

## Appendix D

Supplemental Threatened and Endangered Species Assessment  
for the Minimal Operable Segment

The New Jersey – Pennsylvania Lackawanna Cut-Off  
Passenger Rail Service Restoration Project

**Lackawanna Cut-off Passenger Rail Service Restoration Project  
Supplemental Threatened and Endangered Species Assessment**

**July 31, 2008**

*Prepared for*

**NJ TRANSIT**

*Prepared by*

**Jacobs Engineering Group  
in association with  
Amy S. Greene Environmental Consultants, Inc.**

## SUMMARY

Correspondence from the US Fish & Wildlife Service (USFWS) and the New Jersey Department of Environmental Protection identified potential locations of federal or state-listed threatened or endangered species, and state-listed species of concern within the project area. Federal-listed species are the bog turtle, bald eagle, and Indiana bat. State-listed faunal species within the project area are the barred owl, bobcat, Cooper's hawk, great blue heron (foraging habitat), red-shouldered hawk, and wood turtle; floral species are Canada hawkweed and Shrubby St. John's wort. Field work was performed for the area between Port Morris Yard and the proposed Andover Station, the Minimal Operable Segment, to determine if there was suitable habitat for any of the identified faunal species, and if there were any observances of the identified floral species on-site.

Three areas along the alignment were found to have suitable habitat for the bog turtle. During the permitting and design phase, additional studies would likely be required to determine whether bog turtles actually inhabit any areas along the alignment. Should they be identified, the USFWS may require timing restrictions and construction monitoring to protect the bog turtle and its habitat. The bald eagle is not a concern for this section of the alignment as there are no known active nest sites or foraging habitat. Habitat does exist for roosting Indiana bats within the project area. A seasonal restriction on tree clearing between April 1st and September 30th for potential summer roosting areas would be implemented. Direct impacts to the barred owl, bobcat, Cooper's hawk, red-shouldered hawk would be nominal because the project is not expected to impact preferred habitat areas. Similarly, the project would not impact the foraging habitat of the great blue heron. Impacts to wood turtle habitat are expected to be negligible during operation; however, to minimize impacts during construction, timing restrictions, construction monitoring, and exclusion fencing are recommended. The two plant species identified as having the potential to be located on site, Canada hawkweed and Shrubby St. John's wort, were not identified during field investigations.

Therefore, the supplemental survey revealed that there are no unmitigable impacts to federal or state-listed threatened or endangered species, or state-listed species of concern associated with the operation or the construction of the project between Port Morris Yard and Andover.

## **INTRODUCTION**

This report is a summary of findings for a threatened and endangered species habitat assessment for the proposed Lackawanna Cut-off restoration project between Port Morris Yard in Roxbury Township, Morris County and the proposed Andover Station in Andover Township, Sussex County, New Jersey. This project area is a subset of a larger project within New Jersey that runs from the Port Morris Yard to the Delaware River.

The target species for this habitat assessment are based upon correspondence from US Fish & Wildlife Service (USFWS) and the New Jersey Department of Environmental Protection (NJDEP) Natural Heritage Program. The letters issued by these agencies included species for the entire New Jersey alignment from Port Morris Yard to the Delaware River. This study refined the species of concern to include only those identified by the agencies as occurring between the Port Morris Yard and the proposed Andover Station.

## **FEDERALLY PROTECTED SPECIES**

In a letter dated May 30, 2007, the USFWS issued a letter that identified three Federally-listed threatened and endangered species as occurring within the proposed project area. The USFWS identified bog turtle (*Glyptemys {Clemmys} muhlenbergii*), bald eagle (*Haliaeetus leucocephalus*), and Indiana bat (*Myotis sodalis*). The following is a description of findings for each of these species.

### **Bog Turtle**

Amy S. Greene Environmental Consultants, Inc. (ASGECI) performed a Phase I Bog Turtle Habitat Survey on wetlands associated with and adjacent to the NJ TRANSIT Lackawanna Cut-off Rail Alignment between Port Morris Yard and the proposed Andover Station. The habitat survey was conducted by Bill Romaine and Harry Strano, USFWS Recognized Qualified Bog Turtle Surveyors (NJ), in accordance with methodologies outlined in the USFWS's "Guidelines for Bog Turtle Surveys (revised April 2006)", "Bog Turtle (*Clemmys muhlenbergii*) Northern Population Recovery Plan (May 2001)" and also incorporating new requirements discussed at the February 2006 "Qualified Bog Turtle Surveyors Meeting".

