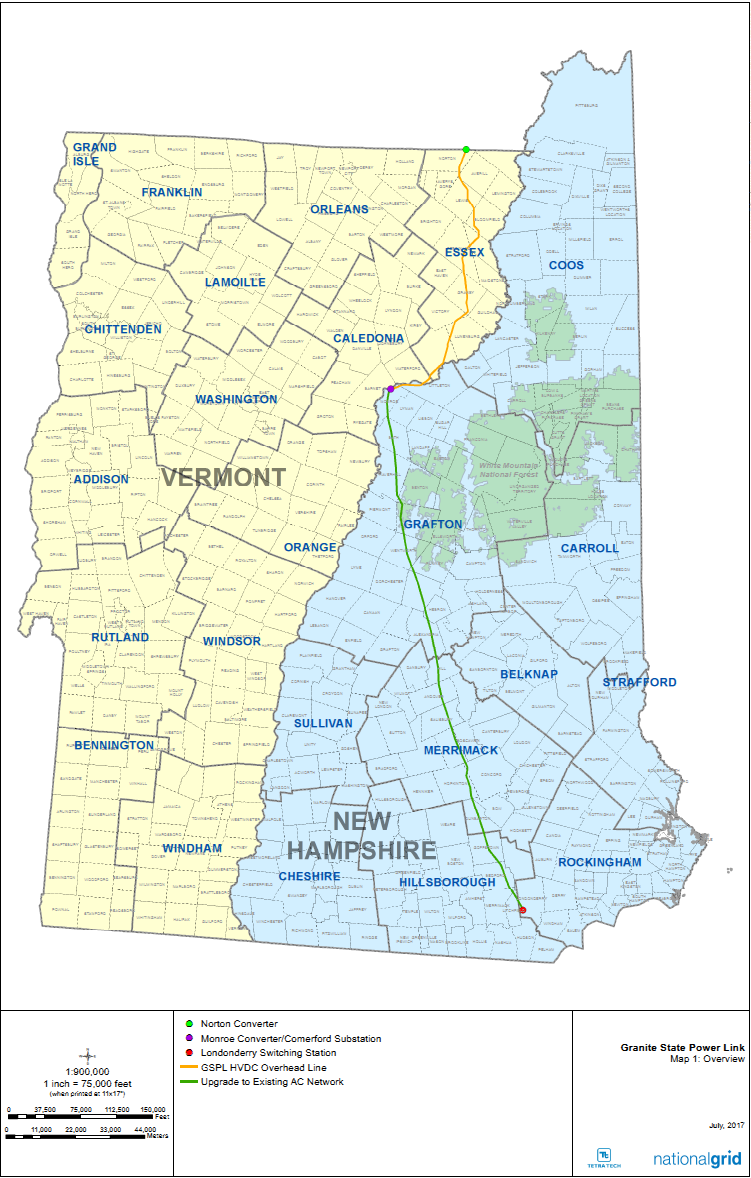
**Attachment 6.3 - AC Upgrade Preliminary Environmental Assessment**

As noted previously, the GSPL Project will trigger upgrades within portions of the electrical transmission system controlled by New England Power (NEP) and Eversource (shown in green in Figure 1), although the full scope of these upgrades will not be known until completion of the SIS.



**Figure 1. GSPL Project Route and AC Upgrades**

A significant feature of the GSPL Project is that by interconnecting to the ISO-NE system in Monroe, NH, it avoids the need to construct new right-of-way (ROW) through much of New Hampshire. GridAmerica also anticipates that the NEP upgrades would not cause significant impacts insofar as they will involve upgrades to existing infrastructure over approximately 108 miles of ROW, and only 1.8 miles of ROW width expansion. Similarly, the Eversource system upgrades in New Hampshire are anticipated to pose minimal impacts and both companies have extensive experience designing and constructing such projects using proven methods to minimize and mitigate impacts. The NEP and Eversource upgrades are not under GridAmerica control, but will be the responsibility of the controlling entity, and therefore discussions of anticipated impacts are indicative only.

