

## PART III – WILDLIFE AND HABITAT PROTECTIONS

### A. THE ENDANGERED SPECIES ACT

#### Summary of the Act

Adopted in 1973 and subjected to many revisions thereafter, the Endangered Species Act (ESA) was designed to protect critically imperiled species from extinction as a consequence of economic growth and unchecked development.<sup>535</sup> The Act provides broad protection for species of fish, wildlife and plants that are listed as threatened or endangered and includes provisions for listing of species, recovery plans and for the designation of critical habitat for listed species. It also outlines procedures for federal agencies to follow when taking actions that may jeopardize listed species and sets forth exceptions and exemptions to the Act. The ESA is also the enabling legislation for the Convention on International Trade and Endangered Species of Wild Fauna and Flora.

Responsibility for carrying out the ESA rests with the Secretary of the Interior, with the exception of protections for fish and marine species, which is the responsibility of the Secretary of Commerce. The Secretaries' responsibilities are carried out by the respective organizations they oversee, the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS), respectively.

Section	Citation	Purpose
Section 2	16 USC 1531	Purpose of Act
Section 4	16 USC 1533	Listing of Endangered or Threatened Species
Section 5	16 USC 1534	Acquisition of Lands and Waters to Conserve Species
Section 6	16 USC 1535	Cooperation with States
Section 7	16 USC 1536	Interagency Cooperation
Section 8	16 USC 1537	International Cooperation
Section 8a	16 USC 1537a	CITES Implementation
Section 9	16 USC 1538	Prohibited Acts
Section 10	16 USC 1539	Exceptions

## **Components of the Act**

### ***Section 2 – Purpose of the Act***

The ESA's primary goal is to prevent the extinction of imperiled plant and animal life, and to provide a way to recover and maintain those populations by removing or lessening the threats to their survival. To achieve this, the ESA provides a means to conserve the habitat upon which threatened and endangered species depend.<sup>536</sup>

### ***Section 4 – Listing of Endangered or Threatened Species***

The ESA allows listing of a species for a number of reasons, including habitat destruction; overutilization of a species for commercial, recreational, scientific or educational purposes; decline of the species due to disease or predation; the inadequacy of existing regulatory mechanisms; or other natural or manmade factors that are affecting the continued existence of the species.<sup>537</sup>

Listings are made solely on the basis of the best scientific and commercial data available and can occur only after a review of the status of the species and consideration of any efforts already being made to protect the species by a state or foreign nation. Listings can be made two ways. The FWS or the NMFS can list a species directly through its candidate assessment program, or an individual or organization can submit a petition requesting the FWS or NMFS to list a species.

Amendments to the ESA in 1978 added the requirement that a regulation designating critical habitat for the species being listed must be published at the same time as the listing. Critical habitat is to be designated on the basis of the best scientific data available, although the 1978 amendments allowed the FWS and NMFS to consider the economic impact and any other relevant impact of the critical habitat designation. These amendments also allowed the delay or withdrawal of a listing if it was determined that the critical habitat was not yet determinable. Linking the ESA listing to critical habitat designation and economic considerations almost completely halted new listings, and approximately 2,000 species proposed for listing were withdrawn from consideration in 1978.<sup>538</sup>

The Act was amended again in 1982 in an effort to relieve the bottleneck created by the 1978 amendments. The 1982 amendments required critical habitat designation concurrent with the listing of a species, but only “to the maximum extent prudent and determinable.”<sup>539</sup> Congress also added language to stress that the listing decision itself must be based “solely” on the basis of biological criteria and not economic considerations, and allowed listings to proceed even if a corresponding critical habitat determination would be delayed up to a year.<sup>540</sup>

Currently, an area may be excluded from a critical habitat designation if it is determined that the benefits of the exclusion outweigh the benefits of a designation, unless the exclusion will result in the extinction of the species.

Emergency listings are permitted if it can be shown that an emergency exists that poses a significant risk to the well-being of any species. The regulation listing the species must give detailed reasons for the emergency listing and actual notice must be provided to each state in which the species occurs. An emergency listing takes effect immediately upon publication and remains in effect for 240 days.

Once a species is listed, the FWS and the NMFS have the authority to issue whatever regulations they deem necessary to conserve the species, including regulations that incorporate the prohibitions against takings and other actions set forth in section 9 of the ESA.

Adopted during the Nixon administration, the annual rate of listings under the ESA increased steadily from the Ford administration (47 listings, 15 per year) through Carter (126 listings, 32 per year), Reagan (255 listings, 32 per year) and Clinton (521 listings, 65 per year) before it declined to its lowest rate ever under George Bush (60 listings, 8 per year).<sup>541</sup>

### ***Section 5 – Land Acquisition***

This section requires the FWS and NMFS, as well as the Secretary of Agriculture as the overseer of the National Forest System, to establish and implement a program to conserve fish, wildlife and plants, including those listed under the ESA. The Act contemplates that these agencies will carry out such a program through land acquisition and other authorities vested in them by the Fish and Wildlife Act of 1956, the Fish and Wildlife Coordination Act and the Migratory Bird Conservation Act. The ESA authorizes the use of funds from the Land and Water Conservation Fund Act of 1956 for the acquisition of lands, waters or interests therein.

### ***Section 6 – Cooperation with States***

Pursuant to this section, the FWS and NMFS must cooperate to the maximum extent practicable with the states, including consulting with a state before acquiring land or waters for the conservation of listed species. The federal agencies may enter into agreements with states for administration and management of areas established for species protection.<sup>542</sup> In addition, cooperative agreements may be entered into with states which establish and maintain their own adequate and active programs for conservation of listed species. For a program to be considered adequate and active, the FWS or NMFS must make the following findings on an annual basis:

- The state agency has the authority to conserve the resident listed species;
- Acceptable conservation programs have been established and provided to the federal agency for all resident listed species;
- The state agency is authorized to determine the status and requirements for survival of the resident species of fish and wildlife and to establish programs, including land or other acquisitions, for the conservation of the resident listed species; and
- The program includes a mechanism for public participation in the listing process.<sup>543</sup>

Alternatively, the NMFS or FWS must find that certain of these requirements are met and that plans are included for immediate attention to listed species most urgently in need of conservation programs. Cooperative agreements also may be entered into for conservation of listed resident plant species. Provisions are identical to those for fish and wildlife species.<sup>544</sup>

State laws regarding the importation or exportation of listed species are void to the extent that they permit anything prohibited by the ESA or its regulations, or prohibit actions authorized under exemptions or permits under the ESA. A state law or regulation may be more but not less restrictive than the ESA or its regulations.<sup>545</sup> The prohibitions of section 9 of the ESA do not apply to the taking of listed species within any state that is a party to a cooperative agreement unless (i) the state has adopted its own regulations that incorporate the prohibitions, (ii) upon the request of the state or (iii) when the FWS or NMFS finds that an emergency situation exists posing a significant risk to the well-being of the species.<sup>546</sup>

Financial assistance may be provided to any state with a cooperative agreement to fund the development of conservation programs or to assist in monitoring candidate species and recovered species.<sup>547</sup>

### ***Section 7 – Interagency Cooperation***

This section applies to federal agencies, but it also covers their issuance of permits for private activities, such as § 404 permits issued by the Corps of Engineers. Specifically, section 7 imposes an affirmative duty on federal agencies to ensure that their actions, including permitting, are not likely to jeopardize the continued existence of a listed plant or animal species or result in the destruction or modification of critical habitat.<sup>548</sup>

To make this decision, the federal agency "consults" with the FWS or NMFS. The "consultation" process is described in the federal regulations and further guidance is provided in an Endangered Species Consultation Handbook.<sup>549</sup> Consultation has several steps. First, the agency asks the FWS or the NMFS whether a protected species may be present in the area. If so, and the project is considered to involve "major construction activities," the agency prepares a biological assessment to determine the impact that the project might have on the species.<sup>550</sup> Next, the FWS or NMFS reviews the information and prepares a Biological Opinion.<sup>551</sup> If it is found that the proposed action is not likely to jeopardize the plant or animal, meaning a "no jeopardy" opinion is issued, the FWS or NMFS must specify the impact of any "incidental take" of the species, as well as any necessary mitigating measures and conditions that should be imposed on the activity.