The Phase I survey of the alignment was conducted on July 16, 18 and 21, 2008. Surveyors utilized GIS mapping to guide in the surveys. Surveyors concentrated on wetland areas that were near or at grade with the Lackawanna Rail Alignment; however, wetlands adjacent to elevated and excavated portions of the alignment were surveyed as well when there was an indication that suitable habitat may be present based on NJDEP wetland maps or when the wetland was located within the same drainage as a known population of bog turtles. The scope of the surveys was based in part on a July, 2008 conversation between Bill Romaine of ASGECI and Carlo Papolizio of the USFWS. Surveyors conducted both visual inspections and probing of muck and mud in wetland

areas to determine the presence or absence of vegetation, substrate and hydrology suitable for bog turtles.

The bog turtle's northern population has been listed as threatened by the USFWS pursuant to Section 7 of the Endangered Species Act of 1973. USFWS guidelines require that surveys for bog turtle habitat (Phase I Bog Turtle Habitat Survey) be performed to determine if potential bog turtle habitat occurs in the vicinity of or within a proposed project limit, in a region where bog turtle habitat is known to be present. If potential bog turtle habitat is present then the USFWS may require a visual bog turtle survey (Phase II Bog Turtle Survey). This Phase I survey identified three sites, Areas B, E, and F described below, as being potentially suitable habitat for bog turtles. Phase II visual and Phase III trapping surveys may be required to determine whether bog turtles do inhabit these wetland complex. Although direct impacts to bog turtles are not expected as a result of this project, the USFWS may require timing restrictions and construction monitoring to protect the bog turtle and its habitat. The following is a brief description of each of the wetlands investigated during the Phase I.

**Area A:** The wetland area is a palustrine forested wetland dominated by red maple (*Acer rubrum*) and spicebush (*Lindera benzoin*). Substrates within this area are firm and lacked evidence of spring-fed hydrology and mucky substrates. In addition, canopy closure was near 80%. This wetland also contains a semi-permanent pond with over 2 feet of standing water. The pond is dominated by spatterdock (*Nuphar luteum*) along its edges. The pond lacked adequate hydrology and vegetation community to support bog turtles. Suitable bog turtle habitat was not identified within Area A.

**Area B:** Area B is a large wetland complex containing both shrub and emergent wetlands surrounding a river. This complex contains both soft mud and mucky substrates suitable for bog turtles. Soft mud and muck generally ranges from 3 inches to 1 foot deep with occasional two plus foot pockets of muck. The extent of mud and muck on the site would likely expand during wetter parts of the year. There was evidence of spring fed hydrology throughout this complex. Vegetation within this complex is fairly diverse. Dominant herbaceous vegetation within this complex includes purple loosestrife (*Lythrum salicaria*), rice cutgrass (*Leersia oryzoides*), tussock sedge (*Carex stricta*), broad-leaved cattail (*Typha latifolia*), soft rush (*Juncus effusus*), porcupine sedge (*Carex hystericina*), arrowhead (*Sagittaria latifolia*), waterpepper (*Persicaria hydropiper*), spikerush (*Eleocharis* sp.), swamp milkweed (*Asclepias incarnata*) and common reed (*Phragmites australis*). Shrub vegetation includes swamp rose (*Rosa palustris*), arrowwood (*Viburnum dentatum*) and juvenile red maple.

The portion of Area B on the south side of the alignment contains suitable bog turtle habitat. The railroad alignment is however approximately 40 feet above grade within the vicinity of this wetland. Furthermore, the southern end of the observed bog turtle habitat appears to be greater than 300 feet from the base of the rail alignment berm. During the design and permitting phase, should it be determined that this area will be affected by the construction of the project, a Phase II and Phase II bog turtle survey would likely be required. Evaluated areas on the north side of the alignment include a pond surrounded

by mesic deciduous forest. This area lacks adequate substrate, hydrology and vegetation for bog turtles.

