Indiana Bat (*Myotis sodalis*) Roost Tree Survey Report Proposed Bell Bend NPP Site Luzerne County, Pennsylvania

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Indiana Bat Roost Tree Survey Report
For The
Proposed Bell Bend Nuclear Power Plant Site
Luzerne County, Pennsylvania

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RECORD OF REVISIONS

Revision	Date	Pages/Sections Changed	Brief Description
000	December 2010	All	Initial Release
001	January 2011	Pages 4, 7, 9, 10, Table 7, Figure 3 and Appendix D as detailed below.	Rev. 0 of document was revised to address owner acceptance review comments detailed below and in Comment Resolution #s: PPL-EPR-10-69-R0 and EA-EPR-10-669-R0.
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001		Title Page	Date
001		Page 4	3.0: citation added
001		Page 7	4.2.1: text revisions
001		Page 9	6.0: text revisions
001		Page 10	7.0: reference added
001		Table 7	Revised footnotes
001		Figure 3	Legend revised
001		Appendix D	Figures revised
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002		Title Page	Date
002		Page i	TOC: Added headings regarding LOD changes, updated page numbers
002		Page ii	TOC: Added heading for new figure of LOD changes
002		Page 3	1.0: Text Revisions, updated area calculations
002		Page 5	Section 3.1: Added text on changes to Forest Interior Areas Based on LOD Boundary Revisions
002		Page 6	Section 3.2: Added text on changes to Forest Edges Based on LOD Boundary Revisions

Revision	Date	Pages/Sections Changed	Brief Description
002		Page 8-10	4.0: Text Revisions, updated area calculations and results based on 2011 survey
002		Page 11	5.0: Text Revisions, updated area calculations and results based on 2011 survey
002		Page 11	6.0: Text Revisions, updated results based on 2011 survey
002		Table 1	Changed title of table to reflect that these area calculations are from 2010 LOD boundary
002		Table 2	Created new table with new area calculations from 2011 survey and revised LOD boundary
002		Tables 3-8	Formerly Tables 2-7. Updated tables with new area calculations and results from 2011 survey
002		Figures 1 and 2	Updated figures with revised LOD boundary
002		Figure 3	Created new figure to reflect changes in forested cover within the revised LOD boundary.
002		Figures 4-6	Formerly Figures 3-5. Updated figures with results from 2011 survey
002		Appendices A, B, and C	Updated appendices with results from 2011 survey
002		Appendix D	Added revised LOD boundary and new sample plot and PRT locations to Forest Area maps

1.0 INTRODUCTION

1.1 STUDY OBJECTIVES

Normandeau Associates, Inc. (Normandeau) conducted a quantitative in-field survey of Indiana bat (*Myotis sodalis*) roost trees within the forested areas proposed for clearing at the Bell Bend Nuclear Power Plant (NPP) project site during 28 September through 20 October 2010 and 13 and 14 July 2011. The objective of this study was to determine the distribution, density, and quality of Indiana bat roosting habitat provided by these forest areas with a particular focus on roosting habitat for males during the summer and for both sexes during the time of fall swarming. Indiana bats are listed as an Endangered Species by the U.S. Fish and Wildlife Service (USFWS), which has jurisdiction over species of flora and fauna designated as listed, proposed, or candidate under the Federal Endangered Species Act (ESA). Indiana bats are also listed as Endangered by the Pennsylvania Game Commission (PGC), which has jurisdiction over birds and mammals classified as Threatened or Endangered under the Pennsylvania Game and Wildlife Code.

The USFWS has reviewed the Bell Bend NPP project for potential impacts to Federally-listed species of special concern through ongoing coordination with PPL Corporation (USFWS, 2009). As the project site is located within 10 miles of three known Indiana bat hibernacula, the agency has determined that proposed forest clearing necessary for project construction could result in the loss of potential Indiana bat foraging and roosting habitat.

1.2 SITE DESCRIPTION

As proposed, Bell Bend NPP will be sited adjacent to the Susquehanna Steam Electric Station (SSES) in Salem Township, Luzerne County, Pennsylvania. Potential areas of disturbance associated with Bell Bend NPP will extend across 687 acres (1.1 mile^2, 278 hectares [ha]) within the 2,055-acre (3.2 mile^2, 832 ha) Bell Bend NPP Project Boundary (Figure 1). The site terrain is variable and ranges from steeply sloping hills in the north and west to the relatively level floodplain of the Susquehanna Riverlands in the east. The net topographic relief is approximately 500 feet (152 m).

A total of approximately 623 acres (252 ha) of plant communities and other habitats will be impacted by construction of Bell Bend NPP of which 402.4 acres (162.8 ha) will be permanent impacts and 220.3 acres (89.2 ha) will be temporary impacts. Areas to be disturbed as a result of project construction activities are contained within a defined "Limit of Disturbance," (LOD) as presented on Figure 3. The LOD was used to define the area within which roost tree survey activities would be contained, and at the time of the 2010 survey the LOD depicted approximately 236 acres (96 ha) of forested habitat to be cleared, of which 227 acres (92 ha) were upland and 8.2 acres (3.3 ha) were wetland (Table 1). In 2011, the LOD boundary was revised and based on this updated boundary, 233.5 acres (94.5 ha) of forested habitat will be cleared, of which 222.2 acres (89.9 ha) are upland and 11.3 acres (4.6 ha) are wetland (Table 2). Figure 2 shows the new proposed forest clearing within the BBNPP boundary based on the revised LOD boundary. Figure 3 shows the changes to the surveyed areas based on the 2011 LOD boundary.

2.0 INDIANA BAT ROOSTING HABITAT

The following section provides background information for the survey plan and was summarized from the U.S. Fish and Wildlife Service Draft Recovery Plan for the Indiana Bat (USFWS, 2007).

2.1 SUMMER ROOSTS

Summer roosting habitat for male Indiana bats is not well known. Males are most commonly found in the vicinity of their hibernaculum but may also disperse throughout their summer range and roost individually or in small groups.

Reproductive female Indiana bats migrate from the hibernacula to summer roosting habitat, and have shown strong site fidelity to their traditional summer roosting and foraging areas. They form maternity colonies after arriving at their summer range (late March to mid-May) and cluster in maternity roosts with suitable microclimates, which facilitate roost temperatures favorable for prenatal and postnatal development. Maternity colonies most commonly consist of 60 to 100 adult females but may be larger, and may include females from more than one hibernaculum. Composition of the colony is fluid with females moving between as many as 10 to 20 different maternity roost trees. The majority of female bats use one to three primary maternity roost trees, while the rest of the trees are alternate or secondary maternity roosts that are intermittently used by small numbers of females throughout the summer, or on only a few days, or as temporary night roosts.

Maternity colonies may occupy maternity roost trees for a number of years; however all maternity roost trees are ephemeral and become unusable by losing important structural characteristics such as bark, or by falling to the ground, or due to competition with other animals. The use of alternate maternity roost trees is thought to be a behavioral mechanism that enables bats to evaluate new trees for use as future primary maternity roosts.

Summer roosting habitat for non-reproductive female Indiana bats is less well known. They may remain close to their hibernaculum or migrate to summer habitat where they roost individually or in small numbers. Typically, non-reproductive females do not roost in maternity colonies but may be present in the same trees as reproductive females.

2.2 FALL ROOSTS

Beginning in the late summer and into the fall, Indiana bats return to the vicinity of their hibernacula and engage in swarming behavior, which peaks in September and early October. This behavior is characterized by large numbers of bats moving in and out of hibernacula at night but with few roosting inside during daylight hours. Instead, the bats tend to roost individually in surrounding forests. Mating occurs during the swarming period and bats also feed heavily to build up fat reserves for hibernation. Indiana bats may travel considerable distances from their hibernacula to foraging areas based on the level of competition for food resources, with those from hibernacula with large numbers of Indiana and/or other bats most likely traveling furthest. Limited radio telemetry studies during fall swarming have shown Indiana bats traveling as far as 19 miles (31 km) in a single night in Indiana and up to 9 miles (14 km) over several weeks in Pennsylvania.

2.3 ROOST TREE CHARACTERISTICS

Indiana bats roost under the exfoliating bark of trees and occasionally in longitudinal crevices within trees but rarely use cavities created by rot or woodpeckers. For maternity roosts (primary and alternate), females prefer dead or nearly dead trees, or dead parts of living trees such as dead trunks of trees with multiple trunks. They are occasionally found on living trees with lose peeling bark; however, these trees are thought to be used primarily as alternate maternity roosts during exceptionally warm or wet weather. A wide variety of tree species are used for maternity roosts and use is primarily related to local availability of trees with suitable structure rather than a preference for a particular species. In addition, regional differences in maternity roost tree characteristics may result from influencing factors such as weather and altitude.

Maternity roost trees are typically found in areas with high solar exposure such as openings within a forest, in a fence line, or along a wooded edge. Higher solar exposure creates warmer roosting sites and, thereby, facilitates faster prenatal and postnatal development of young bats. Female Indiana bats may use structurally suitable trees in more interior sections of forest as maternity roosts during exceptionally warm or wet weather. Maternity roost trees vary in size, although larger diameter trees are preferred and may provide advantages for thermoregulation, as well as more roosting spaces. The average range-wide

diameter of primary maternity roost trees is 18 inches (46 cm). However, average diameters of primary and alternate maternity roost trees in several Midwestern states ranged from 16 inches (41 cm) to 24 inches (61 cm), and an alternate maternity roost tree in Pennsylvania had a diameter of only 11 inches (28 cm). The method of measuring the tree widths was not specific but is presumably diameter-at-breast height (dbh). The minimum height of maternity roost trees is typically greater than 10 feet (3 m), although the absolute height of maternity roost trees is thought to be less important than height and position relative to surrounding trees, which can affect the amount of solar exposure received by a tree.

Male Indiana bats are more flexible in their preferred summer roosting habitat. They roost in the same types of structurally suitable trees as females but not necessarily in areas with high solar exposure. In addition, male bats are more likely to roost in living trees and trees that are smaller, with a 13-inch (33 cm) average diameter range-wide.

3.0 SURVEY METHODOLOGY

Normandeau's survey was based on a study plan developed specifically for the Bell Bend NPP site, since neither the USFWS nor PGC have an official, standardized Indiana bat roost tree survey methodology. However, the USFWS provided considerable technical input to the study plan (PPL, 2010). This survey encompassed both the interior portions and edges of the Forest Areas proposed for clearing onsite. Forest Areas are defined as discrete or closely associated blocks of forest that are separated from other such areas by roads, lands formerly in agricultural use and developed properties (Figure 4). Using a sub-sampling procedure, each Forest Area was characterized by canopy cover and inventoried for potential roost trees (PRTs). Forest edges were inventoried for PRTs only. The information collected in the field was then used to determine the distribution, density, and quality of available roost trees for Indiana bats based on criteria specified by the USFWS and metrics available in the scientific literature (USDOI, 2009).

3.1 FOREST INTERIORS

Normandeau surveyed all contiguous Forest Areas in which approximately 2 acres (0.8 ha) or greater (18 total) were proposed for clearing to quantify potential Indiana bat roosting habitat (Figure 4). There were nine Forest Areas between 2 acres (0.8 ha) and 10 acres (4 ha) in size and eight Forest Areas greater than 10 acres (4 ha) in size. A small portion of Forest Area 26 was also surveyed even though it was smaller than 2 acres (0.8 ha) since temporary impacts to forested wetlands were anticipated. In total, eighteen Forest Areas were surveyed when Forest Area 26 was included. Forest areas were surveyed at the rate of one 100-ft (30 m) radius (0.72 acres, 0.29 ha) sample plot per 5 acres (2 ha), or fraction thereof, using a stratified random sampling procedure. ESRI ArcMap software was used to randomly locate plots across each impacted forest polygon. An internal 100-ft (30 m) edge buffer was applied to each Forest Area polygon to ensure that all plots fell entirely within each polygon, and each polygon was filled with randomly located plots to enable stratification for different forest communities, age classes or other features that could affect roost tree abundance. The sequence in which the plots were surveyed was also randomly ordered by the ArcMap software. When necessary, additional non-random plots were located within the forest areas to ensure that sampling was representative of all forest habitats present, particularly forested wetlands. Using sub-meter level global positioning system (GPS) units, Normandeau's field survey teams navigated to the forest plots, which were then inventoried for PRTs and characterized by species composition, species dominance, diameter (minimum, maximum and average), number of snags and stubs (See Section 3.3). PRT locations were taken with a sub-meter GPS and all data was recorded in digital format using a GPS data dictionary.

In early 2010, the BBNPP Project Boundary and LOD were slightly enlarged to accommodate on-site fill placement without impacting wetlands. These boundary changes enlarged the BBNPP site by adding lands contiguous to the previous BBNPP boundaries. As a result of these changes, additional roost tree survey activities were required to ensure that Forest Areas at BBNPP were consistently investigated and characterized; these additional surveys were completed in July, 2011.

Review of the newly defined boundaries (Figure 3) demonstrates that some of the previously surveyed Forest Areas are now outside of the LOD, and that new areas of proposed disturbance have been added to the LOD. These new additions represented approximately 37 acres (15 ha) of forest, and included large Forest Area totaling 22.1 acres (9 ha) within Forest Areas 15 and 16. These two areas were the focus of the supplemental survey activities completed in 2011. The remainder of the newly added forest consists of small, scattered forest patches not meeting the defined standard for survey. To complete the supplemental survey, two additional 100-ft [30 m] radius sample plots were surveyed in Forest Area 15, and three additional sample plots were surveyed in Forest Area 16.

It should be noted that data collected on Forest Areas that are no longer within the LOD continued to be presented in this survey report. The rational for retaining this information is that the forest no longer within the LOD is very similar in structure and species composition to the new forest added to the LOD, and is representative of habitat within and adjacent to the BBNPP.

3.2 FOREST EDGES

Normandeau biologists also inventoried all the edges of the Forest Areas proposed for clearing for all PRTs within a distance of approximately 50-feet (15 m) of the forest edge. The 50-foot (15 m) margin has been used in published scientific studies (Callahan et al., 1997) and represents a conservative boundary for identifying suitable roost trees along forest edges that are likely to receive increased solar radiation relative to trees located in forest interior habitats. Locations and data for these PRTs were recorded with a GPS as noted above.

As described in Section 3.1, changes to the Project Boundary and LOD in early 2010 necessitated supplemental roost tree survey activities to ensure comprehensive evaluation of forested areas affected by BBNPP construction. Significant new forest edges were incorporated into the revised LOD associated with Forest Areas 15 and 16, and these edges were surveyed using identical methods to those employed in the 2010 survey. Accordingly, 1,007 feet (306.9 m) and 1,895 feet (577.6 m) of forest edges were evaluated at Forest Areas 15 and 16 respectively.

As done with the forest interior PRT survey, data from forest edges surveyed in 2010 that now fall outside of the LOD continue to be presented in this report. As visible on Figure 3, forest edges no longer within the LOD are very close to the LOD and exhibit similar forest structure and composition; consequently this data remains germane to this survey.

3.3 FIELD MEASUREMENTS

3.3.1 FOREST COVER

Characterization of the forest cover for each survey-plot encompassed the following information: 1) species composition, 2) dominant species, 3) diameter-at-breast-height (dbh) - maximum, minimum and average, 4) number of snags, 5) number of stubs, 6) date, 7) surveyor, 8) sampling location. Forest cover field measurements are explained in more detail below.

1) Species composition: All trees in the plot were identified to species and a list of species was compiled.

2) Dominant species: Dominance was determined based on a visual assessment of the number and relative dbh of stems, and overall canopy cover of each tree species.

3) Diameter-at-breast-height (dbh): The maximum, minimum and average dbh was determined by measuring a representative subsample of trees with a Biltmore stick. Typically, dbh is measured at a height of 4.5 feet (1.4 m) on the uphill side of a tree.

4) Number of snags: Snags were defined as dead trees that still have branches and an overall tree-like form. This count was for snags within each forest area that were not structurally suitable as roost trees and, therefore, did not qualify as PRTs.

5) Number of stubs: Stubs were defined as the remaining trunks of long dead trees that were still standing but generally lacked branches and no longer had a tree-like form. This count was for stubs within each forest area that were not structurally suitable as roost trees and, therefore, did not qualify as PRTs.

6) Date: The date of the survey was recorded as MMDDYYYY.

7) Surveyor: The name of the person who identified the tree to species, measured dbh, and determined the number of snags and stubs was recorded. If more than one person contributed to the data, then a lead and assistant(s) were identified for each line of data.

8) Sampling location: The latitude and longitude near the center of each forest plot was recorded using a sub-meter GPS.

3.3.2 POTENTIAL ROOST TREES

All trees in the survey- plots were evaluated for suitability as roosts for Indiana bats using criteria specified for this study by the USFWS. A tree was designated as a PRT if it had a 5 inch (13 cm) or greater dbh and suitable roost structure in the form of exfoliating or defoliating bark, crevices and/or cavities. The following information was recorded for each PRT: 1) species, 2) diameter-at-breast-height, 3) roost tree condition (live, dead, or partially dead), 4) type of roost structure(s) (bark, crevice, and/or cavity), 5) date, 6) surveyor, 7) sampling location (GPS coordinates), and 8) roost tree potential (high, medium or low). PRT field measurements are explained in more detail below.

1) Species identification: All trees were identified to species. Dead trees and snags that were too far decayed for identification were designated as unknown.

2) Diameter-at-breast-height (dbh): The dbh of each roost tree was measured to the nearest inch using a Biltmore stick.

3) Roost tree condition (live, dead, or partially dead): Trees designated as live were healthy in appearance and had more than 80% live canopy. Trees designated as partially dead had 10-80% live canopy. Trees designated as dead encompassed snags and trees with less than 10% live canopy.

4) Type of roost structure: The type(s) of roost structure on the tree were identified as bark (exfoliating or defoliating bark), longitudinal crevices within the trunk and large branches, and/or internal cavities that were accessible by bats through above ground openings but not easily accessed by potential predators at ground level.

5) Date: The date of the survey was recorded as MMDDYYYY.

6) Surveyor: The name of the person who identified the tree to species, measured dbh, and classified roost tree condition; type of roost structure(s) and roost tree potential was recorded. If more than one person contributed to the data, then a lead and assistant(s) were identified for each line of data.

7) Sampling location: The latitude and longitude at the base of each roost tree was recorded using a sub-meter GPS. A single GPS location was taken at the center of clumps or otherwise closely associated groups of suitable roost trees; however, the trees were inventoried separately.

8) Roost tree potential - Trees were categorized as having a "high," "moderate," or "low" potential for serving as a roost tree for Indiana bats:

   High – Live, dead, and partially dead trees that are ≥16" (41 cm) dbh and have roost structure.

   Medium – Live, dead, and partially dead trees that are 9" (23 cm) to 15" (38 m) dbh and have roost structure.

   Low – Live, dead, and partially dead trees that are 5" (13 cm) to 8" (20 cm) dbh and have roost structure.

9) Setting: The location (edge or interior) in which the tree was located.

4.0 RESULTS

4.1 FOREST COVER CHARACTERIZATION

The forest cover totaling 46.2 acres (18.7 ha), of which 41.7 acres (16.9 ha) are upland and 4.5 acres (1.8 ha) are wetland, was characterized using the sub-sampling methodology described in Section 3.1. Results are presented here by forest plot (Table A-1). The majority of the upland forest cover was dominated by red maple (*Acer rubrum*) with red oak (*Quercus rubra*), white oak (*Quercus alba*), and sweet birch (*Betula lenta*) being less common dominant tree species. Red maple was also the most common subdominant tree species in upland forest plots with white oak, black cherry (*Prunus serotina*), and black oak (*Quercus velutina*) being less common subdominants. The majority of the wetland forest cover was dominated by red maple with pin oak (*Quercus palustris*), silver maple (*Acer saccharinum*), tulip poplar (*Liriodendron tulipfera*), and black locust (*Robinia pseudoacacia*) being less common dominant tree species. Pin oak was the most common subdominant tree species in wetlands followed by red maple, black cherry, black walnut (*Juglans nigra*), and river birch (*Betula lenta*). See Table A-1 for a complete list of dominant and subdominant tree species by upland and wetland forest cover plots. Other species that were commonly observed in the overstory are listed in Table 3.

A review of available archival aerial photographs for the vicinity of the Bell Bend NPP project area indicates that in 1939 most of the Forest Areas surveyed for this study had limited or no forest cover (PDCNR, 2010). However, by 1959 many of these areas had forest cover and by 1969 most but not all were vegetated by forest. Therefore, many of the mature trees onsite are at least 40 years old and some are 70 years or more in age. Our field survey indicated that the larger and older trees primarily occurred in wetlands, on steep slopes, or in generally inaccessible areas that were not historically tilled.

Across all eighteen Forest Areas surveyed (Figure 4), the minimum dbh ranged from 3 inches (8 cm) to 8 inches (20 cm) and the maximum dbh ranged from 10 inches (25 cm) to 60 inches (152 cm) (Table 4). The average number of PRTs was 14, the average number of snags was eight, and the average number of stubs was 18. For this survey, snags and stubs (defined in Section 3.3) do not qualify as PRTs due to a lack of suitable roosting structure. However, they may have been PRTs in the past and illustrate the ephemeral nature of Indiana bat roost trees.

The average maximum dbh across all Forest Area survey plots was 21 inches (53 cm) with 31 of 69 plots (45 percent) having a maximum dbh greater than 20 inches (51 cm) (Table A-1). The average minimum dbh across all plots was 4 inches (10 cm). The average number of PRTs across all plots was four. Snags

and stubs were relatively common, with only five of the 69 plots (7 percent) having no stubs or snags and 56 plots (81 percent) having more than one stub/snag.

When survey plots were separated into upland and wetland, the average minimum dbh was 4 inches (10 cm) for both upland and wetland plots. The average maximum dbh was larger across all wetland plots than upland plots (26 inches [66 cm] vs. 20 inches [51 cm]). The average number of PRTs for all upland plots and wetland plots was four and three, respectively. Snags and stubs were more common in upland plots than wetland plots, with only three of the 58 upland plots (5 percent) having no stubs or snags and two of the 11 wetland plots (18 percent) having no stubs or snags. In addition, only five of 11 wetland plots (45 percent) had more than a single stub/snag as opposed to 51 of 58 upland plots (88 percent) (Table A-1).

4.2 POTENTIAL ROOST TREES

4.2.1 INTERIOR FOREST

A total of 46.2 acres (18.7 ha) of forest was surveyed for PRTs (41.7 upland acres [16.9 ha], 4.5 wetland acres [1.8 ha]). Out of the 255 PRTs in the interior forest survey area, 118 were live, 114 were dead, and 23 were partially dead (Table 5). The average dbh for all PRTs observed in the forest interior was 14 inches (36 cm) (Table C-1). In regards to roost type, 252 PRTs offered potential roost sites in the form of exfoliating or defoliating bark, 13 PRTs had suitable crevices, and 5 PRTs had suitable cavities. A summary of interior forest PRTs by Forest Area survey plot is provided in Table B-1 and a comprehensive list of all PRTs (interior forest and edge) with individual PRT identification numbers is provided in Table C-1. The locations of survey plots, interior forest PRTs and forest edge PRTs for each surveyed Forest Area are shown in the figures enclosed in Appendix D. Photographs of representative PRTs are provided in Appendix E.

