wetland vegetation is likely to increase under this alternative compared to the No Action Alternative (B). Conversely, species favoring habitats containing taller/denser vegetation and/or habitats with more trees and woody vegetation are likely to decline in areas being actively managed for massasaugas.

Under CCAs, land managers agree to conduct their management actions in a manner deemed beneficial to massasaugas. However, management for massasaugas can be sufficiently flexible to allow managers to focus on other species or priorities, as well. Furthermore, CCAs do not restrict land managers from also managing other areas under their control for other game or non-game species or for recreational uses. Because massasaugas seldom occur across an entire park or preserve, management efforts for the snake will typically be restricted to just those areas containing suitable habitat.

As compared to Alternative B (no action), Alternative A will reduce current threats to remaining core massasauga populations and increase the quality and quantity of wetland habitats on protected lands within R3 States. When fully implemented, management actions taken under Alternative A may be sufficient to preclude the need to federally list the subspecies. If only currently ongoing actions are continued and no additional conservation measures are made during the candidate stage (Alternatives B and C), then massasauga populations will remain vulnerable to threats, some populations will likely be extirpated, and the subspecies will inevitably need to be federally listed.

4.2.3 Listed Species

Implementing Alternative A will result in an immediate and long-term reduction of threats to core populations throughout a major portion of eastern massasauga's U.S. range. Ultimately, with continued implementation of the CCAs, the species' decline should be arrested, and possibly reversed, such that the protections of the ESA are not needed. These beneficial effects are anticipated as a result of implementing massasauga-friendly management, enhancement and restoration of massasauga habitat, and increased awareness by managers and pertinent landowners of the need for such efforts.

As with any species that occupies a successional habitat type, management actions may unavoidably harm (e.g., prescribed burning, mowing, etc.) individual animals despite concerted efforts to avoid such incidents. However, this level of anticipated harm is expected to be well below what is currently occurring and will not adversely affect the population status at any particular site. Our reasoning for this is that under CCAs, managers will implement massasauga management guidelines that are designed to minimize adverse effects to individuals. Currently, at many sites, the massasauga is not a management target, and consequently, some activities are incidentally harming individuals and degrading massasauga habitat suitability. In fact, management conflict was identified as a major threat to the species (Candidate Elevation package 1999). At a few sites, massasaugas are specific management targets–or at least are considered in management decisions. For many, however, suitable habitat, is being fortuitously maintained (i.e., the managers are unaware of massasauga biology and could alter the management regime at some future point and unknowingly destroy the habitat). The remaining populations are subject to deteriorating, or in some instances total destruction of, habitat conditions as a result of incompatible management activities.

We anticipate Alternative A will eliminate most of the management conflict that exists in Region 3. If this occurs, we believe the current decline of massasauga will slow, stall, or possibly be reversed. Although the proposal could result in some short-term adverse effects to individual massasaugas, the species will not be jeopardized. This non-jeopardy Section 7 determination was made in consultation with the FWS' Bloomington Ecological Services Field Office (concurrence dated 2/25/02, Appendix D).

Because some protected properties in R3 may contain other federally listed species such as the Indiana bat (*Myotis sodalis*), bald eagle (*Haliaeetus leucocephalus*), copperbelly water snake (*Nerodia erythrogaster neglecta),* Mitchell's satyr butterfly (*Neonympha mitchellii mitchellii*), and the eastern prairie fringed orchid (*Platanthera leucophaea*), land managers will coordinate with the Fish and Wildlife Service. The FWS will review site-specific massasauga management plans within each CCA to determine potential effects on any other federally listed, proposed, or candidate species that may be present. Therefore, because this review would occur as part of Alternative A, this alternative would be more protective of listed species than Alternative B activities. The Service's Implementation of CCAs for massasaugas in R3 is not likely to jeopardize other federally listed species or adversely modify any designated critical habitat.

4.2.4 Cumulative Impacts

Wetlands, prairies, savannahs, and open woodlands have seriously declined and continue to be lost and degraded across the Midwest. By implementing CCAs (Alternative A) in R3 States that promote the maintenance, creation, and restoration of these habitat types in areas that surround remaining massasauga populations, the Service would be taking a proactive, positive step against the negative trends of habitat loss, fragmentation, degradation, and loss of biodiversity. Albeit limited in magnitude and scale, the Service anticipates that implementing CCAs would have the greatest net positive cumulative effect on massasaugas and the quantity and quality of their habitat. Alternative A would help to halt or reverse the trends toward population decline and the net loss of habitat, biodiversity, and genetic diversity more than actions proposed under either Alternative B or C, especially for massasaugas on protected lands. Similarly, Alternative A would have the greatest net positive cumulative effect on other wildlife species that depend upon early-successional wetlands because protected lands under CCAs would likely serve as refugia for these species and may prevent some species from becoming threatened. While a loss of some old field and scrub-shrub wetlands is expected as land managers convert and restore these habitats to early successional wetlands, these habitat types are generally not as limited in the Midwest and show some indications of being on the rise (Dahl 2000).

The gains in suitable massasauga habitat (i.e., early successional wetlands) will eventually facilitate an increase in massasauga abundance within protected lands in R3 States. Because massasauga populations are expected to stabilize or increase on lands being managed under CCAs, these protected lands may eventually serve as 'source populations'— producing massasaugas that may naturally (or assisted by man) disperse and recolonize other areas. Dispersal movements should be facilitated on

properties under CCAs because these areas will be managed to increase the degree of habitat connectivity, which would help slow the ongoing trend of habitat fragmentation.

Lastly, the proactive implementation of CCAs for massasaugas would ultimately be more cost effective and cost the Federal government (and R3 of the Service) far less money to recover massasauga populations than either Alternative B or C. If CCA efforts are successful in eliminating threats to remaining massasauga populations (and potentially other wetland-dependent species) in R3 States to the extent that the need to list them under the ESA is precluded, then 1) Alternative A would enable the Service in R3 to dedicate much more of its limited budget towards recovery efforts for the continually growing number of federally listed species, and 2) the cumulative dollar amount in cost savings to the U.S. Government and private sectors would likely be substantial.

4.2.5 Overall Management Discretion

Under Alternative A, R3 States and other local land-management agencies would voluntarily enter into CCAs with the FWS, which collectively may improve the species' status, and preclude the need for federally listing the eastern massasauga under the ESA. If CCAs are successful in precluding the need to federally list massasaugas, then R3 States and others would maintain much more latitude or discretion when making decisions as how to best manage their lands. Conversely, overall management discretion would be more restrictive under Alternative C and somewhat restrictive under Alternative B as compared to Alternative A.

