

F. Conservation Zones, Assessments, and Strategies within the Delaware Bay Landscape

1. Cohansey River

- a. Habitats*
- b. Wildlife of Greatest Conservation Need*
- c. Threats to Wildlife and Habitats*
- d. Conservation Goals*
- e. Conservation Actions*
- f. Potential Partnerships to Deliver Conservation*
- g. Monitoring success*

a. Habitats

This Conservation Zone in western Cumberland County encompasses the Cohansey River and its associated marshes and grasslands (Figure 12). The rich farmlands along the river system are an extension of predominant habitats of Salem County. Not all habitats classified as grassland are suitable for grassland birds, as agricultural uses often create unsuitable conditions for early-succession wildlife. The region has some stands of wild rice marshes, tidal marshes, freshwater wetlands, and upland pine-oak forest.

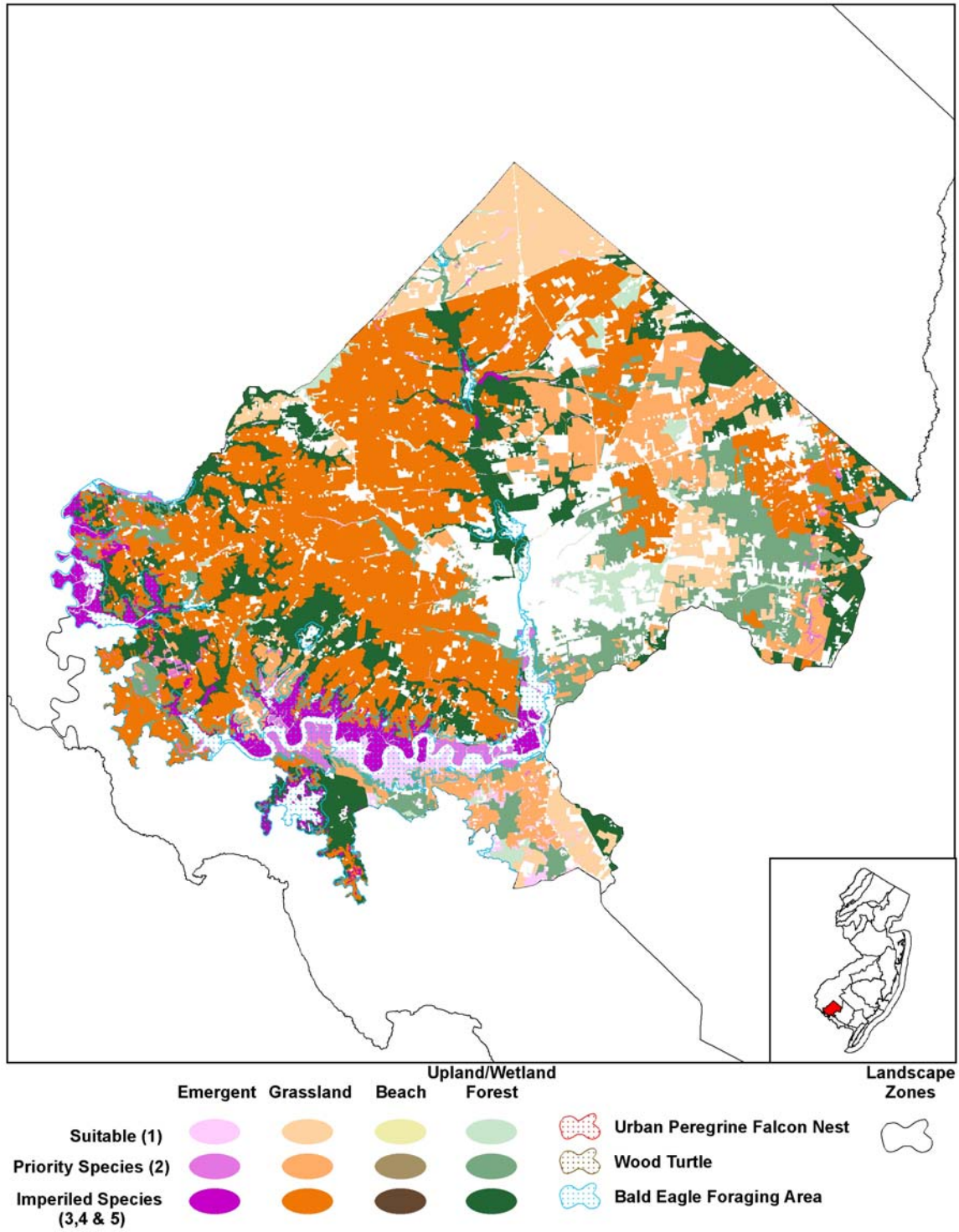
This zone has the least amount of public land in the Delaware Bay region, with approximately less than 405 hectares (1.5 sq. mi.). However, there are significant opportunities for preserving farmland and maintaining vast areas of tidal marsh.

b. Wildlife of Greatest Conservation Need

The Cohansey River region supports six state endangered, seven state threatened, and 48 special concern and regional priority wildlife species. Bald eagle, northern harriers, red-shouldered hawks, vesper sparrows, Cope's gray treefrogs, and bronze coppers are among the state endangered wildlife. State threatened species include barred owls, bobolinks, Cooper's hawks, grasshopper sparrows, ospreys, red-headed woodpeckers, and savannah sparrows. Special concern wildlife includes grassland birds, scrub-shrub birds, forest passerines, reptiles and amphibians. In addition, summer populations of forest-dwelling bat species, potentially including the federal endangered Indiana bat, are suspected to occur in the Cohansey River zone.