PRT densities were evaluated for the site as a whole and by surveyed Forest Area against U.S. Department of the Interior (USDOI) standards for suitable Indiana bat summer habitat which recommend a minimum of 6 PRTs/acre (14.8 PRTs/ha) for interior forest. The 255 PRTs identified within the interior forest area yielded an estimated 5.5 PRTs/acre (13.6 PRTs/ha) and five of the 18 Forest Areas provided greater than 6 PRTs/acre (14.8 PRTs/ha) (Table 6). Within the upland plots, 219 PRTs were identified, yielding an estimated 5.2 PRTs/acre (13.0 PRTs/ha) and within the wetland plots, 36 PRTs were identified, yielding an estimated 8.1 PRTs/acre (19.9 PRTs/ha).

PRT quality for the surveyed area as a whole and by surveyed Forest Area was evaluated based on the density of "high," "moderate," or "low" roost trees as determined by the USFWS PRT ranking system. Seventy-eight PRTs were determined to be of high roost potential with 111 being of medium potential and 66 considered PRTs of low potential. As a whole, the interior forest portion yielded an estimate of 1.7 high PRTs/acre (4.2 high PRTs/ha), 2.4 medium PRTs/acre (5.9 medium PRTs/ha), and 1.4 low PRTs/acre (3.5 low PRTs/ha) (Table 6). Forest Areas 7, 8 and 9 had the highest numbers of high potential roost trees with 12, 11 and 27, respectively. However when analyzed by high PRTs/acre, Forest Areas 8, 10 and 11 were highest with 3.5 high PRTs/acre (8.7 high PRTs/ha), 3.9 high PRTs/acre (9.7 medium PRTs/ha) and 4.1 high PRTs/acre (10.0 low PRTs/ha), respectively.

When broken into uplands and wetlands, 60 PRTs were determined to be of high potential in the surveyed uplands with 100 being of medium potential, and 59 were considered PRTs of low potential (Table 6). The surveyed uplands portions yielded an estimate of 1.4 high PRTs/acre (3.6 high PRTs/ha), 2.4 medium PRTs/acre (5.9 medium PRTs/ha), and 1.4 low PRTs/acre (3.5 low PRTs/ha). Eighteen PRTs were determined to be of high roost potential in the surveyed wetlands with 11 being of medium potential and 7 considered PRTs of low potential. The surveyed wetlands portions yielded an estimate of 4.0 high PRTs/acre (9.9 high PRTs/ha), 2.5 medium PRTs/acre (6.1 medium PRTs/ha), and 1.6 low PRTs/acre (3.9 low PRTs/ha).

4.2.2 FOREST EDGE

Approximately 75,581ft (23,035 m) of forest edge were surveyed for the presence of PRTs. Out of the 286 PRTs identified, 192 were live, 77 were dead, and 17 were partially dead (Table 7). The average dbh for PRTs observed on the forest edge was 14 inches (36 cm) (Table C-1). In regards to roost type, 295 PRTs offered potential roost sites in the form of exfoliating or defoliating bark, 4 PRT had a crevice suitable for roosting, and 1 PRT had a cavity suitable for roosting.

PRT densities were evaluated for the site as a whole and by surveyed Forest Area edges against USDOI standards for suitable Indiana bat summer habitat which recommend a minimum of 1 PRT/500 ft (1 PRT/152 m) along forest edges. The 286 PRTs observed along the forest edge yielded 1.9 PRTs/500 ft (1.9 PRTs/152 m) with 13 of the 18 Forest Areas providing greater than 1 PRTs/500 ft (1 PRTs/152 m) (Table 8). Potential roost trees located along edges were most common in Forest Area 1 and 5 with 8.0 PRTs/500 ft (8.0 PRTs/152 m) and 5.3 PRTs/500 ft (5.3 PRTs/152 m), respectively. PRTs were absent or below 1 PRTs/500 ft in Forest Area 12, 15, 17, 25 and 29 (Table 8).

PRT quality for the surveyed area as a whole and by surveyed Forest Area edges was evaluated based on the density of "high," "moderate," or "low" roost trees as determined by the USFWS PRT ranking system. Ninety-two PRTs were determined to be of high roost potential with 121 being of medium potential and 73 considered PRTs of low potential (Table 7). The forest edges as a whole yielded an estimate of 0.6 high PRTs/500 ft (0.6 high PRTs/152 m), 0.8 medium PRTs/500 ft (0.8 medium PRTs/152 m), and 0.5 low PRTs/500 ft (0.5 low PRTs/152 m) (Table 8). Forest Areas 9, 10 and 18 had the highest numbers of high potential roost trees with 26, 10 and 19, respectively. However when analyzed by high potential PRTs/500 ft (high potential PRTs/152 m), Forest Areas 11, 16 and 18 were highest with 1.2 high PRTs/500 ft (1.2 high PRTs/152 m), 1.3 high PRTs/500 ft (1.3 high PRTs/152 m), 3.1 high PRTs/500 ft (3.1 high PRTs/152 m), respectively.

5.0 DISCUSSION

5.1 HABITAT QUALITY

The forested habitat on the Bell Bend NPP site provides abundant foraging opportunities for bats in general, including the Indiana bat. Bats often forage over water and wetlands, and along forest edges. Standing water is present in most of the wetlands on the Bell Bend NPP site, depending on time of year and precipitation received. In normal years, many of the wetlands on the Bell Bend NPP site hold water year-round. Wetlands make a small portion of the Forest Areas to be impacted (11.3 wetland acres [4.6 ha] out of approximately 233.5 forested acres [94.5 ha]). The majority of forested areas to be impacted are uplands.

5.1.1 RELATIVE ABUNDANCE OF PRTS IN FOREST INTERIOR AND EDGE

Interior forest areas surveyed for this study as a whole, and when subdivided into wetlands and uplands essentially met or exceeded the recommended 6 PRTs/acre (14.8 PRTs/ha) for suitable Indiana bat summer roosting habitat (USDOI, 2009). Wetlands at 8.1 PRTs/acre (19.9 PRTs/ha) exceeded the threshold, and interior forest as a whole (5.5 PRTs/acre [13.6 PRTs/ha]) and uplands (5.2 PRTs/acre [13.0 PRTs/ha]) were just slightly below the threshold (Figure 5). Analysis by Forest Area illustrated the patchy nature of PRT distribution (Figure 6). Five Forest Areas (1, 8, 9, 10, and 12) ranged from 6.6 PRTs/acre (16.1 PRTs/ha) to 19.4 PRTs/acre (48.3 PRTs/ha) and exceeded the threshold while Forest Area 11 was slightly below the threshold at 5.5 PRTs/acre (13.3 PRTs/ha) (Table 6). The remaining Forest Areas provided moderate to low PRT densities at 4.7 PRTs/ acre (11.6 PRTs/ha) to 0.7 PRTs/acre (1.7 PRTs/ha).

Surveyed Forest Area edges also provide PRTs at densities suitable for Indiana bat summer roosting habitat. At 1.9 PRTs/500 ft (1.9 PRTs/152 m), the surveyed forest edge as a whole exceeds the USDOI

recommended 1 PRT/500 ft (1 PRT/152 m). When analyzed by Forest Area, 13 of the 18 forest areas (1, 3, 5, 7, 8, 9, 10, 11, 13, 14, 16, 18, and 26) at 1.1 PRTS/500 ft (1.1 PRTs/152 m) to 8.0 PRTs/500 ft (8.0 PRTs/152 m) exceeded the USDOI threshold (Table 8). Potential roost trees were most common along edges in Forest Area 1 and 5 with 8.0 PRTs/500 ft (8.0 PRTs/152 m) and 5.3 PRTs/500 ft (5.3 PRTs/152 m), respectively. PRTs were absent or below 1 PRTs/500 ft (1 PRTs/152 m) in Forest Area 12, 15, 17, 25 and 29, only, which ranged from 0 PRTs/500 ft (0 PRTs/152 m) to 0.7 PRTs/500 ft (0.7 PRTs/152 m).

5.1.2 RELATIVE ABUNDANCE OF HIGH PRTS IN FOREST INTERIOR AND EDGE

Alternatively, the concentration of high potential, PRTs as specified by the USFWS, may be used to determine the surveyed Forest Areas that may serve as the most suitable summer habitat for Indiana bats. The surveyed interior forest as a whole yielded an estimate of 1.7 high PRTs/acre (4.2 high PRTs/ha), 2.4 medium PRTs/acre (5.9 medium PRTs/ha), and 1.4 low PRTs/acre (3.6 low PRTs/ha). Forest Areas 8, 10 and 11 had the greatest densities of high PRTs/acre at 3.5 high PRTs/acre (8.7 high PRTs/ha), 3.9 high PRTs/acre (9.7 medium PRTs/ha) and 4.1 high PRTs/acre (10.0 low PRTs/ha), respectively (Figure 6).

Subdividing the interior forest into wetlands and uplands indicated that wetlands provided higher densities of high PRTs (4.0 high PRTs/acre [9.9 high PRTs/ha] vs. 1.4 high PRTs/acre [3.6 high PRTs/ha]), similar densities of medium PRTs (2.5 medium PRTs/acre [6.1 medium PRTs/ha] vs. 2.4 medium PRTs/acre [5.9 medium PRTs/ha]) and similar densities of low PRTs (1.6 low PRTs/acre [3.9 low PRTs/ha] vs. 1.4 low PRTs/acre [3.5 low PRTs/ha]).

The surveyed Forest Area edges as a whole yielded an estimate of 0.6 high PRTs/500 ft (0.6 high PRTs/152 m), 0.8 medium PRTs/500 ft (0.8 medium PRTs/152 m), and 0.5 low PRTs/500 ft (0.5 low PRTs/152 m). Forest Areas 11, 16 and 18 had the greatest densities of high PRTs/acre (high PRTs/152 m) with 1.2 high PRTs/500 ft (1.2 high PRTs/152 m), 1.3 high PRTs/500 ft (1.3 high PRTs/152 m), 3.1 high PRTs/500 ft (3.1 high PRTs/152 m), respectively.

6.0 CONCLUSIONS

Some of the interior forest and many of the forest edges surveyed for this study provided densities of PRTs suitable for Indiana bat roosting habitat based on USDOI criteria. For interior forest, five Forest Areas (1, 8, 9, 10, and 12) exceeded the USDOI recommended threshold of 6 PRTs/acre (14.8 PRTs/ha). Forest Area 11 was just slightly below the threshold and the remaining Forest Areas (3, 5, 7, 13, 14, 15, 16, 17, 18, 25 and 26) were below the threshold. For forest edges, 13 of the 18 Forest Areas (1, 3, 5, 7, 8, 9, 10, 11, 13, 14, 16, 18, and 26) exceeded the USDOI recommended threshold of 1 PRT/500 ft (1 PRT/152 m). PRTs were absent or below the threshold along the edges of Forest Area 12, 15, 17, 25 and 29.

Additionally, based on the USDOI and USFWS criteria, forested wetlands provided higher quality roosting habitat than forested uplands at the site. Forested wetlands had higher overall densities of interior forest PRTs and higher overall densities of high PRTs than upland forests.

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TABLES

Table 1. Summary of Proposed Upland and Wetland Forest Clearing Impacts Within the Bell Bend NPP Project Site (2010 LOD Boundary).[1]

Forest	Pre-construction Size		Post-construction Size		Total Forest Impact [3]		Uplands Forest Impact [3]		Wetlands Forest Impact [3, 4]		Number of Survey Plots [5]		
Area [2]	Acres	Hectares	Acres	Hectares	Acres	Hectares	Acres	Hectares	Acres	Hectares	Uplands	Wetlands	Total
1	53.45	21.63	48.95	19.81	4.50	1.82	4.50	1.82	NI	NI	1	0	1
2	16.31	6.60	16.24	6.57	0.07	0.03	0.07	0.03	NI	NI	0	0	0
3	32.65	13.21	13.27	5.37	19.39	7.85	19.39	7.85	NI	NI	4	0	4
4	5.39	2.18	5.39	2.18	NI	NI	NI	NI	NI	NI	0	0	0
5	60.69	24.56	52.76	21.35	7.92	3.21	7.92	3.21	NI	NI	2	0	2
6	8.47	3.43	8.47	3.43	NI	NI	NI	NI	NI	NI	0	0	0
7	59.12	23.92	32.14	13.01	26.97	10.92	26.97	10.92	NI	NI	6	0	6
8	20.72	8.38	3.58	1.45	17.14	6.94	16.16	6.54	0.99	0.40	3	2	5
9	85.80	34.72	30.20	12.26	55.60	22.46	50.03	20.21	5.57	2.25	10	4	14
10	14.45	5.84	5.85	2.37	8.60	3.47	8.52	3.45	0.08	0.03	2	2	4
11	5.16	2.09	2.84	1.15	2.32	0.94	2.31	0.94	0.01	0.00	1	1	2
12	17.05	6.90	5.09	2.07	11.96	4.83	10.82	4.37	1.14	0.46	2	1	3
13	16.49	6.67	13.31	5.39	3.18	1.29	3.18	1.29	NI	NI	1	0	1
14	21.63	8.75	0	0	21.63	8.75	21.63	8.75	NI	NI	5	0	5
15	26.00	10.52	9.12	3.69	16.89	6.83	16.89	6.83	NI	NI	4	0	4
16	15.04	6.09	13.02	5.27	2.02	0.82	2.02	0.82	NI	NI	1	0	1
17	194.41	78.54	172.82	69.80	21.59	8.74	21.59	8.74	NI	NI	5	0	5
18	17.80	7.19	13.19	5.33	4.61	1.86	4.61	1.86	NI	NI	2	0	2
19	4.14	1.68	4.14	1.68	NI	NI	NI	NI	NI	NI	0	0	0
20	2.37	0.96	2.37	0.96	NI	NI	NI	NI	NI	NI	0	0	0
21	14.71	5.95	14.71	5.95	NI	NI	NI	NI	NI	NI	0	0	0

Table 1. Continued.

Forest Area [2]	Pre-construction Size		Post-construction Size		Total Forest Impact [3]		Uplands Forest Impact [3]		Wetlands Forest Impact [3, 4]		Number of Survey Plots [5]		
	Acres	Hectares	Acres	Hectares	Acres	Hectares	Acres	Hectares	Acres	Hectares	Uplands	Wetlands	Total
22	17.11	6.93	17.11	6.93	NI	NI	NI	NI	NI	NI	0	0	0
23	5.32	2.15	5.32	2.15	NI	NI	NI	NI	NI	NI	0	0	0
24	9.62	3.89	9.61	3.89	0.01	0.00	0.01	0.00	NI	NI	0	0	0
25	19.14	7.75	11.71	4.74	7.43	3.01	7.43	3.01	NI	NI	2	0	2
26	29.67	11.99	28.37	11.46	1.30	0.53	1.30	0.53	0 [6]	0	1	0	1
27	19.07	7.70	19.07	7.70	NI	NI	NI	NI	NI	NI	0	0	0
28	0.33	0.13	0.33	0.13	NI	NI	NI	NI	NI	NI	0	0	0
29	49.12	18.19	46.73	17.22	2.39	0.97	1.98	0.79	0.41 [6]	0.16	1	1	2
30	2.09	0.85	2.09	0.85	NI	NI	NI	NI	NI	NI	0	0	0
31	0.11	0.05	0.04	0.02	0.07	0.03	0.07	0.03	NI	NI	0	0	0
32	1.86	0.75	1.86	0.75	NI	NI	NI	NI	NI	NI	0	0	0
33	0.88	0.36	0.88	0.36	NI	NI	NI	NI	NI	NI	0	0	0
Total =	846.17	340.55	610.58	245.27	235.58	95.28	227.39	91.99	8.20	3.30	53	11	64

[1] Based on Sargent & Lundy Limit of Disturbance drawing SK-12198-421-001, rev. 1, 4/14/10; BBNPP NRC Environmental Report - Section 2.4.1, Plant Communities Map, Figure 2.4.1-2, rev. 2, 10/01/2010; and BBNPP Wetlands Delineation and Exceptional Values Analysis Report (rev. 5, November 2010).

[2] See Figure 3. Bell Bend NPP Forest Areas.

[3] No impact = NI and 0.00 indicates that impacts were less than 1/100 of an acre/hectare.

[4] Wetlands data is based on BBNPP NRC Environmental Report - Section 2.4.1, Plant Communities Map, Figure 2.4.1-2 (rev. 2, 10/01/2010), and BBNPP Wetlands Delineation and Exceptional Values Analysis Report (rev. 5, November 2010).

[5] Wetland forest areas proposed for clearing were surveyed in their entirety except for Forest Area 9.

[6] Temporary forested wetlands impacts associated with pipelines in Forest Areas 26 and 29 are currently unknown.

Table 2. Summary of Proposed Upland and Wetland Forest Clearing Impacts Within the Bell Bend NPP Project Site (2011 LOD Boundary).[1]

Forest Area [2]	Pre-construction Size		Post-construction Size		Total Forest Impact [3]		Uplands Forest Impact [3]		Wetlands Forest Impact [3, 4]		Number of Survey Plots		
	Acres	Hectares	Acres	Hectares	Acres	Hectares	Acres	Hectares	Acres	Hectares	Uplands	Wetlands	Total
1	60.33	24.41	55.29	22.37	5.04	2.04	5.04	2.04	0.00	0.00	1	0	1
2	18.15	7.34	18.01	7.28	0.14	0.06	0.14	0.06	NI	NI	0	0	0
3	34.79	14.08	12.02	4.86	22.77	9.22	21.28	8.61	1.50	0.61	4	0	4
4	6.60	2.67	6.60	2.67	NI	NI	NI	NI	NI	NI	0	0	0
5	57.02	23.08	49.82	20.16	7.20	2.92	6.76	2.74	0.45	0.18	2	0	2
6	10.09	4.08	10.09	4.08	NI	NI	NI	NI	NI	NI	0	0	0
7	58.12	23.52	36.89	14.93	21.23	8.59	21.23	8.59	NI	NI	6	0	6
8	20.69	8.37	5.55	2.24	15.14	6.13	14.47	5.86	0.67	0.27	3	2	5
9	85.81	34.73	29.52	11.95	56.29	22.78	49.89	20.19	6.40	2.59	10	4	14
10	13.45	5.44	9.97	4.04	3.47	1.40	3.39	1.37	0.08	0.03	1	2	3
11	5.16	2.09	2.88	1.17	2.28	0.92	2.28	0.92	NI	NI	1	1	2
12	17.09	6.92	6.48	2.63	10.61	4.29	9.57	3.87	1.04	0.42	2	1	3
13	17.51	7.09	15.24	6.17	2.27	0.92	2.27	0.92	NI	NI	1	0	1
14	22.30	9.02	0.27	0.10	22.03	8.92	22.03	8.92	NI	NI	5	0	5
15	26.09	10.56	0.34	0.14	25.75	10.42	25.75	10.42	NI	NI	6	0	6
16	16.69	6.76	0.49	0.20	16.21	6.56	16.21	6.56	NI	NI	4	0	4
17	198.06	80.15	189.03	76.49	9.04	3.66	9.04	3.66	NI	NI	1	0	1
18	33.19	13.43	28.49	11.53	4.70	1.90	4.70	1.90	NI	NI	2	0	2
19	4.08	1.65	4.08	1.65	NI	NI	NI	NI	NI	NI	0	0	0
20	2.47	1.00	2.47	1.00	NI	NI	NI	NI	NI	NI	0	0	0
21	14.71	5.95	14.71	5.95	NI	NI	NI	NI	NI	NI	0	0	0

Table 2. Continued.

Forest	Pre-construction Size		Post-construction Size		Total Forest Impact [3]		Uplands Forest Impact [3]		Wetlands Forest Impact [3, 4]		Number of Survey Plots		
Area [2]	Acres	Hectares	Acres	Hectares	Acres	Hectares	Acres	Hectares	Acres	Hectares	Uplands	Wetlands	Total
22	17.38	7.03	17.38	7.03	NI	NI	NI	NI	NI	NI	0	0	0
23	5.31	2.15	5.31	2.15	0.00	0.00	0.00	0.00	NI	NI	0	0	0
24	9.84	3.98	9.84	3.98	0.01	0.00	0.01	0.00	NI	NI	0	0	0
25	19.10	7.73	14.47	5.86	4.63	1.87	4.63	1.87	0.00	0.00	1	0	1
26	31.51	12.75	31.31	12.67	0.20	0.08	NI	NI	0.20	0.08	0	0	0
27	22.90	9.27	22.90	9.27	NI	NI	NI	NI	NI	NI	0	0	0
28	0.33	0.13	0.33	0.13	NI	NI	NI	NI	NI	NI	0	0	0
29	49.08	19.86	46.22	18.71	2.85	1.15	1.84	0.74	1.01	0.41	1	1	2
30	2.54	1.03	2.53	1.02	0.02	0.01	0.02	0.01	NI	NI	0	0	0
31	0.33	0.14	0.19	0.08	0.15	0.06	0.15	0.06	NI	NI	0	0	0
32	1.62	0.66	1.43	0.58	0.19	0.08	0.19	0.08	NI	NI	0	0	0
33	2.73	1.11	1.41	0.58	1.32	0.53	1.32	0.53	NI	NI	0	0	0
Total =	885.08	358.18	651.55	263.65	233.53	94.51	222.18	89.92	11.34	4.59	51	11	62

[1] Based on Pennoni Associates Limit of Disturbance drawing, rev. 2, 8/25/11; BBNPP NRC Environmental Report - Section 2.4.1, Plant Communities Map, Figure 2.4.1-2, rev. 5, 9/2011; and BBNPP Wetlands Delineation and Exceptional Values Analysis Report (rev. 7, September 2011).

[2] See Figure 3. Bell Bend NPP Forest Areas.

[3] No impact = NI and 0.00 indicates that impacts were less than 1/100 of an acre/hectare.

[4] Wetlands data is based on BBNPP NRC Environmental Report - Section 2.4.1, Plant Communities Map, Figure 2.4.1-2 (rev. 5, 9/2011), and BBNPP Wetlands Delineation and Exceptional Values Analysis Report (rev. 7, September 2011).

Table 3. Trees Observed in Forest Areas at the Bell Bend NPP Project Site.

Scientific Name	Common Name
Acer saccharinum	silver maple
Acer rubrum	red maple
Ailanthus altissima	tree-of-heaven
Betula alleghaniensis	yellow birch
Betula lenta	sweet birch
Betula nigra	river birch
Betula populifolia	gray birch
Carya cordiformis	bitternut hickory
Carya ovata	shagbark hickory
Carya tomentosa	mockernut hickory
Celtis occidentalis	hackberry
Cornus florida	flowering dogwood
Fagus grandifolia	American beech
Fraxinus americana	white ash
Fraxinus pennsylvanica	green ash
Juglans nigra	black walnut
Juniperus virginiana	eastern red cedar
Liriodendron tulipifera	yellow poplar
Malus spp.	apples
Nyssa sylvatica	black gum
Pinus resinosa	red pine
Pinus strobus	eastern white pine
Pinus sylvestris	Scots pine
Platanus occidentalis	American sycamore
Populus deltoides	eastern cottonwood
Populus tremuloides	quaking aspen
Prunus serotina	black cherry
Quercus alba	white oak
Quercus bicolor	swamp white oak
Quercus palustris	pin oak
Quercus rubra	northern red oak
Quercus velutina	black oak
Robinia pseudoacacia	black locust
Sassafras albidum	sassafras
Tilia americana	American basswood
Tsuga canadensis	eastern hemlock
Ulmus rubra	slippery elm

Table 4. Characteristics of Forest Cover Areas Proposed for Clearing at the Bell Bend NPP Project Site.