Based on GridAmerica’s system impact studies, the NEP upgrade will include the partial rebuild and reconductoring of two existing NEP-owned lines from 230 kV to 345 kV within approximately 106 miles of an existing 108-mile corridor that extends from the Monroe Converter Station and the Point of Interconnection in Monroe, NH, heading South though Grafton County and then through Merrimack, Hillsborough, and Rockingham Counties, as shown in Figure 1 above. This work would not require the expansion of the ROW or require additional property rights. Within the last approximately 1.8 miles, the existing ROW will be expanded to the east and the west to accommodate two new 345 kV lines that will connect to a new switching station in the town of Londonderry, NH.

This 108-mile ROW between Monroe, NH and Londonderry, NH, generally parallels the I-93 corridor between 5 and 8 miles to the west. Land use changes dramatically along the length of the existing AC ROW as the rural and somewhat remote setting of the northern end of the ROW gives way to increasing agricultural use and finally commercial and residential development associated with the urbanized area of Manchester at the southern end.

Since the NEP system upgrades are more geographically extensive and GridAmerica feels more confident in the scope of those upgrades given the results of its system impact studies, a preliminary environmental assessment and discussion of impacts follows:

1. *Impacts during site development*

It is anticipated that NEP and Eversource system upgrades would be designed, constructed and operated in a manner that avoids or minimizes impacts to environmental resources within the rights-of-way. The GSPL Project team will coordinate with both Eversource and NEP to ensure that system upgrades under their control are completed prior to the completion of construction of the GSPL Project. Site development along the upgrades would be anticipated to involve several distinct activities, including the following:

***Clearing*** Clearing for the NEP AC upgrades in New Hampshire would likely be limited to the southernmost 1.8 miles of expanded ROW. Maintenance is anticipated to be in accordance with NEP’s Transmission Right of Way Management Program.

***Access Roads*** As noted previously, NEP would undertake transmission upgrades along their existing AC line. Similar to the GSPL Project, the existing NEP ROW has existing access along portions of it which may be utilized or upgraded in order to minimize the need for new roadway construction.

***Construction*** It is anticipated that overall GSPL Project coordination with NEP will occur in order to ensure that NEP upgrades to their existing AC line are scheduled for completion prior to those for the GSPL Project. It is also anticipated that NEP would follow similar construction management to that described in Section 7.3 for GSPL relative to the following:

* ***Structure Installation*** As noted, the NEP upgrade would require far fewer structural upgrades than GSPL. Where structural changes are needed, it is anticipated that NEP would replace the structures in the same general location and would utilize similar installation methods to those employed for GSPL (see Section 7.3).
* ***Stringing of Conductors*** It is anticipated that NEP would utilize similar stringing methods to those employed for GSPL (see Section 7.3).
* ***Clean-up and Restoration*** It is anticipated that NEP would utilize similar clean-up and restoration methods to those employed for GSPL (see Section 7.3).
* ***Material Storage Yards and Staging Areas*** It is anticipated that NEP would establish similar material storage yards and staging areas as those employed for GSPL (see Section7.3).

*ii Transportation infrastructure*

The existing NEP AC ROW in New Hampshire crosses 89 roads, most of which are under local or county jurisdiction. Many if not all of these road crossings will provide access for construction, but a detailed access plan will likely be prepared by NEP as part of their engineering and design. The AC ROW also crosses Interstate-89 in the town of Hopkinton, Merrimack County and the Everett Turnpike in the town of Merrimack, Hillsborough County. Eversource system upgrades are anticipated to cross some additional transportation infrastructure, but as noted impacts would are not expected to be significant. Because these upgrade involve work on existing lines, only temporary impacts to transportation infrastructure are anticipated.