**Area C:** Area C contains two palustrine forested wetland areas that border a lake. These wetlands are dominated by red maple in the canopy and spicebush in the understory. Skunk cabbage was present in spots. Canopy closure ranges from 60 to 80%. Narrow emergent patches of wetland dominated by broad-leaved cattail and some tussock sedge were observed along the edge of the lake; however it appears that the hydrology of these areas are derived from the lake and are flooded. Remaining forested wetlands lacked adequate substrate and hydrology for bog turtles. The alignment is approximately 40 feet above grade in this area. No bog turtle habitat was observed in Area C.

**Area D:** Area D contains a palustrine forested wetland. The wetland canopy is dominated by red maple and hophornbeam (*Ostrya virginiana*). The shrub understory is dominated by spicebush with some other species including beaked hazelnut (*Corylus cornuta*) and highbush blueberry (*Vaccinium corymbosum*). Herbaceous vegetation in the understory includes skunk cabbage and tussock sedge with pockets of sphagnum moss. The understory is hummocky with patches of soft mud and muck ranging from 6 inches to 2 feet in depth. Evidence of spring fed hydrology include patches of muck and soft mud between tree and sedge hummocks. Portions of this wetland do meet USFWS criteria for bog turtle habitat; however the wetland contains a canopy of nearly 80% closure with mature 12+” diameter at breast height (DBH) trees with no substantial openings. No wetland connections to shrub or emergent habitats were observed. Based on the near complete canopy closure by mature trees and its relative isolation from open wetlands, this wetland is highly unlikely to support bog turtles and further surveys would not be recommended. The railroad alignment within this area is approximately 10 feet above grade.

**Area E:** Area E is a large complex of emergent and modified wetlands. The complex contains central ponded areas that appear to contain over one foot of water. Substrates within this complex range from three or less inches of soft mud to deep quaking muck. Open wetland areas appear to be the result of past excavations. Extensive succession by a number of herbaceous species has occurred along many of the pond fringes. Dominant herbaceous species include common reed, rice cutgrass, spikerush, woolgrass (*Scirpus cyperinus*), porcupine sedge and pondweed (*Potamogeton nodosus*). Patches of bur-reed (*Sparganium americanum*) were also identified within this complex.

Although Area E wetlands are characterized by some seasonal flooding and past disturbance that lessens the chance of bog turtles occurring onsite, much of this wetland complex meets the substrate, hydrology and vegetation criteria for bog turtle habitat and potential impacts to this wetland may result in the necessity of Phase II and Phase III surveys. The railroad alignment is below the grade of the wetland in this area, but is separated from the wetland by a large elevated upland berm.

**Area F:** Area F is a large, dense shrub/emergent wetland complex located primarily north of the rail alignment, with some patches of emergent wetland south of the rail

alignment. Herbaceous species include tussock sedge, skunk cabbage, halberd-leaved tearthumb (*Polygonum arifolium*), cinnamon fern (*Osmunda cinnamomea*), sensitive fern (*Onoclea sensibilis*) skunk cabbage and common reed. Shrubs include multiflora rose (*Rosa multiflora*) and spicebush and young red maple. Much of the observed wetland contains dense shrubs interspersed with small open areas dominated by herbaceous vegetation. The complex contains tussock and root hummocks separated by areas of soft mud and muck ranging from three inches to 1 foot deep. Substrates suitable for bog turtles exist on both sides of the rail alignment. Area F meets the hydrological, substrate and vegetation criteria for bog turtles and disturbance to the wetland would likely require Phase II and Phase III surveys. The railroad alignment is at grade throughout this area.

An additional patch of palustrine forested wetland was evaluated approximately 1000 feet north of the Area F on the south side of the rail alignment. This area contains a red maple canopy and a spicebush understory. Patches of common reed and skunk cabbage exist within the wetland. Substrates are primarily firm and unsuitable for bog turtles with some small patches of soft mud. Based on the limited amount of suitable hydrology and substrate and 60 to 80% canopy closure, this portion of the wetland complex is not suitable for bog turtles.