Forest Area Number	Dominant Tree Species	Subdominant Tree Species	Maximum DBH[1] Range		Minimum DBH[1] Range		Average DBH[1] Range		Number of PRTs[2]	Number of Snags[3]	Number of Stubs[4]
			Inches	Centimeters	Inches	Centimeters	Inches	Centimeters			
1	Red oak	Mockernut hickory	20	51	3	8	12	30	14	6	19
3	Red maple	none	15 to 30	38 to 76	3	8	10 to 12	25 to 30	8	14	27
5	White oak, Red pine	none	10 to 14	25 to 36	3	8	8 to 9	20 to 23	1	8	32
7	White oak, Red oak, Red maple	Red oak, White oak, Black oak, Black cherry	17 to 30	43 to 76	3 to 4	8 to 10	10 to 14	25 to 36	20	14	37
8	Shagbark hickory, Red maple, Sweet birch, Black locust	White oak, Red maple, Black walnut	11 to 16	28 to 41	3 to 6	8 to 15	7 to 12	18 to 30	38	22	16
9	Red maple, White oak, Red oak, Sweet birch, Mockernut hickory, Red pine, Tulip poplar	Red maple, Red oak, Pin oak, Black cherry	12 to 60	30 to 152	3 to 8	8 to 20	6 to 23	15 to 58	80	21	50
10	Red oak, Red maple, Pin oak	Red maple, Black cherry	23 to 33	58 to 84	4 to 6	10 to 15	9 to 15	23 to 38	10	3	9
11	White pine, Pin oak	none	11 to 23	28 to 58	3 to 5	8 to 13	6 to 14	15 to 36	4	1	3
12	Black oak, Red maple, Sweet birch	Pin oak, Black oak	14 to 28	36 to 71	3 to 4	8 to 10	9 to 13	23 to 33	17	2	20
13	Sweet birch	none	22	56	5	13	12	30	2	0	2
14	Red maple	none	11 to 18	28 to 46	3 to 4	8 to 10	8 to 10	20 to 25	17	5	8
15	Quaking aspen, Sassafras, Red maple, Black oak	Red maple, Scots pine	10 to 21	25 to 53	3 to 7	8 to 18	7 to 10	18 to 25	12	13	31
16	Red oak, Black oak, Black cherry	Red maple, Scots pine, Mockernut hickory	15 to 26	38 to 66	4 to 6	10 to 15	9 to 12	23 to 30	9	6	12
17	Red maple	none	16 to 24	41 to 61	3 to 4	8 to 10	10 to 12	25 to 30	10	12	37
18	White pine, Silver maple	none	12 to 17	30 to 43	4 to 7	10 to 18	10 to 11	25 to 28	5	7	0
25	White oak, Black cherry	none	16 to 40	41 to 102	3 to 4	8 to 10	10 to 12	25 to 30	5	2	6
26	White oak	Red maple	18	46	5	13	12	30	2	1	2
29	Red oak, Silver maple	River birch	17 to 42	43 to 107	3 to 5	8 to 13	10 to 15	25 to 38	1	2	15
							Cumulative Forest Area Totals		**255**	**139**	**326**
							Cumulative Forest Area Averages		**14**	**8**	**18**

[1]DBH = Diameter at breast height

[2]PRTs = Potential Roost Trees

[3]Number of snags = snags that didn't qualify as roost trees

[4]Number of stubs = stubs that didn't qualify as roost trees

Table 5. Indiana Bat (*Myotis sodalis*) Potential Roost Trees in the Interior Forest Areas at the Bell Bend NPP Project Site.

Forest Area Survey Plot		DBH Range [1]		Condition			Roost Type			Roost Potential		
Number	Tree Species	Inches	Centimeters	Live	PD [2]	Dead	Bark	Crevice	Cavity	Low	Medium	High
1	Red oak, White oak, Black oak, Shagbark hickory, Unknown	7 to 16	18 to 41	3	0	11	14	0	0	5	8	1
3	Black cherry, Red maple, White pine	9 to 21	23 to 53	2	4	2	8	0	0	0	7	1
5	Shagbark hickory	8	20	1	0	0	1	0	0	1	0	0
7	Red maple, White oak, Red oak, Black walnut, Red pine, Black cherry, Sassafras, Unknown	7 to 32	18 to 81	9	4	7	19	2	2	2	6	12
8	Red maple, Shagbark hickory, White ash, Black cherry, White oak, Scots pine, Sweet birch, Black locust, American basswood	6 to 25	15 to 64	24	2	12	38	4	1	7	20	11
9	Red maple, White ash, Black cherry, Red pine, Shagbark hickory, White oak, Pin oak, River	5 to 60	13 to 152	48	8	24	79	5	1	17	36	27
10	Shagbark hickory, White oak, Red oak, Red maple, Black gum, Unknown	7 to 28	18 to 71	7	1	2	9	1	1	0	4	6
11	White pine, White oak, Unknown	14 to 36	36 to 91	2	0	2	4	1	0	0	1	3
12	Shagbark hickory, White oak, White pine, Unknown	6 to 28	15 to 71	9	0	8	17	0	0	1	11	5
13	Sweet birch, Unknown	20 to 23	51 to 58	1	0	1	2	0	0	0	0	2
14	Red maple, Unknown	6 to 13	15 to 33	2	0	15	17	0	0	12	5	0
15	Red maple, Red pine, Quaking aspen, Sassafras	6 to 13	15 to 33	0	4	8	12	0	0	4	8	0
16	Red maple, Black oak	7 to 34	18 to 86	3	0	6	9	0	0	5	0	4
17	Red maple, Bigtooth aspen, Unknown	6 to 13	15 to 33	1	0	9	10	0	0	8	2	0
18	White pine, Silver maple	7 to 21	18 to 53	2	0	3	5	0	0	2	0	3
25	White oak, Black cherry, Unknown	7 to 40	18 to 102	3	0	2	5	0	0	1	3	1
26	Shagbark hickory, White oak, Black cherry, Black locust, Unknown	40 to 46	102 to 117	1	0	1	2	0	0	0	0	2
29	Unknown	15	38	0	0	1	1	0	0	0	0	1
	Cumulative Forest Area Totals			**118**	**23**	**114**	**252**	**13**	**5**	**66**	**111**	**78**

Notes:

[1] DBH = Diameter at breast height

[2] PD = Partially dead

Table 6. Density[2] of Interior Forest Indiana Bat (*Myotis sodalis*) Potential Roost Trees by Forest Area at the BBNPP Project Site.

	Area Surveyed		All PRTs[1]			High PRTs[1]			Medium PRTs[1]			Low PRTs[1]		
Forest Area	Acres	Hectares	**Number**	**PRTs/Acre**	**PRTs/Hectare**	**Number**	**PRTs/Acre**	**PRTs/Hectare**	**Number**	**PRTs/Acre**	**PRTs/Hectare**	**Number**	**PRTs/Acre**	**PRTs/Hectare**
1	0.72	0.29	14	19.4	48.3	1	1.4	3.4	8	11.1	27.6	5	6.9	17.2
3	2.88	1.17	8	2.8	6.8	1	0.3	0.9	7	2.4	6.0	0	0.0	0.0
5	1.44	0.58	1	0.7	1.7	0	0.0	0.0	0	0.0	0.0	1	0.7	1.7
7	4.32	1.75	20	4.6	11.4	12	2.8	6.9	6	1.4	3.4	2	0.5	1.1
8	3.15	1.27	38	12.1	29.9	11	3.5	8.7	20	6.3	15.7	7	2.2	5.5
9	9.15	3.70	80	8.7	21.6	27	3.0	7.3	36	3.9	9.7	17	1.9	4.6
10	1.52	0.62	10	6.6	16.1	6	3.9	9.7	4	2.6	6.5	0	0.0	0.0
11	0.73	0.30	4	5.5	13.3	3	4.1	10.0	1	1.4	3.3	0	0.0	0.0
12	2.47	1.00	17	6.9	17.0	5	2.0	5.0	11	4.5	11.0	1	0.4	1.0
13	0.72	0.28	2	2.8	7.1	2	2.8	7.1	0	0.0	0.0	0	0.0	0.0
14	3.60	1.46	17	4.7	11.6	0	0.0	0.0	5	1.4	3.4	12	3.3	8.2
15	4.32	1.75	12	2.8	6.9	0	0.0	0.0	8	1.9	4.6	4	0.9	2.3
16	2.88	1.17	9	3.1	7.7	4	1.4	3.4	0	0.0	0.0	5	1.7	4.3
17	3.60	1.46	10	2.8	6.8	0	0.0	0.0	2	0.6	1.4	8	2.2	5.5
18	1.44	0.58	5	3.5	8.6	3	2.1	5.2	0	0.0	0.0	2	1.4	3.4
25	1.44	0.58	5	3.5	8.6	1	0.7	1.7	3	2.1	5.2	1	0.7	1.7
26	0.72	0.29	2	2.8	6.9	2	2.8	6.9	0	0.0	0.0	0	0.0	0.0
29	1.13	0.46	1	0.9	2.2	1	0.9	2.2	0	0.0	0.0	0	0.0	0.0
Interior Forest Totals	**46.23**	**18.71**	**255**	N/A	N/A	**78**	N/A	N/A	**111**	N/A	N/A	**66**	N/A	N/A
Wetlands Totals	**4.47**	**1.81**	**36**	N/A	N/A	**18**	N/A	N/A	**11**	N/A	N/A	**7**	N/A	N/A
Uplands Totals	**41.76**	**16.90**	**219**	N/A	N/A	**60**	N/A	N/A	**100**	N/A	N/A	**59**	N/A	N/A
Interior Forest PRT[1] Density[2]	N/A	N/A	N/A	**5.5**	**13.6**	N/A	**1.7**	**4.2**	N/A	**2.4**	**5.9**	N/A	**1.4**	**3.5**
Wetlands PRT[1] Density[2]	N/A	N/A	N/A	**8.1**	**19.9**	N/A	**4.0**	**9.9**	N/A	**2.5**	**6.1**	N/A	**1.6**	**3.9**
Uplands PRT[1] Density[2]	N/A	N/A	N/A	**5.2**	**13.0**	N/A	**1.4**	**3.6**	N/A	**2.4**	**5.9**	N/A	**1.4**	**3.5**

[1]PRTs = Potential Roost Trees

[2]Density = Number of PRTs/acre (PRTs/hectare) surveyed

Table 7. Indiana Bat (*Myotis sodalis*) Potential Roost Trees along the Forest Area Edges at the Bell Bend NPP Project Site.

Forest Area		DBH Range [1]		Condition			Roost Type			Roost Potential		
Number	Tree Species	Inches	Centimeters	Live	PD[2]	Dead	Bark	Crevice	Cavity	Low	Medium	High
1	Shagbark hickory, Red maple, Sweet birch, Unknown	5 to 13	13 to 33	4	0	5	9	0	0	5	4	0
3	Shagbark hickory, Red maple, Black cherry, Red oak, Unknown	5 to 30	13 to 76	13	1	11	25	0	0	9	15	1
5	Shagbark hickory, Red maple, Black cherry, Unknown	5 to 14	13 to 36	15	0	6	21	0	0	12	9	0
7	Shagbark hickory, White pine, Red maple, White oak, Red oak, Unknown	8 to 53	20 to 135	8	0	9	17	0	0	2	7	8
8	Shagbark hickory, White oak, Red maple, White pine, Unknown	6 to 29	15 to 74	10	0	6	16	0	0	5	6	5
9	Shagbark hickory, Red oak, Black cherry, White pine, Red maple, White oak, Black oak, Unknown	5 to 45	13 to 114	77	7	10	93	1	0	25	43	26
10	Shagbark hickory, White oak, Red maple, White pine, Unknown	6 to 28	15 to 71	14	0	5	19	0	0	3	6	10
11	White oak, Red oak, Unknown	12 to 49	31 to 125	7	0	1	8	0	0	0	3	5
12	Black cherry, Red maple, White oak	7 to 19	18 to 48	4	0	2	6	0	0	2	2	2
13	Red maple, Shagbark hickory, Sweet birch	9 to 22	23 to 56	1	1	1	3	0	0	0	2	1
14	Red maple, Black cherry, Shagbark hickory, Unknown	6 to 20	15 to 51	8	1	6	15	0	0	5	8	2
15	Black oak, American sycamore, Red maple, Black cherry, Red oak, River birch	8 to 31	20 to 79	4	1	1	6	1	0	1	3	2
16	Red maple, River birch, Sassafras, Black cherry, Bigtooth aspen, Black locust, Pin oak	9 to 35	23 to 90	5	3	9	17	2	1	2	6	9
17	Red maple	9	23	0	1	0	1	0	0	0	1	0
18	Silver maple, Red maple, Unknown	6 to 48	15 to 122	16	2	2	20	0	0	1	0	19
25	Red maple, White oak, Unknown	7 to 32	18 to 81	1	0	3	4	0	0	1	2	1
26	Shagbark hickory, White oak	11 to 36	28 to 91	5	0	0	5	0	0	0	4	1
29	No potential roost trees found	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Cumulative Forest Area Totals			**192**	**17**	**77**	**295**	**4**	**1**	**73**	**121**	**92**

Notes

[1]DBH = Diameter at breast height

[2]PD = Partially dead

N/A = Not Applicable

Table 8. Density[1] of Forest Edge Indiana Bat (*Myotis sodalis*) Potential Roost Trees by Forest Area at the Bell Bend NPP Project Site.

	Distance Surveyed[2]		All PRTs[3]			High PRTs[3]			Medium PRTs[3]			Low PRTs[3]		
Forest Area	Feet	Meters	Number	PRTs/500 ft	PRTs/152 m	Number	PRTs/500 ft	PRTs/152 m	Number	PRTs/500 ft	PRTs/152 m	Number	PRTs/500 ft	PRTs/152 m
1	564	172	9	8.0	8.0	0	0.0	0.0	4	3.5	3.5	5	4.4	4.4
3	6,666	2,032	25	1.9	1.9	1	0.1	0.1	15	1.1	1.1	9	0.7	0.7
5	1,970	600	21	5.3	5.3	0	0.0	0.0	9	2.3	2.3	12	3.0	3.0
7	4,203	1,281	17	2.0	2.0	8	1.0	0.9	7	0.8	0.8	2	0.2	0.2
8	5,418	1,651	16	1.5	1.5	5	0.5	0.5	6	0.6	0.6	5	0.5	0.5
9	16,669	5,081	94	2.8	2.8	26	0.8	0.8	43	1.3	1.3	25	0.7	0.7
10	6,724	2,049	19	1.4	1.4	10	0.7	0.7	6	0.4	0.4	3	0.2	0.2
11	2,140	652	8	1.9	1.9	5	1.2	1.2	3	0.7	0.7	0	0.0	0.0
12	4,061	1,238	6	0.7	0.7	2	0.2	0.2	2	0.2	0.2	2	0.2	0.2
13	1,387	423	3	1.1	1.1	1	0.4	0.4	2	0.7	0.7	0	0.0	0.0
14	6,040	1,841	15	1.2	1.2	2	0.2	0.2	8	0.7	0.7	5	0.4	0.4
15	4,542	1,384	6	0.7	0.7	2	0.2	0.2	3	0.3	0.3	1	0.1	0.1
16	3,518	1,072	17	2.4	2.4	9	1.3	1.3	6	0.9	0.9	2	0.3	0.3
17	1,595	486	1	0.3	0.3	0	0.0	0.0	1	0.3	0.3	0	0.0	0.0
18	3,101	945	20	3.2	3.2	19	3.1	3.1	0	0.0	0.0	1	0.2	0.2
25	4,043	1,232	4	0.5	0.5	1	0.1	0.1	2	0.2	0.2	1	0.1	0.1
26	665	203	5	3.8	3.7	1	0.8	0.7	4	3.0	3.0	0	0.0	0.0
29	2,275	693	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
Forest Edge Totals	**75581**	**23035**	**286**	N/A	N/A	**92**	N/A	N/A	**121**	N/A	N/A	**73**	N/A	N/A
Forest Edge PRT[1] Density	N/A	N/A	N/A	**1.9**	**1.9**	N/A	**0.6**	**0.6**	N/A	**0.8**	**0.8**	N/A	**0.5**	**0.5**

[1]Density = Number of PRTs/500 ft (PRTs/152 m) surveyed.

[2]Linear feet (linear meters) surveyed along the edge of the forest area.

[3]PRTs = Potential Roost Trees

FIGURES

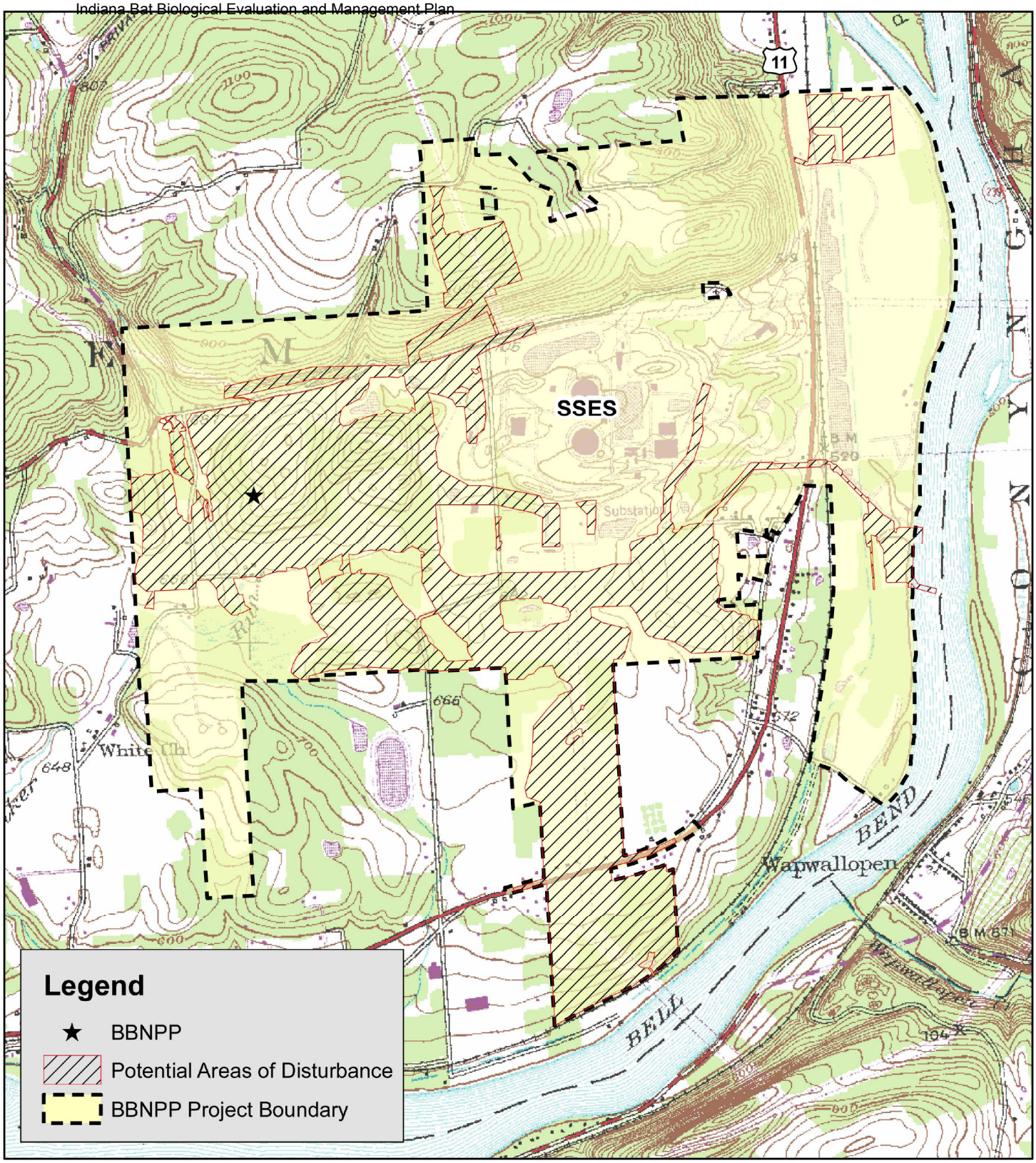

Figure 1.
Bell Bend NPP
Site Location Map

NORMANDEAU ASSOCIATES
ENVIRONMENTAL CONSULTANTS
400 Old Reading Pike, Bldg A, Suite 101 Stowe, PA 19464

date: 12/14/10
prepared by: s.sherman
project: 22474.000

rev. date: 09/13/11
prepared for: c. roche
file name: Figure1._Roost_Tree_Report

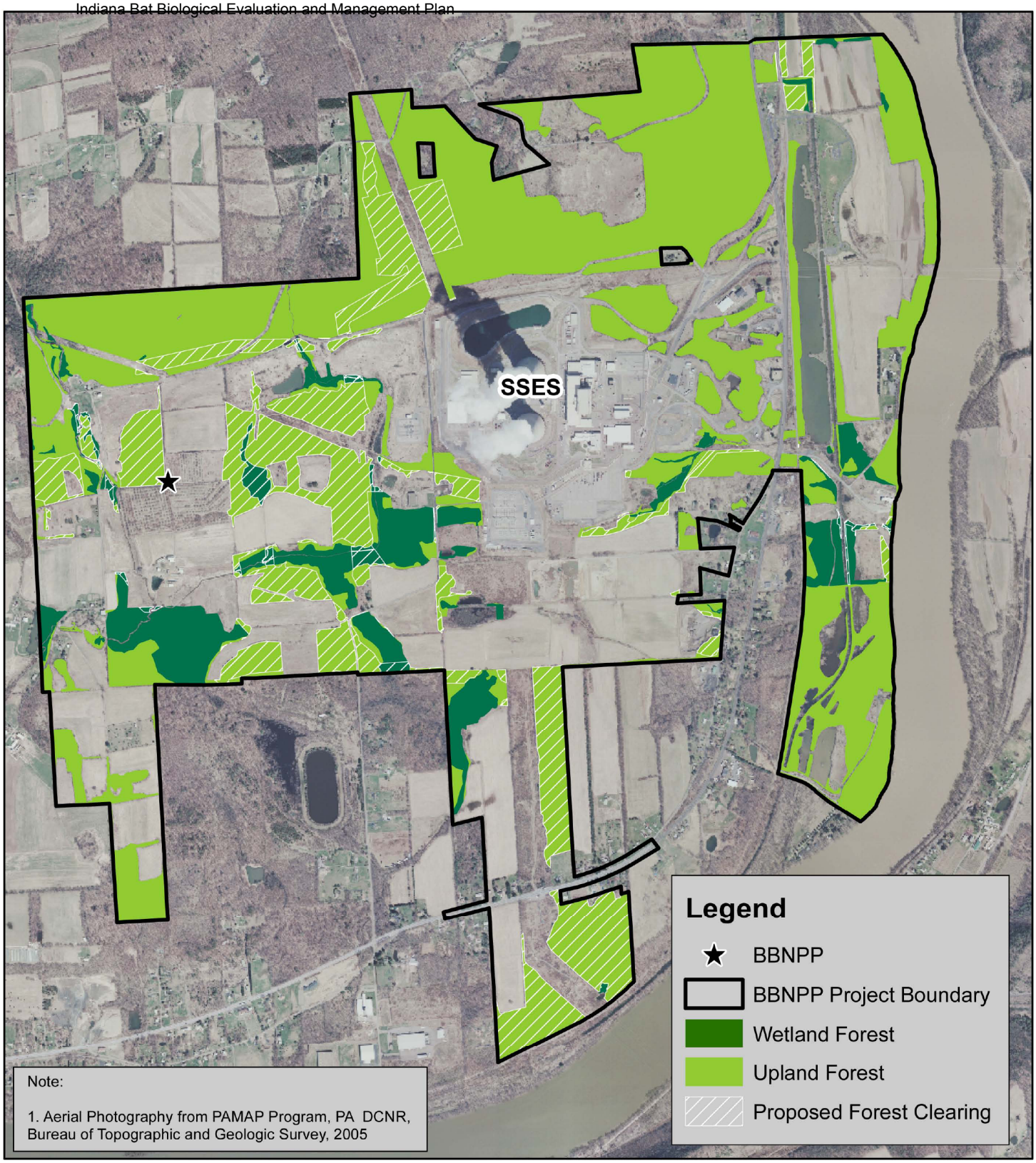

Figure 2.
Bell Bend NPP
Proposed Forest Clearing

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date: 12/12/10
prepared by: s.sherman
project: 22474.000

rev. date: 09/13/11
prepared for: c. roche
file name: Figure2.Proposed Forest Clearing