**Table 1: Airports and Heliports within 5 Miles of the NEP AC Upgrade Right-of-way**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Facility Name** | **Facility Type** | **Town** | **County** | **Distance from AC Lines (miles)** | **Direction from AC Lines** |
| Newfound Valley | Airport | Bristol | Grafton | 2.3 | East |
| Dean Memorial | Airport | Haverhill | Grafton | 1.9 | West |
| Brookside | Heliport | Haverhill | Grafton | 2.3 | West |
| Wentworth Aerodrome | Airport | Wentworth | Grafton | 0.8 | East |
| Tucker Farm | Airport | Andover | Merrimack | 1.2 | East |
| Concord Hospital | Heliport | Concord | Merrimack | 3.9 | Northeast |
| Chiefs Hut | Heliport | Dunbarton | Merrimack | 1.7 | Southwest |
| D.W. | Heliport | Franklin | Merrimack | 4.8 | Northeast |
| Country Club Air Park | Airport | Goffstown | Merrimack | 1.4 | Southwest |
| Merrimack | Heliport | Merrimack | Merrimack | 4.9 | Southwest |
| Dean Kamen | Heliport | Bedford | Hillsborough | 1.6 | Southwest |
| Dragonwings | Heliport | Bedford | Hillsborough | 2.7 | Southwest |
| Dean Kamen Ii | Heliport | Bedford | Hillsborough | 1.3 | Southwest |
| Westport | Heliport | Litchfield | Hillsborough | 2.1 | Southwest |
| Manchester | Airport | Manchester | Hillsborough | 2.4 | Northeast |
| Catholic Medical Center | Heliport | Manchester | Hillsborough | 2.2 | Northeast |
| Norden Systems | Heliport | Merrimack | Hillsborough | 4.6 | Southwest |
| Pomroy | Heliport | Londonderry | Rockingham | 3.2 | Southeast |

Source: BTS, 2015.

*iii. Air quality impacts*

Air quality impacts associated with NEP and Eversource transmission system upgrades are anticipated to be minimal. Impacts would be limited to fugitive dust, vehicle exhaust, and possible use of temporary portable concrete batch plants during the construction period. Emissions during the operational phase would be similar to those currently taking place at these existing transmission facilities, and limited to vehicle exhaust and dust during infrequent maintenance activities such as inspections and vegetation management.

*iv. Access to water resources/water quality impacts*

The existing NEP AC ROW is located primarily in the Merrimack River Watershed. The Merrimack River is formed at the confluence of the Pemigewasset and Winnipesaukee Rivers in central New Hampshire, flowing south before draining into the Atlantic Ocean. The Merrimack River Watershed drains 3,834 square miles in New Hampshire. Within this watershed, the existing ROW crosses three sub-watersheds including Pemigewasset, Contoocook, and Merrimack River. The northern end of the existing ROW is located within the Connecticut River Watershed. The Connecticut River originates from Fourth Connecticut Lake adjacent to the Canadian border, flowing south before draining into the Long Island Sound. The Connecticut River Watershed drains 3,063 square miles in New Hampshire. Within this watershed, the existing AC line crosses one sub-watershed, the Waits sub-watershed (NHDES 2017).

The New Hampshire Department of Environmental Services (NHDES) utilizes the NHD to document streams throughout the State. The NHDES classifies select rivers in the State as “Designated Rivers”, which are noted for their outstanding natural and cultural resources and are protected under the Rivers Management and Protection Program (NHDES 2017). The NHDES also lists stream and river segments that are protected under the Shoreland Water Quality Protection Act (SWQPA).

The existing NEP AC ROW in New Hampshire crosses 104 streams included in the NHD, including the named streams listed below:

|  |  |
| --- | --- |
| **Ammonoosuc River\*** | Harry Brook |
| Atwell Brook\* | Hunt Mountain Brook |
| Baker River\* | Little Pond Brook |
| Beaverdam Brook | **Merrimack River**\* |
| Bog Brook\* | North Branch Oliverian Brook\* |
| Boutwell Mill Brook | Oliverian Brook\* |
| Bowman Brook | One Stack Brook |
| Childs Brook | Ore Hill Brook |
| Clark Brook | Patten Brook |
| Cockermouth River\* | **Piscataquog River**\* |
| **Contoocook River**\* | Pointer Club Brook |
| Deer Meadow Brook | Pond Brook\* |
| Dolf Brook | Smith River\* |
| Fowler River\* | South Branch Baker River\* |
| Halls Brook | Tilton Brook |
| Hardy Brook | Tural Brook |
| **Bold text** above indicates the feature is a NHDES ‘Designated River’  \* indicates the feature, or segments of the feature, are protected under the SWQPA; however, the segments of these streams that are protected may not necessarily be located within the existing AC ROW. | |

Construction activities required for the 230 kV upgrades will likely be confined to the existing ROW and structure locations, and conductor pulling sites can be located away from stream banks. Use of the existing access roads by NEP would also help to avoid new stream crossings.

It is anticipated that the Eversource upgrades may also require similar crossing of water resource areas; for the same reasons impacts are not expected to be significant.