4.2.6 Socio-economic Impacts

Implementation of Alternative A (while the eastern massasauga is still a candidate species) is expected to expedite recovery of the species. Therefore, in the long-run, Alternative A will cost the Federal Government, R3 States, and other landowners far less money for recovery actions than Alternative C and potentially Alternative B as well (also see Section 4.2.4 above).

Refuge/park visitors and certain recreational activities (e.g., use of all-terrain vehicles) may be excluded from sensitive areas during specific times of the year. When deemed necessary and feasible, the temporary closure of some key roadways may occur to lessen road mortality during peak massasauga migration periods. Road closures are most likely to occur within refuge/park boundaries and therefore would have minimal impacts on external traffic patterns and have little socio-economic impact. In addition, some land managers may opt to employ additional staff to watch roadways and escort massasaugas to safety.

4.3 ALTERNATIVE B - CONTINUE ONGOING CONSERVATION MEASURES (NO ACTION)

4.3.1 Physical Impacts

Under Alternative B, no significant changes to topographic relief, soils, hydrology, and water quality are likely to occur. As a result of the FWS' ongoing educational outreach, technical assistance efforts, and interagency section 7 consultations/conferences, some land managers are likely to voluntarily restore some wetland areas and thereby benefit some massasauga populations on public and private lands. However, the number of wetland restorations on protected lands resulting from Alternative B are expected to be fewer than the number that would occur if Alternative A were selected.

Under Alternative B, the FWS would continue to recommend prescribed burning as a method of maintaining and managing many types of fire-dependent habitat such as prairies and wet prairies used by massasaugas. Therefore, some fire-related impacts (e.g., short-term smoke exposures) would continue on lands in R3 States. However, because CCAs would not be implemented under Alternative B, some land managers are likely to use different techniques for maintaining early successional habitat that may be easier or less expensive to conduct (e.g., mowing). Some management techniques may have adverse impacts to the physical environment. For example, if mowing is repeatedly used in an area, then soil compaction is likely to occur.

As discussed above, physical impacts from continuing ongoing conservation measures would be of a low magnitude and geographically localized. Because land managers will not necessarily have to adhere to FWS-recommended seasonal burning restrictions (e.g., burning only allowed from 15 Nov. to 15 March) under Alternative B, timing of potential fire/smoke-related impacts will be less predictable and may occur at a time of year when people often engage in outdoor activities. Conversely, if prescribed burns are conducted under Alternative A, land managers would be required to adhere to seasonal restrictions that are protective of massasaugas (i.e., certain timing).

4.3.2 Biological Impacts

Ongoing conservation measures (i.e., Alternative B) would have some biological impacts to wetland-dependent fauna as land managers would be encouraged to voluntarily maintain, expand, and/or enhance existing massasauga habitat. Under this alternative, vegetation within some wetlands and wet prairie areas will be maintained at an early successional stage by periodically removing trees and other woody plants via mowing, prescribed burning, and/or herbicide use. Diversity and abundance of wildlife species dependent on early-successional wetland vegetation on protected lands is likely to remain stable or perhaps decrease under this alternative as compared to Alternative A. However, species favoring habitats containing taller/denser vegetation and/or habitats with more trees and woody vegetation are likely to increase in areas not being actively managed for massasaugas. Without CCAs, land managers will not be obligated to conduct management actions in a manner deemed beneficial to massasaugas. For example, a land manager may decide to manage a property for

other game or non-game species or for recreational uses that are not compatible with massasauga conservation.

As compared to Alternative A (implementing CCAs), Alternative B (no-action/continue current efforts) is much less likely to reduce current threats to remaining core massasauga populations and less likely to increase the quality and quantity of wetland habitats on protected lands within R3 States. In fact, loss of suitable wetland habitats would likely continue under Alternative B and management actions prompted by the Service's ongoing conservation efforts (Alternative B) would probably not be sufficient to preclude the need to federally list the subspecies. So, if no new conservation efforts are initiated during the candidate stage (Alternatives B and C), then massasauga populations will remain vulnerable to threats, some populations will likely be extirpated, and the subspecies will eventually need to be federally listed. Likewise, if no new conservation efforts are initiated while the eastern massasauga is still a candidate species (i.e., status quo/Alternative B) or are delayed until after listing (e.g., SHAs/Alternative C), then recovery of the eastern massasauga will be prolonged and ultimately require a much greater commitment of human resources than if Alternative A were implemented.

4.3.3 Listed Species

Although some candidate conservation efforts are ongoing, without formal agreements, such as CCAs in place, threats to eastern massasauga populations are likely to continue. At the current level of protection, the decline of eastern massasauga populations is likely to continue to the point that protection from the ESA is required. Continued declines are anticipated as a result of non-massasauga-friendly management of public and private lands by managers and landowners who are unaware of the massasaugas life history and habitat needs. Continued implementation of Alternative B is not likely to eliminate most of the management conflict that exists in Region 3.

Because some protected properties in R3 may contain other federally listed species such as the Indiana bat (*Myotis sodalis*), bald eagle (*Haliaeetus leucocephalus*), copperbelly water snake (*Nerodia erythrogaster neglecta),* Mitchell's satyr butterfly (*Neonympha mitchellii mitchellii*), and the eastern prairie fringed orchid (*Platanthera leucophaea*), the FWS will continue to coordinate with and offer technical assistance to land managers. Ongoing conservation measures (Alternative B actions) are not likely to adversely affect any federally listed species or adversely modify any designated critical habitat.

4.3.4 Cumulative Impacts

Despite ongoing conservation efforts under Alternative B, a net loss and degradation of early successional wetlands and their adjacent upland habitats is likely to continue in R3 States. Because, the ongoing efforts under Alternative B have not effectively halted habitat loss or massasauga population declines, it does not have the greatest net positive cumulative effect among the three alternatives under consideration.