The Cohansey River area is notable for supporting one of the densest bald eagle populations in the state for both nesting and wintering eagles. As part of the Atlantic Flyway, the habitats along the river are also important to the migration of songbirds, water birds, and raptors. Hardwood swamps and the mosaic of forest and agricultural land are habitat for bald eagles, migrating raptors and passerines, Cooper's and broad-winged hawks, and eastern box turtle. The grasslands are particularly valuable habitat for nesting grassland birds, supporting six listed grassland bird species. Marshes, tidal wetlands, and other wetlands are habitat for rails, northern harriers, bronze coppers, and rare damselflies and dragonflies. Tables DB9 - DB14 identify the species of greatest conservation need within this zone.

Figure 12. Critical landscape habitats within the Cohansey River conservation zone, as identified through the Landscape Map (v2).



Wildlife Species and Associated Habitats of Cohansey River

Table DB9. Federal Endangered Species*

Common Name	Water	Wetlands	Grasslands	Forests and Forested Wetlands
Reptiles				
Bog turtle		X		X

*All Federal Endangered and Threatened species have an Endangered status on the NJ List of Endangered Wildlife

X: Species occurs within the identified habitat.

Table DB10. State Endangered Species

Common Name	Water	Wetlands	Grasslands	Forests and Forested Wetlands
Birds				
American bittern		X		
Bald eagle		X	X	X
Loggerhead shrike			R	
Northern harrier		X	X	
Red-shouldered hawk				X
Vesper sparrow			X	
Amphibians				
Cope's gray treefrog				X
Insects				
Bronze copper		X		

R: Proposed reintroduction of species.

X: Species occurs within the identified habitat.

Table DB11. State Threatened Species

Common Name	Water	Wetlands	Grasslands	Forests and Forested Wetlands
Birds				
Barred owl				X
Bobolink			X	
Cooper's hawk				X
Grasshopper sparrow			X	
Osprey		X		
Red-headed woodpecker				X
Savannah sparrow			X	

X: Species occurs within the identified habitat.

Table DB12. Nongame Species of Conservation Concern

Common Name	Water	Wetlands	Grasslands	Forests and Forested Wetlands
Mammals				
Eastern red bat				X*
Eastern small-footed myotis				X*
Hoary bat				X*
Silver-haired bat				X*
Birds				
Acadian flycatcher				X
American kestrel			X	
Baltimore oriole				X
Black-and-white warbler				X
Black-billed cuckoo				X
Blue-winged warbler				X
Broad-winged hawk				X
Brown thrasher				X
Chimney swift			X	X
Chuck-will's-widow				X
Common barn owl			X	
Dickcissel			X	
Eastern kingbird			X	X

NJ Wildlife Action Plan: 01/23/08

Nongame Species of Conservation Concern (continued)

Common Name	Water	Wetlands	Grasslands	Forests and Forested Wetlands
Birds (continued)				
Eastern meadowlark			X	
Eastern screech-owl				X
Eastern towhee				X
Eastern wood-pewee				X
Field sparrow			X	
Gray catbird				X
Great blue heron		X		
Great-crested flycatcher				X
Great egret		X		
Horned lark			R	
Indigo bunting			X	X
Kentucky warbler				X
Least bittern		X		
Louisiana waterthrush				X
Marsh wren		X		
Northern flicker				X
Pine warbler				X
Prothonotary warbler				X
Scarlet tanager				X
Seaside sparrow				
Whip-poor-will				X
Wood thrush				X
Yellow-billed cuckoo				X
Yellow-breasted chat				X
Yellow-throated vireo				X
Yellow-throated warbler				X
Reptiles				
Eastern box turtle				X
Eastern king snake				X
Spotted turtle		X		
Amphibians				
Carpenter frog		X		X
Fowler's toad		X		
Marbled salamander		X		X
Insects				
Hessel's hairstreak		X		X
A noctuid moth, <i>Meropleon titan</i>		X		
Pink streak, <i>Faronta rubripennis</i>				X
Rare skipper, <i>Problema bulenta</i>				X

*Potential presence.

R: Proposed reintroduction of species.

X: Species occurs within the identified habitat.

Table DB13. Game Species of Regional Priority

Common Name	Water	Wetlands	Grasslands	Forests and Forested Wetlands
Birds				
American black duck	X	X		
American woodcock				X
Bufflehead	X	X		
Canada Goose (Atlantic population)	X	X		
Clapper rail		X		
Northern bobwhite quail			X	X
Northern pintail	X	X		
Virginia rail		X		
Wood duck				

X: Species occurs within the identified habitat.