*v. Ecological and natural resources impacts*

***Wetlands*** The NHDES Wetlands Bureau protects and preserves wetlands from unregulated alteration that would impact wetland functions and values including flood water mitigation, storm water treatment, groundwater recharge, critical habitat for fish and wildlife, and public enjoyment. The NHDES Wetlands Bureau utilizes NWI mapping to document wetlands throughout the State. The NWI classifies wetlands based on habitat as defined in Cowardin et al (1979).

In addition, individual municipalities in New Hampshire may elect to designate “prime wetlands”. Wetlands are given this designation following a thorough review that involves a field and desktop reconnaissance. Prime wetlands are typically large in size (at least 2 acres), have not been significantly altered, and provide habitat to rare or threatened plant and animal species. A 100-foot buffer zone is designated adjacent to all prime wetlands. Following approval from the residents of the municipality, the NHDES reviews the submission for designation before final approval.

Based on a review of the NWI, 171 wetlands are crossed by the centerline of the existing AC ROW between the Comerford Substation and the proposed Londonderry switching station site in New Hampshire for a total distance of approximately 6.2 miles; the longest individual crossing is approximately 1,411 feet. A total of 294 wetlands are located within the NEP existing ROW, and the total area of wetlands within the existing ROW is approximately 243.7 acres. Table 2 presents the various wetland types that are located within the existing ROW.

**Table 2: Wetland Types and Acreage within the Existing NEP AC Right-of-Way in New Hampshire**

|  |  |
| --- | --- |
| **Wetland Type** | **Acreage within NEP Right-of-Way** |
| Freshwater emergent | 120.7 |
| Freshwater forested/shrub | 73.3 |
| Riverine | 36.3 |
| Freshwater pond | 9.3 |
| Freshwater lake | 4.1 |
| **Total** | **243.7** |

As noted previously, NEP would be permitting, constructing and operating their AC transmission upgrades so the specific route might follow either the east or west side of their right-of way. Expansion of the existing NEP ROW to the east in the last 1.8 miles would cross approximately 0.5 acres of freshwater emergent wetlands. Expansion of the existing NEP ROW alternately to the west in the last 1.8 miles would cross approximately 0.06 acres of freshwater forested/shrub wetlands.

Based on review of the most recent data available from the NHDES Wetlands Bureau (October 2012), the existing AC lines cross two municipalities that contain designated prime wetlands: the town of Andover in Merrimack County and the town of Goffstown in Hillsborough County. It is anticipated that NEP would conduct local outreach to confirm whether the existing ROW crosses any prime wetlands.

Construction activity within the limits of a wetland area can have lasting effects and is strongly discouraged by regulators. However, construction activities required for the non-GridAmerica AC line upgrades will generally be confined to the existing ROW and structure locations, and conductor pulling sites can be located outside of wetland areas. Wetland impacts along the existing right of ways are therefore expected to be temporary except where expanded ROW would require additional clearing in wetland areas.

***Vernal Pools*** Vernal pools are resources protected from unregulated alteration under the NHDES Wetlands law and rules. Specifically, the NHDES adopted rules (NH Administrative Rules Env-Wt) regarding vernal pools require that any standard application for a minor or major State wetlands permit, locate and delineate vernal pools and consider the impact of the proposed Project on vernal pools.

Because of their seasonal nature, vernal pool surveys will need to be conducted during the Spring, in accordance with agency-approved protocols. The presence of vernal pools within or near the non-GridAmerica ROWs could result in seasonal restrictions for construction of transmission upgrades in order to minimize or avoid potential impacts.

***Rare, Threatened and Endangered Species*** In New Hampshire there are five federally listed endangered species and four federally listed threatened species. Federally protected species that may occur within the existing NEP AC Upgrade area include Canada lynx, gray wolf (Canis lupus), northern long-eared bat, and Karner blue butterfly (Lycaeides melissa samuelis). Although not listed in New Hampshire, the Indiana bat, federally listed as endangered, may also occur within the NEP AC Upgrade area.