### **Bald Eagle**

In the May 30, 2007 letter, the USFWS stated that there are no known active nest sites for bald eagle (*Haliaeetus leucocephalus*) in the vicinity of the project area; however, they also recommended that the NJDEP Endangered and Non-game Species Program be contacted in order to coordinate efforts to mitigate impacts to potential bald eagle foraging habitat as identified on the NJDEP Landscape Project Mapping. According to the NJDEP Landscape Project Mapping, there is no bald eagle foraging habitat within the proposed project area between Port Morris Yard and the proposed Andover Station. Bald eagle is therefore not a species of concern for this portion of the proposed alignment.

### **Indiana Bat**

Indiana bat *Hibernaculum* are found in limestone caves as well as abandoned mine shafts. In the summer months these bats roost in various forest habitats underneath loose tree bark or in cavities of dead trees/snags during the day. In order to protect roosting Indiana bats that may be utilizing the project area, the USFWS recommended that tree removal activities be prohibited between April 1 and September 30. NJ TRANSIT has agreed to abide by these timing restrictions for the removal of trees.

**STATE-LISTED THREATENED AND ENDANGERED SPECIES - FAUNA**

According to a letter from the NJDEP Natural Heritage Program dated May 22, 2007, there are records of occurrence for 30 State-endangered, threatened or special concern species along the Lackawanna Cut-off alignment between Port Morris and the Delaware River. ASGECI conducted a refined search of the NJDEP Landscape Project Maps to include only those State-listed species that are known to have habitat patches that intersect the alignment between Port Morris and the proposed Andover Station. This refined search reduced the list of species of concern to six (see Table 1).

**TABLE 1: FAUNAL SPECIES OF CONCERN  
Onsite Occurrences According to NJDEP Landscape Project Maps**

| COMMON NAME                            | SCIENTIFIC NAME           | FEDERAL STATUS | STATE STATUS |
|--|---------------------------|----------------|--------------|
| Barred owl                             | <i>Strix varia</i>        | --             | T            |
| Bobcat                                 | <i>Lynx rufus</i>         |                | E            |
| Cooper’s hawk                          | <i>Accipiter cooperii</i> | --             | T            |
| Great Blue Heron<br>(foraging habitat) | <i>Ardea herodias</i>     | --             | SC/S         |
| Red-shouldered hawk                    | <i>Buteo lineatus</i>     | --             | E/T          |
| Wood turtle                            | <i>Clemmys insculpta</i>  |                | T            |

**State Status:** E = Endangered, T = Threatened, S = Stable, SC = Special Concern. Status for animals separated by a slash (/) indicates dual status. First status refers to breeding population and the second status refers to the migratory or winter population.

The following is a description of the habitat requirements for each State-listed species followed by conclusions and recommendations as to potential impacts and mitigation measures.

**Barred Owl**

Barred owls require large tracts of undisturbed forest dominated by mature and old growth stands and high canopy cover (Bosakowski et al. 1987, Bosakowski 1989). Large tree habitat is necessary to provide large trees with cavities for nest sites as well as open flyway space below the canopy for hunting (Devereux and Mosher 1984). Barred owls have been known to use hawk nests when tree cavities are not available (Beans and Niles, 2003). Bosakowski, *et al.* (1987) noted that wetlands were used significantly more by barred owls than by other sympatric nesting owls. The reason for a preference for wetlands seems to be two-fold. The first reason appears to be related to wetland prey, which often account for a significant portion of the barred owl’s diet (Bosakowski and Smith 1992). The second reason is that large wetland complexes are often undeveloped and often represent the last remaining refuges for forest species. Barred owls will nest immediately outside of wetlands if suitable nest sites within the wetland are unavailable (Beans and Niles, 2003).

Barred owl territories are very large (mean = 676 acres) and encompass the entire home range (Nicholls and Fuller, 1987). Owl sites were located a considerable distance (mean = 2,204 feet) from houses and other buildings (Bosakowski and Smith, 1997) showing a significant avoidance of human disturbance and habitat alteration in the Pequannock Watershed.

For the purposes of this assessment, critical habitat for barred owl includes large wetland complexes with mature deciduous trees that are large enough to provide nest cavities. This critical habitat area extends up to 300-feet beyond the wetland limit if adjacent habitat includes upland forest.