A cumulative gain in old field and scrub-shrub wetlands will likely occur at the expense of former early-successional habitats as some land managers allow vegetative succession to proceed without disturbance (natural or man-made) on some protected lands. Without CCAs or Federal protection for the massasauga (i.e., the conditions that will exist under Alternative B), cumulative losses/degradation to early successional wetlands are anticipated and abundance of massasaugas and other wetland species on protected lands in R3 States will likely continue to decline. Because the continued implementation of Alternative B is not likely to remove the threat of all incompatible management practices and regimes on remaining massasauga populations on all protected lands in R3 States the potential remains for some individuals to be inadvertently killed or even for some populations to be extirpated. These additional incremental losses could cause a substantial cumulative loss of genetic diversity within the subspecies, hamper/delay subsequent recovery efforts, and increase recovery costs. The probability that such losses will occur under Alternative B (no action) are uncertain.

4.3.5 Overall Management Discretion

Under Alternative B, R3 States and other local land-management agencies would maintain their current level of management discretion. However, because this alternative is not likely to remove existing threats to massasaugas, the subspecies would eventually become federally listed and then overall management discretion would be reduced. Some land management restrictions would be required, particularly for properties that receive Federal funds (e.g., Federal Aid funds).

4.3.6 Socio-economic Impacts

If the Service continues its current level of efforts to conserve massasaugas (i.e., Alternative B), then the associated costs will remain relatively low for the short-term. However, because the continued implementation of Alternative B is not likely to lead to a speedy recovery of massasaugas, it may over a longer period of time cost the Federal government, R3 States, and other landowners more money than implementing CCAs as proposed in Alternative A. Although, if effectively implemented, Alternative B may be less costly than delaying concerted conservation efforts until massasaugas are federally listed as proposed in Alternative C.

4.4 ALTERNATIVE C - USE REGULATORY TOOLS AND RECOVERY EFFORTS SUBSEQUENT TO LISTING THE MASSASAUGA

4.4.1 Physical Impacts

Under Alternative C, ongoing conservation measures would continue until after the massasauga is federally listed and then regulatory tools and recovery efforts would be pursued. Implementation of this alternative would result in relatively minor changes to topographic relief and hydrology. Some massasauga populations may benefit from wetland restoration on protected lands. Wetland restorations often require earthen berms to be constructed. Berms are typically built several feet above the surrounding

ground level to create shallow wetland areas and moist soil units. Once constructed/restored, wetlands should improve local hydrology by slowing surface runoff, act as biological filters to improve water quality, recharge ground water/aquifers, and ameliorate the effects of flooding.

Prescribed burning is an important tool that would be incorporated into some SHAs, HCPs, and recovery efforts. Prescribed burning is used to maintain and manage many types of fire-dependent habitat such as prairies and wet prairies used by massasaugas. Prescribed burning also is an important tool to reduce buildup of fuels that may lead to large uncontrollable wildfires. Because some SHAs, HCPs, and recovery efforts may implement the use of prescribed fire where it previously has not been used, air quality in these areas may periodically be affected by smoke under Alternative C. However, because individual burn units are typically only burned once every four to seven years, disturbance to neighboring land owners from smoke will be minimal. In addition, land managers will attempt to minimize negative impacts to the surrounding population by burning under very narrow prescriptions. Unexpected weather changes may cause some short term smoke exposure for some neighbors.

As discussed above, physical impacts from implementing Alternative C would be of a low magnitude and geographically localized. Because lands managed under SHAs and HCPs would have to adhere to seasonal burning restrictions (e.g., burning only allowed from 15 Nov. to 15 March) under Alternative C, timing of potential fire/smoke-related impacts will be more predictable and occur at a time of year when fewer people engage in outdoor activities. Conversely, if prescribed burns are conducted under Alternative B, land managers may or may not adhere to seasonal restrictions that are protective of massasaugas (i.e., uncertain timing).

4.4.2 Biological Impacts

Under Alternative C, the Service would continue standard conservation measures until after the massasauga was federally listed. Once listed, the Service would initiate recovery tasks outlined in a recovery plan , conduct section 7 consultations with other agencies having a Federal nexus, pursue SHAs, approve HCPs, and administer grant programs for the conservation and recovery of the snakes. Therefore, biological impacts during the interim period prior to listing would be the same as those described in Section 4.3.2 for Alternative B (i.e., losses of habitat and populations would continue). Biological impacts associated with SHAs and HCPs would vary.

Safe Harbor Agreements are voluntary agreements that give private businesses and land owners some regulatory assurances for allowing their land to be managed for listed species. Safe Harbor Agreements may have net beneficial effects on massasaugas and other wetland-dependent species, however, they ultimately can only ensure that baseline conditions are maintained in an area.

Incidental take permits are required when non-Federal activities will result in “take” (as defined in the ESA) of threatened and endangered species. An HCP must accompany an application for an ITP. The purpose of the HCP process is to ensure there is

adequate minimizing and mitigating of the effects of the authorized incidental take. Once completed and approved by the Service, HCPs ultimately allow incidental take to occur (e.g., some type of degradation or alteration of a listed species habitat). Although some HCPs may contain mitigation efforts that benefit a listed species, they are not intended to improve conservation status. Furthermore, because HCP development is voluntary, plans will seldom be completed unless the Service is successful in convincing land managers that incidental "take" is reasonably certain to occur.

Although section 7 consultations should result in land management practices that avoid and minimize impacts to massasaugas, action agencies could also receive authorization for incidental take of massasaugas. Therefore, section 7 consultations are limited in their capacity to function as a conservation or recovery tool for listed species.

Implementation of Alternative C would allow remaining massasauga populations to continue to decline until federally listed, but even then this alternative is not likely to reduce threats at a meaningful geographical scope. Implementing Alternative C rather than Alternative A would delay recovery of the eastern massasauga.

4.4.3 Listed Species

Under Alternative C, ongoing conservation measures would continue until after the massasauga is federally listed and then recovery tools such as SHAs would be pursued. Therefore, prior to listing, threats to eastern massasauga populations would remain and massasauga populations would continue to decline. After listing and the subsequent implementation of conservation and recovery efforts, remaining massasauga populations would ideally stabilize and some could potentially increase. However, by this time, many populations will have declined to the point of being functionally non-viable and others may have been completely extirpated. Therefore, recovery of massasaugas under Alternative C would likely require many years of intensive management.