The NHFG, Nongame and Endangered Wildlife Program maintains a list of rare, threatened, and endangered RTE species in New Hampshire. The NHFG lists 27 endangered species and 14 threatened species in New Hampshire, some of which are also federally listed. Of these, 18 State-listed species may be found along the existing AC route based on review of NHFG species distribution data. The New England cottontail (Sylvilagus transitionalis), American marten, northern harrier (Circus cyaneus), golden eagle (Aquila chrysaetos), common nighthawk (Chordeiles minor), upland sandpiper, bald eagle, pied-billed grebe, common loon (Gavia immer), peregrine falcon, grasshopper sparrow (Ammodramus savannarum), blanding’s turtle (Emydoidea blandingii), spotted turtle (Clemmys guttata), eastern hognose snake (Heterodon platirhinos), black racer (Coluber constrictor), ringed boghaunter (Williamsonia lintneri), frosted elfin butterfly (Callophrys irus), and brook floater mussel (Alasmidonta varicose) may be found within the existing AC ROW.

Approximately 9.25 miles of the northern portion of the existing NEP AC ROW crosses the White Mountain National Forest (WMNF). Some of the federal and State-listed species listed above are associated with habitats found in the WMNF and are protected under the WMNF Land and Resource Management Plan. One of the goals of this management plan is to provide sufficient habitat and protect species listed under the ESA or species designated as Regional Forester’s Sensitive Species (RFSS). Species are classified as RFSS based on their global and national conservation rank, and their risk evaluation. In addition to federal and State-listed species found within the WMNF, Bicknell’s thrush, a designated RFSS is also found within the WMNF.

The NHFG does not provide specific locations of listed species without a formal request. Based on the response that is received from NHFG, NEP and/or Eversource may need to undertake presence/absence surveys for transient and mobile species in order to prepare for transmission upgrades. Assuming certain species may be present in the existing AC Upgrade areas, it may be prudent for NEP/Eversource to develop mitigation measures to limit incidental take during construction rather than trying to document their absence, but this would be determined with agency input.

***Significant Wildlife Habitat*** The NHFG maintains a database of highest ranked wildlife habitat. These areas represent wildlife habitats that are in the best relative condition in New Hampshire based on biological, landscape, and human influences, particularly for those species of greatest conservation need. Habitats are categorized under three rankings: Highest Ranked in the State; Highest Ranked in the Biological Region; and Supporting Landscapes. Highest Ranked in the State includes habitat types in the top 15 percent by area of each habitat, including all especially rare habitats (i.e., alpine, dunes, saltmarshes, and rocky shores) and known critical habitats of State-listed species. Highest Ranked in the Biological Region compares habitats within regions of the State that share similar climate, geology, and other environmental factors that influence biology. Within each biological region, the top 30 percent of each habitat type is included in this ranking, except those habitats already included in the Highest Ranked in the State. Supporting Landscapes include the remainder of the top 50 percent of each habitat with some large intact forest stands that were not included in the other rankings.

An analysis of the GIS database indicated that the total area of Highest Ranked in the State habitat within the existing ROW is approximately 746 acres, or approximately 16 percent of the total existing ROW. The total area of Highest Ranked in the Biological Region habitat within the existing ROW is approximately 496 acres, or approximately 11 percent of the total existing ROW. The total area of Supporting Landscapes habitat within the existing ROW is approximately 1,639 acres, or approximately 36 percent of the total existing ROW. Although this data indicates that approximately 63 percent of the existing ROW is designated as important wildlife habitat, the existing ROW has been subject to vegetation management for several decades consistent with guidelines for reliability of the existing powerlines, and the habitat ranking appears to be related to the broader areas that the ROW traverses.

The proposed expansion areas along the southern-most 1.8 miles of the existing NEP ROW are also designated as highest ranked wildlife habitat. The expansion area to the east is designated as Highest Ranked in the Biological Region habitat (9.5 acres; approximately 94 percent) and Highest Ranked in the State habitat (0.6 acres; approximately 6 percent). The expansion area to the west is also designated as Highest Ranked in the Biological Region habitat (5.2 acres; approximately 78 percent) and Highest Ranked in the State habitat (0.05 acres; approximately 0.7 percent).

The NHFG owns 89 WMA’s, encompassing approximately 52,000 acres in New Hampshire. These lands serve to protect and improve wildlife habitat. The WMAs are also open to the public for hunting, fishing, trapping, and wildlife viewing. The existing AC ROW crosses the Dumping Brook WMA in the towns of Merrimack and Bedford. The land for the 188-acre Dumping Brook WMA was acquired between 1947 and 1953 to provide a water source for the NHFG Reed’s Ferry Fish Hatchery, which was subsequently sold in the 1950’s. The Dumping Brook WMA now consists primarily of pine-oak-maple forests intermittent with streams and powerline ROWs, with the Merrimack River located approximately 2,500 feet east. The forest provides habitat for deer, fox, turkey, and a variety of songbirds. Prairie warblers (Setophaga discolor), indigo buntings (Passerina cyanea), and eastern towhees (Pipilo erythrophthalmus) are often found on the powerlines (NHFG 2017b).