Table DB14. Game Species

Note: Species identified within the table have seasonal harvests within New Jersey and currently are not identified as regional priority species, but they are considered by NJDFW to be species of concern.

Common Name	Water	Wetlands	Grasslands	Forests and Forested Wetlands
Mammals				
River otter	X	X		
Birds				
Ruffed grouse				X
Sora rail		X		

X: Species occurs within the identified habitat.

c. Threats to the Wildlife and Habitats of the Cohansey River

For complete literature review on the impacts of habitat loss and fragmentation, please see New Jersey’s Landscape Project Report, Attachment A or visit our website:

www.njfishandwildlife.com/ensp/landscape/lp_report.pdf

The Cohansey zone of the Delaware Bay landscape region remains a relatively rural area dominated by agriculture. However, critical wildlife habitat is threatened in a number of ways: fragmentation and loss of grasslands due to development expansion from Bridgeton; intensive agriculture methods that don’t allow grassland birds to nest successfully; and conversion of grasslands and annual agriculture fields to nursery stock sites. The Cohansey River and its associated wetlands and forest patches are critical to the regional and statewide bald eagle nesting and wintering population, and are threatened by development associated with a growing human population, as well as potential heavy uses of the river for recreation and transportation. Furthermore, this zone contains very little publicly-owned land, so long-term protection will be a challenge. Landowner incentives and easements will be important conservation tools here. Also see Section I-E “Threats to Wildlife and Habitats” (page 17) of this document.

d. Conservation Goals

- Identify, protect, enhance and/or restore endangered, threatened and special concern wildlife and fish populations and their habitats through full implementation of Landscape Project.
- Protect, enhance, and restore critical habitats as identified by the Landscape Project, focusing on habitat for grassland bird and scrub-shrub bird communities including grasslands (areas with >75 % herbaceous and <25% woody vegetation) and early-successional habitats with a mix of grassland (areas with >75 % herbaceous and <25% woody vegetation) and scrub-shrub habitats (areas with >25% woody vegetation <20 feet in height).
- Protect, enhance, and restore critical habitats as identified by the Landscape Project, focusing on woodland and open habitats near waterways for species such as the bald eagle and osprey.
- Protect and enhance the tidal wetlands and open waters.
- Protect and enhance water quality and the availability of wetlands to preserve aquatic ecosystems, particularly for species of conservation concern that rely on high water quality.

- Inventory and monitor all endangered, threatened and special concern wildlife in this zone.
- Prevent, stabilize, and reverse declines of grassland bird and scrub-shrub bird species, bald eagles, and rare invertebrate wildlife such as damselflies and dragonflies in the core grassland and agricultural areas of this zone.
- Maintain and enhance populations of nesting, wintering, and summering bald eagles.
- Monitor, maintain, and enhance populations of breeding, migratory, and wintering waterfowl of conservation concern.
- Maintain ecological integrity of natural communities and regional biodiversity by controlling invasive species and overabundant wildlife.
- Protect and enhance important and unique natural communities.
- Assess large-scale habitat change (every five to 10 years).
- Promote public education and awareness, wildlife conservation, and viewing opportunities.

e. Conservation Actions

The actions below are identified as primary (1° or priority) and secondary (2°). Prioritization was determined by the Delaware Bay Regional Landscape stakeholders during a meeting held on September 12, 2007 (see *Attachment J*). These actions, with a focus on the priority actions, should be incorporated in planning and project development in conjunction with the priority state-level objectives (goals) and strategies (actions).

Priority	Conservation Actions
Protect wildlife habitat through implementation of Landscape Project mapping	
1°	Revise existing Landscape Project species occurrence areas through research and, where lacking, develop new species occurrence areas as data on species habitat requirements become available. Develop, review, and improve species-habitat associations as new land use/land cover data become available. (<i>Protect habitat – Landscape Project</i>)
2°	Use GIS, other remote sensing tools, and surveys to identify and map significant natural vegetative communities that may host wildlife species of conservation need, particularly on public lands and lands that serve as wildlife corridors. (<i>Conserve wildlife – rare wildlife</i>)
Protect critical grassland and early-succession habitats	
1°	Use GIS, other remote sensing tools, and surveys to identify critical grassland habitats and assess their condition for nesting birds, maintain information, and incorporate all new survey and mapping data into the Landscape Project and Biotics database. Identify protection strategies (e.g., landowner incentives, farmland preservation, and acquisition) to maintain large core areas of grassland in perpetuity. Identify proximate habitats that can be managed to enhance the total size of suitable grassland habitat, with the goal of managing grassland/early succession areas totaling 2,000-3,000 ha (7.7–11.5 square miles). (<i>Protect habitat – Landscape Project</i>)