If the FWS or NMFS issues a "jeopardy" opinion, it must also propose reasonable and prudent alternatives that would not violate the ESA.<sup>552</sup> The applicant then has several choices including taking the "reasonable and prudent alternative" offered by the FWS or NMFS, appealing the matter to the Endangered Species Committee, or seeking judicial review in federal court.<sup>553</sup>

On December 16, 2008, the Bush administration issued a rule that exempted many federal actions from the review of the FWS and the NMFS under section 7 of the ESA. Instead, it allowed federal employees to use their own discretion to decide whether their actions were likely to harm endangered species, even if they did not have the scientific expertise to make those

decisions.<sup>554</sup> On March 3, 2009, President Obama issued a memorandum rescinding the Bush rule and reinstating the requirement for section 7 consultations that existed prior to December 16, 2008.<sup>555</sup>

### ***Section 9 – Prohibitions***

Under the ESA, it is unlawful for any person subject to the jurisdiction of the United States to:

- import any such species into, or export any such species from the United States;
- take any such species within the United States or the territorial sea of the United States or take any such species upon the high seas;
- possess, sell, deliver, carry, transport, or ship, by any means whatsoever, any such species taken in violation of the Act;
- deliver, receive, carry, transport, or ship in interstate or foreign commerce, by any means whatsoever and in the course of a commercial activity, any such species;
- sell or offer for sale in interstate or foreign commerce any such species; or
- violate any regulation pertaining to such species or to any threatened species of fish or wildlife listed pursuant to section 4 of the ESA and promulgated by the FWS or NMFS under the Act.<sup>556</sup>

Significant to these prohibitions is the definition of the word “take,” which means “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.”<sup>557</sup> The term “harm” means an act which actually kills or injures wildlife, including significant habitat modification or degradation when it actually kills or injures wildlife by significantly impairing essential behavioral patterns including breeding, feeding or sheltering.<sup>558</sup> These prohibitions apply to everyone, including private parties and private land. In other words, a landowner is not allowed to harm an endangered animal or its habitat on his own property.<sup>559</sup>

### ***Section 10 – Exceptions***

Exceptions to the prohibited acts are provided for scientific purposes, for the establishment and maintenance of experimental populations or to otherwise enhance the propagation and survival of an affected species.<sup>560</sup> The FWS or the NMFS may issue a permit to allow for an incidental taking of a listed species that might occur through an otherwise lawful activity if the applicant submits a conservation plan for review and approval. The plan must address the impact of the taking, mitigation measures being taken, alternative actions that were considered, and any other measures required by the FWS or NMFS as deemed necessary or appropriate.<sup>561</sup> If the conservation plan is approved and a determination is made that the taking will not reduce the likelihood of the survival and recovery of the species, a permit may be issued. The FWS or

NMFS must revoke the permit if the permittee fails to comply with the terms of conditions of the permit.<sup>562</sup>

## Implementation of the Act

### *The Federal Endangered and Threatened Species List*

There are 18 federally-listed species under the ESA in Delaware and 20 listed species in New Jersey.<sup>563</sup> These species and their status are set forth in the tables below.

Table 14 Endangered and Threatened Species Listed Under the ESA in New Jersey and Delaware		
New Jersey Species	Delaware Species	Species Status
<b>Animals</b>		
Indiana Bat	-----	E
Piping Plover	Piping Plover	T/T
Roseate Tern	-----	E
Loggerhead Sea Turtle	Loggerhead Sea Turtle	T/T
Hawksbill Sea Turtle	Hawksbill Sea Turtle	E/E
Kemp's Ridley Sea Turtle	Kemp's Ridley Sea Turtle	E/E
Leatherback Sea Turtle	Leatherback Sea Turtle	E/E
Bog Turtle	Bog Turtle	T/T
-----	Green Sea Turtle	T
Northeastern Beach Tiger Beetle	-----	T
Dwarf Wedgemussel	-----	E
-----	Delmarva Peninsula Fox Squirrel	E
Shortnose Sturgeon	Shortnose Sturgeon	E/E
Finback Whale	Finback Whale	E/E
Humpback Whale	Humpback Whale	E/E
Right Whale	Right Whale	E/E
<b>Plants</b>		
Seabeach Amaranth	Seabeach Amaranth	T/T
Swamp Pink	Swamp Pink	T/T
Small Whorled Pogonia	Small Whorled Pogonia	T/T
American Chaffseed	American Chaffseed	E/E
Sensitive Joint-Vetch	Sensitive Joint-Vetch	T/T
Knieskern's Beaked Rush	-----	T
-----	Canby's Dropwort	E

As is true of most states, both Delaware and New Jersey have cooperative agreements with the FWS and the NMFS in that they have established and maintained adequate and active programs

for the conservation of federally listed species that occur in their states.<sup>564</sup> The federal agencies review these programs on an annual basis to ensure that they remain adequate and active by requiring each state to report whether any changes have been made to the program and to explain any such changes.<sup>565</sup> These cooperative agreements give Delaware and New Jersey the authority to protect the listed species that occur in their jurisdictions, as long as the protections are in accordance with federal law.<sup>566</sup> The state programs can be more, but not less stringent than what is required by the ESA.<sup>567</sup>

### ***Section 7 Biological Opinion Regarding Surface Water Criteria (New Jersey)***

New Jersey first adopted its Surface Water Quality Standards in 1989 and revised and recodified them in 1993. Pursuant to the CWA, the standards are ultimately the responsibility of the U.S. EPA and thus require the EPA to review and approve the standards and any subsequent amendments to them. Because one of the designated uses of New Jersey's waters is the maintenance, migration and propagation of wildlife, including threatened and endangered wildlife species, the EPA is also required by Section 7 of the ESA to consult with the FWS regarding its approval or disapproval of New Jersey's Surface Water Quality Standards.

In 1994, EPA consulted with the FWS and proposed its intent to approve New Jersey's standards. On June 26, 1996, the FWS issued a Biological Opinion regarding EPA's proposed approval that focused on the effects of the approval on three federally-listed species, the threatened bald eagle, the endangered peregrine falcon and the endangered dwarf wedgemussel.<sup>568</sup> In its Opinion, the FWS determined that, although the EPA's approval would not jeopardize the continued existence of these species, because of New Jersey's inadequate water quality criteria for DDT, PCBs and mercury, it could result in the incidental taking of individuals from each of these species in violation of the ESA.<sup>569</sup> As a result, it was determined that more protective and defensible criteria based on the best and most appropriate science available should be developed for these contaminants and adopted by New Jersey that would be protective of the three endangered or threatened species.<sup>570</sup>

In the 1996 Biological Opinion and in a subsequent 1998 letter to the EPA slightly amending the requirements of the Opinion, the FWS set forth "terms and conditions" that EPA must comply with in order to be in compliance with the ESA. The FWS made it clear that "these terms and conditions are nondiscretionary," and included the following:

- By 1999, New Jersey's Surface Water Quality Criteria must include a provision within its mixing zone policy that prohibits mixing zones, meaning areas in which treated wastewater is authorized by DEP to mix with a water body, in areas with documented occurrences of the dwarf wedgemussel;
- By 1999, New Jersey's Surface Water Quality Criteria must include a provision within its antidegradation policy stating that federally listed species are existing uses under the CWA. Further, the antidegradation policy must state that existing and designated uses of New Jersey surface waters, including maintenance, migration and, as appropriate, propagation of all federally listed endangered or threatened species, and the water quality level necessary to protect those uses, shall be maintained and protected;

- By 1999, based on a joint effort, the EPA, the DEP and the FWS must develop numeric wildlife criteria for DDT, PCBs and mercury that are protective of federally listed threatened and endangered species, including the bald eagle and the peregrine falcon, using the Great Lakes Initiative wildlife methodology and all available New Jersey-specific data. In the event that national wildlife criteria for these substances are developed prior to the development of New Jersey-specific criteria, the national wildlife criteria may be adopted by the DEP.<sup>571</sup>

With regard to the wildlife criteria, the FWS also made a point of stating in the nondiscretionary terms and conditions that “If DEP fails to adopt the resultant criteria, the EPA must take appropriate action to promulgate numeric wildlife criteria for the State of New Jersey.”<sup>572</sup>

After the Biological Opinion was issued, staff from the FWS, EPA and New Jersey DEP did work together to develop the wildlife criteria which were completed in July 2001.<sup>573</sup> The DEP formally proposed the adoption of the new wildlife criteria on November 18, 2002, to be finally adopted after an opportunity for public comment by the “sunset” date of November 23, 2003, exactly one year after the proposal date.<sup>574</sup> The sunset date came and went, and, citing reasons related to the “economic and social impacts” associated with adoption of the criteria, DEP failed to adopt them.<sup>575</sup> The DEP engaged in numerous subsequent re-adoptions and amendments to its Surface Water Quality Standards, and yet failed to re-propose or adopt the wildlife criteria established by the three agencies for DDT, PCBs and mercury.

In 2007, the DEP again proposed amendments to its Surface Water Quality Standards but failed to include the wildlife criteria in the proposal. The DEP proposal did include a reference to an ongoing national wildlife criteria consultation being performed by the FWS, the NMFS and the EPA that was entirely unrelated to the wildlife criteria developed by the FWS, EPA and the DEP. Specifically, the proposal stated:

The use of a waterbody by E & T species is an existing use that must be protected. The United States Fish and Wildlife Service (USFWS), in cooperation with the United States Environmental Protection Agency, are evaluating existing aquatic life criteria to ensure protection of federally listed E&T species. Until a determination is made that the existing criteria do not adequately protect a federally listed species, the Department and the USEPA believe that the existing water quality criteria are adequate.<sup>576</sup>

In response, the FWS sent comments to the DEP chastising the agency for failing to address the wildlife criteria that the FWS, EPA and the DEP had developed more than six years prior.<sup>577</sup> The FWS comments referenced the above-quoted section of the DEP proposal as follows:

It is our interpretation that these statements were not directly addressing the Wildlife Criteria, which were the subject of the...[1996] Biological Opinion. The ongoing national criteria consultation referred to above pertains to all listed species, both wildlife as well as aquatic life and additionally includes the National Marine Fisheries Service as a federal

participant. However, our agencies jointly developed protective Wildlife Criteria for DDT, PCBs and mercury that were to be implemented as part of the Biological Opinion's Terms and Conditions. Staff from the Service, USEPA and NJDEP worked together closely in the derivation of the wildlife criteria and agreed that the end product, a set of three protective and defensible criteria based on the best and most appropriate science available, should be adopted by the State.