Because some protected properties in R3 may contain other federally listed species such as the Indiana bat (*Myotis sodalis*), bald eagle (*Haliaeetus leucocephalus*), copperbelly water snake (*Nerodia erythrogaster neglecta),* Mitchell's satyr butterfly (*Neonympha mitchellii mitchellii*), and the eastern prairie fringed orchid (*Platanthera leucophaea*), the FWS will continue to coordinate with and offer technical assistance to land managers. If multiple federally listed species are present in an area, then multi-species HCPs may necessary on some properties. Some individual massasaugas and/or other listed species would be adversely affected by activities allowed under incidental take permits and HCPs. Development of SHAs, may benefit some local massasauga populations and other listed species, but are not likely to lead to recovery on a larger scale.

Once fully implemented, Alternative C may or may not slow the range-wide decline of massasaugas. Likewise, because incidental take is likely to continue (e.g., via section 10 permits) as well as some degree of illegal take (e.g., poaching), it is not clear

whether the eastern massasauga would be jeopardized by implementing this alternative.

4.4.4 Cumulative Impacts

It seems reasonable to assume that if current trends remain the same, then some substantial losses and degradation of early-successional wetlands, adjacent upland habitats, and their associated wildlife species are likely to occur in R3 States (particularly on private lands) between now and the time when massasaugas eventually are federally listed. Should the Service opt not to intervene and implement available conservation tools (e.g., CCAs) to slow or halt the ongoing threats to massasaugas and their habitats prior to listing, we would run the risk that some of the additional habitat, population, and genetic losses incurred during the interim period, might exceed population viability thresholds for some remaining populations and thereby cause future recovery efforts to be more difficult and less likely to succeed. These additional incremental losses could cause a substantial cumulative loss of genetic diversity within the subspecies, and greatly increase recovery costs. While the probability that such losses will occur under Alternative C are uncertain, it is apparent that this alternative would not have the greatest net positive cumulative effect.

During the interim period prior to listing, a cumulative gain in old field and scrub-shrub wetlands may also occur as land managers choose not to (or lack the funds or staff to) actively manage, restore, or maintain early successional habitats. Under Alternative C (once the massasauga is federally listed), the abundance of massasauga habitat (i.e., early successional wetlands) within protected lands in R3 States may or may not increase in quantity or improve in quality. This partly may depend on the attitudes and perceptions of land managers towards the Federal government and being regulated. For example, some land owners or managers may perceive having a federally listed species on their property to be a liability and opt not to actively manage their early successional wetlands for massasaugas, but instead allow the wetlands to be degraded through natural vegetative succession. In this situation, the Service may have a very difficult time convincing someone that their lack of human intervention constitutes “take” of a federally listed species (especially on Non-Federal lands) and the Service may be hesitant to prosecute someone for taking no action.

4.4.5 Overall Management Discretion

Under Alternative C, R3 States and other local land-management agencies would maintain their current level of management discretion until the massasauga is federally listed, then their management discretion likely would be reduced. We anticipate Alternative C initially would heighten the management conflict that exists in Region 3, because all activities resulting in “take” would need to cease until appropriate authorizations were obtained from the Service (e.g., section 10 permits). Some land management restrictions would be required to avoid adverse affects to massasaugas, particularly for properties that receive Federal funds. Therefore, overall management discretion would be more restrictive under Alternative C than for Alternative A or B.

4.4.6 Socio-economic Impacts

Under Alternative C, the Service would not make concerted conservation efforts until after the eastern massasauga was federally listed. In this scenario, massasauga populations are likely to decline to a lower point than if Alternative A had been implemented. Therefore, post-listing recovery efforts would ultimately cost the Federal government, R3 States, and other landowners the most money because fewer remaining snakes would require more intensive management (e.g., establishing captive breeding programs and monitoring programs) and require a much longer time period to achieve recovery goals. Once the massasauga is federally listed, implementation of some HCPS may limit economic growth in some municipalities by precluding development of large areas of public and/or private lands to protect the snakes. In addition, associated land-use restrictions may effectively reduce the potential tax bases of some areas.

4.5 SUMMARY OF ENVIRONMENTAL CONSEQUENCES BY ALTERNATIVE (TABLE)

Characteristics	Alternative A. Implement CCAs on Protected Lands throughout R3 (Proposed Action)	Alternative B. Continue Ongoing Conservation Measures (No Action)	Alternative C Use Regulatory Tools and Recovery Efforts Subsequent to Listing the Massasauga
Air Quality	Minor short-term negative effects from operating mechanized equipment and prescribed burns.	Same effects as Alternative A, but to a lesser extent.	Similar to Alternative A once recovery efforts are implemented
Topography and Soils	Minor changes in local topographic relief and minor soil compaction and ground disturbance from maintenance and management activities.	Generally the same as Alternative A, but may allow more soil compaction from repeated mowing	Similar as Alternative A for public lands and status quo on private lands
Water Quality and Quantity	Some short-term negative effects to water quality from maintenance and management activities. Long-term improvement to water quality from increased wetland development.	Similar to Alternative A, but fewer improvements to water quality are expected as fewer wetlands are likely to be restored	Similar to Alternative A, but fewer improvements to water quality are expected as fewer restorable wetlands would remain
Socio-Economic	Refuge/park visitors may be excluded from sensitive areas, some road closures may occur within parks during peak migration periods, additional temporary staffing may be needed.	No impacts anticipated	Development of some HCPs may negatively affect local economics from reduction in taxable landbase. Land-use restrictions.
Cultural and Historic	Any adverse effects on historic properties will be mitigated	Any adverse effects on historic properties will be mitigated	Any adverse effects on historic properties will be mitigated
Recreation	Some recreational activities may be restricted from sensitive massasauga areas (e.g., hibernacula) during portions of the year, Hunting opportunities for waterfowl may decrease locally.	No impacts anticipated	Some recreational activities may be restricted or prohibited from sensitive massasauga habitat after it is listed.
Biological	Management and recreational activities are adjusted to better accommodate massasaugas resulting in more stable populations and increase in numbers. Other associated wetland species likely to benefit as well, but may reduce quality of waterfowl habitat.	Some management practices that are incompatible with massasauga conservation will continue on public lands and negatively impact local populations. Some small conservation projects would likely benefit a few massasauga pops.	SHAs could retain or increase massasauga habitat quantity and/or quality. If extensive recovery efforts are successfully made then some isolated populations may recover over time.
Human Health and Safety	As local massasauga populations grow, the risk of snakebite may minimally increase for people visiting massasauga habitats. However, risk for these people should be greatly reduced/mitigated via educational outreach and signage.	Risk of snakebite is likely to decline with fewer snakes, but short-term increases are possible in areas where new developments encroach upon remaining unbuffered habitats.	Similar to Alternative B initially, but as (or if) the species recovers then same as Alternative A.