### **Bobcat**

Bobcats are primarily found in northern New Jersey (primarily Sussex, Warren, Morris, and Passaic Counties). They are also found in portions of southern New Jersey (primarily Burlington and Ocean counties). They are extremely adaptable animals and live in a variety of habitats. In general, they prefer “broken” habitat consisting of a patchwork of early and late successional stages, sometimes with dense understory (Beans and Niles, 2003). Bobcats do not utilize areas of dense suburbanization or intense agriculture, but will utilize agricultural areas interspersed with forest and other natural habitats that contain sufficient prey populations (Godin, 1977; McCord, 1977).

Rock outcrops and formations within forested areas are preferred shelter for bobcats in northern New Jersey (Beans and Niles, 2003). Bobcats may also utilize dense understory or other dense cover that includes briars, vines, saplings and shrubs (Leopold, *et al.* 1995). Understories consisting of rhododendron (*Rhododendron maximum*) and mountain laurel (*Kalmia latifolia*); conifer stands; and shrubby swamps are all habitat areas utilized by bobcats.

Bobcat home range sizes may vary depending on prey availability for females and mating opportunities for males. Home ranges have varied from 0.5 to 280 square kilometers (sq. km.) (Kohler 1987). NJ Division of Fish and Wildlife (J. Sciascia, 1997) identified northern New Jersey home ranges of approximately 18 sq. km. for two adult males. Bobcats do not hibernate and are active throughout the year. Most of their activity is during dusk and dawn (crepuscular).

Declines in New Jersey bobcat populations are primarily due to deforestation. Urban sprawl and intensive agriculture are the major threats to these species since it reduces and overly fragments their habitat. Feline distemper, which will kill bobcat, is spread from feral domesticated cats (Beans and Niles, 2003).

### **Cooper’s Hawk**

Cooper’s hawks nest in expansive submature and mature forest stands. In the northern part of New Jersey, the basal area of 21 nest stands (135 square feet per acre) was

significantly higher than available forest (random sites), suggesting that young forest was avoided for nesting (Bosakowski, *et al.* 1992a). In that study, it was also noted that canopy cover (mean = 88.9%) at nest sites was greater than at available forest (mean = 82.5%), suggesting that a dense canopy was preferred for nesting. If available, Cooper's hawks seem to prefer coniferous or mixed forest, and nesting occurred infrequently (10.5%) in pure deciduous stands in the Pequannock Watershed. Nests in conifers occurred in groves of white pine, hemlock, Scotch pine, and Norway spruce. On a landscape basis, nest sites were significantly closer to forest edge and wetlands, which were probably important habitats for hunting.

Seasonal home range size for an adult radio-tagged male was very large (1,936 acres) and daily home range averaged 570 acres (Murphy, *et al.* 1988). Active nests are generally well spaced, but, in prime habitat, can be spaced as close as 0.74 miles apart (Bosakowski, *et al.* 1992a). Nests are typically placed high (mean 67.3% of tree height) in live tall trees, and conifers are generally preferred if available (Bosakowski, *et al.* 1992a). Similarly, Bent (1937) noted that 58.3% of nests in Massachusetts were in white pine. The hawks construct a platform stick nest, which is typically slightly larger than a crow nest.

Because the study area contains large tracts of land that are suitable habitat for Cooper's hawk, critical habitat has been refined to include known or potential nest areas plus a 100 meter buffer. The identification of nesting area is based upon Natural Heritage Data as well as field observations.

### **Great Blue Heron (foraging habitat)**

Great blue herons typically nest in colonies (of up to 100 nests) within trees typically 30 to 70 feet above ground on the edges of marshes, open wetlands and other water bodies. Occasionally nests are found 90 or more feet off of the ground. Nests are constructed of medium sized sticks and twigs, grass, leaves, reeds and mosses, and are reused from season to season. Nest sizes range from 1.5 to 4 feet across (Andrle, 1988).

Great blue herons occupy a variety of wetland habitat types for breeding and foraging. Typical waters associated with great blue herons are slow moving rivers, ponds, lakes, marshes and swamps. Nesting usually occurs in trees, however great blue herons have nested in shrubs, man made structures and nest platforms (Butler, 1992, Scharf, 1991).