\* \* \* \* \*

The USEPA and the State continue to be in non-compliance with the Service's Biological Opinion and may be vulnerable to legal challenges. The federal delisting of the bald eagle (effective August 8, 2007) and similarly the past delisting of the peregrine falcon, does not mean species are no longer susceptible to historic and current pollution and hazardous substance releases, including sediment contamination of major ecosystems within New Jersey (e.g., Hackensack Meadowlands, New York/New Jersey Harbor, Delaware River and Bay). We recommend NJDEP and USEPA coordinate with the Service to resolve the outstanding issues addressed above. The Service is most willing to work in partnership to resolve resource management challenges that crosscut our respective authorities and programs.<sup>578</sup>

The DEP adopted a provision prohibiting mixing zones in areas inhabited by dwarf wedgemussels in 2002.<sup>579</sup> In 2009, the DEP adopted a provision in its antidegradation policy stating that federally listed species are existing uses under the CWA that must be protected.<sup>580</sup> To date, neither the DEP nor the EPA has promulgated the wildlife criteria for DDT, PCBs and mercury deemed necessary to protect the bald eagle and peregrine falcon.

## **B. THE MIGRATORY BIRD CONSERVATION ACT**

### **Establishment and Purpose of the Act**

In 1914, the last of the passenger pigeons died in the Cincinnati Zoological Gardens. It is thought to be no coincidence that, around this same time, migratory birds became the focus of the federal government's special attention. Bird conservation efforts were further advanced by the formation of groups such as the National Audubon Society and the Wildlife Management Institute. In addition, the extinction of game bird species mobilized hunters and the sport-related arms and ammunition industries to convince Congress that laws to assist states in protecting wildlife populations for sport were necessary.<sup>581</sup>

As a result of these efforts, the Migratory Bird Conservation Act was passed in 1929 with the purpose of establishing sanctuaries in which migratory birds could live.<sup>582</sup> To carry out this purpose, the Act established the Migratory Bird Conservation Commission to consider and approve any areas of land or water recommended by the Secretary of the Interior for purchase or

lease.<sup>583</sup> The Commission was also authorized to fix the prices at which such areas may be purchased or leased and to establish new waterfowl refuges, which led to the establishment of the FWS National Wildlife Refuge System.<sup>584</sup>

## **Funding for Sanctuary and Refuge Lands and Waters**

Pursuant to the Act, the Commission is comprised of the Secretary of the Interior, as chairman, the Administrator of the Environmental Protection Agency, the Secretary of Agriculture, two Members of the Senate and two Members of the House of Representatives.<sup>585</sup> Acquisitions under the Act may be completed only after consultation with affected local and state governments, and were initially financed by the Migratory Bird Conservation Fund, also established by the Act. These funds were intended to also provide resources for maintenance of the acquired lands, the preservation of habitat, and for any other related expenses.<sup>586</sup>

It became immediately apparent that the \$7.8 million dollars originally appropriated for the Migratory Bird Conservation Fund was insufficient to accomplish the purposes of the Act. As a result, Congress enacted the Migratory Bird Hunting Stamp Act of 1934, which required all hunters to attach stamps to their state hunting licenses, providing additional funds, known as the Duck Stamp Funds, for the creation of bird sanctuaries and refuges.<sup>587</sup> Additional funding came in 1937 with the adoption of the Pittman-Robertson Bill, which imposed an excise tax on guns and shells to extract more funds from hunters for the benefit of wildlife. Today these funds are supplemented by the sale of refuge admission permits and reverted Federal Aid funds.<sup>588</sup>

In 1989, the North American Wetlands Conservation Act (WCA) was passed to, among other things, carry out the North American Waterfowl Management Plan.<sup>589</sup> The Plan is an international agreement that provides a strategy for the long term protection of wetlands and associated uplands habitats needed by waterfowl and other migratory birds in North America. It was signed in 1986 by the Canadian Minister of the Environment and the U.S. Secretary of the Interior and was updated in 1994, at which time Mexico became a signatory to the Plan.<sup>590</sup>

To carry out the Plan, the WCA provides federal funding to encourage partnerships to protect, enhance, restore, and manage wetlands and other habitats for migratory birds and other fish and wildlife. The responsibility for dispensing funds under the WCA was given to the Migratory Bird Conservation Commission, based upon project recommendations submitted by the North American Wetlands Conservation Council, which was also created by the WCA.<sup>591</sup> The Council, composed of the Director of the U.S. Fish and Wildlife Service, the Secretary of the National Fish and Wildlife Foundation, a state fish and game agency director from each Flyway, and three representatives of different non-profit organizations participating in projects under the Plan, has submitted over 500 high priority projects for consideration by the Commission since its establishment.<sup>592</sup> All have been approved for funding, representing a total of \$244 million for the protection of wetland habitat.<sup>593</sup>

## **Implementation of the Act in the Project Area**

Since the Commission's establishment, more than 4 million acres have been acquired by the FWS by fee purchase, easement or lease with monies from the Migratory Bird Conservation Act and the Wetlands Conservation Act.<sup>594</sup> In the Project Area, these acquisitions have led to the establishment of the Cape May National Wildlife Refuge in New Jersey and the Bombay Hook and Prime Hook National Wildlife Refuges in Delaware.

### ***The Cape May National Wildlife Refuge (New Jersey)***

Established as part of the National Wildlife Refuge System in 1989, the Cape May refuge began with the FWS's purchase of 11,500 acres with funds authorized by the Migratory Bird Conservation Act.<sup>595</sup> Ultimately, the refuge will protect over 21,200 acres of wildlife habitat in New Jersey's Cape May Peninsula. It occupies a key location in the Atlantic Flyway and is also in a portion of the Delaware Bay watershed that is designated a Wetland of International Importance due to the extent it is used by migrating shorebirds, such as the red knot, ruddy turnstone, semi-plated sandpiper and sanderling.<sup>596</sup> The Cape May refuge has been designated a "Flagship Project" of the North American Waterfowl Management Plan because of its importance to migratory waterfowl, particularly the American black duck.<sup>597</sup>

The Cape May refuge is comprised of three units. The Great Cedar Swamp Division is at the northern end of the refuge in Dennis and Upper Townships. Habitats such as salt marsh, hardwood swamp, bog, grasslands and large tracts of forested uplands are used by wildlife such as blue-winged warblers, ovenbirds, and short-eared owls. The refuge connects with a state forest and the Pineland National Reserve.

The Delaware Bay Division is located in Middle Township and extends along five miles of Delaware Bay. Bayshore, salt marsh, wet and dry forests, vernal pools, shrub and scrub habitat and grasslands are found in this division.<sup>598</sup> Thousands of shorebirds, including red knot, ruddy turnstone and sanderling use the bayshore habitat during migration. In addition, the vernal pools are critical for the state endangered Eastern tiger salamander.<sup>599</sup>

The Two Mile Beach Unit is a barrier island with beachfront, tidal ponds and maritime forest in Lower Township. The site is important for the federally threatened piping plover, the state endangered least tern, and the American black duck.<sup>600</sup>

Cape May National Wildlife Refuge supports 317 bird species, 42 mammal species, 55 reptile and amphibian species, and numerous fish, shellfish and other invertebrates.<sup>601</sup>

### ***The Bombay Hook National Wildlife Refuge (Delaware)***

The Bombay Hook National Wildlife Refuge was established in 1937 as a resting and feeding area for migratory and wintering waterfowl. At that time, the property contained 12,000 acres and was purchased with Duck Stamp Funds under the Migratory Bird Conservation Act.<sup>602</sup> Currently comprised of 15,978 acres, of which approximately four-fifths is tidal salt marsh, the refuge has one of the largest expanses of nearly unaltered tidal salt marsh in the mid-Atlantic

region.<sup>603</sup> It also includes 1,100 acres of impounded fresh water pools, brushy and timbered swamps, 1,100 acres of agricultural lands, and timbered and grassy upland. For the most part, the refuge terrain is flat and less than ten feet above sea level.<sup>604</sup>

Located in Delaware Bay, the second largest staging area for spring migratory shorebirds in North America, the Bombay Hook management programs are primarily aimed at developing and protecting habitat for waterfowl and other migratory birds, including the threatened bald eagle.<sup>605</sup> The refuge is a focal point for waterfowl migrating between their northern breeding grounds and southern wintering areas. Large numbers of ducks and geese arrive each fall to spend the winter or just stop over as they head south.

Water levels in refuge impoundments are manipulated to produce desirable emergent and underwater plants for waterfowl. When pools are drawn down, large populations of shore and wading birds feed on the mudflats. Upland agricultural crops are grown on more than 1,000 acres of the property to provide additional food for waterfowl and other migratory birds.

The tidal salt marsh of the refuge is some of the most valuable wildlife habitat in Delaware. Large portions of the refuge have been maintained in a near pristine state. The marsh, including tidal streams and rivers, provides excellent natural habitat for birds and mammals and serves as a nursery for marine organisms.