Priority	Conservation Actions (continued)
2°	<p>Increase the effective size and connectivity of grasslands on permanently protected public lands and surrounding private lands through incentive programs and targeted land acquisition. Use GIS measures, other remote sensing tools, and surveys to identify important corridors that connect large, contiguous tracts of grasslands and target these areas for acquisition to maintain a system of large, connected tracts of grasslands within and between conservation zones. Where possible, enhance and restore grassland habitat through revegetation and management practices such as prescribed burns and appropriate mowing strategies, brush-hogging, and other appropriate methods with little or no impact to forested and wetland dependent species of greatest conservation need. Work with the NJ DEP, Green Acres Program and the Dept. of Agriculture to identify parcels for acquisition or purchase of development rights. Acquire habitat through direct purchase or easements and enlist private lands in preservation and management programs that offer long-term stability of a matrix of grassland schemes. Target 2,000 hectare (7.7 sq. mi.) regions. <i>(Enhance habitat – private lands; Corridors – sprawl, migratory birds; Protect habitat – Landscape Project; Agriculture – land management)</i></p>
2°	<p>Develop, implement, and evaluate best management practices (BMPs) and guidelines to enhance habitats for resident and migratory grassland bird and scrub-shrub bird communities on public and private lands. <i>(Other practices – land management)</i></p>
2°	<p>Protect habitats through innovative public and private partnerships. Promote existing landowner incentives for protecting and managing wildlife habitat and develop landowner cooperative agreements to protect significant populations of grassland and scrub-shrub birds. <i>(Protect habitat – migratory birds, Landscape Project; Conserve wildlife – rare wildlife; Enhance habitat – private lands)</i></p>
Protect critical woodland habitats and waterways	
1°	<p>Develop, implement, and evaluate best management practices (BMPs) and guidelines to maintain, enhance, and/or restore bald eagle and forest-interior passerine and raptor habitat on public and private lands. <i>(Conserve wildlife – rare wildlife)</i></p>
1°	<p>Identify and protect habitat for fish by plotting distributions of special concern fish species, and integrate those data into the Biotics database. <i>(Protect habitat – Landscape Project, fish)</i></p>
2°	<p>Use GIS, other remote sensing tools, and surveys to identify critical habitats supporting local bald eagle nesting, summering and wintering populations and assess their condition. Take action to minimize habitat loss and maintain contiguous habitats by restoring, enhancing, and/or protecting woodland and riverine habitats and waterways on public and private lands through direct purchase or easements. Enlist private lands in preservation programs that will maintain forest free of human disturbance during key periods. <i>(Conserve wildlife – rare wildlife; Enhance habitat – private lands; Protect habitat – Landscape Project)</i></p>

Priority	Conservation Actions (continued)
2°	Maintain and manage forest patches adjacent to marshes and grasslands for bald eagle and raptor suitability. Maintain and enhance floodplain forests for forest passerines and raptors. Set and implement guidelines for human disturbance on critical lands and allow forests and forest patches to mature to old growth to maximize suitability. <i>(Conserve wildlife – rare wildlife; Silviculture – land management)</i>
2°	Protect habitats through innovative public and private partnerships. Promote existing landowner incentives for protecting and managing wildlife habitat and develop landowner cooperative agreements to protect significant populations of bald eagles populations. <i>(Protect habitat – migratory birds, Landscape Project; Conserve wildlife – rare wildlife; Enhance habitat – private lands)</i>
Protect and enhance tidal wetlands and open water habitats.	
1°	Identify and protect critical areas of submerged aquatic vegetation to benefit waterfowl, finfish, and shellfish species through surveys, GIS measures and other remote sensing tools, expert opinion, and historical records. Reestablish/restore historically important submerged aquatic vegetation beds in Delaware Bay tributaries to benefit waterfowl and waterbirds. <i>(Conserve wildlife – game species)</i>
2°	Investigate and improve current marsh management techniques to benefit critical wildlife species, in particular high marsh nesting birds and waterfowl, and include in marsh BMPs and species dependent on mudflats and impoundments. <i>(Conserve wildlife – rare wildlife, game species)</i>
Protect water quality and maintain adequate buffers	
1°	Maintain optimal biological buffers (beyond regulatory requirements) around wetlands, riparian, and floodplain areas and minimize destruction per the NJ DEP Wetland Buffer Guidelines for Species of Conservation Concern in New Jersey (in prep). Stabilize wetland buffers and streambanks by encouraging plantings of native vegetation through public education, volunteer programs, and land managers to stabilize wetland buffers and stream banks and prevent erosion. <i>(Protect habitat – Landscape Project, sprawl, rare wildlife, fish; Enhance habitat – private lands)</i>
1°	Protect water quality and aquatic-dependent species by appropriately designating Category One waters. <i>(Protect habitat – rare wildlife, fish)</i>
1°	Seek appropriate classifications for stream segments based on IBI results that do not fulfill Category One requirements. <i>(Protect habitat – rare wildlife, fish)</i>
1°	Prevent chemical contamination, siltation, eutrophication, and other forms of pollution/contamination to wetlands used by wildlife especially as breeding sites that could directly harm breeding species or their food supply (including birds, amphibians, and invertebrates). Evaluate protection efforts through regular monitoring of water quality. <i>(Conserve wildlife – contaminants)</i>