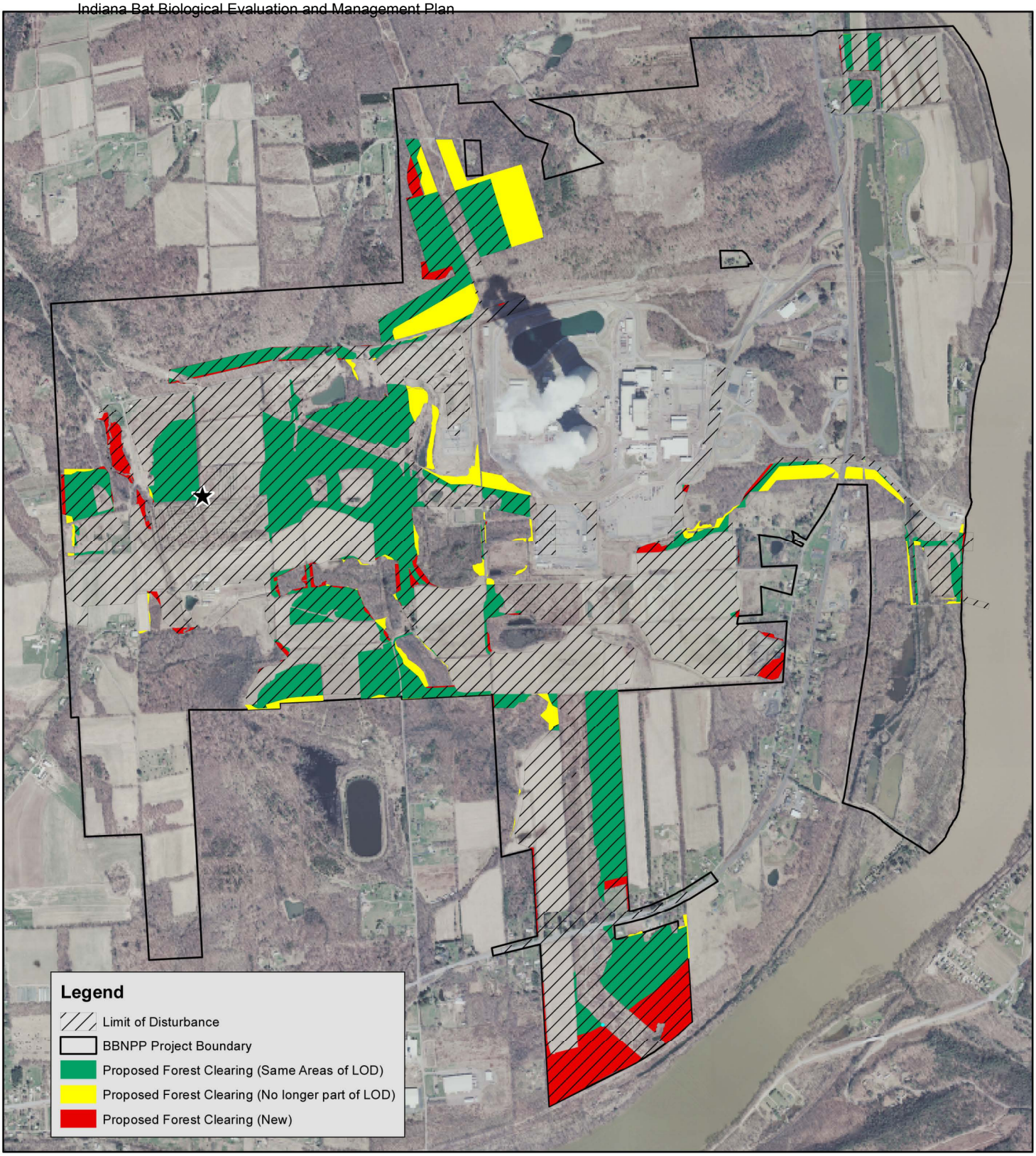

Figure 3.

Changes to Surveyed Areas with Respect to Revised LOD Boundary.

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date: 09/22/11
prepared by: s.sherman
project: 22474.000

rev. date:
prepared for: c.roche
file name: Impact_Changes

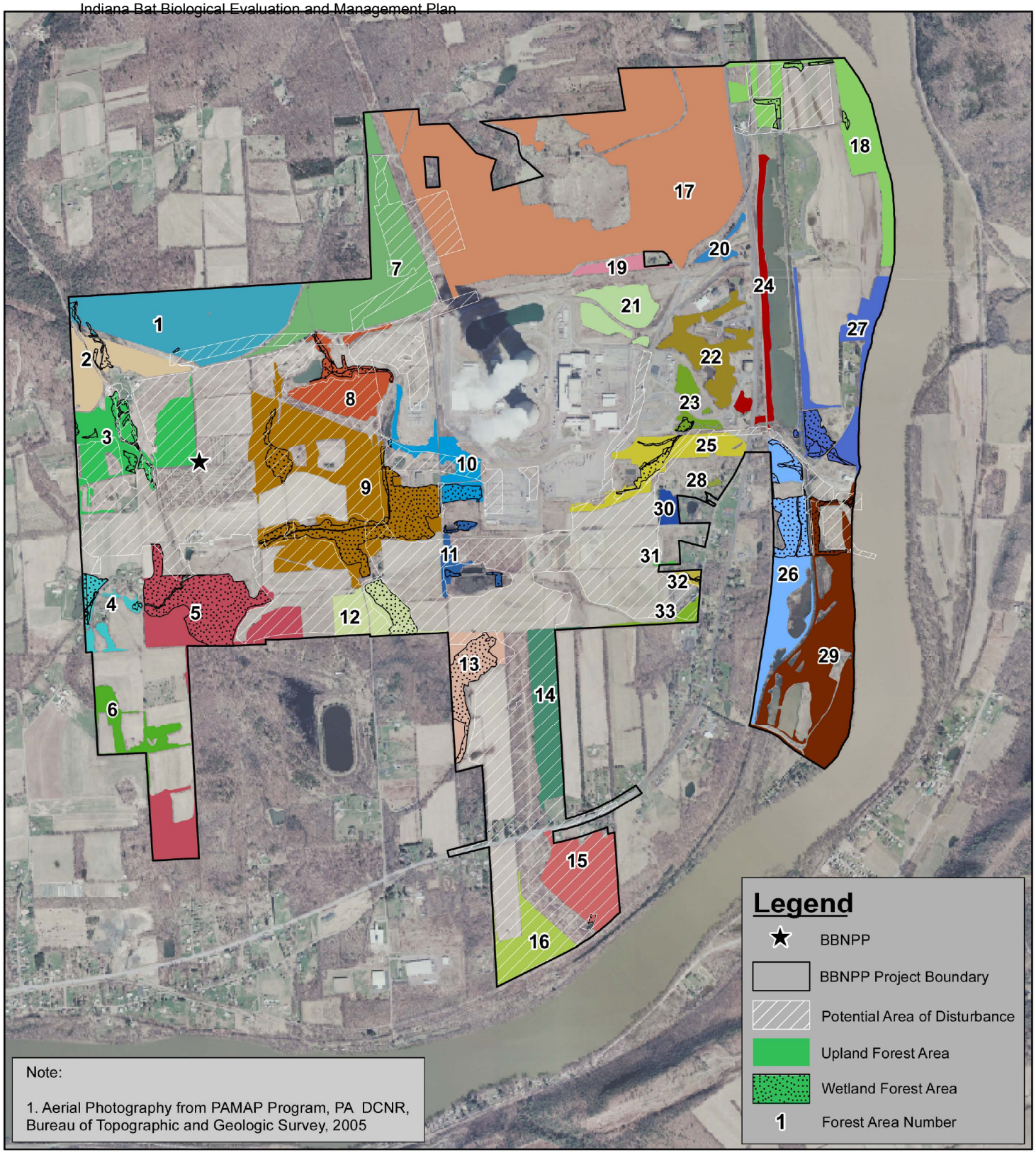

Figure 4.
Bell Bend NPP
Forest Areas

NORMANDEAU ASSOCIATES
ENVIRONMENTAL CONSULTANTS
400 Old Reading Pike, Bldg A, Suite 101 Stowe, PA 19464

date: 12/13/10
prepared by: s.sherman
project: 22474.000

rev. date: 09/13/11
prepared for: c. roche
file name: Figure4.Forest Areas

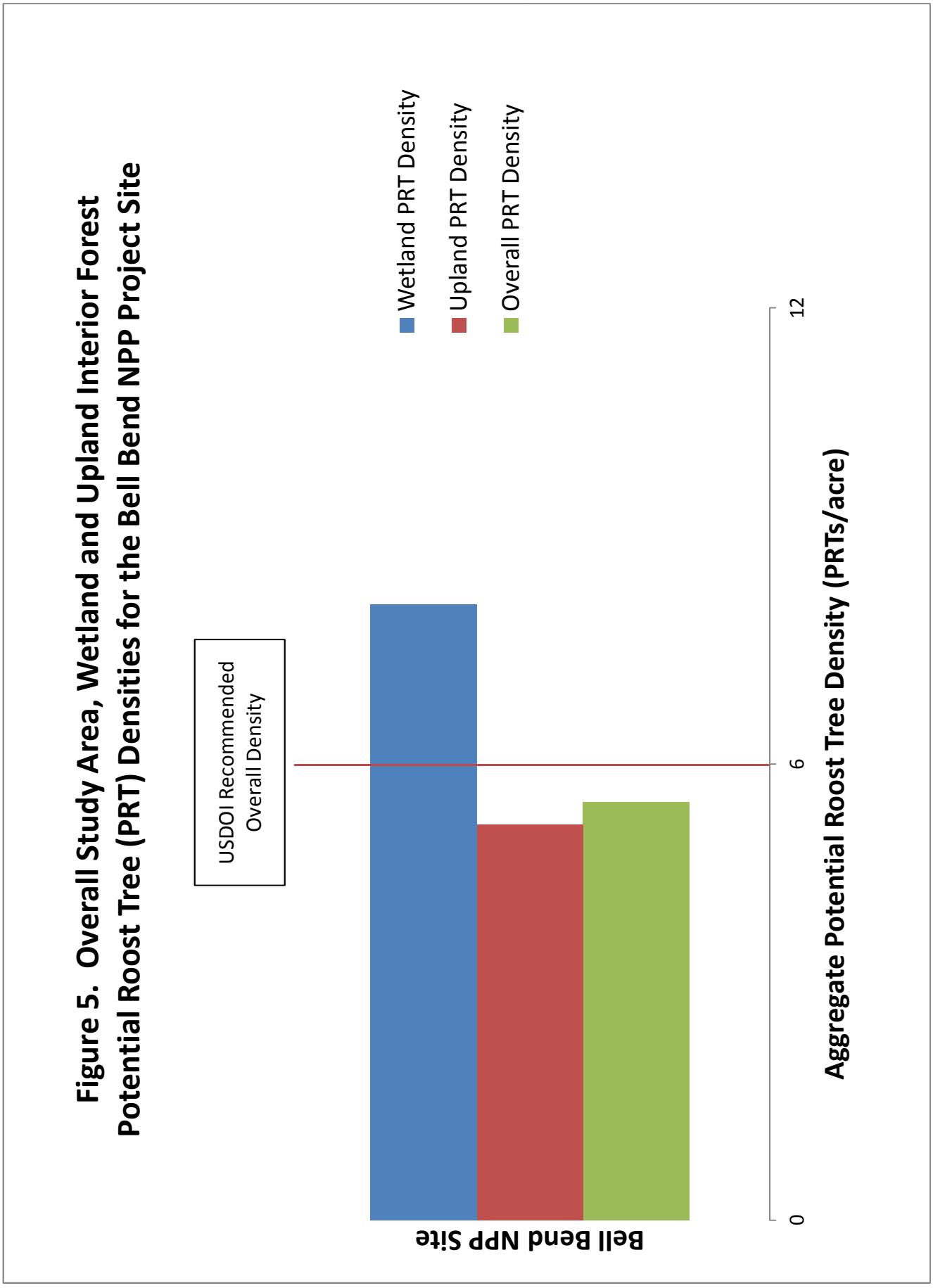
Figure 5. Overall Study Area, Wetland and Upland Interior Forest Potential Roost Tree (PRT) Densities for the Bell Bend NPP Project Site
Wetland PRT Density
Upland PRT Density
Overall PRT Density
USDOI Recommended Overall Density
Bell Bend NPP Site
0
6
12
Aggregate Potential Roost Tree Density (PRTs/acre)

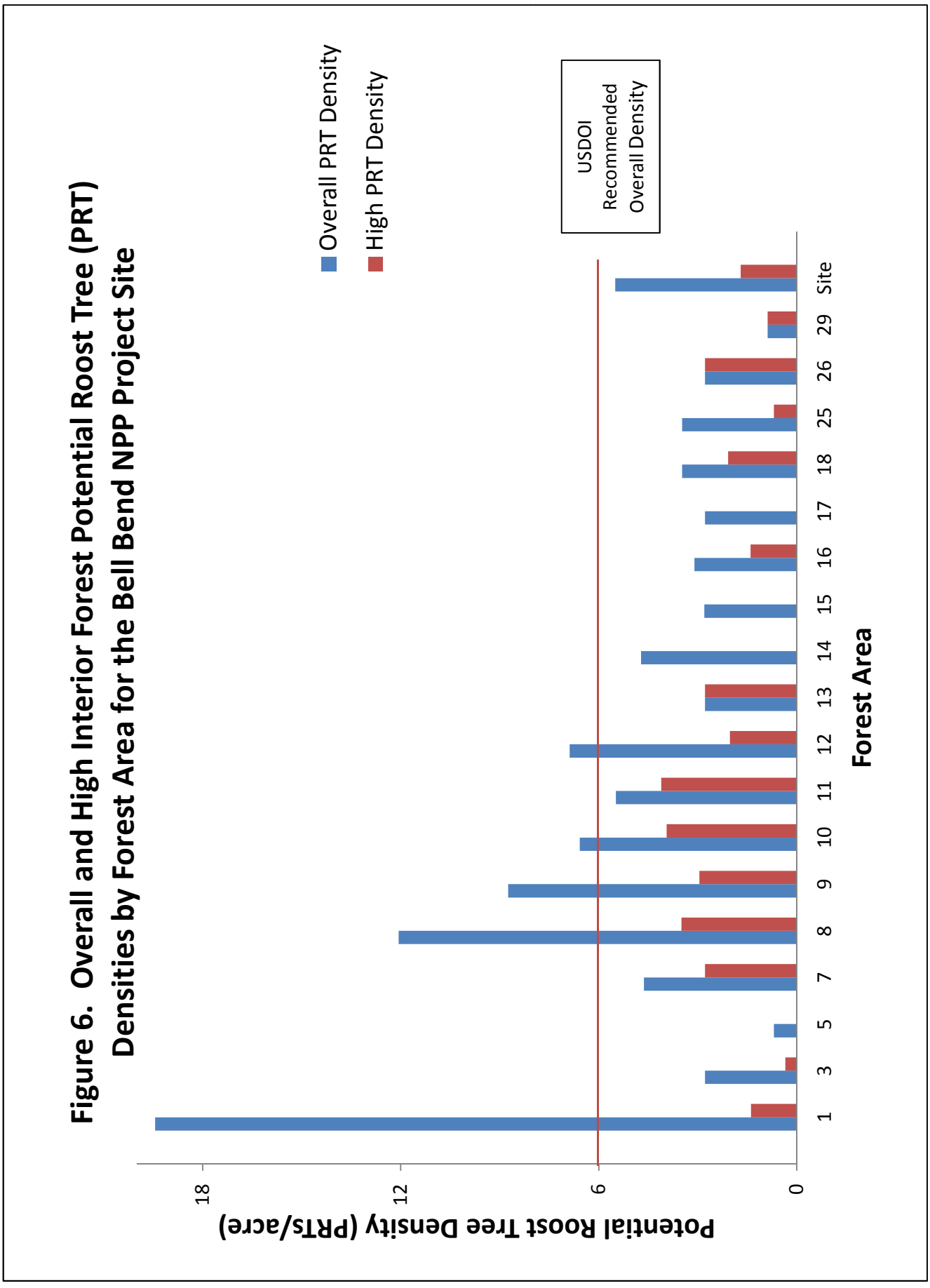

Figure 6. Overall and High Interior Forest Potential Roost Tree (PRT) Densities by Forest Area for the Bell Bend NPP Project Site

APPENDIX A

Characteristics of Forest Areas

Table A-1. Characteristics of Forest Areas at the Bell Bend NPP Project Site.

Forest Area Survey Plot Number	Setting	Tree Species		Diameter at Breast Height (DBH)			Number of PRTs[1]	Number of Snags[2]	Number of Stubs[3]
		Dominant	Subdominant	Maximum Inches (cm)	Minimum Inches (cm)	Average Inches (cm)			
1-1	Upland	Red oak	Mockernut hickory	20 (51)	3 (8)	12 (30)	14	6	19
3-1	Upland	Red maple	none	15 (38)	4 (10)	10 (25)	4	5	8
3-2	Upland	Red maple	none	30 (76)	4 (10)	12 (30)	1	5	7
3-3	Upland	Red maple	none	21 (53)	4 (10)	11 (28)	1	2	6
3-5	Upland	Red maple	none	17 (43)	4 (10)	11 (28)	2	2	6
5-1	Upland	White oak	none	10 (25)	3 (8)	8 (20)	1	7	21
5-4	Upland	Red pine	none	14 (36)	3 (8)	9 (23)	0	1	11
7-1	Upland	White oak	Red oak	30 (76)	4 (10)	14 (36)	4	1	4
7-2	Upland	Red oak	Black oak	26 (66)	4 (10)	13 (33)	2	1	4
7-3	Upland	Red maple	none	17 (43)	3 (8)	10 (25)	4	4	13
7-4	Upland	White oak	Black cherry	30 (76)	3 (8)	13 (33)	3	2	5
7-7	Upland	Red maple	none	20 (51)	4 (10)	10 (25)	2	3	6
7-8	Upland	Red maple	White oak	26 (66)	4 (10)	14 (36)	5	3	5
8-1	Upland	Shagbark hickory	none	16 (41)	3 (8)	10 (25)	21	1	3
8-2	Upland	Red maple	White oak	20 (51)	4 (10)	10 (25)	4	3	8
8-3	Upland	Sweet birch	Red maple	15 (38)	3 (8)	9 (23)	1	4	4
8a	Wetland	Black locust	Black walnut	11 (28)	3 (8)	7 (18)	1	1	0
8b	Wetland	Red maple	none	28 (71)	6 (15)	12 (30)	11	13	1
9-1	Upland	Red maple	none	13 (33)	3 (8)	6 (15)	2	0	0
9-2	Upland	White oak	none	24 (61)	3 (8)	11 (28)	7	1	5
9-3	Upland	Red oak	Red maple	16 (41)	4 (10)	10 (25)	4	1	7
9-4	Upland	Red pine	none	21 (53)	5 (13)	11 (28)	5	2	8
9-5	Upland	Mockernut hickory	Red oak	32 (81)	4 (10)	11 (28)	11	3	4
9-6	Upland	Mockernut hickory	none	20 (51)	3 (8)	11 (28)	1	6	3
9-7	Upland	White oak	none	21 (53)	3 (8)	11 (28)	1	2	2

Table A-1. Characteristics of Forest Areas at the Bell Bend NPP Project Site.

Forest Area Survey Plot Number	Setting	Tree Species		Diameter at Breast Height (DBH)			Number of PRTs[1]	Number of Snags[2]	Number of Stubs[3]
		Dominant	Subdominant	Maximum Inches (cm)	Minimum Inches (cm)	Average Inches (cm)			
9-8	Upland	Red maple	none	26 (66)	4 (10)	12 (30)	4	2	8
9-9	Upland	Sweet birch	Red maple, Black Cherry	17 (43)	5 (13)	10 (25)	7	1	5
9-10	Upland	White oak	none	22 (56)	4 (10)	10 (25)	22	1	4
9-29	Wetland	Red maple	Pin oak	60 (152)	8 (20)	23 (58)	14	1	1
9-30	Wetland	Tulip poplar	none	35 (89)	3 (8)	15 (38)	2	0	3
9b	Wetland	Red maple	none	25 (64)	3 (8)	9 (23)	0	1	0
9d	Wetland	Red maple	none	12 (30)	3 (8)	8 (20)	0	0	0
10-1	Upland	Red oak	none	23 (58)	4 (10)	11 (28)	4	1	2
10-2	Upland	Red maple	none	30 (76)	5 (13)	13 (33)	4	1	5
10a	Wetland	Red maple	Black cherry	33 (84)	4 (10)	9 (23)	1	0	2
10b	Wetland	Pin oak	Red maple	29 (74)	6 (15)	15 (38)	1	1	0
11-1	Upland	White pine	none	23 (58)	5 (13)	14 (36)	4	1	3
11	Wetland	Pin oak	none	11 (28)	3 (8)	6 (15)	0	0	0
12-1	Upland	Black oak	Pin oak	14 (36)	4 (10)	9 (23)	4	1	7
12-2	Upland	Sweet birch	Black oak	28 (71)	4 (10)	11 (28)	7	1	12
12	Wetland	Red maple	Pin oak	28 (71)	3 (8)	13 (33)	6	0	1
13-1	Upland	Sweet birch	none	22 (56)	5 (13)	12 (30)	2	0	2
14-1	Upland	Red maple	none	12 (30)	4 (10)	8 (20)	0	1	0
14-2	Upland	Red maple	none	14 (36)	3 (8)	9 (23)	0	1	0
14-3	Upland	Red maple	none	11 (28)	4 (10)	8 (20)	0	0	0
14-4	Upland	Red maple	none	14 (36)	4 (10)	9 (23)	12	2	4
14-5	Upland	Red maple	none	18 (46)	4 (10)	10 (25)	5	1	4
15-1	Upland	Quaking aspen	Red maple	15 (38)	5 (13)	10 (25)	5	2	7
15-2	Upland	Sassafras	Red maple	14 (36)	4 (10)	10 (25)	0	3	6
15-3	Upland	Red maple	none	10 (25)	3 (8)	7 (18)	4	2	6

Table A-1. Characteristics of Forest Areas at the Bell Bend NPP Project Site.