There are 16 Important Bird Areas (IBA) in New Hampshire, and one – the Merrimack River Floodplain – occurs along the existing NEP AC ROW. The Merrimack River Floodplain is a State-recognized IBA that encompasses the Merrimack River whose waters and river banks provide habitat for the bald eagle (State-listed threatened), osprey (Pandion haliaetus), and bank swallow (Riparia riparia). The most critical habitat of this IBA is the floodplain forest, which provides habitat for warbling vireo (Vireo gilvus), blue-gray gnatcatcher (Polioptila caerulea), veery (Catharus fuscescens), American redstart (Setophaga ruticilla), rose-breasted grosbeak (Pheucticus ludovicianus), Baltimore oriole (Icterus galbula), and a variety of waterfowl species, swallows, and other landbirds. The White Mountains High Elevation IBA is located approximately 2.5 miles east of the existing AC ROW. It is a Global recognized IBA located in the WMNF, encompasses high-elevation spruce-fir forests which provides habitat for the State-listed threatened peregrine falcon; Bicknell’s thrush, one of the most range-restricted bird species in North America; and other species of State or regional concern including spruce grouse, American three-toed woodpecker (Picoides dorsalis), boreal chickadee, bay-breasted warbler, and blackpoll warbler (Setophaga striata). The existing NEP AC ROW also crosses two Continental recognized IBA’s, the Grafton Forest Block and Rollins Forest Block IBA (Audubon 2016).

These data should not be regarded as a substitute for on-site surveys required for environmental assessments. Consultation with the NHFG would be needed to determine if field surveys of significant habitat areas will be required to document the presence or absence of these communities within the existing ROWs and areas planned for ROW expansion. It is likely that time of year restrictions on tree clearing would be developed in order to minimize impacts to bird nesting habitat and roosting habitat for bats.

***Rare Plants and Communities*** The New Hampshire Natural Heritage Bureau (NH NHB) documents and facilitates the conservation of New Hampshire’s rare plants and natural communities. The NH NHB goals are to protect native plant species in the State, investigate the condition and degree of rarity of plant species, and distribute information regarding these plant species and their habitats. The NH NHB maintains a database of 386 plant species determined to be rare or imperiled in New Hampshire. The database includes 288 State-listed threatened or endangered species and 98 species that are considered rare. The NH NHB provides county and town lists of RTE plant occurrences.

The NH NHB also tracks “exemplary” natural communities throughout the State. New Hampshire is largely comprised of relatively common natural community types, however, distinctive natural communities are scattered throughout the State. To be considered “exemplary”, a natural community must be of a rare type or must be an exceptional example of a common type. The NH NHB provides town lists of exemplary community types including terrestrial communities, palustrine communities, and estuarine communities.

The FWS IPaC tool indicated that Project activities along the existing AC ROW may affect the federally listed threatened small whorled pogonia (Isotria medeoloides); however, the existing ROW does not cross critical habitat for this species, or any other plant species, based on IPaC review (FWS 2017). Preferred habitat includes a relatively open understory in upland mixed deciduous or mixed deciduous-coniferous forests. The WMNF Land and Resource Management Plan aims to protect the small whorled pogonia, and specific goals for this species include maintaining or enhancing habitat conditions around known occurrences, including vegetation management to increase levels of light, if necessary (USFS 2005).

The WMNF Land and Resource Management Plan also aims to protect the dwarf cinquefoil (Potentilla robbinsiana), a RFSS designated species. This species is found exclusively in alpine communities in the WMNF. Preferred habitat includes wind terraces or within the ledges and cracks of cliffs. Specific goals include maintaining habitats for a successful recovery of the dwarf cinquefoil in the WMNF (USFS 2005). While it is unlikely that the existing NEP ROW encompasses suitable habitat for this plant, NEP would likely consult with the U.S. Forest Service (USFS) to determine if pre-construction surveys or other mitigation measures are warranted.