Priority	Conservation Actions (continued)
Inventory, determine distribution, and monitor rare fish and wildlife	
1°	Use the Biotics database and Landscape Project to identify where species location data and monitoring gaps exist. Design and implement coordinated presence/absence surveys and monitoring to acquire data in those areas.
1°	Survey suitable habitats to determine distribution and trends of grassland birds on a regular basis. Survey and monitor grassland bird nesting every four years, with more frequent surveys in actively managed grasslands. . (<i>Conserve wildlife – rare wildlife, Monitor wildlife – long-term monitoring</i>)
1°	Survey and monitor bald eagle nesting and production annually. (<i>Protect habitat - Landscape Project; Conserve wildlife – rare wildlife; Monitor wildlife – long-term monitoring</i>)
1°	Survey and monitor osprey nesting and production every three years. (<i>Protect habitat - Landscape Project; Conserve wildlife – rare wildlife; Monitor wildlife – long-term monitoring</i>)
1°	Survey and monitor woodland raptors’ distribution every four years. (<i>Protect habitat - Landscape Project; Conserve wildlife – rare wildlife; Monitor wildlife – long-term monitoring</i>)
1°	Identify and research water quality parameters for bald eagle, osprey, spotted turtle, and special concern amphibian populations. (<i>Conserve wildlife – rare wildlife; Protect aquatic wildlife - humans, development</i>)
2°	Develop and conduct nighttime surveys to inventory nightjars (whip-poor-wills, chuck-will’s-widows, common nighthawks), northern saw-whet owls, and eastern screech-owls. (<i>Conserve wildlife – rare wildlife; Monitor wildlife – long-term monitoring</i>)
2°	Continue ground surveys of all known great blue heron rookeries every 3-5 years. Improve census methods to capture population and reproductive success metrics at a finer scale. (<i>Monitor wildlife – long-term monitoring; Conserve wildlife – rare wildlife</i>)
2°	Establish a formal ground survey for inland colonies of colonial waterbirds, with a particular emphasis on black and yellow-crowned night herons. Once the survey is instituted, continue on a rotation of once every other year. (<i>Monitor wildlife – long-term monitoring; Conserve wildlife – rare wildlife</i>)
Prevent and reverse declines of grassland birds, bald eagles, osprey, and other fish and wildlife species of conservation concern	
1°	ENSP biologists will be responsible for notifying the NJ Division of Fish and Wildlife’s Bureau of Law Enforcement and the Division of Parks and Forestry Bureau of Law Enforcement and managers, where and when appropriate, of critical sites (nesting, basking, gestation, dens) to implement stringent enforcement of endangered species laws, including protection of wildlife from illegal collection (northern pine snakes, corn snakes, timber rattlesnakes) and human disturbance (off-road vehicles). (<i>Protect wildlife – humans, recreational vehicles</i>)

Priority	Conservation Actions (continued)
1°	Research the intensity and characteristics of threats to wildlife species of conservation concern and their habitats, including causes and effects of habitat loss, degradation, and alteration, edge, disturbance, impacts of roads, predation, competition by invasive plants and animals, disease, contaminants, food availability, hybridization, and how water quality degradation and contaminants affect rare species. <i>(Protect habitat – sprawl, recreational vehicles, humans; Conserve wildlife – contaminants, invasives, rare wildlife, subsidized predator; Evaluate restoration – roads)</i>
1°	Develop and implement proactive habitat conservation goals that will meet and maintain the recovery needs of all endangered and threatened wildlife and fish populations, particularly for grassland and scrub-shrub species and bald eagles within this zone. <i>(Conserve wildlife – rare wildlife; Protect habitat – Landscape Project)</i>
1°	Develop a fish Index of Biotic Integrity (IBI) to better assess the presence and distribution of fish species within the area’s streams. <i>(Protect habitat – fish)</i>
1°	Research the habitat requirements for grassland birds. Develop guidance on prescribed burning and other management techniques that benefit (and reduce negative impacts to) grassland species. Some techniques include delayed mowing, alternate patch mowing, timing restrictions for management, and cooperative agreements with utility companies for maintenance of rights-of-way. <i>(Conserve wildlife – rare wildlife; Protect habitat – Landscape Project)</i>
2°	Recruit and provide training for local law enforcement personnel that are willing to assist in the enforcement of endangered species laws. Develop a partnership between local law enforcement, USFWS Special Agents, the NJ Division of Fish and Wildlife’s Bureau of Law Enforcement, and the Division of Parks and Forestry Bureau of Law Enforcement to enforce protection of native wildlife from illegal collection (northern pine snakes), and human disturbance (off-road vehicles). <i>(Protect wildlife – humans, recreational vehicles)</i>
2°	Work with public and private landowners and managers with significant grassland bird and scrub-shrub/open field bird populations, bald eagle, cavity-nester, freshwater wetland bird, and raptor populations to enhance targeted wildlife habitat through the implementation of best management practices and incentive programs. <i>(Enhance habitat – private lands; Protect habitat – rare wildlife; Conserve wildlife – rare wildlife; Agriculture – land management; Silviculture – land management)</i>
Maintain and enhance bald eagle populations	
1°	Provide the NJ Division of Fish and Wildlife’s Bureau of Law Enforcement with a map of critical sites to implement stringent enforcement of endangered species laws including harassment and human disturbance; update map as additional data become available. <i>(Protect habitat – humans)</i>
1°	Develop and implement proactive habitat conservation plans that will help meet and maintain the recovery goals for bald eagles. <i>(Conserve wildlife – rare wildlife; Protect habitat – Landscape Project)</i>