Summary of Environmental Consequences by Alternative (continued).

Characteristics	Alternative A. Implement CCAs on Protected Lands throughout R3 (Proposed Action)	Alternative B. Continue Ongoing Conservation Measures (No Action)	Alternative C Use Regulatory Tools and Recovery Efforts Subsequent to Listing the Massasauga
Cumulative Impacts	• Further losses of early-successional wetlands in R3 are slowed as managers under CCAs take steps to maintain, restore, and expand this habitat type for massasaugas. • Further degradation and fragmentation of remaining massasauga habitats in R3 are slowed and connectivity improved. • Further genetic erosion is largely prevented and genetic diversity is eventually enhanced through improved connectivity. • The Service anticipates that implementing CCAs would have the greatest net positive cumulative effect on massasaugas and the quantity and quality of their habitat	• Wetland losses continue - status quo. • Further degradation and fragmentation of remaining massasauga habitats are likely to continue and further threaten remaining massasauga populations • Additional incremental losses of genetic diversity could cause a substantial cumulative loss within the subspecies, hamper/delay subsequent recovery efforts, and greatly increase recovery costs.	• Wetland losses continue during the interim period – After listing, losses of remaining early-successional wetlands are slowed but fewer are left • Prior to Listing, further degradation and fragmentation of remaining massasauga habitats are likely to continue, but would slow as habitat restoration and connectivity efforts are initiated after Listing. • Prior to Listing, additional incremental losses of genetic diversity could cause a substantial cumulative loss within the subspecies, hamper/delay subsequent recovery efforts, and greatly increase recovery costs.
Environmental Justice	No effect	No effect	No effect
Anticipated Population Dynamics of Massasaugas in R3	Short-term: measurable increases on lands under CCAs, declines elsewhere. Long-term: many viable/stable pops. across R3 States	Short-term: negligible increases, but a steady decline is likely. Long-term: unstable until several years post-listing.	Short-term: few local increases, but probably an overall pop. decline. Long-term: gradually stabilizing, but multiple pops. extirpated.
Relative Cost to Federal Government	Short- term: moderate Long-term: low	Short- term: low Long-term: moderate	Short- term: low Long-term: high
Baseline Information collected?	Yes	No	Yes, if available
Consistency of Massasauga Management	Highly consistent across all R3 States on properties under CCAs	Largely inconsistent	Inconsistent until a recovery plan is approved and widely followed

Summary of Environmental Consequences by Alternative (continued).

Characteristics	Alternative A Implement CCAs on Protected Lands throughout R3 (Proposed Action)	Alternative B Continue Ongoing Conservation Measures (No Action)	Alternative C Use Regulatory Tools and Recovery Efforts Subsequent to Listing the Massasauga
Level of Management Discretion	Moderate	High	Low
Speed of Recovery	High potential for speedy recovery	Slow	Slow
Benefits to Massasauga	Removal of threats to survival to remaining core populations on a regional scale.	Educated land managers may alter incompatible practices to avoid/minimize impacts to massasaugas and their habitat. Educated public is more supportive of conservation	After Listing, some impacts are avoided and minimized via sec.7 consultations. Habitats may be preserved/restored for the long term with HCPs/Fed. grants. Habitat may be enhanced/created under SHAs. Greater level of protection if a Federal nexus exists.
Benefits for FWS	Jump start to recovery, reduced cost of recovery should the species be listed; more conservation options.	In the short-term, it frees limited staff and financial resources for other needs.	Typically more tools/funds available for long-term protection/acquisition of key areas and ability to improve additional habitat (SHA).
Benefits for landowners	Flexibility. CCAs with states and certificates of inclusion for private landowners facilitate the process and buffers landowners from bureaucracy. Certainty that they won't have to do anything more if the species is listed (CCAAs).	Completely voluntary and more flexibility when working with an unlisted species. Avoids bureaucracy and constraints of formal agreements. Free technical assistance available.	Private developments can proceed with an approved HCP and ITP. Gov. won't ask for more to be done (when under an HCP). Won't be penalized for doing good things for species (if under a SHA).

5.0 LIST OF PREPARERS

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6.0 CONSULTATION/COORDINATION WITH THE PUBLIC AND OTHERS

During the preparation of the R3 States collective proposal and this EA, consultation and coordination occurred between the FWS Bloomington Field Office (BFO), the FWS Regional Office (RO), and numerous state and Federal agencies. Endangered Species Act Section 7 consultation has been completed concurrently with the review of this EA. All requirements and suggestions resulting from the Section 7 consultation have been followed and addressed in the final EA.

The Regional Director, Region 3, US FWS, will provide the State Historic Preservation Officers and Tribal Historic Preservation Officers (HPOs) with this environmental assessment as part of the public review and comment, drawing their attention to the recommended procedure for implementing Section 106 of the National Historic Preservation Act as described in 36 Code of Federal Regulations Part 800.

Maintaining a good working relationship with various agencies in R3 is essential to the overall conservation program. Throughout the planning and writing process, the Service was in direct contact with many organizations. The following agencies were given and asked to comment on preliminary drafts of the grant proposal and EA:

U.S. Fish and Wildlife Service's Ecological Services Field Office in Bloomington, Indiana

Indiana Department of Natural Resources, Division of Fish and Wildlife

Ohio Department of Natural Resources, Division of Fish and Wildlife

State Contacts:

Jennifer Windus & Carolyn Caldwell, Ohio Department of Natural Resources

Ray Rustem, Lori Sargent, & Pat Lederle, Michigan Department of Natural Resources

Katie Smith, Indiana Department of Natural Resources

Glen Kruse & Joe Kath, Illinois Department of Natural Resources

Bob Hay, Wisconsin Department of Natural Resources

Peggy Horner & Jeff Briggler, Missouri Department of Conservation

Daryl Howe, Iowa Department of Natural Resources

Rich Baker, Minnesota Department of Natural Resources

Federal Contacts:

Angela Boyer, Reynoldsburg Ecological Services Field Office, Ohio

Mike DeCapita, East Lansing Ecological Services Field Office, Michigan

Scott Pruitt and Lori Pruitt, Bloomington Ecological Services Field Office, Indiana

Kristopher Lah and Michael Redmer, Chicago Ecological Services Field Office, Illinois

Cathy Carnes & Joel Trick, Green Bay Ecological Services Field Office, Wisconsin

Paul McKenzie, Columbia Ecological Services Field Office, Missouri

Gerry Bade, Rock Island Ecological Services Field Office, Illinois (no longer with FWS)

Phil Delphey, Twin Cities Ecological Services Field Office, Minnesota

Through these contacts, during the planning and writing process, the Service was able to identify the concerns of these agencies and, where possible, incorporated their concerns and suggestions into this document. In addition, this EA was made available during a 90-day formal public comment and review period. We responded to each comment received by either 1) making suggested changes and clarifications, 2) addressing previously unidentified concerns, 3) providing our rationale for not making suggested changes, or 4) we responded with some combination of these actions as documented in Chapter 7.