Forest Area Survey Plot Number	Setting	Tree Species		Diameter at Breast Height (DBH)			Number of PRTs[1]	Number of Snags[2]	Number of Stubs[3]
				Maximum	Minimum	Average			
		Dominant	Subdominant	Inches (cm)	Inches (cm)	Inches (cm)			
15-4	Upland	Red maple	none	21 (53)	4 (10)	10 (25)	3	3	9
15-12	Upland	Black oak	none	18 (46)	7 (18)	12 (30)	0	1	0
15-14	Upland	Black oak	Scots pine	17 (43)	5 (13)	11 (28)	0	2	3
16-1	Upland	Red oak	none	15 (38)	4 (10)	9 (23)	4	4	3
16-3	Upland	Black oak	Mockernut hickory	26 (66)	5 (13)	12 (30)	4	1	4
16-4	Upland	Black oak	Scots pine	17 (43)	6 (15)	11 (28)	0	0	0
16-5	Upland	Black oak, Black cherry	Red maple	18 (46)	6 (15)	11 (28)	1	1	5
17-1	Upland	Red maple	none	24 (61)	3 (8)	11 (28)	4	8	4
17-2	Upland	Red maple	none	20 (51)	4 (10)	10 (25)	3	0	9
17-3	Upland	Red maple	none	23 (58)	4 (10)	10 (25)	2	1	11
17-4	Upland	Red maple	none	22 (56)	4 (10)	12 (30)	0	0	9
17-5	Upland	Red maple	none	16 (41)	4 (10)	10 (25)	1	3	4
18-1	Upland	White pine	none	12 (30)	7 (18)	10 (25)	1	5	0
18-3	Upland	Silver maple	none	17 (43)	4 (10)	11 (28)	4	2	0
25-2	Upland	White oak	none	40 (102)	4 (10)	12 (30)	1	0	1
25-3	Upland	Black cherry	none	16 (41)	3 (8)	10 (25)	4	2	5
26-1	Upland	White oak	Red maple	18 (46)	5 (13)	12 (30)	2	1	2
29-1	Upland	Red oak	none	42 (107)	5 (13)	15 (38)	1	1	8
29	Wetland	Silver maple	River birch	17 (43)	3 (8)	10 (25)	0	1	7
						Cumulative Survey Plot Totals	**255**	**139**	**326**
						Cumulative Wetland Survey Plot Totals	**36**	**18**	**15**
						Cumulative Upland Survey Plots Totals	**219**	**121**	**311**

Max DBH[1]	Min DBH[1]			
Inches (cm)	Inches (cm)	PRTs[2]	Snags	Stubs

Table A-1. Characteristics of Forest Areas at the Bell Bend NPP Project Site.

Forest Area Survey Plot Number	Setting	Tree Species: Dominant	Tree Species: Subdominant	Diameter at Breast Height (DBH): Maximum Inches (cm)	Diameter at Breast Height (DBH): Minimum Inches (cm)	Diameter at Breast Height (DBH): Average Inches (cm)	Number of PRTs[1]	Number of Snags[2]	Number of Stubs[3]
Cumulative Survey Plot Averages				**21 (53)**	**4 (10)**	**4**	**2**	**5**	
Cumulative Wetland Survey Plot Averages				**26 (66)**	**4 (10)**	**3**	**2**	**1**	
Cumulative Survey Upland Survey Plot Averages				**20 (51)**	**4 (10)**	**4**	**2**	**5**	

[1]DBH = Diameter at breast height

[2]PRTs = Potential Roost Trees

[3]Number of snags = snags that didn't qualify as roost trees

[4]Number of stubs = stubs that didn't qualify as roost trees

APPENDIX B

Potential Roost Trees by Forest Area

Table B-1. Indiana Bat (*Myotis sodalis*) Potential Roost Trees within the Interior Forest Areas at the Bell Bend NPP Site.

Forest Area - Survey Plot Number	Setting	Tree Species	DBH[1] Range		Condition			Roost Type			Roost Potential		
			Inches	Centimeters	Live	PD[2]	Dead	Bark	Crevice	Cavity	Low	Medium	High
1-1	Upland	Red oak, White oak, Black oak, Shagbark hickory, Unknown	7 to 16	18 to 41	3	0	11	14	0	0	5	8	1
3-1	Upland	Black cherry, Red maple, White pine	10 to 14	25 to 36	1	1	2	4	0	0	0	4	0
3-2	Upland	Black cherry	13	33	0	1	0	1	0	0	0	1	0
3-3	Upland	Black cherry	21	53	1	0	0	1	0	0	0	0	1
3-5	Upland	Red maple	9 to 10	23 to 25	0	2	0	2	0	0	0	2	0
5-1	Upland	Shagbark hickory	8	20	1	0	0	1	0	0	1	0	0
5-4	Upland	No potential roost trees found	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7-1	Upland	Red maple, White oak	11 to 30	28 to 76	4	0	0	3	1	0	0	1	3
7-2	Upland	Black walnut, Red oak	15 to 18	38 to 46	1	1	0	2	0	0	0	1	1
7-3	Upland	Red maple, Red pine	10 to 32	25 to 81	1	1	2	4	0	0	0	2	2
7-4	Upland	Black cherry, Black walnut, Unknown	15 to 26	38 to 66	0	2	1	3	0	2	0	1	2
7-7	Upland	Red maple, Sassafras	7 to 20	18 to 51	1	0	1	2	1	0	1	0	1
7-8	Upland	White oak, Sassafras, Unknown	7 to 26	18 to 66	2	0	3	5	0	0	1	1	3
8-1	Upland	Shagbark hickory, White ash, Black cherry, White oak	8 to 24	20 to 61	21	0	0	21	0	0	1	14	6
8-2	Upland	Scots pine, Red maple	7 to 15	18 to 38	0	1	3	4	0	0	2	2	0
8-3	Upland	Sweet birch	15	38	0	0	1	1	0	1	0	1	0
8a	Wetland	Black locust	6	15	0	0	1	0	1	0	1	0	0
8b	Wetland	Red maple, Sweet birch, White ash, Shagbark hickory, American basswood	6 to 25	15 to 64	3	1	7	12	3	0	3	3	5
9-1	Upland	Shagbark hickory	9	23	2	0	0	2	0	0	0	2	0

Table B-1. Indiana Bat (*Myotis sodalis*) Potential Roost Trees within the Interior Forest Areas at the Bell Bend NPP Site.

Forest Area - Survey Plot Number	Setting	Tree Species	DBH[1] Range		Condition			Roost Type			Roost Potential		
			Inches	Centimeters	Live	PD[2]	Dead	Bark	Crevice	Cavity	Low	Medium	High
9-2	Upland	Shagbark hickory, White oak, Red Maple, Unknown	10 to 24	25 to 61	5	0	2	7	1	0	0	3	4
9-3	Upland	Red maple, Black cherry, Unknown	7 to 15	18 to 38	0	2	2	4	0	0	3	1	0
9-4	Upland	Red maple, White ash, Black cherry, Red pine, Shagbark hickory	6 to 10	15 to 25	1	1	3	5	0	0	3	2	0
9-5	Upland	Shagbark hickory, White oak, Unknown	8 to 36	20 to 91	10	0	1	11	0	0	1	7	3
9-6	Upland	Black cherry	20	18	0	1	0	1	0	0	1	0	0
9-7	Upland	White oak	21	53	1	0	0	1	0	0	1	0	0
9-8	Upland	Red maple, Pin oak	7 to 24	18 to 61	1	1	2	4	0	0	2	0	2
9-9	Upland	Black cherry, Red maple, Shagbark hickory, Red pine, White oak	9 to 23	23 to 58	3	1	3	7	1	0	0	3	4
9-10	Upland	Red maple, White oak, Shagbark hickory, Unknown	6 to 22	15 to 56	14	1	7	22	0	0	4	12	6
9-29	Wetland	Red maple, Black cherry, Pin oak, River birch	5 to 60	13 to 152	11	1	2	13	3	1	2	4	8
9-30	Wetland	Red maple	9 to 11	23 to 28	0	0	2	2	0	0	0	2	0
9b	Wetland	No potential roost trees found	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
9d	Wetland	No potential roost trees found	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10-1	Upland	Shagbark hickory, White oak	7 to 13	18 to 33	4	0	0	4	0	0	1	3	0
10-2	Upland	Red oak, Unknown	12 to 24	30 to 61	2	0	2	4	0	0	0	1	3
10a	Wetland	Red maple	33	84	0	1	0	1	1	0	0	0	1
10b	Wetland	Black gum	28	71	1	0	0	0	0	1	0	0	1
11-1	Upland	White pine, White oak, Unknown	14 to 36	36 to 91	2	0	2	4	1	0	0	1	3

Table B-1. Indiana Bat (*Myotis sodalis*) Potential Roost Trees within the Interior Forest Areas at the Bell Bend NPP Site.

Forest Area - Survey Plot			DBH[1] Range		Condition			Roost Type			Roost Potential		
Number	Setting	Tree Species	Inches	Centimeters	Live	PD[2]	Dead	Bark	Crevice	Cavity	Low	Medium	High
11	Wetland	No potential roost trees found	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
12-1	Upland	White pine, Unknown	12 to 13	30 to 33	0	0	4	4	0	0	0	4	0
12-2	Upland	Shagbark hickory, White oak, Unknown	9 to 28	23 to 71	3	0	4	7	0	0	0	5	2
12	Wetland	Shagbark hickory	6 to 21	15 to 53	6	0	0	6	0	0	1	2	3
13-1	Upland	Sweet birch, Unknown	20 to 23	51 to 58	1	0	1	2	0	0	0	0	2
14-1	Upland	No potential roost trees found	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
14-2	Upland	No potential roost trees found	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
14-3	Upland	No potential roost trees found	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
14-4	Upland	Red maple, Unknown	6 to 13	15 to 33	2	0	10	12	0	0	7	5	0
14-5	Upland	Red maple	7	18	0	0	5	5	0	0	5	0	0
15-1	Upland	Red pine, Quaking aspen, Sassafras	6 to 11	15 to 28	0	0	5	5	0	0	3	2	0
15-2	Upland	No potential roost trees found	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
15-3	Upland	Red maple, Quaking aspen	9 to 11	23 to 28	0	1	3	4	0	0	0	4	0
15-4	Upland	Red maple	7 to 13	18 to 33	0	3	0	3	0	0	1	2	0
15-12	Upland	No potential roost trees found	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
15-14	Upland	No potential roost trees found	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
16-1	Upland	Red maple, Black oak	7 to 8	18 to 20	0	0	4	4	0	0	4	0	0
16-3	Upland	Pin oak, Black oak	7 to 26	18 to 66	2	0	2	4	0	0	1	0	3
16-4	Upland	No potential roost trees found	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
16-5	Upland	Pin oak	34	86	1	0	0	1	0	0	0	0	1
17-1	Upland	Red maple, Unknown	6 to 13	15 to 33	1	0	3	4	0	0	3	1	0
17-2	Upland	Red maple	6 to 7	15 to 18	0	0	3	3	0	0	3	0	0
17-3	Upland	Red maple, Bigtooth aspen	6 to 8	15 to 20	0	0	2	2	0	0	2	0	0
17-4	Upland	No potential roost trees found	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
17-5	Upland	Unknown	12	30	0	0	1	1	0	0	0	1	0

Table B-1. Indiana Bat (*Myotis sodalis*) Potential Roost Trees within the Interior Forest Areas at the Bell Bend NPP Site.

Forest Area - Survey Plot Number	Setting	Tree Species	DBH[1] Range		Condition			Roost Type			Roost Potential		
			Inches	Centimeters	Live	PD[2]	Dead	Bark	Crevice	Cavity	Low	Medium	High
18-1	Upland	White pine	7	18	0	0	1	1	0	0	1	0	0
18-3	Upland	Silver maple	7 to 21	18 to 53	2	0	2	4	0	0	1	0	3
25-2	Upland	White oak	40	102	1	0	0	1	0	0	0	0	1
25-3	Upland	Black cherry, Unknown	7 to 13	18 to 33	2	0	2	4	0	0	1	3	0
26-1	Upland	Black locust, Unknown	40 to 46	102 to 117	1	0	1	2	0	0	0	0	2
29-1	Upland	Unknown	15	38	0	0	1	1	0	0	0	0	1
29	Wetland	No potential roost trees found	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Cumulative Survey Plot Totals			**118**	**23**	**114**	**252**	**13**	**5**	**66**	**111**	**78**
		Cumulative Wetland Survey Plot Totals			**21**	**3**	**12**	**34**	**8**	**2**	**7**	**11**	**18**
		Cumulative Upland Survey Plot Totals			**97**	**20**	**102**	**218**	**5**	**3**	**59**	**100**	**60**

[1]DBH = Diameter at breast height

[2]PD = Partially dead

APPENDIX C

Comprehensive List of Potential Roost Trees

Table C-1. Comprehensive List of Indiana Bat (*Myotis sodalis*) Potential Roost Trees at the Bell Bend NPP Project Site.

Identification Number	Forest Area Number	Setting	Tree Species	DBH[1]		Condition	Roost Type			Roost Potential	Longitude	Latitude	Date Observed
				in	cm		Bark	Crevice	Cavity				
1	1	Interior Upland	Red oak	7	18	Dead	yes	no	no	Low	-76.164194410	41.093752309	10/6/2010
2	1	Interior Upland	Red oak	7	18	Dead	yes	no	no	Low	-76.164161593	41.093808025	10/6/2010
3	1	Interior Upland	Red oak	9	23	Dead	yes	no	no	Medium	-76.164177113	41.094014816	10/6/2010
4	1	Interior Upland	Red oak	15	38	Dead	yes	no	no	Medium	-76.164148850	41.094036442	10/6/2010
5	1	Interior Upland	Shagbark hickory	9	23	Live	yes	no	no	Medium	-76.164643137	41.093821423	10/6/2010
6	1	Interior Upland	White oak	12	30	Live	yes	no	no	Medium	-76.164529982	41.093864568	10/6/2010
7	1	Interior Upland	Black oak	11	28	Dead	yes	no	no	Medium	-76.164492893	41.093897978	10/6/2010
8	1	Interior Upland	Unknown	7	18	Dead	yes	no	no	Low	-76.164380903	41.093862641	10/6/2010
9	1	Interior Upland	Red oak	8	20	Dead	yes	no	no	Low	-76.164212008	41.093948912	10/6/2010
10	1	Interior Upland	Red oak	11	28	Dead	yes	no	no	Medium	-76.164245718	41.093897586	10/6/2010
11	1	Interior Upland	Unknown	10	25	Dead	yes	no	no	Medium	-76.164337407	41.093699451	10/6/2010
12	1	Interior Upland	Red oak	8	20	Dead	yes	no	no	Low	-76.164414857	41.093748860	10/6/2010
13	1	Interior Upland	White oak	16	41	Live	yes	no	no	High	-76.164507910	41.093745692	10/6/2010
14	1	Interior Upland	Black oak	10	25	Dead	yes	no	no	Medium	-76.164744226	41.093796118	10/6/2010

Table C-1. Comprehensive List of Indiana Bat (*Myotis sodalis*) Potential Roost Trees at the Bell Bend NPP Project Site.

Identification Number	Forest Area Number	Setting	Tree Species	DBH[1]		Condition	Roost Type			Roost Potential	Longitude	Latitude	Date Observed
				in	cm		Bark	Crevice	Cavity				
15	1	Edge	Shagbark hickory	11	28	Live	yes	no	no	Medium	-76.166601572	41.093426001	10/18/2010
16	1	Edge	Shagbark hickory	9	23	Live	yes	no	no	Medium	-76.166219586	41.093310683	10/18/2010
17a	1	Edge	Unknown	8	20	Dead	yes	no	no	Low	-76.166239605	41.093354395	10/18/2010
17b	1	Edge	Unknown	8	20	Dead	yes	no	no	Low	-76.166239605	41.093354395	10/18/2010
18	1	Edge	Red maple	5	13	Dead	yes	no	no	Low	-76.162693206	41.093892166	10/18/2010
19	1	Edge	Red maple	7	18	Dead	yes	no	no	Low	-76.162746268	41.093973968	10/18/2010
20	1	Edge	Red maple	13	33	Live	yes	no	no	Medium	-76.162372397	41.094030193	10/18/2010
21	1	Edge	Red maple	8	20	Live	yes	no	no	Low	-76.162058387	41.094146488	10/18/2010
22	1	Edge	Red maple	10	25	Dead	yes	no	no	Medium	-76.162054612	41.094192573	10/18/2010
23	3	Interior Upland	Black cherry	14	36	Live	yes	no	no	Medium	-76.166559877	41.091029027	10/6/2010
24	3	Interior Upland	Red maple	13	33	Dead	yes	no	no	Medium	-76.166786841	41.090869215	10/6/2010
25	3	Interior Upland	White pine	15	38	Dead	yes	no	no	Medium	-76.166837178	41.090850929	10/6/2010
26	3	Interior Upland	Black cherry	10	25	Partially Dead	yes	no	no	Medium	-76.166819996	41.091171848	10/6/2010
27	3	Interior Upland	Black cherry	13	33	Partially Dead	yes	no	no	Medium	-76.166416121	41.090290121	10/6/2010
28	3	Interior Upland	Black cherry	21	53	Live	yes	no	no	High	-76.171158463	41.089976932	10/6/2010
29	3	Interior Upland	Red maple	10	25	Partially Dead	yes	no	no	Medium	-76.167504186	41.090390429	10/6/2010
30	3	Upland	Red maple	9	23	Dead	yes	no	no	Medium	-76.166971136	41.090420109	10/6/2010
31	3	Edge	Shagbark hickory	6	15	Live	yes	no	no	Low	-76.171719841	41.088607582	10/18/2010

Table C-1. Comprehensive List of Indiana Bat (*Myotis sodalis*) Potential Roost Trees at the Bell Bend NPP Project Site.

Identification Number	Forest Area Number	Setting	Tree Species	DBH[1] in	DBH[1] cm	Condition	Roost Type Bark	Roost Type Crevice	Roost Type Cavity	Roost Potential	Longitude	Latitude	Date Observed
32	3	Edge	Shagbark hickory	9	23	Live	yes	no	no	Medium	-76.171534580	41.088464176	10/18/2010
33	3	Edge	Shagbark hickory	6	15	Live	yes	no	no	Low	-76.171406704	41.088522280	10/18/2010
34	3	Edge	Shagbark hickory	30	76	Live	yes	no	no	High	-76.171333965	41.088559158	10/18/2010
35	3	Edge	Black cherry	9	23	Partially Dead	yes	no	no	Medium	-76.171324939	41.088650000	10/18/2010
36	3	Edge	Red maple	11	28	Live	yes	no	no	Medium	-76.170884642	41.088644234	10/18/2010
37	3	Edge	Shagbark hickory	8	20	Live	yes	no	no	Low	-76.170904431	41.088706664	10/18/2010
38	3	Edge	Red oak	10	25	Dead	yes	no	no	Medium	-76.170975122	41.088942575	10/18/2010
39	3	Edge	Black cherry	8	20	Dead	yes	no	no	Low	-76.170912611	41.089050386	10/18/2010
40	3	Edge	Black cherry	9	23	Live	yes	no	no	Medium	-76.170924901	41.089064843	10/18/2010
41	3	Edge	Shagbark hickory	12	30	Live	yes	no	no	Medium	-76.170942045	41.089183273	10/18/2010
42	3	Edge	Shagbark hickory	14	36	Live	yes	no	no	Medium	-76.170938746	41.089520189	10/18/2010
43	3	Edge	Red maple	8	20	Dead	yes	no	no	Low	-76.168376002	41.089488831	10/18/2010
44	3	Edge	Red maple	7	18	Dead	yes	no	no	Low	-76.167407790	41.091602002	10/18/2010
45	3	Edge	Shagbark hickory	11	28	Live	yes	no	no	Medium	-76.166305364	41.091631754	10/18/2010
46	3	Edge	Shagbark hickory	10	25	Live	yes	no	no	Medium	-76.166321240	41.091357078	10/18/2010
47	3	Edge	Unknown	11	28	Dead	yes	no	no	Medium	-76.166366924	41.091266491	10/18/2010
48	3	Edge	Shagbark hickory	6	15	Live	yes	no	no	Low	-76.166316384	41.091213411	10/18/2010
49	3	Edge	Red maple	5	13	Dead	yes	no	no	Low	-76.166348574	41.091194639	10/18/2010
50	3	Edge	Red maple	7	18	Dead	yes	no	no	Low	-76.166373642	41.091142893	10/18/2010

Table C-1. Comprehensive List of Indiana Bat (*Myotis sodalis*) Potential Roost Trees at the Bell Bend NPP Project Site.

Identification Number	Forest Area Number	Setting	Tree Species	DBH[1] in	DBH[1] cm	Condition	Roost Type Bark	Roost Type Crevice	Roost Type Cavity	Roost Potential	Longitude	Latitude	Date Observed
51	3	Edge	Shagbark hickory	13	33	Live	yes	no	no	Medium	-76.166242327	41.090956991	10/18/2010
52a	3	Edge	Unknown	9	23	Dead	yes	no	no	Medium	-76.166861985	41.089035751	10/18/2010
52b	3	Edge	Unknown	9	23	Dead	yes	no	no	Medium	-76.166861985	41.089035751	10/18/2010
52c	3	Edge	Unknown	9	23	Dead	yes	no	no	Medium	-76.166861985	41.089035751	10/18/2010
53	3	Edge	Red maple	9	23	Dead	yes	no	no	Medium	-76.167657463	41.089167396	10/18/2010
54	5	Interior Upland	Shagbark hickory	8	20	Live	yes	no	no	Low	-76.162508415	41.082682229	10/7/2010
55	5	Edge	Unknown	13	33	Dead	yes	no	no	Medium	-76.162132951	41.083101476	10/19/2010
56	5	Edge	Black cherry	6	15	Dead	yes	no	no	Low	-76.162534080	41.082914593	10/19/2010
57	5	Edge	Black cherry	6	15	Dead	yes	no	no	Low	-76.162610706	41.082806874	10/19/2010
58	5	Edge	Unknown	9	23	Dead	yes	no	no	Medium	-76.162707749	41.082747583	10/19/2010
59	5	Edge	Shagbark hickory	14	36	Live	yes	no	no	Medium	-76.163678957	41.081881723	10/19/2010
60	5	Edge	Shagbark hickory	8	20	Live	yes	no	no	Low	-76.163779211	41.081876271	10/19/2010
61	5	Edge	Shagbark hickory	8	20	Live	yes	no	no	Low	-76.161118942	41.083177012	10/19/2010
62	5	Edge	Shagbark hickory	10	25	Live	yes	no	no	Medium	-76.160992503	41.083309609	10/19/2010
63	5	Edge	Shagbark hickory	10	25	Live	yes	no	no	Medium	-76.160847375	41.083255075	10/19/2010
64	5	Edge	Shagbark hickory	7	18	Live	yes	no	no	Low	-76.160825557	41.083238960	10/19/2010
65	5	Edge	Shagbark hickory	8	20	Live	yes	no	no	Low	-76.160849600	41.083116518	10/19/2010

Table C-1. Comprehensive List of Indiana Bat (*Myotis sodalis*) Potential Roost Trees at the Bell Bend NPP Project Site.