Great blue herons forage for a variety of aquatic species including frogs, fish, snakes, crayfish and crabs in waters and wetlands. Alternate foraging sites within close proximity to existing nesting and foraging habitat may be significant in the breeding success of a colony. Food supply is crucial in determining nesting locations, spacing of colonies and habitat use (Butler, 1995). Great blue herons may forage up to 29 km (18 mi) from a colony, but typically forage within 2-5 km (1-3 mi) of the colony (Short and Cooper 1985, Butler 1995).

Preferred nesting habitat typically includes wooded swamps or upland islands surrounded by wetlands or waters. The relative isolation of the nesting habitat reduces the potential for snake or mammal predation (Butler, 1992). Tree species that may be utilized for nesting include ash (*Fraxinus* spp.), birch (*Betula* spp.), maple (*Acer* spp.), elm, (*Ulmus* spp.), hickory (*Carya* spp.), oaks (*Quercus* spp.) and aspen (*Populus* spp.) (Scharf, 1991). Herons may also utilize conifer species including cedar (*Thuja*) and spruce (*Picea*) species for nesting in parts of their range.

Great blue heron colonies are sensitive to human disturbance (Parker, 1980, English, 1978). The nature and proximity of human disturbance can impact colony site selection (Watts and Bradshaw, 1994). Great blue herons have abandoned rookeries in response to housing and industrial development, highway construction, logging, vehicle traffic, and repeated human intrusions (Leonard 1985, Parker 1980, Kelsall and Simpson 1979, Werschkul et al. 1976).

### **Red-shouldered Hawk**

In northern New Jersey, red-shouldered hawks are found in lowland hardwood, mixed or coniferous forests or upland mixed and coniferous forests. Nesting habitat is typically associated with waterbodies including swamps, rivers or ponds.

Red-shouldered hawks prefer mature forested wetlands and riparian forests, but will use upland forest, particularly for feeding and roosting. The upland areas they typically utilize are near water bodies with associated wetlands. Nesting occurs in deciduous, coniferous, and mixed woodlands, often containing standing water. They most commonly nest in large deciduous trees of various species located in or near wetlands (Bosakowski et al,1991). Red-shouldered hawks prefer large wilderness areas and tend to avoid areas of human habitation. “An area-sensitive species, the red-shouldered hawk typically nests away from residences, roads, and development” (Beans and Niles 2003).

For the purposes of this Assessment, critical habitat for red-shouldered hawk includes large wetland complexes with mature deciduous and/or coniferous trees that are large enough to provide nest sites. This critical habitat area extends up to 300-feet beyond the wetland limit if adjacent habitat includes upland forest.

### **Wood Turtle**

Wood turtles are found throughout northern New Jersey. They utilize a variety of aquatic and terrestrial habitats including streams, open or forested floodplains, wet meadows and forested wetlands with emergent or shrubby vegetation. Although wood turtle activity often occurs in wooded and marshy stream corridors, turtles may travel well into a variety of atypical upland areas including woodlots, successional areas meadows and agricultural fields, particularly after warm spring and summer rains (NJDEP, 2004).

Wood turtle wetland habitats are typically associated with streams over 10 feet in width and 12 to 57 inches deep, which they utilize for mating and hibernating (Brewster and Brewster 1991). Hibernacula may occur in an undercut bank with a submerged root

system from species such as American sycamore (*Platanus occidentalis*) (Farrell and Graham 1991) or within muskrat burrows (Zappalorti et al, 1984). They may also hibernate directly on the stream bottom (Ernst and Barbour; Carroll and Ehrenfeld, 1978).

Wood turtles breed underwater; often within slow moving, soft bottomed streams in either April and May or September and October (Harding and Bloomer, 1979; Zappalorti and Farrell, 1980; Farrell and Graham, 1991). Turtles have been identified mating while buried within 7-13 inches of soft stream substrate (Ernst, 1986).

The reported terrestrial habitats utilized by wood turtles vary greatly (NJDEP, 2004). Wooded and marshy borders of streams are commonly identified terrestrial habitats (Carroll and Ehrenfeld, 1978). Associated lowland forest habitats may include oaks, black birch (*Betula lenta*) and red maple (*Acer rubrum*) (Stang 1983). Adjacent thickets of alder (*Alnus* spp.), greenbriar (*Smilax* spp) and multiflora rose (*Rosa multiflora*) may be used for basking. Cornfields and successional habitats may also be utilized by wood turtles to a lesser extent.