7.0 PUBLIC COMMENT ON DRAFT EA AND RESPONSE

No.	Issue	Commenter	Comment	Response
1	Confusion over applicability of management activities	Wisconsin DNR	Under 2.2.1- Wisconsin- Page 9 under the paragraph starting with Prescribed fires: I think these comments need to be applied region-wide.	Noted. The first paragraph following the word "Wisconsin" in the Draft EA applied to all CCAs in R3 States (not just Wisconsin). We have made appropriate formatting adjustments to clarify that "Wisconsin" is not a subheading.
2	Mention of specific timing restrictions for when prescribed burns may occur	Wisconsin DNR	"I would suggest that you remove the specific timing restriction for burning and replace it with language that requires each agency or entity entering into a CCA (under Alt A and HCP or SHA under Alt C) to develop an area-appropriate timing restriction and/or list other conditions that must be met in addition to or in place of a set of calendar dates, such as soil temperatures and ambient air temperatures on the day of the burn. …In other words, don't allow the EA to restrict management, but acknowledge in the EA that restrictions on some management will be required as part of the CCA or the HCP or SHA."	The draft EA stated "To minimize potential adverse effects to snakes on the ground surface, controlled burns would only be conducted during the period when massasaugas are inactive (generally between 15 Nov. and 15 March depending on soil temperature). Each CCA will establish site-specific burn windows that are protective of massasaugas by analyzing appropriate factors such as local/regional soil temperatures and snake activity patterns." We agree with your comment. However, after rereading our statements on this issue in the Draft EA, we do not see a need to make changes. It clearly states that burn windows will be established for each CCA on a site-specific basis. Also, please notice that we purposely used the word "generally" before the calendar dates, and have added text to reflect that conditions would naturally vary across the latitude of R3. We feel it is appropriate to give

No.	Issue	Commenter	Comment	Response
				the public some general dates/time frame of when prescribed fires would be expected to occur.
3	Necessity of pre-burn visual searches for massasaugas	Wisconsin DNR	Related to the burning issue is the EA's requirement for pre-burn surveys. We do not support this with one exception. First let me explain our objection. We know from years of working with the massasauga that predicting their emergence is quite doable using a combination of soil temperatures (at 15 cm depth) and ambient conditions. As a result, we are confident that if we are planning a burn, we are quite assured that snakes will not be out. Surveys would not yield snakes and would therefore be unnecessary. Our objection may not apply to southern IL or MO where snake emergence is so highly variable because the weather is. In those states, and possibly others lower in the region, pre-burn surveys may need to be required. I would suggest that in these instances, snakes encountered during surveys be held until after the burn to help minimize take, but do not think it is feasible to delay the burn a year because massasaugas are found. In the	The draft EA stated "To further minimize the potential for incidentally harming or killing massasaugas, pre-burn visual searches will be conducted. If any massasaugas are found during these searches, then the burns will be postponed or cancelled until the next inactive season. Alternatively, prescribed burns may be able to proceed if someone having the proper training/expertise, equipment, and required permits is available to capture and temporarily hold any massasaugas found during the pre-burn searches." On sites where conditions (such as soil temperature) under which ingress and egress from hibernacula are known, we agree that these conditions may be used in deciding when prescribed burns are appropriate. In the absence of such known conditions, we do not believe it is unreasonable, nor would it be overly burdensome for managers to have someone conduct a brief pre-burn visual search, especially on properties that have already identified where the hibernacula are located. However, we have modified the statement regarding pre-burn surveys by changing "will be conducted" to "should be conducted" for properties where annual spring emergence

No.	Issue	Commenter	Comment	Response
			lower parts of the region, it may be more appropriate to require burning on days when daytime high temps are likely too cool to have snakes active above ground. Without some latitude to burn with some level of frequency, habitats may become severely degraded and this could pose a greater threat to the snakes than a few that may be killed by burning. I am not suggesting that we get reckless with the guidance, but I do think the protocols should be site/area specific so management can be practically accomplished without jeopardizing populations.	dates or weather conditions that influence massasaugas to remain in hibernacula have not been adequately defined". We also added text suggesting that local land managers should determine such site-specific conditions when possible.
4	Exception to pre-burn surveys	Wisconsin DNR	I think we need the flexibility to conduct burning, at least in WI, outside the normal burn window (even the window we presently have in place with our IT guidance) in the event weather patterns make burning impossible during the guidance window for many years (rather likely in WI river bottoms). We would like to maintain the flexibility to conduct burn where we believe the habitat is threatened without burning. In these instances, we would require a pre-burn survey to remove as many snakes as possible in order to minimize take	We believe that the need to conduct prescribed burns outside of pre-approved, site-specific burn windows will be a rare occurrence that will have to be considered on a case-by-case basis in coordination with the appropriate FWS Field Office. Therefore, we have changed the wording on page 9 of the Final EA to better reflect our position on this topic.