Priority	Conservation Actions (continued)
2°	Actively protect, monitor, and manage bald eagle nests and foraging areas, including posting signs in waterways to prevent disturbance by recreational activity, delineating and posting nests and significant roosting areas, building cooperation with private landowners, and working closely with law enforcement and volunteers to minimize disturbance at nest sites. <i>(Conserve wildlife – rare wildlife; Protect habitat – recreational vehicles, humans)</i>
2°	Continue to monitor nest occupancy and reproductive success of bald eagles, and identify and monitor concentration and roosting areas to understand their role in population maintenance. <i>(Conserve wildlife – rare wildlife; Protect habitat – recreational vehicles, humans)</i>
Monitor, maintain and enhance populations of breeding, migratory and wintering waterfowl of conservation concern	
1°	Use GIS, other remote sensing tools, and surveys to identify critical aquatic and wetland habitats and assess their condition for migratory and wintering waterfowl, finfish, and shellfish populations of conservation concern. Take action to minimize habitat loss by restoring, enhancing, and/or protecting habitat on public and private lands through protection strategies (e.g., acquisition, landowner incentives) and to maintain/ enhance existing waterfowl habitat where such management complements rare species management. <i>(Conserve wildlife – game species)</i>
2°	Conduct the annual Mid-Winter Waterfowl Survey to monitor population trends. <i>(Conserve wildlife – game species; Monitor wildlife – long-term monitoring)</i>
2°	Conduct the Atlantic Flyway Breeding Waterfowl Survey annually to monitor population trends. <i>(Conserve wildlife – game species; Monitor wildlife – long-term monitoring)</i>
2°	Determine carrying capacity of area marshes for wintering American black ducks to inform decisions in setting Atlantic Flyway population objectives and to guide management actions. <i>(Conserve wildlife – game species)</i>
Maintain natural biodiversity, community integrity and structure and ecosystem function by controlling invasive and overabundant species	
1°	Identify areas where invasive, non-indigenous plants and animals are either already established or are becoming established through GIS, other remote sensing tools, surveys, public participation, and creating a system for reporting and qualifying new locations of invasive species. Prioritize areas in need of control projects according to the potential level of impact on the ecosystem and species of conservation concern and the likelihood of success. <i>(Conserve wildlife – invasives; Evaluate restoration – invasives)</i>
1°	Work with appropriate government agencies to survey and monitor the spread of invasive insect species that jeopardize forest health. The species of primary concern include the southern pine beetle, gypsy moth, orange-striped oakworm, and oak lace bug. Take appropriate control methods to reduce tree damage and limit the spread of infestations, provided such methods avoid excessive direct or indirect harm to non-target species. <i>(Conserve wildlife – invasives)</i>

Priority	Conservation Actions (continued)
1°	Use appropriate measures to control the spread of phragmites in the tidal Cohansey River. <i>(Conserve wildlife – invasives)</i>
1°	Work with public and private landowners and managers and regulatory agencies to employ physical, chemical, or biological control measures, or a combination of these, to reduce invasive, non-indigenous plants in areas that are identified as providing critical habitat for endangered, threatened, or priority wildlife species and are being threatened by such plants. <i>(Conserve wildlife – invasives; Evaluate restoration – invasives)</i>
1°	Develop, implement, and evaluate management strategies to reduce the impacts of mute swan herbivory on native vegetation in impoundments and marshes of the Cohansey River supporting species of conservation concern. <i>(Conserve wildlife – invasives)</i>
1°	Monitor and evaluate the impacts of snow goose herbivory to the Cohansey River salt marshes and the native wildlife that rely upon this habitat. Develop, implement, and evaluate management strategies to minimize any unreasonable negative impacts on native wildlife, focusing on areas supporting species of conservation concern. <i>(Conserve wildlife – invasives)</i>
1°	Monitor and evaluate the impacts of vegetative damage to the wild rice marshes by resident Canada geese. Develop, implement, and evaluate management strategies to maintain and enhance the wild rice marshes by minimizing goose damage and controlling resident Canada goose populations. <i>(Conserve wildlife – invasives; Evaluate restoration – invasives)</i>
2°	Develop area-specific deer density or percent-reduction targets to reduce herd size to a sustainable level where regeneration of native vegetative communities is possible and to enhance forest health and biodiversity. <i>(Evaluate restoration – deer; Conserve wildlife – deer, rare wildlife)</i>
2°	Where appropriate, continue to develop and expand incentives for harvesting antlerless deer. <i>(Conserve wildlife - deer)</i>
Protect and enhance important and unique habitats	
1°	Identify (through Landscape Project, radar studies, IBAs, and surveys), protect (through incentive programs and land acquisition), and enhance (through incentive programs and best management practices) critical migratory stopover habitats, including but not limited to the Cohansey River, Stow Creek, Raccoon Ditch, and habitats in and adjacent to tidal wetlands. <i>(Protect habitat – migratory birds; Corridors – migratory birds)</i>
2°	Incorporate ENSP approved sightings data from nominated and approved Important Bird Areas into the Biotics database and Landscape Project mapping providing the sightings meet the ENSP Biotics and Landscape Project standards. <i>(Corridors – migratory birds; Protect habitat – migratory birds, Landscape Project)</i>