Identification Number	Forest Area Number	Setting	Tree Species	DBH[1]		Condition	Roost Type			Roost Potential	Longitude	Latitude	Date Observed
				in	cm		Bark	Crevice	Cavity				
66	5	Edge	Shagbark hickory	6	15	Live	yes	no	no	Low	-76.160774072	41.083046680	10/19/2010
67	5	Edge	Shagbark hickory	9	23	Live	yes	no	no	Medium	-76.160854503	41.082925434	10/19/2010
68	5	Edge	Shagbark hickory	9	23	Live	yes	no	no	Medium	-76.160762108	41.082823863	10/19/2010
69	5	Edge	Shagbark hickory	8	20	Live	yes	no	no	Low	-76.160779594	41.082697023	10/19/2010
70	5	Edge	Red maple	5	13	Dead	yes	no	no	Low	-76.160778990	41.082619953	10/19/2010
71	5	Edge	Shagbark hickory	8	20	Live	yes	no	no	Low	-76.160749648	41.082611707	10/19/2010
72	5	Edge	Shagbark hickory	7	18	Live	yes	no	no	Low	-76.160765384	41.082551534	10/19/2010
73	5	Edge	Shagbark hickory	9	23	Live	yes	no	no	Medium	-76.160845305	41.082546908	10/19/2010
74	5	Edge	Shagbark hickory	8	20	Live	yes	no	no	Low	-76.160809640	41.082378393	10/19/2010
75	5	Edge	Shagbark hickory	12	30	Dead	yes	no	no	Medium	-76.160879065	41.082224918	10/19/2010
76	7	Interior Upland	Red maple	11	28	Live	no	yes	no	Medium	-76.156942285	41.095006775	10/7/2010
77	7	Interior Upland	White oak	22	56	Live	yes	no	no	High	-76.156872818	41.095032511	10/7/2010
78	7	Interior Upland	White oak	30	76	Live	yes	no	no	High	-76.156869697	41.095035700	10/7/2010
79	7	Interior Upland	White oak	30	76	Live	yes	no	no	High	-76.156841437	41.095115375	10/7/2010
80	7	Interior Upland	Black walnut	18	46	Partially Dead	yes	no	no	High	-76.155551478	41.095690990	10/7/2010
81	7	Interior Upland	Red oak	15	38	Live	yes	no	no	Medium	-76.155412182	41.095358790	10/7/2010

Table C-1. Comprehensive List of Indiana Bat (*Myotis sodalis*) Potential Roost Trees at the Bell Bend NPP Project Site.

Identification Number	Forest Area Number	Setting	Tree Species	DBH[1] in	DBH[1] cm	Condition	Roost Type Bark	Roost Type Crevice	Roost Type Cavity	Roost Potential	Longitude	Latitude	Date Observed
82	7	Interior Upland	Red maple	13	33	Dead	yes	no	no	Medium	-76.155305849	41.097305263	10/7/2010
83	7	Interior Upland	Red maple	10	25	Partially Dead	yes	no	no	Medium	-76.155319182	41.097383251	10/7/2010
84	7	Interior Upland	Red maple	32	81	Live	yes	no	no	High	-76.155193912	41.097476801	10/7/2010
85	7	Interior Upland	Red pine	18	46	Dead	yes	no	no	High	-76.154955602	41.097218638	10/7/2010
86	7	Interior Upland	Unknown	15	38	Dead	yes	no	yes	Medium	-76.161253302	41.094103723	10/7/2010
87	7	Interior Upland	Black cherry	26	66	Partially Dead	yes	no	no	High	-76.161218820	41.094155846	10/7/2010
88	7	Interior Upland	Black walnut	18	46	Dead	yes	no	yes	High	-76.161398391	41.094097005	10/7/2010
89	7	Interior Upland	Red maple	20	51	Live	yes	yes	no	High	-76.154946773	41.098579788	10/8/2010
90	7	Interior Upland	Sassafras	7	18	Dead	yes	no	no	Low	-76.154892503	41.098425676	10/8/2010
91	7	Interior Upland	Unknown	7	18	Dead	yes	no	no	Low	-76.156263487	41.101291507	10/11/2010
92	7	Interior Upland	White oak	26	66	Live	yes	no	no	High	-76.156030315	41.101311224	10/11/2010
93	7	Interior Upland	Unknown	20	51	Dead	yes	no	no	High	-76.155919604	41.101244831	10/11/2010
94	7	Interior Upland	White oak	21	53	Live	yes	no	no	High	-76.155885930	41.101244480	10/11/2010
95	7	Upland	Sassafras	12	30	Dead	yes	no	no	Medium	-76.155760368	41.101056148	10/11/2010
96	7	Edge	White pine	14	36	Dead	yes	no	no	Medium	-76.156357950	41.094784324	10/20/2010
97	7	Edge	Unknown	12	30	Dead	yes	no	no	Medium	-76.156323352	41.094676732	10/20/2010

Table C-1. Comprehensive List of Indiana Bat (*Myotis sodalis*) Potential Roost Trees at the Bell Bend NPP Project Site.

Identification Number	Forest Area Number	Setting	Tree Species	DBH[1] in	DBH[1] cm	Condition	Roost Type Bark	Roost Type Crevice	Roost Type Cavity	Roost Potential	Longitude	Latitude	Date Observed
98	7	Edge	White pine	11	28	Dead	yes	no	no	Medium	-76.155993132	41.094877919	10/20/2010
99	7	Edge	Unknown	8	20	Dead	yes	no	no	Low	-76.153644529	41.095531438	10/20/2010
100	7	Edge	Red maple	11	28	Dead	yes	no	no	Medium	-76.153749081	41.096044657	10/20/2010
101	7	Edge	Shagbark hickory	8	20	Live	yes	no	no	Low	-76.153768202	41.096087090	10/20/2010
102	7	Edge	Red maple	13	33	Dead	yes	no	no	Medium	-76.153566049	41.096243438	10/20/2010
103	7	Edge	Unknown	16	41	Dead	yes	no	no	High	-76.153727298	41.096435292	10/20/2010
104	7	Edge	White oak	25	64	Live	yes	no	no	High	-76.153887192	41.097073381	10/20/2010
105	7	Edge	White oak	10	25	Live	yes	no	no	Medium	-76.154170486	41.097589964	10/20/2010
106a	7	Edge	White oak	21	53	Live	yes	no	no	High	-76.154335087	41.097635624	10/20/2010
106b	7	Edge	White oak	21	53	Live	yes	no	no	High	-76.154335087	41.097635624	10/20/2010
107	7	Edge	White oak	19	48	Live	yes	no	no	High	-76.154318395	41.097699577	10/20/2010
108	7	Edge	White oak	53	135	Live	yes	no	no	High	-76.154430028	41.097793925	10/20/2010
109	7	Edge	Red oak	42	107	Live	yes	no	no	High	-76.154430897	41.097939691	10/20/2010
110	7	Edge	Unknown	26	66	Dead	yes	no	no	High	-76.154996062	41.099189250	10/20/2010
111	7	Edge	Red maple	14	36	Dead	yes	no	no	Medium	-76.154992427	41.099211063	10/20/2010
112	8	Interior Upland	Shagbark hickory	8	20	Live	yes	no	no	Low	-76.156212839	41.092365684	10/11/2010
113	8	Interior Upland	Shagbark hickory	10	25	Live	yes	no	no	Medium	-76.156126022	41.092344350	10/11/2010
114	8	Interior Upland	Shagbark hickory	10	25	Live	yes	no	no	Medium	-76.156122358	41.092325657	10/11/2010
115	8	Interior Upland	Shagbark hickory	12	30	Live	yes	no	no	Medium	-76.156050913	41.092261216	10/11/2010
116	8	Interior Upland	Shagbark hickory	12	30	Live	yes	no	no	Medium	-76.156192453	41.092218616	10/11/2010
117	8	Interior Upland	Shagbark hickory	14	36	Live	yes	no	no	Medium	-76.156209973	41.092191146	10/11/2010
118	8	Interior Upland	Shagbark hickory	16	41	Live	yes	no	no	High	-76.156190983	41.092187351	10/11/2010

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Identification Number	Forest Area Number	Setting	Tree Species	DBH[1] in	DBH[1] cm	Condition	Roost Type Bark	Roost Type Crevice	Roost Type Cavity	Roost Potential	Longitude	Latitude	Date Observed
119	8	Interior Upland	Shagbark hickory	10	25	Live	yes	no	no	Medium	-76.156115727	41.092153625	10/11/2010
120	8	Interior Upland	Black cherry	12	30	Live	yes	no	no	Medium	-76.156118619	41.092237725	10/11/2010
121	8	Interior Upland	Shagbark hickory	9	23	Live	yes	no	no	Medium	-76.156387571	41.092168602	10/11/2010
122	8	Interior Upland	Shagbark hickory	12	30	Live	yes	no	no	Medium	-76.156451406	41.092276997	10/11/2010
123a	8	Interior Upland	Shagbark hickory	14	36	Live	yes	no	no	Medium	-76.156414079	41.092228126	10/11/2010
123b	8	Interior Upland	Shagbark hickory	14	36	Live	yes	no	no	Medium	-76.156414079	41.092228126	10/11/2010
124	8	Interior Upland	Shagbark hickory	18	46	Live	yes	no	no	High	-76.156473504	41.092232642	10/11/2010
125	8	Interior Upland	Shagbark hickory	19	48	Live	yes	no	no	High	-76.156518635	41.092307378	10/11/2010
126	8	Interior Upland	White oak	20	51	Live	yes	no	no	High	-76.156490486	41.092406233	10/11/2010
127	8	Interior Upland	Shagbark hickory	11	28	Live	yes	no	no	Medium	-76.156511261	41.092311191	10/11/2010
128	8	Interior Upland	Shagbark hickory	11	28	Live	yes	no	no	Medium	-76.156519308	41.092459115	10/11/2010
129	8	Interior Upland	Shagbark hickory	13	33	Live	yes	no	no	Medium	-76.156520734	41.092510633	10/11/2010
130	8	Interior Upland	White ash	21	53	Live	yes	no	no	High	-76.156207302	41.092562880	10/11/2010
131	8	Interior Upland	White oak	24	61	Live	yes	no	no	High	-76.156345913	41.092306704	10/11/2010
132	8	Interior Upland	Scots pine	15	38	Partially Dead	yes	no	no	Medium	-76.159358659	41.091639737	10/11/2010
133	8	Interior Upland	Red maple	7	18	Dead	yes	no	no	Low	-76.158983185	41.091390030	10/11/2010

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Identification Number	Forest Area Number	Setting	Tree Species	DBH[1] in	DBH[1] cm	Condition	Roost Type Bark	Roost Type Crevice	Roost Type Cavity	Roost Potential	Longitude	Latitude	Date Observed
134	8	Interior Upland	Red maple	7	18	Dead	yes	no	no	Low	-76.159017774	41.091399279	10/11/2010
135	8	Interior Upland	Scotch pine	12	30	Dead	yes	no	no	Medium	-76.158971824	41.091528283	10/11/2010
136	8	Interior Upland	Sweet birch	15	38	Dead	yes	no	yes	Medium	-76.157903337	41.091832361	10/11/2010
137	8	Interior Wetland	Black locust	6	15	Dead	no	yes	no	Low	-76.159620377	41.094200536	9/29/2010
138	8	Interior Wetland	Shagbark hickory	18	46	Live	yes	no	no	High	-76.157088137	41.092880696	9/29/2010
139	8	Interior Wetland	American basswood	25	64	Partially Dead	no	yes	no	High	-76.156962020	41.092878929	9/29/2010
140	8	Interior Wetland	White ash	17	43	Dead	yes	no	yes	High	-76.156345174	41.092752969	9/29/2010
141	8	Interior Wetland	White ash	6	15	Dead	yes	no	no	Low	-76.155752724	41.092611747	9/29/2010
142	8	Interior Wetland	White ash	7	18	Dead	yes	no	no	Low	-76.155755394	41.092724023	9/29/2010
143	8	Interior Wetland	Red maple	11	28	Dead	yes	no	no	Medium	-76.157091340	41.092806785	9/29/2010
144	8	Interior Wetland	Red maple	21	53	Live	yes	no	no	High	-76.156915805	41.092734610	9/29/2010
145	8	Interior Wetland	American basswood	8	20	Dead	yes	no	no	Low	-76.156071939	41.092772757	10/6/2010
146	8	Interior Wetland	Red maple	12	30	Dead	no	yes	no	Medium	-76.156942996	41.092714820	9/29/2010
147	8	Interior Wetland	Red maple	11	28	Dead	yes	no	no	Medium	-76.157233952	41.092788704	9/29/2010
148	8	Interior Wetland	Sweet birch	22	56	Live	yes	no	no	High	-76.157385144	41.092821818	9/29/2010

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Identification Number	Forest Area Number	Setting	Tree Species	DBH[1]		Condition	Roost Type			Roost Potential	Longitude	Latitude	Date Observed
				in	cm		Bark	Crevice	Cavity				
149	8	Edge	Shagbark hickory	15	38	Live	yes	no	no	Medium	-76.156111729	41.092097276	10/11/2010
150	8	Edge	Unknown	29	74	Dead	yes	no	no	High	-76.156150932	41.090421543	10/19/2010
151	8	Edge	Shagbark hickory	11	28	Live	yes	no	no	Medium	-76.156171368	41.090412551	10/19/2010
152	8	Edge	Shagbark hickory	20	51	Live	yes	no	no	High	-76.156686320	41.091465059	10/19/2010
153	8	Edge	White oak	28	71	Live	yes	no	no	High	-76.157648188	41.090938140	10/19/2010
154	8	Edge	Shagbark hickory	6	15	Live	yes	no	no	Low	-76.157670691	41.090956235	10/19/2010
155	8	Edge	White oak	20	51	Live	yes	no	no	High	-76.157841753	41.091048801	10/19/2010
156	8	Edge	Shagbark hickory	8	20	Live	yes	no	no	Low	-76.157809652	41.091060135	10/19/2010
157	8	Edge	Red maple	8	20	Dead	yes	no	no	Low	-76.158756472	41.091293738	10/19/2010
158	8	Edge	White pine	11	28	Dead	yes	no	no	Medium	-76.159691912	41.091579456	10/19/2010
159	8	Edge	Red maple	13	33	Live	yes	no	no	Medium	-76.159934744	41.091650384	10/19/2010
160	8	Edge	Unknown	6	15	Dead	yes	no	no	Low	-76.160517309	41.091773053	10/19/2010
161	8	Edge	Unknown	13	33	Dead	yes	no	no	Medium	-76.160805498	41.091901422	10/19/2010
162	8	Edge	Unknown	14	36	Dead	yes	no	no	Medium	-76.160678077	41.091958110	10/19/2010
163	8	Edge	Shagbark hickory	8	20	Live	yes	no	no	Low	-76.160491119	41.092004880	10/19/2010
164	8	Edge	White oak	27	69	Live	yes	no	no	High	-76.160188860	41.092043404	10/19/2010
165a	9	Interior Upland	Shagbark hickory	9	23	Live	yes	no	no	Medium	-76.159759849	41.089223423	10/12/2010
165b	9	Interior Upland	Shagbark hickory	9	23	Live	yes	no	no	Medium	-76.159759849	41.089223423	10/12/2010
166	9	Interior Upland	Unknown	10	25	Dead	yes	no	no	Medium	-76.159524086	41.090677240	10/12/2010
167	9	Interior Upland	Shagbark hickory	13	33	Live	yes	no	no	Medium	-76.159280741	41.090797268	10/12/2010

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Identification Number	Forest Area Number	Setting	Tree Species	DBH[1] in	DBH[1] cm	Condition	Roost Type Bark	Roost Type Crevice	Roost Type Cavity	Roost Potential	Longitude	Latitude	Date Observed
168	9	Interior Upland	Shagbark hickory	10	25	Live	yes	no	no	Medium	-76.159520670	41.090337916	10/12/2010
169	9	Interior Upland	Shagbark hickory	17	43	Live	yes	no	no	High	-76.159527227	41.090350208	10/12/2010
170	9	Interior Upland	Shagbark hickory	16	41	Live	yes	no	no	High	-76.159532984	41.090375902	10/12/2010
171	9	Interior Upland	Red maple	16	41	Dead	yes	no	no	High	-76.159463866	41.090431555	10/12/2010
172	9	Interior Upland	White oak	24	61	Live	yes	yes	no	High	-76.159453555	41.090556989	10/12/2010
173	9	Interior Upland	Unknown	8	20	Dead	yes	no	no	Low	-76.161195812	41.085585809	10/12/2010
174	9	Interior Upland	Red maple	7	18	Partially Dead	yes	no	no	Low	-76.160881691	41.085650707	10/12/2010
175	9	Interior Upland	Unknown	7	18	Dead	yes	no	no	Low	-76.160895870	41.085700596	10/12/2010
176	9	Interior Upland	Black cherry	15	38	Partially Dead	yes	no	no	Medium	-76.161013633	41.085710319	10/12/2010
177	9	Interior Upland	Red pine	7	18	Dead	yes	no	no	Low	-76.160381696	41.090934727	10/12/2010
178	9	Interior Upland	Red maple	6	15	Dead	yes	no	no	Low	-76.160404302	41.090949908	10/12/2010
179	9	Interior Upland	White ash	10	25	Dead	yes	no	no	Medium	-76.160052561	41.090600125	10/12/2010
180	9	Interior Upland	Black cherry	9	23	Partially Dead	yes	no	no	Medium	-76.160358926	41.090545551	10/12/2010
181	9	Interior Upland	Shagbark hickory	7	18	Live	yes	no	no	Low	-76.160261124	41.090721005	10/12/2010
182	9	Interior Upland	Unknown	15	38	Dead	yes	no	no	Medium	-76.157796286	41.088413752	10/12/2010
183	9	Interior Upland	Shagbark hickory	19	48	Live	yes	no	no	High	-76.158107344	41.088412969	10/12/2010

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Identification Number	Forest Area Number	Setting	Tree Species	DBH[1] in	DBH[1] cm	Condition	Roost Type Bark	Roost Type Crevice	Roost Type Cavity	Roost Potential	Longitude	Latitude	Date Observed
184a	9	Interior Upland	Shagbark hickory	11	28	Live	yes	no	no	Medium	-76.158107855	41.088486184	10/12/2010
184b	9	Interior Upland	Shagbark hickory	11	28	Live	yes	no	no	Medium	-76.158107855	41.088486184	10/12/2010
185	9	Interior Upland	Shagbark hickory	9	23	Live	yes	no	no	Medium	-76.157856121	41.088615117	10/12/2010
186	9	Interior Upland	Shagbark hickory	8	20	Live	yes	no	no	Low	-76.157859581	41.088590394	10/12/2010
187	9	Interior Upland	Shagbark hickory	13	33	Live	yes	no	no	Medium	-76.157786270	41.088606577	10/12/2010
188	9	Interior Upland	Shagbark hickory	13	33	Live	yes	no	no	Medium	-76.157764696	41.088680722	10/12/2010
189	9	Interior Upland	White oak	16	41	Live	yes	no	no	High	-76.157709275	41.088560127	10/12/2010
190	9	Interior Upland	White oak	14	36	Live	yes	no	no	Medium	-76.157745388	41.088544284	10/12/2010
191	9	Interior Upland	White oak	36	91	Live	yes	no	no	High	-76.157691483	41.088600532	10/12/2010
192	9	Interior Upland	Black cherry	20	51	Partially Dead	yes	no	no	High	-76.161233256	41.084961022	10/11/2010
193	9	Interior Upland	White oak	21	53	Live	yes	no	no	High	-76.162741275	41.090491493	10/12/2010
194	9	Interior Upland	Red maple	24	61	Live	yes	no	no	High	-76.156815113	41.085664949	10/12/2010
195	9	Interior Upland	Red maple	7	18	Dead	yes	no	no	Low	-76.156883708	41.085653524	10/12/2010
196	9	Interior Upland	Pin oak	8	20	Dead	yes	no	no	Low	-76.156744275	41.085654768	10/12/2010
197	9	Interior Upland	Pin oak	18	46	Partially Dead	yes	no	no	High	-76.156832990	41.085516733	10/12/2010
198	9	Interior Upland	Black cherry	18	46	Dead	yes	no	no	High	-76.162947537	41.088630064	10/12/2010

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Identification Number	Forest Area Number	Setting	Tree Species	DBH[1] in	DBH[1] cm	Condition	Roost Type Bark	Roost Type Crevice	Roost Type Cavity	Roost Potential	Longitude	Latitude	Date Observed
199	9	Interior Upland	Red pine	17	43	Dead	yes	yes	no	High	-76.162805577	41.088603142	10/12/2010
200	9	Interior Upland	White oak	23	58	Live	yes	no	no	High	-76.162943124	41.088678388	10/12/2010
201	9	Interior Upland	Shagbark hickory	10	25	Live	yes	no	no	Medium	-76.162921814	41.088833144	10/12/2010
202	9	Interior Upland	Shagbark hickory	9	23	Live	yes	no	no	Medium	-76.162947216	41.088874389	10/12/2010
203	9	Interior Upland	Black cherry	10	25	Dead	yes	no	no	Medium	-76.162749478	41.088996925	10/12/2010
204	9	Interior Upland	Red maple	18	46	Partially Dead	yes	no	no	High	-76.162413019	41.088849133	10/12/2010
205	9	Interior Upland	Shagbark hickory	8	20	Live	yes	no	no	Low	-76.157605481	41.090082467	10/12/2010
206	9	Interior Upland	Unknown	12	30	Dead	yes	no	no	Medium	-76.157640096	41.090040552	10/12/2010
207	9	Interior Upland	White oak	21	53	Live	yes	no	no	High	-76.157748901	41.089985983	10/12/2010
208	9	Interior Upland	Red maple	11	28	Dead	yes	no	no	Medium	-76.157747252	41.089976839	10/12/2010
209	9	Interior Upland	Red maple	8	20	Partially Dead	yes	no	no	Low	-76.157794966	41.089899395	10/12/2010
210	9	Interior Upland	Red maple	9	23	Dead	yes	no	no	Medium	-76.157862323	41.089924401	10/12/2010
211	9	Interior Upland	White oak	20	51	Live	yes	no	no	High	-76.157873132	41.090002500	10/12/2010
212	9	Interior Upland	Red maple	12	30	Dead	yes	no	no	Medium	-76.157853076	41.090073707	10/12/2010
213	9	Interior Upland	Unknown	9	23	Dead	yes	no	no	Medium	-76.157785999	41.090131673	10/12/2010
214	9	Interior Upland	Shagbark hickory	10	25	Live	yes	no	no	Medium	-76.157665414	41.090175072	10/12/2010

Table C-1. Comprehensive List of Indiana Bat (*Myotis sodalis*) Potential Roost Trees at the Bell Bend NPP Project Site.