In terms of wildlife, waterfowl populations are at their peak in the refuge in October and November, when more than 150,000 ducks and geese inhabit the site.<sup>606</sup> March is another peak month for waterfowl populations on their way towards their northern breeding grounds. April brings early migratory shorebirds from South America and reptiles and amphibians emerging from winter hibernation.<sup>607</sup>

Shorebirds are at their highest concentration during May when they come to Delaware Bay to feed on the horseshoe crab eggs laid along the shore. They also feed on invertebrates in the tidal marshes and exposed mudflats. May is also the peak time for warblers.<sup>608</sup>

Wading birds such as herons, egrets and glossy ibis are at their peak numbers during the summer months.<sup>609</sup> Mammals can be seen year round and include white-tailed deer, beaver, muskrat, red fox, river otter, woodchuck and opossum.<sup>610</sup>

### ***The Prime Hook National Wildlife Refuge (Delaware)***

Established in 1963 under the authority of the Migratory Bird Conservation Act, the Prime Hook National Refuge is considered one of the most significant and high quality wetland habitat areas along the Atlantic Coast.<sup>611</sup> Comprised of 10,000 acres, of which approximately 6,000 are wetlands, the refuge is located 22 miles southeast of Dover near the western shore of Delaware Bay.<sup>612</sup>

The refuge provides a diverse landscape of freshwater and salt marshes, woodlands, grasslands, scrub-brush habitats, ponds, bottomland forested areas, a 7-mile long creek, and agricultural lands. Through this diversity, the refuge provides habitat for approximately 267 species of birds,

35 species of reptiles and amphibians and 36 different mammals.<sup>613</sup> Its carefully-managed freshwater impoundments are important stopover sites for the spring and fall bird migrations as well as for wading birds. Endangered and threatened species management activities provide habitat for the Delmarva fox squirrel, nesting bald eagles and migrating peregrine falcons and neotropical land birds passing through the area utilize the refuge's upland forested habitat during the spring and fall.<sup>614</sup>

## **C. THE NEOTROPICAL MIGRATORY BIRD CONSERVATION ACT**

### **Establishment and Purpose of the Act**

Of the nearly 800 bird species that occur in the United States, approximately 500 migrate across our borders. The majority of these species winter in the Caribbean or Latin America, but return to breed in Canada or the United States.<sup>615</sup> Habitat loss due to deforestation and development continues to occur on a hemisphere-wide basis, threatening the survival of many of these species. On July 21, 2000, the Neotropical Migratory Bird Conservation Act (NMBCA) was passed by Congress in recognition of the importance of conserving migratory birds and the habitats they rely upon.<sup>616</sup>

The NMBCA establishes a competitive, matching grants program that supports the formation of public-private partnerships to carry out projects in the United States, Canada, Latin America and the Caribbean to promote the long term conservation of Neotropical migratory birds and their habitats.<sup>617</sup> The goals of the Act are to perpetuate healthy populations of these birds, provide financial resources for bird conservation initiatives and to foster international cooperation for such initiatives.<sup>618</sup>

### **Funding Under the Act**

The NMBCA appropriated a maximum of \$6 million annually for project funding, and began supporting projects in 2002 with an initial appropriation of \$3 million. Funding for the program was \$3 million in 2003, \$4 million in 2004 through 2007, \$4.5 million in 2008 and \$4.75 million in 2009.<sup>619</sup> Between 2002 and 2008, this funding allowed the program to support 260 projects coordinated by partners in 48 U.S. states and territories and 36 countries, with projects involving land conservation affecting approximately three million acres of bird habitat.<sup>620</sup> Nevertheless, many important and qualifying projects did not proceed due to a lack of funding.

In April, 2009, Senator Ben Cardin (D-MD), Chairman of the Environment and Public Works Water and Wildlife Subcommittee, introduced Senate bill S. 690, a bipartisan piece of legislation that would reauthorize the existing NMBCA but significantly boost its funding to \$20 million annually. The cosponsors of the bill included Senators Mike Crapo (R-ID), Robert Menendez (D-NJ), Patrick Leahy (D-VT), Bill Nelson (D-FL), and Joseph Lieberman (I-CT).<sup>621</sup> The bill was passed by the Senate's Environment and Public Works Committee in July 2009, and awaits further action by the House of Representatives.<sup>622</sup>

## **Implementation of the Act in the Project Area**

In 2004, a multi-national project aimed at conservation of red knots in New Jersey, Delaware, Argentina and Chile was funded under the NMBCA.<sup>623</sup> Partners in the project were the State of New Jersey Endangered and Non-Game Species Program, the Fundacion Inalafquen, Universidad Nacional de Patagonia Austral, Province of Tierra Del Fuego, and the Bahia Lomas Shorebird Expedition in Chile.<sup>624</sup>

In New Jersey and Delaware, the project partners were funded to further investigate the relationship between the red knot stopovers in Delaware Bay, a Western Hemisphere Shorebird Reserve Network (WHSRN) site, and the concurrent spawning of horseshoe crab eggs at the Bay. Utilizing 7 years worth of data on horseshoe crabs and shorebirds, the participating scientists were charged with developing a model that quantifies the crab eggs needed to support red knots during their stopover, taking into account an array of environmental and other variables.<sup>625</sup>

In Argentina, at San Antonia Oeste, a WHSRN international site, the project partners were funded to create a Nature Interpretation Center to serve as an environmental education and nature-guide training facility and as a control point for restricting beach access during times of critical shorebird usage. Funding was also provided for the Argentinean project partners to develop a management plan for the site.<sup>626</sup> At the Rio Gallegos Estuary Provincial Reserve, additional funding was provided for the creation of a Nature Interpretation Center for environmental education and nature-guide training programs, to collect data for the development of a management plan and to nominate the reserve as a WHSRN site.<sup>627</sup>

In Chile, Bahia Lomas hosts the hemisphere's largest population of wintering red knots, although a lack of on-site facilities and access to the site has hampered necessary research and conservation actions in the area. Funding was provided to allow the Chilean project partners to develop a modest research and education station at Bahia Lomas and to nominate it as a WHSRN site.<sup>628</sup>

## **D. STATE PROGRAMS TO PROTECT WILDLIFE AND HABITAT**

### **Delaware's Wildlife and Habitat Protection Programs**

Delaware's wildlife and habitat protection programs are overseen by its Division of Fish and Wildlife. Such programs include Delaware's State List of Endangered and Threatened Species, the Delaware Wildlife Action Plan, the National Heritage and Endangered Species Program, the Delaware Shorebird's Project and the Delaware Private Lands Assistance Program. In addition, the Division of Fish and Wildlife is consulted by other Divisions within the DNREC that are seeking to enforce habitat-related provisions of their respective program's regulations.

#### ***Delaware Endangered Species List***

Like most states, Delaware has developed its own list of state endangered species. Based on native wildlife species that are in danger of going extinct and compiled and updated by the Division of Fish and Wildlife, the Delaware endangered species list includes the following:

Birds – Brown Creeper, Bald Eagle, Pied-billed Grebe, Northern Harrier, Cooper's Hawk, Black Crowned Night Heron, Yellow-Crowned Night Heron, Northern Parula, Piping Plover, Short-Eared Owl, American Oystercatcher, Black Rail, Upland Sandpiper, Loggerhead Shrike, Black Skimmer, Henslow's Sparrow, Common Tern, Forster's Tern, Least Tern, Cerulean Warbler, Swainson's Warbler, Red-Headed Woodpecker, Sedge Wren.

Reptiles - Leatherback Sea Turtle, Atlantic Ridley Sea Turtle, Green Sea Turtle, Loggerhead Sea Turtle, Bog Turtle, Corn Snake.

Amphibians – Eastern Tiger Salamander, Barking Treefrog

Mammals – Delmarva Fox Squirrel

Fish – Atlantic Sturgeon

Mollusks – Yellow Lampmussel, Eastern Lampmussel, Dwarf Wedgemussel, Eastern Pondmussel, Brook Floater, Tidewater Mucket

Insects – Little White Tiger Beetle, White Tiger Beetle, Seth Forest Scavenger Beetle, Frosted Elfin, Bethany Firefly, Hessel's Hairstreak, King's Hairstreak, Rare Skipper, Mulberry Wing

Protection of these species and their habitats are implemented through the programs discussed below.

#### ***Delaware Wildlife Action Plan***

The growing list of declining wildlife species, the escalating pace of land development, and the emergence of new threats like invasive species and climate change all pointed to the urgent need to expand the scope of wildlife management in the United States. Recognizing these issues and

the need to work towards the conservation of a variety of habitats rather than focusing on individual species, Congress established the State Wildlife Grants Program in 2002.<sup>629</sup> In doing so Congress challenged the states to demonstrate wildlife conservation needs in terms that considered all species and habitats and not just game, sport fish and endangered species.

To fund this program, revenues collected from Outer Continental Shelf Oil & Gas royalties are deposited into the Land and Water Conservation Fund and apportioned annually to states based on a formula. As a condition of this funding, each state must prepare a “Wildlife Action Plan” that identifies the species in greatest need of conservation (SGNC), describes the state’s efforts to conserve the SGNC and addresses the “full array of wildlife” and wildlife-related issues in the state.<sup>630</sup> Congress authorized additional funding in 2008 and 2009 for a competitive State Wildlife Grant Program to encourage the implementation of actions contained in the Wildlife Action Plans.