Priority	Conservation Actions (continued)
Assess large-scale habitat change every five years	
1°	Collaborate with NJ DEP's Bureau of Geographic Information and Analysis and Rutgers Center for Remote Sensing and Spatial Analysis to develop methods to update DEP's land use/land cover data every five years and perform critical habitat change analysis to assess trend in habitat loss and conversion.
Promote public education and awareness and wildlife conservation	
1°	Raise public awareness of the Cohansey River as a significant bald eagle and raptor wintering area through newsletters, press releases, brochures, presentations, and web pages. <i>(Education – humans)</i>
1°	Preventing establishment of non-indigenous species is the simplest and most cost-effective means of stopping invasions. Encourage native plant use in landscaping through public awareness and discouraging sales of non-native ornamental plants which are often a major source of non-indigenous species that invade natural plant communities. <i>(Education – humans)</i>
1°	Educate public about the importance of keeping cats indoors through newsletters, press releases, brochures, presentations, web pages, etc. Work to develop a statewide policy for local communities to discourage managed cat colonies and trap, neuter and release programs; encourage academic research that examines the full range of impacts of feral cat colonies on local wildlife populations and of feral cat colony management (including TNR) on local wildlife populations and local feral cat populations. <i>(Education – humans)</i>
1°	Engage landowners and NJ citizens in protection and survey efforts for endangered species by increasing enrollment in landowner incentives, forest stewardship, backyard habitat management, and Citizen Science Program. <i>(Education – humans; Conserve wildlife – rare wildlife)</i>
1°	Develop brochures and posters regarding the most aggressive, invasive non-indigenous plants to educate and involve the public in detecting problem areas early while they are still manageable. Early recognition of the establishment of new populations is the key to successful control. <i>(Education – humans; Conserve wildlife – invasives)</i>
2°	Develop and maintain educational brochures and posters and viewing opportunities for the public consistent with species recovery goals to enhance public awareness of wildlife conservation and environmental issues by cooperating with federal, state, and local government, and non-governmental organization partners. <i>(Education – humans)</i>
2°	Educate homeowners, through newsletters, press releases, brochures, presentations, etc., on the proper eviction of house-dwelling bat populations and the importance of providing alternative roosting structures for maternity colonies. <i>(Education – humans)</i>

Priority	Conservation Actions (continued)
2°	Preventing establishment of non-indigenous species is the simplest and most cost-effective means of stopping invasions. Encourage native plant use in landscaping through public awareness and discouraging sales of non-native ornamental plants which are often a major source of non-indigenous species that invade natural plant communities. (<i>Education – humans; Conserve wildlife – invasives</i>)

f. Potential Partnerships to Deliver Conservation

Private Landowners

- Encourage farmers to preserve farmland through conservation easements and Transfer of Development Rights (TDRs) through partnerships with NJ DEP’s Green Acres, The Nature Conservancy–NJ Chapter, NJ State Agriculture Development Committee (NJ SADC), NJ Farm Bureau, local land trusts, and local municipalities for the conservation of bog turtle, forest and grassland bird populations.
- Use landowner incentive programs (DFW’s LIP; USDA’s NRCS programs; and USFWS’ Partners for Fish and Wildlife) to encourage private landowners to manage for endangered and threatened species found on their property through restoration, protection or management activities.

Public

- Expand volunteer Citizen Scientist recruitment and activities.
 - Collaborate with conservation groups (NJ Audubon Society, The Nature Conservancy, NJ Conservation Foundation) and other environmental, member-based organizations to recruit and train Citizen Scientists to locate, survey, and monitor wildlife habitats and populations in a systematic manner to achieve short- and long-term monitoring goals.
 - Involve Citizen Scientists in management projects and protection projects, such as protection and posting of bald eagle nesting areas and installing new osprey nest structures.
 - Recruit North American Butterfly Association volunteers to conduct surveys for lepidoptera species.
 - Promote backyard habitat management for migratory raptors and passerines.
- Collaborate with NJ Audubon Society to educate public on the effects of feral cats on wildlife species of conservation concern.

Wildlife Professionals

- Collaborate with researchers in New York, Pennsylvania, Delaware, and West Virginia to develop best management practices and conservation plans for grassland and scrub-shrub/open field birds.
- Collaborate with researchers in Delaware, Maryland, Virginia, New York, and Pennsylvania to develop best management practices and conservation plans for bald eagle nesting, foraging and wintering areas.

- Consult with entomologists to design and conduct surveys for bronze coppers in wet meadows, marshes, fens, and other appropriate habitats.