Identification Number	Forest Area Number	Setting	Tree Species	DBH[1] in	DBH[1] cm	Condition	Roost Type Bark	Roost Type Crevice	Roost Type Cavity	Roost Potential	Longitude	Latitude	Date Observed
215	9	Interior Upland	Shagbark hickory	12	30	Live	yes	no	no	Medium	-76.157630329	41.090251251	10/12/2010
216	9	Interior Upland	Shagbark hickory	10	25	Live	yes	no	no	Medium	-76.157651398	41.090259166	10/12/2010
217	9	Interior Upland	Shagbark hickory	6	15	Live	yes	no	no	High	-76.157572129	41.090236342	10/12/2010
218	9	Interior Upland	Shagbark hickory	9	23	Live	yes	no	no	Medium	-76.157590004	41.090220317	10/12/2010
219	9	Interior Upland	White oak	21	53	Live	yes	no	no	High	-76.157483793	41.090168101	10/12/2010
220	9	Interior Upland	Unknown	8	20	Dead	yes	no	no	Low	-76.157567659	41.090122101	10/12/2010
221	9	Interior Upland	Shagbark hickory	8	20	Live	yes	no	no	Low	-76.157530903	41.090088657	10/12/2010
222	9	Interior Upland	White oak	20	51	Live	yes	no	no	High	-76.157419863	41.090051377	10/12/2010
223	9	Interior Upland	Shagbark hickory	12	30	Live	yes	no	no	Medium	-76.157360266	41.090038044	10/12/2010
224	9	Interior Upland	White oak	14	36	Live	yes	no	no	Medium	-76.157391562	41.090113014	10/12/2010
225	9	Interior Upland	White oak	22	56	Live	yes	no	no	High	-76.157260331	41.090075194	10/12/2010
226	9	Interior Upland	Unknown	11	28	Dead	yes	no	no	Medium	-76.157378253	41.089795665	10/12/2010
227	9	Interior Wetland	Red maple	17	43	Live	yes	no	yes	High	-76.157070962	41.086518163	10/7/2010
228	9	Interior Wetland	Black cherry	9	23	Live	yes	no	no	Medium	-76.156968040	41.086671464	10/7/2010
229	9	Interior Wetland	Black cherry	5	13	Dead	yes	no	no	Low	-76.156993142	41.086588947	10/7/2010
230	9	Interior Wetland	River birch	8	20	Live	yes	no	no	Low	-76.156988952	41.086739694	10/7/2010

Table C-1. Comprehensive List of Indiana Bat (*Myotis sodalis*) Potential Roost Trees at the Bell Bend NPP Project Site.

Identification Number	Forest Area Number	Setting	Tree Species	DBH[1] in	DBH[1] cm	Condition	Roost Type Bark	Roost Type Crevice	Roost Type Cavity	Roost Potential	Longitude	Latitude	Date Observed
231	9	Interior Wetland	River birch	12	30	Live	yes	no	no	Medium	-76.156908785	41.086708593	10/7/2010
232	9	Interior Wetland	River birch	12	30	Live	yes	no	no	Medium	-76.156786939	41.086749143	10/8/2010
233	9	Interior Wetland	River birch	18	46	Live	yes	no	no	High	-76.156805226	41.086749635	10/8/2010
234	9	Interior Wetland	Red maple	56	142	Live	yes	no	no	High	-76.156906217	41.086510591	10/8/2010
235	9	Interior Wetland	Red maple	35	89	Live	yes	no	no	High	-76.156878064	41.086555165	10/8/2010
236	9	Interior Wetland	Pin oak	60	152	Live	yes	no	no	High	-76.156765679	41.086377815	10/8/2010
237	9	Interior Wetland	Red maple	23	58	Partially Dead	yes	yes	no	High	-76.156923650	41.086303825	10/8/2010
238	9	Interior Wetland	Red maple	16	41	Live	no	yes	no	High	-76.156924767	41.086283546	10/8/2010
239	9	Interior Wetland	Red maple	40	102	Live	yes	yes	no	High	-76.156662635	41.086110366	10/8/2010
240	9	Interior Wetland	Red maple	11	28	Dead	yes	no	no	Medium	-76.156891642	41.086153839	10/8/2010
241	9	Interior Wetland	Red maple	9	23	Dead	yes	no	no	Medium	-76.161757423	41.089110265	10/15/2010
242	9	Wetland	Red maple	11	28	Dead	yes	no	no	Medium	-76.161683493	41.089054155	10/15/2010
243	9	Edge	Black cherry	18	46	Partially Dead	yes	no	no	High	-76.158098455	41.087249976	10/19/2010
244	9	Edge	Black cherry	12	30	Dead	yes	no	no	Medium	-76.158147575	41.088028548	10/19/2010
245	9	Edge	Red oak	16	41	Partially Dead	no	yes	no	High	-76.158168628	41.088257278	10/19/2010
246	9	Edge	White oak	17	43	Live	yes	no	no	High	-76.158270949	41.088337660	10/19/2010

Table C-1. Comprehensive List of Indiana Bat (*Myotis sodalis*) Potential Roost Trees at the Bell Bend NPP Project Site.

Identification Number	Forest Area Number	Setting	Tree Species	DBH[1]		Condition	Roost Type			Roost Potential	Longitude	Latitude	Date Observed
				in	cm		Bark	Crevice	Cavity				
247	9	Edge	Shagbark hickory	8	20	Live	yes	no	no	Low	-76.158264909	41.088411334	10/19/2010
248	9	Edge	Shagbark hickory	17	43	Live	yes	no	no	High	-76.158099501	41.088918386	10/19/2010
249	9	Edge	Shagbark hickory	14	36	Live	yes	no	no	Medium	-76.158154678	41.088893542	10/19/2010
250	9	Edge	Shagbark hickory	7	18	Live	yes	no	no	Low	-76.158120376	41.089063390	10/19/2010
251	9	Edge	Shagbark hickory	10	25	Live	yes	no	no	Medium	-76.158162118	41.089094163	10/19/2010
252a	9	Edge	Black cherry	16	41	Live	yes	no	no	High	-76.158212575	41.089121062	10/19/2010
252b	9	Edge	Black cherry	16	41	Live	yes	no	no	High	-76.158212575	41.089121062	10/19/2010
253	9	Edge	Shagbark hickory	12	30	Live	yes	no	no	Medium	-76.158120909	41.089293973	10/19/2010
254	9	Edge	Shagbark hickory	10	25	Live	yes	no	no	Medium	-76.158076563	41.089419319	10/19/2010
255	9	Edge	Shagbark hickory	7	18	Live	yes	no	no	Low	-76.158113625	41.089599862	10/19/2010
256	9	Edge	Shagbark hickory	12	30	Live	yes	no	no	Medium	-76.158058810	41.089679770	10/19/2010
257a	9	Edge	White oak	14	36	Live	yes	no	no	Medium	-76.157985249	41.090009317	10/19/2010
257b	9	Edge	White oak	14	36	Live	yes	no	no	Medium	-76.157985249	41.090009317	10/19/2010
258	9	Edge	Shagbark hickory	13	33	Live	yes	no	no	Medium	-76.158048328	41.090018597	10/19/2010
259	9	Edge	Shagbark hickory	14	36	Live	yes	no	no	Medium	-76.157971353	41.090254556	10/19/2010
260	9	Edge	Shagbark hickory	8	20	Live	yes	no	no	Low	-76.158132216	41.090134442	10/19/2010
261	9	Edge	White oak	17	43	Live	yes	no	no	High	-76.157877957	41.090297330	10/19/2010

Table C-1. Comprehensive List of Indiana Bat (*Myotis sodalis*) Potential Roost Trees at the Bell Bend NPP Project Site.

Identification Number	Forest Area Number	Setting	Tree Species	DBH[1]		Condition	Roost Type			Roost Potential	Longitude	Latitude	Date Observed
				in	cm		Bark	Crevice	Cavity				
262	9	Edge	Shagbark hickory	13	33	Live	yes	no	no	Medium	-76.157856052	41.090310861	10/19/2010
263	9	Edge	Shagbark hickory	8	20	Live	yes	no	no	Low	-76.159955092	41.090997576	10/19/2010
264	9	Edge	Red maple	10	25	Partially Dead	yes	no	no	Medium	-76.160616974	41.091151563	10/19/2010
265	9	Edge	White oak	22	56	Live	yes	no	no	High	-76.161373042	41.089758112	10/19/2010
266	9	Edge	White oak	28	71	Live	yes	no	no	High	-76.161286020	41.089700188	10/19/2010
267a	9	Edge	Shagbark hickory	6	15	Live	yes	no	no	Low	-76.160268994	41.088851152	10/19/2010
267b	9	Edge	Shagbark hickory	6	15	Live	yes	no	no	Low	-76.160268994	41.088851152	10/19/2010
267c	9	Edge	Shagbark hickory	6	15	Live	yes	no	no	Low	-76.160268994	41.088851152	10/19/2010
268a	9	Edge	White oak	15	38	Live	yes	no	no	Medium	-76.160256876	41.088820630	10/19/2010
268b	9	Edge	White oak	15	38	Live	yes	no	no	Medium	-76.160256876	41.088820630	10/19/2010
269	9	Edge	Shagbark hickory	7	18	Live	yes	no	no	Low	-76.159754787	41.088801775	10/19/2010
270	9	Edge	Shagbark hickory	8	20	Live	yes	no	no	Low	-76.159728887	41.088795260	10/19/2010
271	9	Edge	White oak	45	114	Live	yes	no	no	High	-76.159566473	41.088716599	10/19/2010
272	9	Edge	Shagbark hickory	10	25	Live	yes	no	no	Medium	-76.159589673	41.088787343	10/19/2010
273	9	Edge	Shagbark hickory	11	28	Live	yes	no	no	Medium	-76.159263674	41.088757348	10/19/2010
274	9	Edge	Unknown	6	15	Dead	yes	no	no	Low	-76.158947418	41.088445435	10/19/2010
275	9	Edge	Shagbark hickory	11	28	Live	yes	no	no	Medium	-76.158781723	41.088460146	10/19/2010
276	9	Edge	Shagbark hickory	8	20	Live	yes	no	no	Low	-76.158667464	41.088538387	10/19/2010
277	9	Edge	Shagbark hickory	15	38	Live	yes	no	no	Medium	-76.162501544	41.088134311	10/20/2010

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Identification Number	Forest Area Number	Setting	Tree Species	DBH[1] in	DBH[1] cm	Condition	Roost Type Bark	Roost Type Crevice	Roost Type Cavity	Roost Potential	Longitude	Latitude	Date Observed
278	9	Edge	Shagbark hickory	9	23	Live	yes	no	no	Medium	-76.162841032	41.088099113	10/20/2010
279	9	Edge	Shagbark hickory	8	20	Live	yes	no	no	Low	-76.162875900	41.088156869	10/20/2010
280	9	Edge	White oak	24	61	Live	yes	no	no	High	-76.162885416	41.088201737	10/20/2010
281	9	Edge	Shagbark hickory	22	56	Live	yes	no	no	High	-76.162950167	41.089021665	10/20/2010
282	9	Edge	Shagbark hickory	11	28	Live	yes	no	no	Medium	-76.162949039	41.089063800	10/20/2010
283	9	Edge	Shagbark hickory	15	38	Live	yes	no	no	Medium	-76.162953102	41.089205172	10/20/2010
284	9	Edge	Shagbark hickory	12	30	Live	yes	no	no	Medium	-76.162953334	41.089232987	10/20/2010
285	9	Edge	Shagbark hickory	8	20	Live	yes	no	no	Low	-76.162956000	41.089258452	10/20/2010
286	9	Edge	Shagbark hickory	15	38	Live	yes	no	no	Medium	-76.163049169	41.089301270	10/20/2010
287	9	Edge	Shagbark hickory	16	41	Live	yes	no	no	High	-76.163003243	41.089328324	10/20/2010
288	9	Edge	Unknown	15	38	Live	yes	no	no	Medium	-76.162968922	41.089434672	10/20/2010
289	9	Edge	White oak	21	53	Live	yes	no	no	High	-76.163089748	41.091196817	10/20/2010
290	9	Edge	White oak	26	66	Live	yes	no	no	High	-76.163107760	41.091428776	10/20/2010
291	9	Edge	White oak	30	76	Live	yes	no	no	High	-76.163090132	41.091470838	10/20/2010
292a	9	Edge	Shagbark hickory	11	28	Live	yes	no	no	Medium	-76.163101738	41.091487163	10/20/2010
292b	9	Edge	Shagbark hickory	11	28	Live	yes	no	no	Medium	-76.163101738	41.091487163	10/20/2010
293	9	Edge	Unknown	9	23	Dead	yes	no	no	Medium	-76.163078695	41.091563903	10/20/2010
294	9	Edge	Unknown	11	28	Dead	yes	no	no	Medium	-76.162864947	41.091811193	10/20/2010
295	9	Edge	White pine	11	28	Dead	yes	no	no	Medium	-76.162519076	41.091575226	10/20/2010
296	9	Edge	Red maple	14	36	Dead	yes	no	no	Medium	-76.162791590	41.085789594	10/19/2010

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Identification Number	Forest Area Number	Setting	Tree Species	DBH[1]		Condition	Roost Type			Roost Potential	Longitude	Latitude	Date Observed
				in	cm		Bark	Crevice	Cavity				
297	9	Edge	Shagbark hickory	16	41	Live	yes	no	no	High	-76.162736184	41.085752048	10/19/2010
299	9	Edge	Shagbark hickory	21	53	Live	yes	no	no	High	-76.162729890	41.085743468	10/19/2010
300	9	Edge	Shagbark hickory	9	23	Live	yes	no	no	Medium	-76.162728453	41.085814788	10/19/2010
301	9	Edge	Shagbark hickory	10	25	Live	yes	no	no	Medium	-76.161987736	41.085880895	10/19/2010
302	9	Edge	Shagbark hickory	11	28	Live	yes	no	no	Medium	-76.161728976	41.085818772	10/19/2010
303	9	Edge	Shagbark hickory	7	18	Live	yes	no	no	Low	-76.161688754	41.085850988	10/19/2010
304	9	Edge	Shagbark hickory	10	25	Live	yes	no	no	Medium	-76.161544882	41.085884574	10/19/2010
305	9	Edge	Shagbark hickory	6	15	Live	yes	no	no	Low	-76.161562107	41.085839296	10/19/2010
306	9	Edge	hickory	13	33	Live	yes	no	no	Medium	-76.161418954	41.085859263	10/19/2010
307	9	Edge	Unknown	21	53	Dead	yes	no	no	High	-76.161423414	41.085926452	10/19/2010
308a	9	Edge	Shagbark hickory	7	18	Live	yes	no	no	Low	-76.161323091	41.085861610	10/19/2010
308b	9	Edge	Shagbark hickory	7	18	Live	yes	no	no	Low	-76.161323091	41.085861610	10/19/2010
309	9	Edge	Shagbark hickory	16	41	Live	yes	no	no	High	-76.161329589	41.085847727	10/19/2010
310	9	Edge	Shagbark hickory	9	23	Live	yes	no	no	Medium	-76.161226282	41.085861355	10/19/2010
311	9	Edge	Shagbark hickory	8	20	Live	yes	no	no	Low	-76.161206302	41.085872165	10/19/2010
312	9	Edge	hickory	5	13	Live	yes	no	no	Low	-76.161269911	41.085932669	10/19/2010
313	9	Edge	Black oak	5	13	Dead	yes	no	no	Low	-76.160439172	41.085106051	10/19/2010

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Identification Number	Forest Area Number	Setting	Tree Species	DBH[1]		Condition	Roost Type			Roost Potential	Longitude	Latitude	Date Observed
				in	cm		Bark	Crevice	Cavity				
314	9	Edge	Shagbark hickory	9	23	Live	yes	no	no	Medium	-76.159748480	41.085139837	10/19/2010
315	9	Edge	Unknown	14	36	Dead	yes	no	no	Medium	-76.157857973	41.084862159	10/19/2010
316	9	Edge	Unknown	10	25	Dead	yes	no	no	Medium	-76.160694848	41.084858574	10/19/2010
317a	9	Edge	Black cherry	6	15	Partially Dead	yes	no	no	Low	-76.160821284	41.084881401	10/19/2010
317b	9	Edge	Black cherry	6	15	Partially Dead	yes	no	no	Low	-76.160821284	41.084881401	10/19/2010
317c	9	Edge	Black cherry	6	15	Partially Dead	yes	no	no	Low	-76.160821284	41.084881401	10/19/2010
318	9	Edge	Shagbark hickory	14	36	Live	yes	no	no	Medium	-76.162811736	41.085910667	10/19/2010
319	9	Edge	Shagbark hickory	14	36	Live	yes	no	no	Medium	-76.162733576	41.085917099	10/19/2010
320	9	Edge	Shagbark hickory	26	66	Live	yes	no	no	High	-76.162781794	41.086007481	10/19/2010
321	9	Edge	Shagbark hickory	18	46	Live	yes	no	no	High	-76.162820105	41.086005186	10/19/2010
322	9	Edge	Shagbark hickory	7	18	Live	yes	no	no	Low	-76.162815638	41.086050809	10/19/2010
323	9	Edge	White oak	34	86	Live	yes	no	no	High	-76.162799696	41.086133067	10/19/2010
324	9	Edge	Shagbark hickory	10	25	Live	yes	no	no	Medium	-76.162824239	41.086474665	10/19/2010
325	9	Edge	Black cherry	18	46	Live	yes	no	no	High	-76.162545221	41.086530589	10/19/2010
326	9	Edge	Black cherry	16	41	Live	yes	no	no	High	-76.162095420	41.086568987	10/19/2010
331	9	Edge	Shagbark hickory	12	30	Live	yes	no	no	Medium	-76.159548272	41.086861547	10/19/2010
335	9	Edge	Black cherry	26	66	Partially Dead	yes	no	no	High	-76.158103006	41.087240735	10/19/2010

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Identification Number	Forest Area Number	Setting	Tree Species	DBH[1] in	DBH[1] cm	Condition	Roost Type Bark	Roost Type Crevice	Roost Type Cavity	Roost Potential	Longitude	Latitude	Date Observed
336	10	Interior Upland	Shagbark hickory	12	30	Live	yes	no	no	Medium	-76.154572980	41.089618379	10/13/2010
337	10	Interior Upland	Shagbark hickory	7	18	Live	yes	no	no	Low	-76.154492526	41.089610914	10/13/2010
338	10	Interior Upland	White oak	13	33	Live	yes	no	no	Medium	-76.154976508	41.089643721	10/13/2010
339	10	Interior Upland	Shagbark hickory	10	25	Live	yes	no	no	Medium	-76.154780505	41.089643819	10/13/2010
340	10	Interior Upland	Red oak	20	51	Live	yes	no	no	High	-76.152786980	41.089642881	10/13/2010
341	10	Interior Upland	Red oak	12	30	Dead	yes	no	no	Medium	-76.152469855	41.089497028	10/13/2010
342	10	Interior Upland	Red oak	24	61	Live	yes	no	no	High	-76.152528178	41.089469301	10/13/2010
343	10	Interior Upland	Unknown	17	43	Dead	yes	no	no	High	-76.153050736	41.089385874	10/13/2010
344	10	Interior Wetland	Red maple	33	84	Partially Dead	yes	yes	no	High	-76.155793559	41.089930584	10/1/2010
346	10	Wetland	Black gum	28	71	Live	no	no	yes	High	-76.153144269	41.087506861	10/7/2010
347	10	Edge	Unknown	9	23	Dead	yes	no	no	Medium	-76.153498454	41.089488119	10/20/2010
348	10	Edge	Shagbark hickory	12	30	Live	yes	no	no	Medium	-76.153702443	41.089658099	10/20/2010
349	10	Edge	White oak	20	51	Live	yes	no	no	High	-76.153700702	41.089672401	10/20/2010
350	10	Edge	Shagbark hickory	8	20	Live	yes	no	no	Low	-76.154019956	41.089615528	10/20/2010
351	10	Edge	Shagbark hickory	9	23	Live	yes	no	no	Medium	-76.154147506	41.089655707	10/20/2010
352	10	Edge	Shagbark hickory	11	28	Live	yes	no	no	Medium	-76.154010211	41.089682358	10/20/2010
353	10	Edge	Red maple	16	41	Dead	yes	no	no	High	-76.152528936	41.089022645	10/20/2010
354	10	Edge	Unknown	12	30	Dead	yes	no	no	Medium	-76.152314883	41.088690557	10/20/2010

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Identification Number	Forest Area Number	Setting	Tree Species	DBH[1] in	DBH[1] cm	Condition	Roost Type Bark	Roost Type Crevice	Roost Type Cavity	Roost Potential	Longitude	Latitude	Date Observed
355	10	Edge	White oak	21	53	Live	yes	no	no	High	-76.151153415	41.088734844	10/20/2010
356	10	Edge	White oak	19	48	Live	yes	no	no	High	-76.151100900	41.088735060	10/20/2010
357	10	Edge	Unknown	6	15	Dead	yes	no	no	Low	-76.151493284	41.089165067	10/20/2010
358	10	Edge	White oak	18	46	Live	yes	no	no	High	-76.151626639	41.089205950	10/20/2010
359	10	Edge	White oak	21	53	Live	yes	no	no	High	-76.152163110	41.089391099	10/20/2010
360	10	Edge	White oak	14	36	Live	yes	no	no	Medium	-76.152175131	41.089439237	10/20/2010
361	10	Edge	White pine	6	15	Dead	yes	no	no	Low	-76.152164106	41.089447320	10/20/2010
362	10	Edge	White oak	23	58	Live	yes	no	no	High	-76.152096500	41.089463710	10/20/2010
363	10	Edge	White oak	18	46	Live	yes	no	no	High	-76.152185309	41.089487910	10/20/2010
364	10	Edge	White oak	26	66	Live	yes	no	no	High	-76.152238120	41.089490468	10/20/2010
365	10	Edge	White oak	28	71	Live	yes	no	no	High	-76.152206035	41.089553859	10/20/2010
366	11	Interior Upland	Unknown	14	36	Dead	yes	no	no	Medium	-76.152786436	41.085395315	10/13/2010
367	11	Interior Upland	White pine	28	71	Dead	yes	yes	no	High	-76.152493439	41.085409262	10/13/2010
368	11	Interior Upland	White oak	27	69	Live	yes	no	no	High	-76.152713237	41.085106941	10/13/2010
369	11	Upland	White oak	36	91	Live	yes	no	no	High	-76.152595860	41.085154236	10/13/2010
370	11	Edge	Unknown	16	41	Dead	yes	no	no	High	-76.152375950	41.085459057	10/20/2010
371	11	Edge	Red oak	49	124	Live	yes	no	no	High	-76.152760442	41.085874933	10/20/2010
372	11	Edge	White oak	18	46	Live	yes	no	no	High	-76.152835715	41.085929912	10/20/2010
373	11	Edge	White oak	14	36	Live	yes	no	no	Medium	-76.152895884	41.085807087	10/20/2010
374	11	Edge	White oak	20	51	Live	yes	no	no	High	-76.153060434	41.085941870	10/20/2010
375	11	Edge	White oak	17	43	Live	yes	no	no	High	-76.153041403	41.085925096	10/20/2010
376	11	Edge	White oak	12	30	Live	yes	no	no	Medium	-76.153007328	41.085899138	10/20/2010
377	11	Edge	White oak	14	36	Live	yes	no	no	Medium	-76.153039647	41.085892591	10/20/2010
378	12	Interior Upland	White pine	13	33	Dead	yes	no	no	Medium	-76.157640088	41.083241177	10/13/2010
379a	12	Interior Upland	Unknown	12	30	Dead	yes	no	no	Medium	-76.158116392	41.083017679	10/13/2010

Table C-1. Comprehensive List of Indiana Bat (*Myotis sodalis*) Potential Roost Trees at the Bell Bend NPP Project Site.