Consistent with the federal requirements established by the FWS, Delaware’s Wildlife Action Plan contains the following eight mandatory elements:

- Information on the distribution and abundance of species of wildlife, including low and declining populations that are indicative of the diversity and health of the State’s wildlife.
- Descriptions of locations and relative condition of key habitats and community types essential to the conservation of the aforementioned identified species;
- Descriptions of problems which may adversely affect the species identified or their habitats, and priority research and survey efforts needed to identify factors which may assist in restoration and improved conservation of these species and habitats.
- Descriptions of conservation actions proposed to conserve the identified species and habitats and priorities for implementing such actions.
- Proposed plans for monitoring the species identified and their habitats, for monitoring the effectiveness of the conservation actions proposed, and for adapting these conservation actions to respond appropriately to new information or changing conditions.
- Descriptions of procedures to review the plan at intervals not to exceed ten years.
- Plans for coordinating the development, implementation, review, and revision of the plan with federal, state, and local agencies that manage significant land and water areas within the state or administer programs that significantly affect the conservation of identified species and habitats.
- A plan for allowing broad public participation in the development and implementation of the Wildlife Action Plan, the projects that are carried out under the Plan, and in the identification of the SGNC.<sup>631</sup>

### ***Species in Greatest Need of Conservation (SGNC)***

The primary repository for information on Delaware wildlife species is the Delaware Natural Heritage Program, which tracks rare species distribution and abundance using the methodologies of the international network of Natural Heritage Programs.<sup>632</sup> This methodology is unique in that it allows for the comparison of species status across all taxa. For this reason it was chosen by Delaware as the foundation for determining the SGNC.<sup>633</sup> However, because not all species are currently tracked by the Delaware Natural Heritage Program, including estuarine and marine fish and invertebrates, several national and regional tracking systems were also utilized to determine the SGNC. These tracking systems were selected because they were developed with original methods and not derived from other systems, and because of their special relevance to Delaware.<sup>634</sup> They are:

- American Fisheries Society – Marine, Estuarine, and Diadromous Fish Stocks at Risk of Extinction in North America (Exclusive of Pacific Salmonids);
- Delaware legal status (state listed species);
- Delaware populations with special significance or sensitivity;
- Federal legal status (ESA listed species);
- Mid-Atlantic Bird Conservation Initiative
- National Marine Fisheries Service, Highly Migratory Species Fisheries Management Plans for western Atlantic stocks;
- Natural Heritage state and global ranks; and the
- Northeast Endangered Species and Wildlife Diversity Technical Committee, Wildlife Species of Regional Conservation Concern in the Northeastern United States.<sup>635</sup>

The SGNC list is divided into two tiers. Tier 1 species are those that are most in need of conservation action in order to sustain or restore their populations. They are the focus of the Plan, which is based on analyzing issues that impact their populations and their habitats, and on developing conservation actions to eliminate, minimize or compensate for these issues. Tier 2 species are also in need of conservation action, although not with the urgency of Tier 1 species. Their distribution across the landscape will help determine where conservation actions will be implemented on the ground.<sup>636</sup>

These tiers are further divided into state ranking levels based, for the most part, on species abundance, with an “occurrence” typically referring to a local population:

- S1 = extremely rare in DE – 1-5 occurrences or fewer than 1,000 individuals in the state;
- S2 = very Rare in DE – 6-20 occurrences or 1,000 to 3,000 individuals in the state;

- S3 = rare in DE - 21-100 occurrences or 3,000 to 10,000 individuals in the state;
- S4 = apparently secure in DE - more than 100 occurrences or 10,000 individuals in the state; and
- S5 = demonstrably secure in DE - considerably more than 100 occurrences or 10,000 individuals in the state.<sup>637</sup>

Of the 461 SGNC identified in the Wildlife Action Plan, 120 are in Tier 1.<sup>638</sup> Of the Tier 1 species, 31 are categorized as extremely rare (S1) and 18 additional species are categorized as extremely rare with regard to the breeding population (S1B).<sup>639</sup>

### ***Key Wildlife Habitats***

The Key Wildlife Habitats identified in the Wildlife Action Plan are based on the document entitled Natural Communities of Delaware, prepared by the Delaware Natural Heritage Program in 2000.<sup>640</sup> Because this resource does not include aquatic habitats, these habitats were added, as were early successional habitats and several anthropogenic habitats. And, since Delaware lacks maps for most of the SGNC and its habitat, surrogates for Key Wildlife Habitats were developed from two sources. The first source, the Division of Fish and Wildlife's Habitats of Conservation Concern, are rare habitats, have special significance in Delaware, are particularly sensitive to disturbance, and/or have a high diversity of rare plants. Because of these factors, they are known or expected to harbor SGNC, especially insects that are often dependent on specific host plants.<sup>641</sup>

The second source for the Key Wildlife Habitats consists of large blocks of unfragmented forests and wetlands, selected because of their importance to area-sensitive species, particularly vertebrates. A minimum size of 250 acres was used in this selection process, a size that, based on work done in similar habitats in Maryland, conserves viable populations of at least 80% of forest dwelling bird species. The same threshold was set for wetland blocks, following the methodology used for a Delmarva Conservation Corridor Demonstration Program.<sup>642</sup>

A significant part of the remainder of the Wildlife Action Plan describes the status of the Key Habitats, meaning whether they are currently in poor, fair or good condition, lists the conservation issues of concern that are affecting each habitat and the resident SGNC, and identifies the actions that must be taken to address the conservation issues and habitat status.<sup>643</sup> The Plan also prioritizes the conservation issues and recommended actions.<sup>644</sup>

### ***Natural Heritage and Endangered Species Program***

The Delaware Natural Heritage and Endangered Species Program is the entity that identifies and tracks the more than 800 species of wildlife and 1500 native species of plants that inhabit Delaware. Part of the Division of Fish and Wildlife, the Program also maintains and updates the state's list of endangered species.<sup>645</sup> Critical to the Program is the Natural Heritage Database, an inventory of rare plant and animal species and natural communities in Delaware that is continuously updated and is the state's most comprehensive, centralized source of information on rare plants, animals, and natural communities. The Database is a compilation of information

from a wide range of sources including publications, museum and herbarium collections, and fieldwork.

The research that populates the Natural Heritage Database also serves as the basis for many reports produced by the Program that are used in the management and conservation of species and habitat, many of which were also used to develop the Wildlife Action Plan.<sup>646</sup> Such reports include the Delaware Rare Animal Species of Conservation Concern, the List of State Endangered Species, and the Guide to Delaware Vegetation Communities.<sup>647</sup>

### ***The Delaware Shorebird Project***

Each spring, hundreds of thousands of migratory shorebirds converge on the shores of the Delaware Bay. Some, like the red knot, travel as many as 5,000 miles non stop to reach this destination. After spending the winter at the southern tip of South America, Brazil and the Southeastern United States, the red knot make a final and critical rest stop at the Delaware Bay each spring on their way to the Arctic where they breed during the short Arctic summer.<sup>648</sup> The stopover coincides with the horseshoe crab spawning period, allowing the birds to feed on horseshoe crab eggs and as much as double their body weight to sustain them during their final 2,000 mile leg to the Arctic.<sup>649</sup>

In recent years, the number of shorebirds making their springtime stopover has drastically declined. The nearly 100,000 red knots that visit the Bay each spring declined to approximately 20,000 in 2005.<sup>650</sup> Scientific evidence indicates that the cause of this decline is the overfishing of horseshoe crabs which are used for bait and which has resulted in a lack of food for the birds on their stopover.<sup>651</sup> Other species such as ruddy turnstone, sanderling, and the semipalmated sandpiper have declined in number as well.<sup>652</sup>



Figure 14 – Migratory Patterns of Delaware Shorebirds<sup>653</sup>

The Delaware Shorebird Project is a team of state and federal scientists, local volunteers, local and international researchers, birders and others who work to improve the understanding of the importance of the Delaware Bay in the life cycles of migrant shorebirds and their connection to spawning horseshoe crabs.<sup>654</sup> Partners in this research effort include the British Trust for Ornithology, volunteers from the Wash Wader Ringing Group in Great Britain, as well as the U.S. Fish and Wildlife Service which provides staff and logistical support from the Delaware Bay Estuary Project and the Prime Hook/Bombay Hook National Wildlife Refuge complex. The Delaware Museum of Natural History supports the project by contributing a significant amount of staff time throughout the migratory period and funding for important projects has been provided by the Partnership for the Delaware Estuary.<sup>655</sup>

Project participants have banded nearly 60,000 shorebirds in Delaware Bay since 1997 which has resulted in a growing database of sightings describing their migration routes and timing, stopover duration and other important aspects of their ecology.<sup>656</sup>

Established in 1997 under the DNREC's Division of Soil and Water's Coastal Management Program, the Delaware Shorebird Project was transitioned to the Natural Heritage and Endangered Species Program in 2005 and is currently managed under the Program.<sup>657</sup>

### ***The Delaware Ecological Restoration and Protection Team***

In 2003, the DNREC established the Ecological Restoration and Protection Team (ERTP) to identify and improve wildlife habitat, enhance water quality, provide stream bank protection and reduce erosion throughout the state.<sup>658</sup> Comprised of scientists, managers and environmentalists from more than 32 state and federal agencies and organizations, the ERTTP conducts restoration and protection efforts on streams, drainage ditches, wetlands and riparian corridors.<sup>659</sup> The ERTTP has completed many such projects over the past six years, which have resulted in the restoration of approximately 250 acres of varied types of habitat in the Delaware Bay and Estuary drainage basin alone. A summary of Delaware ERTTP Restoration Projects in the Bay and Estuary is set forth in Part I of this paper in Table 7.<sup>660</sup>

### ***Delaware Private Lands Assistance Program***

Over 80 percent of the available and/or restorable wildlife habitat in Delaware occurs on private lands. Accordingly, the DNREC's Division of Fish and Wildlife has recognized that the future of Delaware's wildlife and habitat resources depend upon the cooperation of Delaware's private landowners and their willingness to become involved in the restoration and enhancement of wildlife habitat on their properties. To facilitate such cooperation, the Division reorganized its staff to devote more resources to assisting private landowners with improvements to their land to protect resident wildlife. It also has biologists on staff devoted to informing landowners about available programs, providing technical assistance in developing habitat projects and securing financial assistance as incentives for participation.<sup>661</sup>