Conservation Organizations

- Partner with watershed and conservation organizations such as NJ Audubon Society (NJAS) and The Nature Conservancy (TNC) to protect and enhance habitats for rare species.
 - Protect and enhance grassland bird habitats.
 - Protect bald eagle, osprey, and raptor nesting, foraging, and wintering areas.
 - Install new osprey nest structures.
- Consult with conservation and watershed organizations to develop educational programs such as classroom curricula and wildlife festivals.
- Encourage the use of the Landscape Project's critical habitat mapping to guide land acquisition by conservation organizations through programs such as Green Acres, State Agricultural Development Committee (SADC) Farmland Preservation, and local land trusts.

Local Government, Other State and Federal Agencies

- Partner with local, state, and federal government agencies, including municipal and county planning boards, USDA's Natural Resources Conservation Service (NRCS), US Fish and Wildlife Service (USFWS), and the Department of Community Affairs (DCA), Office of Smart Growth to protect, enhance, and create habitats, and to protect NJ's native wildlife.
 - NJ Department of Environmental Protection's (DEP) Division of Fish and Wildlife (DFW) to maintain and protect bald eagle, osprey, and grassland bird nesting and foraging sites.
 - DFW, conservation organizations, and land trusts to identify key lands for acquisition and conservation.
 - DFW and DEP's Division of Parks and Forestry (DPF) to pursue identification and mapping of significant natural vegetative communities, particularly on public lands and lands that serve as wildlife corridors, and integrate these in the Landscape Project.
 - DFW to develop a plan to protect sensitive endangered/threatened species areas from disturbance.
 - DFW to share site information and expertise with state and federal law enforcement to increase surveillance of bald eagle sites.
 - DFW and conservation organizations to work with the DEP's Land Use Regulation Program (LURP) to protect vernal pools and appropriately classify wetlands for spotted turtle, special concern amphibian, and bronze copper populations.
 - Expand efforts to create habitat and implement best management practices for grassland birds, forest passerines and raptors, and scrub-shrub birds on state lands and with natural resource managers, county and municipal utility authorities and planners.
 - Work with Division of Watershed Management and other DEP agencies to establish larger buffers for riparian and floodplain areas.
 - DFW to work with state and county mosquito commissions to reduce the use of deleterious insecticides and biological controls at known amphibian breeding sites.
 - DFW to work with USFWS and other state, federal, and non-governmental partners to implement North American Waterfowl Management Plan as appropriate.

- DFW to work with USFWS and other state and federal partners to implement the American Woodcock Management Plan, seeking areas where such management complements rare species management.
- DFW to work with federal and state agencies, including USFWS, USCG, National Oceanic and Atmospheric Administration, NJ Bureau of Emergency Response, and NJ Office of Natural Resources Restoration (NRCS) to plan for and assist with emergency oil spill response.
- DFW and DPF to work with the USFWS to develop effective plans to eradicate invasive non-indigenous plants on federal and state lands that are threatening critical wildlife habitats.
- DFW to work with USDA through NRCS and the WHIP program to control purple loosestrife, Japanese sedge and other invasive plants in critical wildlife habitats.
- DFW to determine groundwater recharge areas for vernal pools with the DEP's Division of Water Quality (DWQ) and the NJ Geological Survey. Expand efforts with DWQ to minimize impacts on water quality and conduct hydrological monitoring in these areas.
- DFW to work with DEP's Bureau of Water Monitoring and Standards to recommend appropriate stream classifications.
- DFW to lead in the development of educational materials for private landowners about wildlife of greatest conservation need and their habitats.
- DFW, conservation organizations, and park commissions to expand public outreach through on-site programs and wildlife viewing opportunities.
- DEP to encourage the use of the Landscape Project's critical habitat mapping to guide habitat protection and land acquisition by federal, state, and local governments through programs such as DEP's Green Acres Program, State Agricultural Development Committee Farmland Preservation, local land trusts, and through mitigation.
- DEP to encourage the use of the Landscape Project's critical habitat mapping to guide land use planning and zoning decisions by planning agencies at the federal, state, and local level.

g. Monitoring Success

- Conduct habitat assessment and monitor habitat changes over time; monitor efficacy of habitat management and restoration efforts on a site-by-site basis.
- Annually monitor abundance, productivity, distribution, and trends of bald eagle, osprey (biannually), and grassland bird and scrub-shrub bird populations. Compare vegetation parameters and populations between managed/protected sites and non-managed sites to provide feedback into management strategies.
- Monitor contaminant levels in Cohansey River and Stow Creek fish that may impact bald eagle and osprey populations.
- Monitor species abundance of migratory raptors at key marsh-edge locations to determine trends in migration counts.
- Monitor populations of breeding, migratory and wintering waterfowl of conservation concern.
- Continue the long-term monitoring of reptile and amphibian populations through the Herp Atlas Project, Calling Amphibian Monitoring Program, and volunteer coverboard surveys.
- Employ/implement adaptive management techniques for the goals and conservation actions established for species of greatest conservation need. Review effectiveness of research and management, and improve techniques as necessary.