Identification Number	Forest Area Number	Setting	Tree Species	DBH[1] in	DBH[1] cm	Condition	Roost Type Bark	Roost Type Crevice	Roost Type Cavity	Roost Potential	Longitude	Latitude	Date Observed
379b	12	Interior Upland	Unknown	12	30	Dead	yes	no	no	Medium	-76.158116392	41.083017679	10/13/2010
380	12	Interior Upland	White pine	13	33	Dead	yes	no	no	Medium	-76.158186971	41.083084656	10/13/2010
381	12	Interior Upland	White oak	28	71	Live	yes	no	no	High	-76.156507564	41.082754573	10/13/2010
382	12	Interior Upland	Unknown	12	30	Dead	yes	no	no	Medium	-76.156530756	41.082776156	10/13/2010
383	12	Interior Upland	Unknown	9	23	Dead	yes	no	no	Medium	-76.156677673	41.082876841	10/13/2010
384	12	Interior Upland	White oak	13	33	Live	yes	no	no	Medium	-76.156706940	41.082977781	10/13/2010
385	12	Interior Upland	Shagbark hickory	14	36	Dead	yes	no	no	Medium	-76.156669465	41.083025212	10/13/2010
386	12	Interior Upland	Shagbark hickory	10	25	Live	yes	no	no	Medium	-76.156617536	41.082911465	10/13/2010
387	12	Interior Upland	Shagbark hickory	16	41	Dead	yes	no	no	High	-76.156234074	41.082715572	10/13/2010
388	12	Interior Wetland	Shagbark hickory	15	38	Live	yes	no	no	Medium	-76.155922139	41.082211828	10/15/2010
389	12	Interior Wetland	Shagbark hickory	6	15	Live	yes	no	no	Low	-76.155462912	41.082289767	10/15/2010
390	12	Interior Wetland	Shagbark hickory	20	51	Live	yes	no	no	High	-76.155106030	41.082368044	10/15/2010
391	12	Interior Wetland	Shagbark hickory	18	46	Live	yes	no	no	High	-76.155016693	41.082263703	10/15/2010
392	12	Interior Wetland	Shagbark hickory	21	53	Live	yes	no	no	High	-76.154937122	41.082167604	10/15/2010
393	12	Interior Wetland	Shagbark hickory	13	33	Live	yes	no	no	Medium	-76.154848102	41.082210842	10/15/2010
394	12	Edge	Black cherry	9	23	Live	yes	no	no	Medium	-76.158025741	41.083714944	10/20/2010

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Identification Number	Forest Area Number	Setting	Tree Species	DBH[1] in	DBH[1] cm	Condition	Roost Type Bark	Roost Type Crevice	Roost Type Cavity	Roost Potential	Longitude	Latitude	Date Observed
395	12	Edge	Red maple	7	18	Dead	yes	no	no	Low	-76.158275702	41.083642543	10/20/2010
396	12	Edge	Red maple	12	30	Dead	yes	no	no	Medium	-76.158753815	41.083148268	10/20/2010
397	12	Edge	Black cherry	8	20	Live	yes	no	no	Low	-76.158778028	41.082868459	10/20/2010
398	12	Edge	Black cherry	19	48	Live	yes	no	no	High	-76.157411461	41.083580446	10/20/2010
399	12	Edge	White oak	18	46	Live	yes	no	no	High	-76.157450746	41.083617008	10/20/2010
400	13	Upland Interior	Sweet birch	20	51	Live	yes	no	no	High	-76.151877493	41.081893579	10/13/2010
401	13	Upland	Unknown	23	58	Dead	yes	no	no	High	-76.151654211	41.082101472	10/13/2010
402	13	Edge	Red maple	9	23	Dead	yes	no	no	Medium	-76.150092430	41.081157902	10/20/2010
403	13	Edge	Shagbark hickory	22	56	Live	yes	no	no	High	-76.150400020	41.081852831	10/20/2010
404	13	Edge	Sweet birch	12	30	Partially Dead	yes	no	no	Medium	-76.150337030	41.082062560	10/20/2010
405	14	Upland Interior	Unknown	6	15	Dead	yes	no	no	Low	-76.147629647	41.079909038	10/13/2010
406	14	Upland Interior	Red maple	7	18	Dead	yes	no	no	Low	-76.147561672	41.079864090	10/13/2010
407	14	Upland Interior	Red maple	7	18	Dead	yes	no	no	Low	-76.147493813	41.079984770	10/13/2010
408	14	Upland Interior	Red maple	13	33	Dead	yes	no	no	Medium	-76.147434320	41.080054220	10/13/2010
409	14	Upland Interior	Red maple	9	23	Dead	yes	no	no	Medium	-76.147465532	41.080068706	10/13/2010
410a	14	Upland Interior	Red maple	11	28	Dead	yes	no	no	Medium	-76.147527680	41.080049802	10/13/2010
410b	14	Upland Interior	Red maple	11	28	Dead	yes	no	no	Medium	-76.147527680	41.080049802	10/13/2010
410c	14	Upland	Red maple	11	28	Dead	yes	no	no	Medium	-76.147527680	41.080049802	10/13/2010

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Identification Number	Forest Area Number	Setting	Tree Species	DBH[1] in	DBH[1] cm	Condition	Roost Type Bark	Roost Type Crevice	Roost Type Cavity	Roost Potential	Longitude	Latitude	Date Observed
411a	14	Interior Upland	Red maple	8	20	Dead	yes	no	no	Low	-76.147669604	41.080052629	10/13/2010
411b	14	Interior Upland	Red maple	8	20	Dead	yes	no	no	Low	-76.147669604	41.080052629	10/13/2010
411c	14	Interior Upland	Red maple	8	20	Live	yes	no	no	Low	-76.147669604	41.080052629	10/13/2010
411d	14	Interior Upland	Red maple	8	20	Live	yes	no	no	Low	-76.147669604	41.080052629	10/13/2010
412	14	Interior Upland	Red maple	7	18	Dead	yes	no	no	Low	-76.147467061	41.081113897	10/13/2010
413a	14	Interior Upland	Red maple	7	18	Dead	yes	no	no	Low	-76.147820630	41.081375206	10/13/2010
413b	14	Interior Upland	Red maple	7	18	Dead	yes	no	no	Low	-76.147820630	41.081375206	10/13/2010
413c	14	Interior Upland	Red maple	7	18	Dead	yes	no	no	Low	-76.147820630	41.081375206	10/13/2010
413d	14	Upland	Red maple	7	18	Dead	yes	no	no	Low	-76.147820630	41.081375206	10/13/2010
414	14	Edge	Red maple	8	20	Dead	yes	no	no	Low	-76.148346400	41.079073199	10/20/2010
415	14	Edge	Red maple	6	15	Dead	yes	no	no	Low	-76.148462596	41.079500654	10/20/2010
416	14	Edge	Red maple	8	20	Partially Dead	yes	no	no	Low	-76.148446707	41.079512294	10/20/2010
417	14	Edge	Black cherry	9	23	Dead	yes	no	no	Medium	-76.148611654	41.080654842	10/20/2010
418	14	Edge	Unknown	8	20	Dead	yes	no	no	Low	-76.148529527	41.080740455	10/20/2010
419	14	Edge	Red maple	11	28	Dead	yes	no	no	Medium	-76.148546550	41.080976483	10/20/2010
420	14	Edge	Red maple	20	51	Live	yes	no	no	High	-76.147893121	41.082220343	10/20/2010
421	14	Edge	Shagbark hickory	14	36	Live	yes	no	no	Medium	-76.147793541	41.082147923	10/20/2010
422	14	Edge	Shagbark hickory	11	28	Live	yes	no	no	Medium	-76.147657960	41.082182821	10/20/2010

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Identification Number	Forest Area Number	Setting	Tree Species	DBH[1]		Condition	Roost Type			Roost Potential	Longitude	Latitude	Date Observed
				in	cm		Bark	Crevice	Cavity				
423	14	Edge	Shagbark hickory	12	30	Live	yes	no	no	Medium	-76.147646812	41.082202758	10/20/2010
424	14	Edge	Shagbark hickory	18	46	Live	yes	no	no	High	-76.147277234	41.081860914	10/20/2010
425	14	Edge	Shagbark hickory	8	20	Live	yes	no	no	Low	-76.147287500	41.081684066	10/20/2010
426	14	Edge	Shagbark hickory	9	23	Live	yes	no	no	Medium	-76.147301014	41.081664680	10/20/2010
427	14	Edge	Red maple	9	23	Dead	yes	no	no	Medium	-76.147322205	41.081211514	10/20/2010
428	14	Edge	Shagbark hickory	13	33	Live	yes	no	no	Medium	-76.147264747	41.081135036	10/20/2010
429	15	Interior Upland	Red pine	6	15	Dead	yes	no	no	Low	-76.146098852	41.072727790	10/13/2010
430	15	Interior Upland	Quaking aspen	10	25	Dead	yes	no	no	Medium	-76.146261157	41.072574359	10/13/2010
431	15	Interior Upland	Red pine	6	15	Dead	yes	no	no	Low	-76.147054547	41.071870739	10/13/2010
432	15	Interior Upland	Sassafras	7	18	Dead	yes	no	no	Low	-76.147212596	41.072359476	10/13/2010
433	15	Interior Upland	Quaking aspen	11	28	Dead	yes	no	no	Medium	-76.147196685	41.072224372	10/13/2010
434	15	Interior Upland	Red maple	11	28	Partially Dead	yes	no	no	Medium	-76.147338496	41.073281938	10/13/2010
435	15	Interior Upland	Quaking aspen	11	28	Dead	yes	no	no	Medium	-76.147061297	41.073062105	10/13/2010
436	15	Interior Upland	Red maple	9	23	Dead	yes	no	no	Medium	-76.147068259	41.073114861	10/13/2010
437	15	Interior Upland	Red maple	10	25	Dead	yes	no	no	Medium	-76.147115876	41.073004973	10/13/2010
438a	15	Interior Upland	Red maple	13	33	Partially Dead	yes	no	no	Medium	-76.147732173	41.072317618	10/13/2010

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Identification Number	Forest Area Number	Setting	Tree Species	DBH[1] in	DBH[1] cm	Condition	Roost Type Bark	Roost Type Crevice	Roost Type Cavity	Roost Potential	Longitude	Latitude	Date Observed
4638b	15	Interior Upland	Red maple	13	33	Partially Dead	yes	no	no	Medium	-76.147732173	41.072317618	10/13/2010
439	15	Interior Upland	Red maple	7	18	Partially Dead	yes	no	no	Low	-76.147820445	41.072295883	10/13/2010
499	15	Edge	Black oak	8	20	Dead	yes	no	no	Low	-76.14437078	41.07255624	7/13/2011
500	15	Edge	American sycamore	11	28	Live	yes	no	no	Medium	-76.14545751	41.07028226	7/14/2011
501	15	Edge	Red maple	11	28	Partially Dead	yes	yes	no	Medium	-76.14529554	41.07040717	7/14/2011
502	15	Edge	Black cherry	19	48	Live	yes	no	no	High	-76.1452139	41.07050118	7/14/2011
503	15	Edge	Red oak	31	79	Live	yes	no	no	High	-76.14586967	41.0706686	7/14/2011
504	15	Edge	River birch	15	38	Live	yes	no	no	Medium	-76.14603137	41.07068584	7/14/2011
440a	16	Interior Upland	Red maple	8	20	Dead	yes	no	no	Low	-76.149145499	41.070487375	10/14/2010
440b	16	Interior Upland	Red maple	8	20	Dead	yes	no	no	Low	-76.149145499	41.070487375	10/14/2010
440c	16	Interior Upland	Red maple	8	20	Dead	yes	no	no	Low	-76.149145499	41.070487375	10/14/2010
441	16	Interior Upland	Black oak	7	18	Dead	yes	no	no	Low	-76.148836141	41.070735929	10/14/2010
512	16	Interior Upland	Pin oak	34	86	Live	yes	no	no	High	-76.15021918	41.06970755	7/14/2011
513	16	Interior Upland	Black oak	7	18	Dead	yes	no	no	Low	-76.14948191	41.0693843	7/14/2011
514	16	Interior Upland	Pin oak	26	66	Live	yes	no	no	High	-76.14935571	41.069573	7/14/2011
515	16	Interior Upland	Pin oak	24	61	Dead	yes	no	no	High	-76.14944895	41.06958881	7/14/2011
516	16	Interior Upland	Pin oak	18	46	Live	yes	no	no	High	-76.14954177	41.06941774	7/14/2011
442	16	Edge	Red maple	9	23	Dead	yes	no	no	Medium	-76.149188375	41.071182461	10/20/2010

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443	16	Edge	Red maple	6	15	Dead	yes	no	yes	Low	-76.149182210	41.071237066	10/20/2010
444	16	Edge	Red maple	10	25	Dead	yes	no	no	Medium	-76.149299437	41.071333577	10/20/2010
445	16	Edge	Red maple	7	18	Dead	yes	no	no	Low	-76.149229329	41.071296371	10/20/2010
505	16	Edge	River birch	28	71	Dead	yes	no	no	High	-76.14857254	41.06884736	7/14/2011
506	16	Edge	Sassafras	32	81	Live	yes	yes	no	High	-76.14873427	41.06875031	7/14/2011
507	16	Edge	Black cherry	24	61	Live	yes	no	no	High	-76.1490073	41.06866859	7/14/2011
508	16	Edge	Red maple	24	61	Dead	yes	yes	no	High	-76.14909531	41.07003401	7/14/2011
509	16	Edge	Red maple	9	23	Partially Dead	yes	no	no	Medium	-76.14909011	41.07004764	7/14/2011
510	16	Edge	Black cherry	22	56	Live	yes	no	no	High	-76.14940777	41.06986685	7/14/2011
511	16	Edge	Bigtooth aspen	9	23	Dead	yes	no	no	Medium	-76.14947187	41.06971834	7/14/2011
517	16	Edge	River birch	20	51	Dead	yes	no	no	High	-76.14922399	41.06865338	7/14/2011
518	16	Edge	River birch	28	71	Dead	yes	no	no	High	-76.14912438	41.06865819	7/14/2011
519	16	Edge	River birch	26	66	Live	yes	no	no	High	-76.14919887	41.06870042	7/14/2011
520	16	Edge	Black locust	15	38	Partially Dead	yes	no	no	Medium	-76.15020528	41.06812299	7/14/2011
521	16	Edge	Black locust	14	36	Partially Dead	yes	no	no	Medium	-76.15069452	41.06799665	7/14/2011
522	16	Edge	Pin oak	35	89	Live	yes	no	no	High	-76.15068241	41.06801803	7/14/2011
446	17	Interior Upland	Red maple	13	33	Live	yes	no	no	Medium	-76.154424382	41.100616790	10/14/2010
447	17	Interior Upland	Red maple	7	18	Dead	yes	no	no	Low	-76.154326841	41.100737827	10/14/2010
448	17	Interior Upland	Red maple	6	15	Dead	yes	no	no	Low	-76.154318359	41.100801085	10/14/2010
449	17	Interior Upland	Unknown	7	18	Dead	yes	no	no	Low	-76.154570097	41.100799277	10/14/2010
450	17	Upland	Red maple	7	18	Dead	yes	no	no	Low	-76.152232989	41.099134977	10/14/2010

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Identification Number	Forest Area Number	Setting	Tree Species	DBH[1] in	DBH[1] cm	Condition	Roost Type Bark	Roost Type Crevice	Roost Type Cavity	Roost Potential	Longitude	Latitude	Date Observed
451	17	Interior Upland	Red maple	6	15	Dead	yes	no	no	Low	-76.152458076	41.098933033	10/14/2010
452	17	Interior Upland	Red maple	7	18	Dead	yes	no	no	Low	-76.152662255	41.098986520	10/14/2010
453	17	Interior Upland	Red maple	8	20	Dead	yes	no	no	Low	-76.151938164	41.099754197	10/14/2010
454	17	Interior Upland	Bigtooth aspen	6	15	Dead	yes	no	no	Low	-76.152103226	41.099761910	10/14/2010
455	17	Interior Upland	Unknown	12	30	Dead	yes	no	no	Medium	-76.154284576	41.100362610	10/14/2010
456	17	Edge	Red maple	9	23	Partially Dead	yes	no	no	Medium	-76.154266237	41.099873225	10/20/2010
457	18	Interior Upland	White pine	7	18	Dead	yes	no	no	Low	-76.136236638	41.103897218	10/14/2010
458	18	Interior Upland	Silver maple	19	48	Dead	yes	no	no	High	-76.135494411	41.102560232	10/14/2010
459	18	Interior Upland	Silver maple	7	18	Dead	yes	no	no	Low	-76.135446502	41.102685457	10/14/2010
460a	18	Interior Upland	Silver maple	21	53	Live	yes	no	no	High	-76.135396257	41.102693512	10/14/2010
460b	18	Upland	maple	21	53	Live	yes	no	no	High	-76.135396257	41.102693512	10/14/2010
461	18	Edge	Red maple	6	15	Dead	yes	no	no	Low	-76.135315193	41.102256453	10/20/2010
462	18	Edge	Silver maple	28	71	Live	yes	no	no	High	-76.135566036	41.102300686	10/20/2010
463	18	Edge	Silver maple	38	97	Live	yes	no	no	High	-76.135610265	41.102347523	10/20/2010
464	18	Edge	Silver maple	20	51	Live	yes	no	no	High	-76.135658191	41.102272128	10/20/2010
465	18	Edge	Silver maple	24	61	Live	yes	no	no	High	-76.135220278	41.103421131	10/20/2010

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Identification Number	Forest Area Number	Setting	Tree Species	DBH[1] in	DBH[1] cm	Condition	Roost Type Bark	Roost Type Crevice	Roost Type Cavity	Roost Potential	Longitude	Latitude	Date Observed
466	18	Edge	Silver maple	25	64	Live	yes	no	no	High	-76.135221312	41.103448600	10/20/2010
467	18	Edge	Unknown	17	43	Dead	yes	no	no	High	-76.135208493	41.103678562	10/20/2010
468	18	Edge	Silver maple	48	122	Live	yes	no	no	High	-76.135270297	41.103710227	10/20/2010
469	18	Edge	Silver maple	72	183	Live	yes	no	no	High	-76.135288652	41.104167528	10/20/2010
470	18	Edge	Silver maple	34	86	Partially Dead	yes	no	no	High	-76.134980919	41.104174116	10/20/2010
471	18	Edge	Silver maple	34	86	Live	yes	no	no	High	-76.134953620	41.103905198	10/20/2010
472	18	Edge	Silver maple	24	61	Partially Dead	yes	no	no	High	-76.134947805	41.103847828	10/20/2010
473a	18	Edge	Silver maple	22	56	Live	yes	no	no	High	-76.134928907	41.103721191	10/20/2010
473b	18	Edge	Silver maple	22	56	Live	yes	no	no	High	-76.134928907	41.103721191	10/20/2010
473c	18	Edge	Silver maple	22	56	Live	yes	no	no	High	-76.134928907	41.103721191	10/20/2010
474	18	Edge	Silver maple	38	97	Live	yes	no	no	High	-76.134973255	41.103450313	10/20/2010
475a	18	Edge	Silver maple	20	51	Live	yes	no	no	High	-76.134966781	41.103458126	10/20/2010
475b	18	Edge	Silver maple	20	51	Live	yes	no	no	High	-76.134966781	41.103458126	10/20/2010
476a	18	Edge	Silver maple	20	51	Live	yes	no	no	High	-76.134949552	41.103418173	10/20/2010
476b	18	Edge	maple	20	51	Live	yes	no	no	High	-76.134949552	41.103418173	10/20/2010
477	25	Interior Upland	White oak	40	102	Live	yes	no	no	High	-76.144232457	41.087402276	10/14/2010

Table C-1. Comprehensive List of Indiana Bat (*Myotis sodalis*) Potential Roost Trees at the Bell Bend NPP Project Site.

Identification Number	Forest Area Number	Setting	Tree Species	DBH[1] in	DBH[1] cm	Condition	Roost Type Bark	Roost Type Crevice	Roost Type Cavity	Roost Potential	Longitude	Latitude	Date Observed
478	25	Interior Upland	Unknown	7	18	Dead	yes	no	no	Low	-76.139209637	41.089627747	10/14/2010
479	25	Interior Upland	Black cherry	9	23	Dead	yes	no	no	Medium	-76.139199117	41.089657504	10/14/2010
480a	25	Interior Upland	Black cherry	13	33	Live	yes	no	no	Medium	-76.139021236	41.089538947	10/14/2010
480b	25	Interior Upland	Black cherry	13	33	Live	yes	no	no	Medium	-76.139021236	41.089538947	10/14/2010
481	25	Edge	White oak	32	81	Live	yes	no	no	High	-76.144179634	41.087686115	10/14/2010
482	25	Edge	Red maple	12	30	Dead	yes	no	no	Medium	-76.137504946	41.089634926	10/20/2010
483	25	Edge	Unknown	14	36	Dead	yes	no	no	Medium	-76.137446216	41.089524336	10/20/2010
484	25	Edge	Unknown	7	18	Dead	yes	no	no	Low	-76.138184894	41.089694779	10/20/2010
485	26	Interior Upland	Unknown	40	102	Dead	yes	no	no	High	-76.136188465	41.089703873	10/15/2010
486	26	Interior Upland	Black locust	46	117	Live	yes	no	no	High	-76.136583866	41.089628458	10/15/2010
491	26	Edge	White oak	36	91	Live	yes	no	no	High	-76.135062380	41.089366425	10/15/2010
494	26	Edge	Shagbark hickory	12	30	Live	yes	no	no	Medium	-76.135371755	41.089518917	10/15/2010
495	26	Edge	Shagbark hickory	11	28	Live	yes	no	no	Medium	-76.135387590	41.089503029	10/15/2010
496	26	Edge	Shagbark hickory	11	28	Live	yes	no	no	Medium	-76.135253697	41.089502253	10/15/2010
497	26	Edge	White oak	15	38	Live	yes	no	no	Medium	-76.135110910	41.089388847	10/15/2010
498	29	Interior Upland	Unknown	15	38	Dead	yes	no	no	High	-76.131758842	41.085952360	10/15/2010

	in (cm)
Average DBH[1] of all PRTs[2]	**14 (36)**
Average DBH[1] of all PRTs[2] in the Interior Forest	**14 (36)**
Average DBH[1] of all PRTs[2] in the Interior Wetlands	**18 (46)**

Table C-1. Comprehensive List of Indiana Bat (*Myotis sodalis*) Potential Roost Trees at the Bell Bend NPP Project Site.

Identification Number	Forest Area Number	Setting	Tree Species	DBH[1] in	DBH[1] cm	Condition	Roost Type Bark	Roost Type Crevice	Roost Type Cavity	Roost Potential	Longitude	Latitude	Date Observed
Average DBH[1] of all PRTs[2] in the Interior Uplands						**13 (33)**							
Average DBH[1] of all PRTs[2] in the Forest Edge						**14 (36)**							

[1]DBH = Diameter at breast height: in = inches; cm = centimeters

[2]PRTs = Potential Roost Trees

APPENDIX D

Forest Area Maps

Figure D-1.
BBNPP Forest Area 1
Potential Roost Tree Locations

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date: 11/29/10
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rev. date: 01/09/11, 09/15/11
prepared for: c. roche
file name: Area1_UP_AppendixFig_Rev