Through the Delaware Landowner Incentive Program (DLIP), the Division encourages private landowners through cost sharing and conservation easements to participate in the Program. With cost sharing, a percentage of the actual restoration costs, ranging from 74 to 100%, is paid for by

the state and/or its partners.<sup>662</sup> Landowners are required to make up the rest of the cost either through a monetary contribution or through in-kind services such as site preparation, planting grass seed or trees. Landowners must sign a conservation agreement to manage and maintain the restoration for a period of five or ten years. In addition, landowners may receive \$146.52 per acre per year for restorative practices established on agricultural lands.<sup>663</sup>

Financial assistance may also be received in the form of a conservation easement, which is a legal agreement between the property owner and the conservation organization. It restricts development on the property for either a termed period or in perpetuity. The landowner still retains ownership of the land and the right to work and sell the property. Payments are based on the fair market value of foregone development.<sup>664</sup>

### ***Protection Through Regulations Developed for Other Programs***

Delaware does not have its own state-level Endangered Species Act, nor does it have specific regulations geared towards preventing or limiting development in critical or important wildlife habitat.<sup>665</sup> However, the Division of Fish and Wildlife does get to exercise its expertise over such issues through the regulations enforced by other DNREC Divisions, such as the Division of Water Resources. More specifically, as summarized below, the Wetlands Regulations, Subaqueous Lands Regulations and Marina Regulations all address habitat to varying degrees. When a permit is sought under these regulations, the Division of Water Resources requests a consultation from the Division of Fish and Wildlife with regard to habitat issues, allowing Fish and Wildlife the opportunity to suggest changes or conditions to the project that allow for habitat protection.<sup>666</sup>

#### **• *Wetlands Regulations***

When reviewing a project under the wetlands regulations, the DNREC is required to take into account the effect of site preparation and the proposed activity on several “wetland values” including its effect on habitat value.<sup>667</sup> More specifically, the Habitat Value regulation requires DNREC to consider the effect of the proposed activity on:

- Habitat for resident species of wildlife, including furbearers, invertebrates, and finfish;
- Habitat for migratory wildlife species including waterfowl, wading birds, shorebirds, passerines, finfish, and shrimp;
- Rearing area, nesting area, and breeding grounds for various species;
- Habitat for rare or endangered plants;
- The presence of plants or animals near the limits of their territorial range; and
- The presence of unique geologic or wetland features.<sup>668</sup>

The DNREC must also evaluate the economic impact of the project, which includes a short and long term evaluation of increases or decreases in the value attributable to wetlands as a source of nutrients to finfish, crustaceans and shellfish and as habitat for these species or other flora or fauna of significant actual or potential economic value.<sup>669</sup>

#### ● ***Subaqueous Lands Regulations***

These regulations require owners of private subaqueous lands to obtain a permit before undertaking any activity on such lands that, as determined by DNREC, may have an adverse impact upon or destroy aquatic habitats.<sup>670</sup> Every application submitted must include, among other things, a map showing the exact location of all wetlands and aquatic habitats.<sup>671</sup> In addition, before issuing a permit, the DNREC must consider the impact on the environment, including:

- Any harm to aquatic or tidal vegetation, benthic organisms or other flora and fauna and their habitats; and
- Any loss of natural aquatic habitat.<sup>672</sup>

The Subaqueous Lands Regulations also set forth specific siting conditions for boat docking facilities, and require that such structures be located away from critical habitats and that they are built with minimal impact on aquatic vegetation and wetlands.<sup>673</sup> With respect to the installation and use of shoreline erosion control measures, applicants must utilize methods in their design that satisfy the following elements:

- Protection of aquatic biota, wetlands and nearshore shallow water habitat;
- Adequate flow and circulation necessary to support the functional value of adjacent wetlands or aquatic habitat.<sup>674</sup>

#### ● ***Marina Regulations***

Like the Wetlands and Subaqueous Lands Regulations, the Marina Regulations give the DNREC another opportunity to protect wildlife habitat. The Marina Regulations prohibit the construction of marinas at sites that are recognized as critical habitats, which are habitats identified by the DNREC as serving an essential role in the maintenance of sensitive species.<sup>675</sup> The intent of this policy is to ensure no net loss of aquatic habitat productivity.<sup>676</sup>

## **New Jersey's Wildlife and Habitat Protection Programs**

### ***The New Jersey Endangered and Nongame Species Conservation Act***

Signed into law on December 14, 1973 – two weeks before President Nixon signed the federal Endangered Species Act – the New Jersey Endangered and Nongame Species Conservation Act is intended to protect species whose survival in New Jersey is imperiled by loss of habitat, over-exploitation, pollution, or other impacts.<sup>677</sup> In adopting the Act, the legislature declared that it is the policy of the state that species of indigenous wildlife found to be endangered should be accorded special protection in order to maintain, and to the extent possible, enhance their

numbers.<sup>678</sup> The legislature further determined that the state, through the DEP, should assist in the protection of species found to be endangered elsewhere by regulating the taking, possession, transportation, exportation, processing, sale or offer for sale or shipment within New Jersey any such species or subspecies of wildlife, including those on the federal endangered species list.<sup>679</sup>

The Act defines “endangered species” to mean any species or subspecies of wildlife whose prospects of survival or recruitment are in jeopardy or are likely to be in jeopardy within the foreseeable future due to any of the following factors:

- The destruction, drastic modification or severe curtailment of its habitat;
- Its over utilization for scientific, commercial or sporting purposes;
- The effects of disease, pollution or predation;
- Other natural or manmade factors affecting the prospects of survival or recruitment within the state; or
- Any combination of these factors.<sup>680</sup>

The definition of “take” in the state Act means to harass, hunt, capture, kill or attempt to harass, hunt, capture or kill wildlife.<sup>681</sup>

The Act also gives the DEP the authority to conduct investigations concerning wildlife in order to develop sound information regarding populations and to determine the management measures necessary to their continued sustainability. In addition, it authorizes the DEP to, by regulation, develop a list of endangered indigenous species and to periodically review and update that list.<sup>682</sup>

Pursuant to this authority, the DEP Division of Fish and Wildlife established the Endangered and Nongame Species Program to carry out the management measures necessary to protect and enhance the state’s endangered species. The Program also developed a list of endangered or threatened species that currently includes the following 37 species:

Birds/Endangered – American Bittern\*, Bald Eagle\*, Peregrine Falcon, Northern Goshawk\*, Pied-Billed Grebe, Northern Harrier\*, Red-Shouldered Hawk\*, Short-Eared Owl\*, Piping Plover, Upland Sandpiper, Loggerhead Shrike, Black Skimmer\*, Henslow’s Sparrow, Vesper Sparrow\*, Least Tern, Roseate Tern, Sedge Wren

Birds/Threatened – Bobolink\*, Bald Eagle, Cooper’s Hawk, Red-Shouldered Hawk, Black-Crowned Night Heron\*, Yellow-Crowned Night Heron, Red Knot\*, Osprey, Barred Owl, Long Eared Owl, Black Rail, Black Skimmer, Grasshopper Skimmer, Savannah Sparrow, Vesper Sparrow, Red-Headed Woodpecker

Reptiles/Endangered – Timber Rattlesnake, Corn Snake, Queen Snake, Bog Turtle, Atlantic Hawksbill, Atlantic Leatherback, Atlantic Loggerhead, Atlantic Ridley

Reptiles/Threatened – Northern Pine Snake, Atlantic Green Turtle, Wood Turtle

Amphibians/Endangered – Blue-Spotted Salamander, Eastern Tiger Salamander, Southern Gray Treefrog

Amphibians/Threatened - Eastern Mud Salamander, Atlantic Green Turtle, Wood Turtle

Invertebrates/Endangered – American Burying Beetle, Northeastern Beach Tiger Beetle, Bronze Copper, Brook Floater (mussel), Green Floater (mussel), Mitchell’s Satyr (butterfly), Arogos Skipper (butterfly), Appalachian Grizzled Skipper (butterfly), Dwarf Wedgemussel

Invertebrates/Threatened – Frosted Elfin (butterfly), Triangle Floater (mussel), Sliver-Bordered Fritillary (butterfly), Eastern Lampmussel, Yellow Lampmussel, Tidewater Mucket (mussel), Eastern Pondmussel, Checkered White (butterfly)

Mammals/Endangered – Indiana Bat, Bobcat, Black Right Whale, Blue Whale, Fin Whale, Humpback Whale, Sei Whale, Sperm Whale, Allegheny Woodrat

Fish/Endangered – Shortnose Sturgeon

\* status applies to breeding population only

The Act also gives DEP the authority to adopt rules and regulations to effectuate the purposes of the Act.<sup>683</sup> To date, rules specifically designed to implement the Endangered and Nongame Species Conservation Act have not been adopted. As discussed below, several of the Coastal Zone Management Rules offer protections to endangered and threatened species and critical habitat.<sup>684</sup>

### ***The New Jersey Rules on Coastal Zone Management***

The New Jersey Rules on Coastal Zone Management (Coastal Rules) are the substantive regulations by which the DEP’s Land Use Regulation Program reviews permit applications under CAFRA, the Wetlands Act of 1970, the Waterfront Development Law as well as Water Quality Certifications and Consistency Determinations.<sup>685</sup> Several of the Coastal Rules address threatened and endangered species and critical wildlife habitat, including those discussed below.