No.	Issue	Commenter	Comment	Response
			prior to the burn and would require an immediate post-burn survey to document any mortality. We already have such requirements in place for some grassland listed species in WI so we have a way to assess our management practices and adapt as needed.	
5	Need of a timing restriction for timber harvesting	Wisconsin DNR	On Page 10…you also mention timber harvest as a management tool. Here is an example where I think it is appropriate to provide some timing guidance, such as: Timber harvest and mechanical brush removal is to occur only during the snakes inactive period, and preferably when the ground is frozen, in order to avoid take and minimize damage to habitats.	The draft EA stated "Cutting or harvesting of standing timber that is adjacent to higher quality massasauga habitat. This activity would only be encouraged if it were conducted in a manner that benefited massasaugas without greatly reducing biodiversity or negatively impacting other rare species." However, we agree with this comment and have added text regarding the appropriate timing of this activity during the period when massasaugas are dormant in winter.
6	How would assurances within a CCAA apply to an HCP and Incidental take permit requirements if the massasauga	Wisconsin DNR	Under 2.2.3 Alternative C Is there some language that can be added here that helps insure that the "assurances" developed under the CCAA will be directly applicable to the HCP requirement so we don't have to re-develop strategies in order to obtain an ITP? I know none	Applicants who are partied to a signed CCAA also apply for an enhancement of survival permit at the time the agreement is approved. This permit becomes valid if and when the massasauga is listed pursuant to the ESA. If a person, who is party to a signed CCAA, intends to engage in activity that will result in take of massasauga, no additional permits or

No.	Issue	Commenter	Comment	Response
	becomes Federally listed?		of us is interested in going through this process more than once and would like to see some way to assure we can simply fold the CCAA language into an HCP if/when necessary.	authorization would be needed provided that the take will be: (1) incidental to an other wise lawful activity, and (2) in accordance with the terms of the CCAA.
7	Minor clarifications	Wisconsin DNR	Under 4.0- Envir Consequences, 2nd paragraph, line 4, change grasses to vegetation, line 5 - change the language about drawdown to read ..."can cause mortality-eliminate the affirmative and the word "high"- we do not have data to state it as currently written. Add a sentence where appropriate that states something like, "The restoration of open-canopy habitat within lowland hardwood forests may create management conflicts with some forest interior birds or birds, such as red-shouldered hawks, but it is unlikely that the scale of restoration is likely to adversely affect their populations.	We made these suggested changes.
8	Clarification of terms: CCAA and CCA	Wisconsin DNR	One last question. I have seen no reference to the term CCAA in this document. What happened to the term "Assurances", and does this document cover CCAAs or not? I think all of us have been under the	The term CCAA is defined on page 2 where it first appears in the document. There is also a footnote at the bottom of page 2, which states “Unless otherwise noted, the terms CCA and CCAA are often used synonymously throughout this EA.” We added another sentence here to

No.	Issue	Commenter	Comment	Response
			impression that we are working on CCAAs. Has something changed?	further clarify the difference between a CCA and a CCAA. So, nothing has changed – assurances are still being offered.
9	Sect. 106 NHPA consultation and compliance protocols are already established for FWS actions in Iowa	IOWA State Historic Preservation Office (SHPO)	Consultation and compliance protocols for many of the resource conservation and management actions proposed under the 3 alternatives have already been established in the May 2002 programmatic agreement (PA) between the Iowa SHPO and the FWS. Therefore, we urge FWS to simply adopt these when preparing the CCA for the Sweet March Project in Bremer County, Iowa and any future CCAs in Iowa rather than applying those outlined in 4.1.2 of the draft EA.	Noted. We were not aware of the PA in Iowa while preparing the Draft EA (in IN), so the Final EA now states that procedures outlined in any pre-existing PAs with SHPOs should be followed where applicable.
10	Wording of Chapter 4.1.2 in the Draft EA regarding who is responsible for making Sec. 106 NHPA determinations	IOWA State Historic Preservation Office (SHPO	"The SHPO serves as a consulting party and technical advisory to the Federal agency and cannot assume legal roles and responsibility of the Federal agency. With this in mind, we recommend the following revision: Notify the appropriate HPOs that the partner/grantee/permittee is authorized to initiate consultation with the HPO on behalf of the FWS for the specific project (undertaking) for the purpose of identifying cultural	Noted. We made your recommended change to the wording in 4.1.2 in the Final EA..

No.	Issue	Commenter	Comment	Response
			resources in the area of potential effects. In consultation with the HPO, the partner/grantee/permittee is authorized to render determinations of no historic properties or no effect on historic properties on behalf of the FWS. Upon the successful conclusion of consultation in these cases, the partner/grantee/permittee shall obtain written concurrence to their determination from the SHPO."	
11	Letter in support of the Service's proposed action	Leah Berkman Rocky Mountain Center for Conservation Genetics and Systematics, University of Denver	I'm writing to show my support for the proposed action in the case of the Draft EA to implement conservation measures for the eastern massasauga… In summary, I support any and all efforts to initiate conservation measures for the eastern massasauga. I'd also like to stress the importance of travel corridors between areas of suitable habitat. In my experience, these corridors are not only a way to sustain gene flow between populations but are in fact a desirable component of the landscape for the eastern massasauga."	Thank you for your support.

Carlyle Lake Comment and Response

The following five pages present an original comment received from a biologist regarding the massasauga population at Carlyle Lake, Illinois which is managed by the US Army Corps of Engineers (Corps). The comment is presented in its entirety along with a response from the Service and a response from the Corps. As described in the Service response, the initial comment resulted in a meeting among the Corps, Service, and the Illinois DNR.

"Donald.B.Shepard-1" <dshepard@ou.edu>
11/04/2003 12:12 PM

To: fw3_massasauga@fws.gov
cc:
Subject: massasauga comment

To Whom It May Concern:
I am responding to make a comment on the draft Environmental Assessment for Implementing Candidate Conservation Agreements for Eastern Massasauga in Mid-Western States. I am a PhD student at the University of Oklahoma in Herpetology and have extensive knowledge and experience with the amphibians and reptiles of the central and mid-western United States. My particular areas of expertise are the biology of frogs and snakes. From August 2000 through August 2002, I worked on a project studying the ecology and life history of the eastern massasauga at Carlyle Lake, Illinois. During my two years on this project, I made thousands of observations of massasaugas in their natural environment either through searching or radio-telemetry. I became intimately familiar with the biology of the species through first-hand experience. I have read all the literature pertaining to the massasauga and I have written manuscripts and published papers on aspects of its biology. I am also aware
of the many problems this species faces that must be addressed if it is to be conserved.
Of the three alternatives listed in the draft, I support Alternative A (the preferred alternative). This is the best alternative because it takes preemptive action to help the species while more data are collected to make a listing decision. My concern with these conservation agreements is that there is no measures or enforcement to make sure they are adhered to. In the two years I worked at Carlyle Lake, the biggest culprit in doing things detrimental to the massasauga population was the US Army Corps of Engineers on the public land that they manage around the lake. Many of their management practices are incompatible with the needs of the snake. We offered many suggestions to modify their practices to reduce mortality, but they were seldom adhered to. They have built campgrounds over hibernacula, mowed over snakes in areas they were not supposed to mow, plowed habitat and converted it to row crops for dove hunting, and many other things. They have a management plan,
but consistenly do things that are against their own management plan. There is no way to enforce this plan. My concern is that these Conservation Agreements are only a fascade through which it looks like attempts are being make to conserve the species, but in reality no changes are being made and the agreement stipulations are not being adhered to. We need a system to enforce the stipulations in the agreement for them to really work. Regardless, Alternative A offers the best chance to conserve this species during the listing process and I therefore support it.