The availability of food species is a key characteristic of quality wood turtle habitat (NJDEP, 2004). Wood turtles forage for berries, mushrooms, green plants, fish, frogs, tadpoles, soft bodied invertebrates and carrion. Wood turtles lay eggs in uplands adjacent to their wetland habitats in areas typically containing loose sand or dirt. Upland habitats required for breeding are included when determining the full habitat requirements for this species (NJDEP, 2004).

The wood turtle is highly dependent on high quality riparian habitats. Habitat loss and stream degradation from development has significantly reduced wood turtle populations in New Jersey and the species was listed as threatened by the NJ Division of Fish and Wildlife in 1979. Although considered globally stable, several northeastern states have reported wood turtle population declines and the effects of predation and disturbance on the turtle's reproductive success and juvenile mortality remain a concern in New Jersey (Beans and Niles, 2003).

## **Conclusions and Recommendations**

### **Barred Owl, Cooper's Hawk, Red-shouldered Hawk**

The NJDEP Landscape Project identified suitable habitat for barred owl, Cooper's hawks, and red-shouldered hawks in areas along both sides of the alignment. Field investigations confirmed that, except for the developed areas, suitable habitat for these birds does exist on both sides of the alignment. However, there are no trees of sufficient size along the ROW that would be suitable for nesting birds. The ROW does afford many opportunities for forage; however, the sparse canopy cover in this corridor would inhibit its use due to the risk of predation. Direct impacts to these birds and their habitat due to construction and use of the ROW as an active railroad line are considered to be nominal because the project is not expected to impact preferred habitat areas. Mitigation for noise impacts associated with construction activities can be provided by identifying potential nest sites

in close proximity to the ROW and implementing timing restrictions on construction to avoid disturbance of nesting birds.

Secondary impacts to barred owls, Cooper's hawks, and red-shouldered hawks may include reduced use of the suitable habitat located along the edges of the alignment due to noise impacts associated with construction of the rail line and subsequent use by trains. However, there is sufficient suitable habitat on both sides of the ROW to allow these birds to breed successfully. In addition, new technology in train and rail design has resulted in decreases in the amount of noise associated with commuter rail lines; therefore, impacts to barred owl associated with the proposed project is expected to be nominal.

### **Bobcat**

The NJDEP Landscape Project identified suitable habitat for bobcat in areas along both sides of the alignment. Field investigations confirmed that, except for the developed areas, suitable habitat for the bobcat does exist on both sides of the alignment. Utilization of the alignment by the bobcat, however, would be considered to be nominal due to the lack of dense understory typically used by the bobcat for cover. However, rock outcrops associated with some of the cuts in the alignment as well as outcrops along the side of some of the steeper hillsides may be used as den sites. It is not anticipated that rock outcrops along the alignment will be impacted by the proposed project; however, utilization of these outcrops by bobcats for dens may diminish due to train activity. In addition, the presence of piles of railroad ties and other debris throughout the ROW would attract forage species and provide the bobcat with many foraging opportunities. However, it is unlikely that the bobcat would utilize the ROW for denning activities due to exposure resulting from the sparse understory. Direct impacts to bobcat and their habitat due to construction and use of the ROW for an active railroad line are considered to be nominal because the project is not expected to impact preferred habitat areas. Secondary impacts associated with train collisions will inevitably increase. Bobcats would certainly cross over the alignment in order to access habitat areas on the other side. Outside of hunting and poaching, vehicular collisions are the main cause of human induced mortality of bobcats. Mitigation for these impacts could include the construction of wildlife crossings at key wildlife corridors.

### **Great Blue Heron (foraging habitat)**

The NJDEP Landscape Project identified suitable habitat for foraging great blue herons on both sides of the ROW throughout the alignment. Nearly every body of water in close proximity of the alignment is considered potential foraging habitat for this bird species, and field investigations have confirmed that those areas identified by the Landscape Project as potential habitat are in fact suitable for this species. Two great blue herons were observed during the field investigations, and one of these birds was foraging within a pond located immediately adjacent to the alignment. The proposed project is not expected to have any impacts, direct or indirect, on foraging habitat for the great blue heron. Some minor work may be required to some of the existing culverts along the

alignment; however, impacts associated with this work will be minimal and short term. Birds that may be foraging near these activities will temporarily relocate to other suitable nearby foraging areas.