#### **• *The Endangered and Threatened Wildlife or Plant Species Habitats Rule***

The Endangered and Threatened Wildlife or Plant Species Habitats Rule (the Habitats Rule) states that development of endangered or threatened wildlife or plant species habitat is prohibited unless it can be demonstrated that the habitat would not, directly or through secondary impacts on the site or the surrounding area, be adversely affected.<sup>686</sup> Such a demonstration must be made through an Endangered or Threatened Wildlife or Plant Species Habitat Impact Assessment (Habitat Impact Assessment), a formal assessment for which the criteria, standards and substance are mandated by the Coastal Rules.<sup>687</sup>

An applicant that disputes the designation of the site as endangered or threatened wildlife species habitat may also attempt to demonstrate that the proposed site is not endangered or threatened wildlife species habitat, and that the Habitat Rule therefore does not apply. Such a demonstration must be made through an Endangered or Threatened Wildlife Species Habitat Evaluation (Habitat Evaluation), a formal evaluation for which the criteria, standards and substance are mandated by another Coastal Rule.<sup>688</sup> This option exists only for wildlife species habitat as the Rules do not allow the opportunity for an applicant to dispute the designation of threatened or endangered plant species habitat.

Requirements for a Habitat Assessment - A Habitat Assessment, through which an applicant demonstrates compliance with the Habitat Rule, must be conducted for each endangered or threatened wildlife or plant species.<sup>689</sup> It must consider the likely effects of the proposed development on the local populations of the particular species on or abutting the site and the impacts of the proposed development, both direct and indirect, must be assessed using accepted ecological principles and scientific literature on each species. The Habitat Assessment must be based on the habitat requirements and life history of each species, and must consider the manner in which the proposed project may alter habitat, including, but not limited to, vegetation, soils, hydrology, human disturbance, and effects on competitor, parasite or predator species.<sup>690</sup>

Requirements for a Habitat Evaluation - A Habitat Evaluation, through which an applicant attempts to demonstrate that the designation of the site or abutting property as endangered or critical wildlife habitat was incorrect, must provide information demonstrating that the habitat is not suitable for each endangered or threatened wildlife species.<sup>691</sup> Specifically, the Habitat Evaluation must:

- Use scientific methodology appropriate for each species or species group;
- Examine specific attributes and characteristics of the site that limit or eliminate its suitability as habitat, including, but not limited to, an examination of vegetative cover, soils, hydrology, existing land use and any other factors that are used to determine suitability of a site for the species; and
- Include an examination of the area surrounding the site using aerial photographs and/or appropriate cover maps.<sup>692</sup>

Significantly, the Rules clearly state that a survey for the endangered or threatened wildlife species is not the equivalent of a Habitat Evaluation and will only be considered in the context of supplementing information on habitat suitability.<sup>693</sup>

• ***The Critical Wildlife Habitats Rule***

The Critical Wildlife Habitats Rule applies to specific areas known to serve an essential role in maintaining wildlife, particularly in wintering, breeding, and migrating.<sup>694</sup> The Rule also states that definitions and maps of critical wildlife habitats are currently available only for colonial waterbird habitat in the 1979 Aerial Colony Nesting Waterbird Survey for New Jersey.<sup>695</sup> Recognizing this as an informational deficiency, the Rule goes on to state that “until additional maps are available, sites will be considered on a case-by-case- basis by the Division of Fish and

Wildlife.” Thus, the fact that a site is not included on the maps and is therefore not specifically identified by DEP as Critical Wildlife Habitat, does not mean the site is devoid of critical habitat. Instead, whether or not critical habitat exists on site is a determination that must be made on a case-by-case basis with the assistance of DEP’s Division of Fish and Wildlife.

The Rule further states that development that would directly or through secondary impacts on the relevant site or surrounding region adversely affect critical wildlife habitats is discouraged.<sup>696</sup> Development might be allowed to proceed, however, if the applicant can demonstrate (i) minimal feasible interference with the habitat; (ii) there is no prudent or feasible alternative location for the development; and (iii) the proposal includes appropriate mitigation measures.<sup>697</sup>

● ***Shellfish Habitat Rule***

This Rule defines shellfish habitat as an estuarine bay or river bottom which has a history of production for hard clams, eastern oysters, bay scallops, or blue mussels.<sup>698</sup> With certain exceptions enumerated in the Rule, construction of docks, piers or boat moorings or new dredging in shellfish habitat is prohibited.<sup>699</sup> New dredging adjacent to shellfish habitat is discouraged in general, but may be permitted if the applicant can demonstrate that the proposed dredging activities will not adversely affect the shellfish habitat, population or harvest.<sup>700</sup>

● ***Surf Clam Areas Rule***

Surf clam areas are coastal waters which can be demonstrated to support significant commercially harvestable quantities of surf clams or areas important for recruitment of surf clam stocks.<sup>701</sup> Again, with a list of exceptions that are enumerated in the Rule, this Rule prohibits development which would result in the destruction, condemnation or contamination of surf clam areas.<sup>702</sup> Exceptions include development that is of a national interest for which there is no prudent or feasible alternative site and sand and gravel mining to obtain material for beach nourishment when the beach nourishment is in the public interest.<sup>703</sup>

● ***Prime Fishing Areas Rule***

Prime fishing areas include tidal water areas and water’s edge areas which have a demonstrable history of supporting “a significant local intensity of recreational or commercial fishing activity,” and include coastal jetties, groins, public fishing piers or docks and artificial reefs.<sup>704</sup> These areas can be used for recreational and commercial fishing and shellfishing, scuba diving, and other water related activities. Prohibited uses of these areas include “sand or gravel submarine mining which would alter existing bathymetry to a significant degree so as to reduce the high fishery productivity of these areas.”<sup>705</sup>

● ***Finfish Migratory Pathways Rule***

Finfish migratory pathways are waterways, meaning rivers, streams, creeks, bays and inlets, which serve as passageways for diadromous fish to or from seasonal spawning areas.<sup>706</sup> Development such as dams, dikes, spillways, channelization, tide gates and intake pipes which creates a physical barrier to the movement of fish along the pathway is prohibited unless acceptable mitigating measures are used, such as fish ladders, erosion control and oxygenation.<sup>707</sup> Development which would lower water quality to the extent that it interferes with the movement of finfish along migratory pathways or violates state and Delaware River Basin Commission water quality standards is prohibited.<sup>708</sup>

- ***Submerged Vegetation Habitat Rule***

Submerged vegetation habitats are water areas supporting, or documented as previously supporting, rooted submerged vascular plants such as widgeon grass, sago pondweed, and eelgrass and less prevalent species such as water weed.<sup>709</sup> Maps detailing the distribution of applicable species are available from the DEP in the New Jersey Submerged Aquatic Vegetation Distribution Atlas, Final Report, 1980 and on Eelgrass Inventory Maps prepared by the Division of Fish and Wildlife in 1983.<sup>710</sup> Subject to a list of at least seven exceptions, development in submerged vegetation habitat is prohibited.<sup>711</sup> However, if an applicant can demonstrate through clear and convincing evidence that a part of the mapped habitat lacks the physical characteristics to support the documented submerged vegetation species, the site will be excluded from the definition of such habitat and the Rule will not apply.<sup>712</sup>

- ***Protection of Wildlife and Habitats through Other Coastal Rules***

Other Coastal Rules provide additional protections to wildlife and wildlife habitat, including the Wetlands Rule, the Wetlands Buffer Rule, the Riparian Zones Rule, the Flood Hazard Rule, the Intermittent Stream Corridors Rule and the Public Open Space Rule.<sup>713</sup>

### ***The Landscape Project of Critical Habitat***

Launched in 1995, the DEP's Landscape Project is a digital mapping program that the agency describes as "a pro-active, ecosystem-level approach for the long-term protection of imperiled species and their important habitats in New Jersey."<sup>714</sup> Through geographic information system (GIS) technology overseen and implemented by the Division of Fish and Wildlife Endangered and Nongame Species Program, the Landscape Project uses species location data and land-use/land-cover studies as well as species life history information to produce maps that depict critical wildlife habitat throughout the state.<sup>715</sup>

Landscape maps and overlays are intended to provide a basis for proactive planning such as the development of local habitat protection ordinances, zoning to protect critical wildlife areas, management guidelines for imperiled species conservation on public and private lands, and land acquisition projects. In addition, the information provided by the Landscape Project can be used to better plan and site proposed development projects, resource extraction such as timber harvests, or conservation measures.<sup>716</sup> The maps are used by, among other entities, the DEP's Land Use Regulation Program, to identify areas of critical habitat when considering development permit applications.<sup>717</sup>

Critical wildlife habitat is identified by landscape type, including emergent wetlands, forested wetlands, forest, grasslands and beach, as well as other special types of habitat such as wood turtle habitat and bald eagle foraging area. The landscape types are mapped in sections of contiguous land area and are ranked based on their suitability as habitat for either threatened or endangered species. The ranking in turn determines the level of protection warranted for that particular land area.

In addition, in an effort to focus on "the big picture," and not just on individual locations of imperiled species as those areas become threatened, the Landscape Project identifies

larger critical wildlife areas that “must be preserved now if we want to ensure the conservation and recovery of New Jersey’s imperiled wildlife for future generations.”<sup>718</sup>

Among these areas, known as Landscape Regions, is the Delaware Bay Landscape, which the DEP’s Landscape Project Report describes as follows:

This landscape encompasses all or parts of Cape May, Atlantic and Cumberland counties. It features significant populations of bald eagle, barred owl, eastern tiger salamander, Cope’s gray treefrog and other endangered and threatened species. The vast woodland tracts of this region are among the largest in the state and support a large portion of New Jersey’s neotropical birds and interior-forest bird populations. The extensive saltwater marsh and sandy overwash beaches support a significant horseshoe crab breeding area and shorebird migration, including the red knot, of worldwide ecological significance. Despite the heavy loss of habitat, the Cape May Peninsula remains one of the country’s most important migratory “stopovers” for hundreds of bird and insect species. The expansive habitat mosaic of rivers and streams flowing into the tidal Delaware Bay supports concentrations of imperiled and rare wildlife and wintering waterfowl.<sup>719</sup>

The current version of the Landscape Project, version 2.1, is an update of 1995 land use/land cover data using 2002 aerial imagery.<sup>720</sup> A more recent update, version 3.0, exists only for the New Jersey Highlands area, in the northwest part of the state.<sup>721</sup>

### ***The New Jersey Wildlife Action Plan***

The New Jersey Wildlife Action Plan was submitted to the U.S. Fish & Wildlife Service on October 1, 2005, and received conditional approval due to a limited public comment period. The New Jersey Division of Fish and Wildlife extended the public comment period into January 2006, incorporating recommendations made by the public, stakeholders, and DEP personnel and resubmitted the document to the U.S. FWS on August 4, 2006, for final approval. The plan continues to be refined and revised, with the most recent version of the Plan dated January 23, 2008.