Sincerely,
Don Shepard
Department of Zoology and
Sam Noble Oklahoma Museum of Natural History
University of Oklahoma
Norman OK 73019

Service Response to Carlyle Lake Issue:

Our preferred alternative is to seek CCAs on protected properties. The Carlyle Lake population is one of these protected properties. This population, as we have discovered only recently, is one of—based on numbers alone--the healthiest populations known for the species. As such, it our aim to work with Illinois DNR and Corps to determine whether a CCA is feasible at Carlyle Lake.

As a result of this comment, on March 4, 2004, representatives from the Service, Illinois DNR, and the Army Corps of Engineers (Corps) met in St. Louis to discuss past, current, and future management of the massasauga at Carlyle Lake. From our discussions thus far, both Illinois DNR and the Corps are committed to seeking a CCA at the site if eastern massasauga management is compatible with the mandated authorities for Carlyle Lake.

If a CCA is developed, the goal will be to ensure the long-term survival of massasauga at Carlyle Lake. The CCA will identify the specific conservation measures that all three agencies commit to and the implementing schedule for these commitments. In determining whether this CCA contributes to conservation of the species and is—taken together with all other conservation efforts on the landscape—sufficient to avoid listing, we will consider (1) the certainty of the conservation efforts at Carlyle Lake being implemented, and (2) the certainty of the conservation effort being effective.

In evaluating "the certainty of the conservation efforts being implemented" speaks directly to the concern expressed by the commenter. Although there are no regulatory conditions that require IL DNR or the Corps to implement a CCA, we believe (1) based on our discussions to date, both agencies are committed to this effort, and (2) the implementation-specific language in the CCA will gives us the greatest assurance possible that the agreed upon measures will be implemented. Specifically, in determining whether the CCA effort contributes to making listing unnecessary, we will look to see that the CCAs include identifying: (a) the parties that will implement the CCA, the staffing and the other resources needed to implement the CCA, and the funding level needed and funding source; (b) the authorizations necessary to implement the CCA and some certainty that the parties will obtain these authorizations; and (c) the implementation schedule.

Thus, in determining whether eastern massasauga warrants listing as a Federal endangered or threatened species, the Service will evaluate whether the conservation efforts in place are sufficient to ensure the long-term survival of the snake and are likely to be implemented and effective. That is, the Service will not simply avoid listing eastern massasauga because we have paper agreements with land managers; rather we will look to have a level of certainty these agreements will be implemented and will be effective in providing for the continued viability of the species.

Carlyle Lake is a critical area for implementation of a CCA for two reasons. First, it is important because the area currently supports a healthy population of massasaugas. Secondly, of the many locations that contain massasauga populations, the Carlyle Lake area, as a growing tourist and recreational area, may receive one of the greatest social and economic impacts if the

species is ultimately listed. For that reason it is important for the three agencies to work cooperatively in conjunction with local residents and groups to ensure that everything possible is being done to sustain this population.

Status: Subsequent to the March, 2004 meeting described above, the Corps sent the attached letter in response to the comment. In that response letter, the Corps requested an example Candidate Conservation Agreement. The Service has provided such an example, but no further progress has been made.

DEPARTMENT OF THE ARMY
ST. LOUIS DISTRICT, CORPS OF ENGINEERS
1222 SPRUCE STREET
ST. LOUIS, MISSOURI 63103-2833

REPLY TO ATTENTION OF:

30 MAR 2004

Construction-Operation
Readiness Division

Mr. T. J. Miller
U.S. Fish and Wildlife Service
1 Federal Drive, Federal Bldg.
Fort Snelling, MN 55111

Dear Mr. Miller:

Thank you for the opportunity to meet with you and your colleagues on March 3, 2004, to discuss the issues concerning the eastern massasauga rattlesnake (EMR) at Carlyle Lake, Illinois. We can agree that both of our respective agencies have a mutual interest in protecting this species and its habitat. In response to the letter dated November 4, 2003, from Mr. Donald Shepard, I offer the following information so you may better respond to his comments.

- The Corps has decreased and modified its mowing to better protect the snake.
- Prescribed burns are completed prior to the EMR's spring emergence.
- Mowing contractors and in-house labor are instructed in EMR identification, the importance of not harming the snake, and in reporting all inadvertent deaths.
- Succession control in known habitat areas is done between October 16 and May 15.
- The Corps is systematically burning and searching areas that are suspected hibernation sites.
- Vegetation manipulation in areas known to contain EMR is being done to increase the desired habitat.
- The Corps has provided equipment and labor to assist the IDNR in the completion of the telemetry study that was conducted at Carlyle Lake.
- The Corps has designed a public relations program concerning the EMR that includes road signs, brochures, a visitor center display, interpretation programs, school education, dialog with watershed partners, and state and federal employee education.

Each of the items listed above are in accordance with our Management Plan for the EMR that was written in cooperation with the IDNR and the USFWS. We will continue to modify our management practices as additional information on the EMR becomes available. The Corps of Engineers remains committed to its EMR Management Plan and the protection of the species.

My staff has reviewed the Draft Candidate Conservation Agreement with Assurances (CCAA) for the EMR in Missouri but because Carlyle Lake is federally owned, we cannot enter into a CCA with Assurances. Please send us an example of a Candidate Conservation Agreement without assurances for review and consideration. Any Candidate Conservation Agreement for the EMR that is being considered for implementation on the federally owned lands of Carlyle Lake must be consistent with the lake's authorized purposes.

I look forward to continuing our cooperation with the IDNR and the local Ecological Resources Office of the USFWS. If we can be of any further assistance, please contact Mr. Lynn Neher at (314)-331-8880 or at Lynn.N.Neher@mvs02.usace.army.mil.

Sincerely,

Peggy A. O'Bryan
Chief, Construction-Operations
Readiness Division

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