### **Wood Turtle**

The NJDEP Landscape Project identified suitable habitat for the wood turtle in the vicinity of the proposed project, though in an area where the ROW is elevated. The steep grade associated with the elevated track would naturally form an impediment to many types of turtles; however, wood turtles are known to be very good climbers. Field investigations confirmed the presence of wood turtle habitat in this area, but no wood turtles were observed. However, turtle eggs, presumably from a snapping turtle, were observed on the ROW at the upper edge of the embankment. The sandy soils on this part of the ROW are preferred by wood turtles for nesting. Impacts to wood turtle habitat associated with the project are expected to be negligible. Although an occasional wood turtle may wander onto the ROW to lay eggs, direct impacts associated with train collisions would require that the turtle be perched on the rail as the train passed through. Impacts associated with track construction are more likely to occur due to intensity of activities and the use of construction vehicles. To mitigate for potential impacts associated with construction activities, timing restrictions, construction monitoring, and exclusion fencing are recommended.

### **Andover Station**

Potential impacts to natural areas associated with the construction of the proposed Andover Station will be more extensive than impacts associated with the reconstruction of the rail line because the station area is previously undeveloped. The proposed location of the Andover Station currently consists of second growth hardwood forest with a moderate understory. Trees within this section of forest are less than 8 inches in diameter at breast height (dbh), and the forest is fragmented by roads and residential development from other large undeveloped tracts of land. The NJDEP Landscape Project identified the proposed station area as suitable habitat for bobcat and barred owl. Both species may utilize the area as an occasional transient; however, due to the lack of large diameter trees, the presence of residential development, and the fragmentation already present in the area, this location would not be considered as critical habitat for either species.

## **STATE-LISTED THREATENED AND ENDANGERED SPECIES - FLORA**

The letter from NJDEP Natural Heritage Program dated May 22, 2007, noted above for fauna, also identified listings for two species of flora along the Lackawanna Cut-off alignment between Port Morris and the Delaware River.

Jacobs Engineering Group environmental professionals performed a visual survey for the two state endangered vascular plant species which may have been historically present along the existing Lackawanna Cut-Off right-of-way (see Table 2). The Hieracium

kalmii (Canada Hawkweed) and *Hypericum prolificum* (Shrubby St. John's wort) surveys were performed on July 24<sup>th</sup>, 2008 along the right-of way.

**TABLE 2: FLORAL SPECIES OF CONCERN  
Onsite Occurrences According to the Landscape Project**

| COMMON NAME             | SCIENTIFIC NAME             | FEDERAL STATUS | STATE STATUS |
|-------------------------|-----------------------------|----------------|--------------|
| Canada hawkweed         | <i>Hieracium kalmii</i>     | --             | E            |
| Shrubby St. John's wort | <i>Hypericum prolificum</i> | --             | E            |

**State Status:** E = Endangered.

The NHP database search revealed that the *Hypericum prolificum* (Shrubby St. John's wort) was identified and listed in the 1980's. Shrubby St. John's-wort is a very small, mound-shaped, deciduous shrub, to approximately 3 ft. tall. It exhibits a dense growth habit, upright branching and exfoliating, red/purple bark. Foliage is characterized by smooth, dark blue/green, fine-textured leaves. Flowers are large, yellow flowers occur singly or in few-flowered clusters.

The NHP database search revealed that the *Hieracium kalmii* (Canada Hawkweed) was identified and listed in 1994. The Canada Hawkweed is characterized by a multi-flowered stem with large (approximately 1") yellow flowers that bloom from July through September. Leaves sharply are toothed approximately 4" long decreasing in size toward the tip of the flowering stem. Growth is from 1-3' tall.

The survey consisted of walking the existing right-of-way and embankment, where access was possible, to locate the described plant species. The existing right-of-way and embankments consisted of overgrown vegetation and in some areas, extremely steep slopes reducing our surveying capability. The Shrubby St. John's wort and Canada Hawkweed species were not found along the right-of-way or the embankment areas. Therefore, barring any additional information, it is concluded that the two plant species in question will not be disturbed or impacted during construction activities proposed for the project.