New Jersey’s Plan contains the eight required elements (discussed above in the Delaware Wildlife Action Plan section of this paper) and sets forth 13 goals that the state hopes to achieve through the Plan’s implementation:

- (1) Restore the population of listed species;
- (2) Conserve key migratory bird corridors;
- (3) Develop a unified approach to land management;
- (4) Minimize habitat loss;
- (5) Minimize habitat fragmentation;

- (6) Continue long-term monitoring;
- (7) Minimize human disturbance;
- (8) Set area-specific deer density goals;
- (9) Protect unique ecosystem processes;
- (10) Reduce impacts from subsidized predators and invasive species;
- (11) Eliminate contamination;
- (12) Protect public natural lands and waterways; and
- (13) Coordinate conservation activities.<sup>722</sup>

• ***Species in Greatest Need of Conservation (SGNC)***

In identifying the SGNC, New Jersey relied upon four existing data sources:

The Landscape Project - The Landscape Project is intended to be a proactive, ecosystem-level, GIS approach to identifying and delineating areas that serve as critical habitat for endangered, threatened and special concern animal species within New Jersey.<sup>723</sup>

The Delphi Species Status Assessment – Also known as the Delphi Process, this is a systematic method for reaching consensus among experts that depends upon anonymity among the participating experts and controlled feedback from the principal investigator. New Jersey adopted the process to develop its endangered and threatened species list, believing it achieves greater objectivity in determining the relative stability or endangerment of a species' population.<sup>724</sup>

The State Wildlife Grants Work Plan - State Wildlife Grants, established in the fall of 2001 by the U.S. FWS, is a federal grant program aimed at preventing SGNC from declining to the point of becoming threatened or endangered. In preparation for annual applications for such funding, the Endangered and Nongame Species Program developed a comprehensive work plan identifying both the necessary research, survey and management projects necessary to protect New Jersey's SGNC and the partnerships necessary to deliver those actions. The efforts outlined within the work plan have been incorporated into the New Jersey Wildlife Action Plan.<sup>725</sup>

The Endangered and Nongame Species Advisory Committee - Established in 1973 pursuant to the New Jersey Endangered and Nongame Species Conservation Act, the Committee is composed of academics (four seats), conservation group leaders (three seats), members of the public (three seats) and a veterinary professional (one seat) to provide an effective review of the actions and plans of the Endangered and Nongame Species Program. The Committee also reviews all recommendations of the Program to change the status of species and provides a regular public review of Program actions, plans and recommendations. The Committee has

reviewed the State Wildlife Grants Work Plan, the Delphi Status Review recommendations, the Landscape Project, and various versions of the Wildlife Action Plan.<sup>726</sup>

New Jersey's Wildlife Action Plan ranks its SGNC in accordance with the following six categories:

- Endangered - A species whose prospects for survival in New Jersey are in immediate danger because of a loss or degradation of habitat, over-exploitation, predation, competition, disease, disturbance, or contamination. An endangered species requires immediate action to avoid extinction in New Jersey.<sup>727</sup>
- Threatened - A species that may become endangered if conditions surrounding it begin or continue to deteriorate. Thus, a threatened species is one that is already vulnerable as a result of small population size, restricted range, narrow habitat affinities, or significant population decline.<sup>728</sup>
- Species of Concern - A species that warrants special attention because continued or further habitat degradation or modification would result in their becoming threatened; species that meet these criteria and for which there is little understanding of their status in the state; and species identified as a regional concern in national and regional conservation plans such as Partners in Flight Bird Conservation Plans, the North American Waterbird Conservation Plan (Mid-Atlantic/ New England/ Maritime), U.S. FWS species of conservation concern (2002), the North American Waterfowl Management Plan, and the United States Shorebird Conservation Plan.<sup>729</sup>
- Secure/Stable – A species that appears to be secure in the state and not in danger of falling into any of the preceding three categories in the near future.<sup>730</sup>
- Extirpated – A species previously known to occur in the state for which there is substantial evidence that no extant populations currently exist.<sup>731</sup>

New Jersey's Wildlife Action Plan identifies 28 species that are "State Endangered," and 25 that are "State Threatened." Of these, 19 of the State Endangered and 15 of the State Threatened are found in the Delaware Bay Landscape Region.<sup>732</sup> They are as follows:

<b>Table 15 New Jersey Endangered and Threatened Species in the Delaware Bay Landscape Region</b>	
<b>State Endangered</b>	<b>State Threatened</b>
<b>Mammals</b>	
Bobcat	N/A
<b>Birds</b>	
American Bittern Bald Eagle Black Skimmer Henslow's Sparrow Least Tern Loggerhead Shrike Northern Harrier Peregrine Falcon Pied-Billed Grebe Red-Shouldered Hawk Sedge Wren Short-Eared Owl Vesper Sparrow	Barred Owl Black Rail Black-Crowned Night Heron Bobolink Cooper's Hawk Grasshopper Sparrow Long-Eared Owl Osprey Red Knot Red-Headed Woodpecker Savannah Sparrow Yellow-Crowned Night Heron
<b>Reptiles</b>	
Corn Snake Timber Rattlesnake	Northern Pine Snake
<b>Amphibians</b>	
Cope's Gray Tree Frog Eastern Tiger Salamander	Pine Barrens Tree Frog
<b>Mollusks</b>	
N/A	N/A
<b>Insects</b>	
Bronze Copper	Frosted Elfin

### *The New Jersey Green Acres Program*

Established in 1961 and administered by the DEP, the Green Acres Program brings public and private partners together to acquire and protect open space and provide outdoor recreational facilities throughout New Jersey.<sup>733</sup> New Jersey totals 4.8 million acres in size of which approximately 1.3 million acres are permanently preserved, 1.4 million acres are developed and 2.4 million acres remain undeveloped.<sup>734</sup> Of the 1.4 million preserved acres, approximately 640,000 were protected through the Green Acres Program.<sup>735</sup> Of the 2.4 million that remains undeveloped, a relatively small portion of it is protected by existing environmental regulations.

For the most part, the Green Acres Program has been funded by the Garden State Preservation Trust (GSPT), established under the Garden State Preservation Trust Act of 1999. The Act was signed into law by former Governor Christine Todd Whitman after

voters approved by a 2-1 margin a statewide ballot initiative to provide a stable source of funding for open space preservation.<sup>736</sup> Among other things, the Act dedicated \$98 million a year for ten years (1999 to 2009) from state sales tax revenue to preserve open space, and authorized the issuance of up to \$1 billion in revenue bonds.

GSPT funds are allocated to the Green Acres program based on the following formula: One-half of the funds is allocated for open space acquisition and park development; 40% for grants and loans to local governments for preservation and recreational development; and 10% for matching grants to nonprofit organizations for land acquisition and recreational development.<sup>737</sup> The GSPT has made approximately \$115 million available to the Green Acres program each year. According to the above formula, this means that each year about \$57 million is used for direct state purchases, \$46 million for grants and loans to towns and counties, and \$11.5 million for matching grants to nonprofit land trusts.<sup>738</sup>

New Jersey residents have shown strong support for the Green Acres Program, evidenced by the approval of 12 statewide ballot initiatives since 1961. On June 25, 2009, in anticipation of the GSPT running out of funding, the New Jersey Assembly and Senate approved legislation authorizing a statewide ballot question regarding the continued funding of the GSPT. Governor Corzine signed the legislation into law, and on November 3, 2009, New Jersey's citizens again voted "yes," authorizing the state to issue bonds in the amount of \$400 million to provide moneys for continued funding of the GSPT.<sup>739</sup>

### ***New Jersey Landowners' Incentive Program***

Established in 2004 and administered through funding provided by the U.S. FWS, the Landowners' Incentive Program awards grants on a competitive basis to individual private landowners to support the recovery of or reduce threats to imperiled species.<sup>740</sup> The Program is overseen by the Endangered and Nongame Species Program and, while it encourages creative, innovative and cost effective methods for conserving habitat, it typically focuses on the following land/habitat types:

- Grasslands
- Critical migratory stopover areas in the lower Cape May Peninsula;
- Projects adjacent to state wildlife areas and other permanently protected open spaces.

Under the Program, Landowner's can engage in a variety of basic practices to help protect endangered or threatened species, such as refraining from mowing fields until after grassland birds are finished nesting to benefit birds such as the Grasshopper Sparrow, the Savanna Sparrow, the Bobolink and the Eastern Meadowlark; and fencing streambanks to exclude livestock and other invasive species to benefit species that depend on good water quality, such as freshwater mussels, salamanders, frogs and turtles.<sup>741</sup>