Construction activity within the limits of RTE plant species or exemplary natural communities is strongly discouraged by regulators. Consultation with the NH NHB would be initiated to determine if existing AC ROWs or proposed expansion areas are located within any exemplary natural communities, or encompass documented occurrences of State-listed RTE plant species.

Prior to filing permit applications, consultation with the FWS and USFS would also be required to determine if RTE plant species have been documented within the existing ROWs and the areas planned for ROW expansion. Rare plant surveys may be undertaken following agency consultations.

***Protected Avian Species*** Large numbers of birds migrate through, and breed in, New Hampshire’s wetlands and forests. Abundance and species richness is lowest during the late fall and winter. Aside from significant wildlife habitats and protected species (including bald eagles), impacts to birds as a result of the proposed AC line upgrades are likely to be limited to potential impacts to nesting birds. The greatest potential for the transmission upgrade to impact nesting birds is during clearing of vegetation for ROW expansion. Additional disruption may occur within the existing ROW due to construction noise.

A total of 17 migratory birds and eagle species occur in the NEP corridor based on the FWS IPaC results. Bird species of particular conservation concern that may be potentially affected by the AC Upgrades include American bittern, American oystercatcher (Haematopus palliates), bald eagle, bay-breasted warbler, Bicknell’s thrush, black-billed cuckoo, blue-winged warbler (Vermivora cyanoptera), Canada warbler, common tern, olive-sided flycatcher, peregrine falcon, pied-billed grebe, prairie warbler, purple sandpiper, short-eared owl, willow flycatcher, and wood thrush. All of these migratory birds occur along the proposed upgrade route for breeding, except the bald eagle, which is present year-round; the purple sandpiper (Calidris maritima), which is present during winter; and the short-eared owl, which is present during winter and for breeding (FWS 2017). Although bald eagles are no longer a federally listed species under the ESA, it remains a State-listed threatened species in New Hampshire. New Hampshire had 15 territorial pairs of bald eagles during the 2008 summer breeding season. Preferred habitat structure consists of open bodies of water with little human disturbance, along with large canopy trees or elevated sites for nesting, perching, and roosting.

Forest clearing for ROW expansion will result in a limited impact to protected avian species by reducing potential habitat. Eagle nest surveys may be required to document potential breeding activity that may be disrupted by ROW clearing and other construction activities, particularly near the Connecticut River and the Merrimack River.

*vi. Land use impacts*

Because the NEP upgrade predominantly involves work on existing lines within an existing ROW, land use impacts are expected to be minor. Land use changes dramatically along the length of the existing NEP AC ROW as the rural and somewhat remote setting of the northern end of the ROW gives way to increasing agricultural use and finally commercial and residential development associated with the urbanized area of Manchester at the southern end. The majority of the existing NEP AC ROW traverses the Northeastern Highlands eco-region of New England, but the 30 miles south of Concord are within the Northeastern Coastal Plain. The ROW generally parallels the I-93 corridor roughly 5 50 8 miles to the west.

The northern half of the AC ROW is in Grafton County, which can generally be characterized as rural with some sections that can be characterized as remote. This portion of the ROW crosses the White Mountain National Forest (WMNF) for a distance of approximately 9 miles; within the WMNF the ROW crosses the Appalachian Trail at the crossing of State Route 25C in the town of Warren. Predominant land use along this portion of the ROW is forest with occasional agricultural use.

The central portion of the existing AC ROW is in Merrimack County, and from north to south the number of road crossings and residences increase, and agricultural use becomes more prevalent. Forest cover is still evident along both sides of the ROW, but the influence of the population centers of Franklin and Concord approximately 5 miles to the east results in a more suburban character in the southern portion of the county, particularly in the area where the ROW crosses I-89 in the town of Hopkinton.

As the ROW crosses into Hillsborough County, residential subdivisions increasingly characterize the surrounding landscape. The land use surrounding the existing AC ROW becomes predominantly developed with commercial and higher density residential developments that are part of the urbanized area of Manchester, which is located approximately 3 miles to the east. Medium density residential subdivisions predominate the area to either side of the ROW in the town of Bedford with the ROW located approximately 2 miles west of the Manchester-Boston Regional Airport.

The existing ROW crosses the Merrimack River and into Rockingham County, where the southern-most 1.8 miles in Londonderry are planned for expansion to accommodate the two 345 kV transmission lines that will terminate at the proposed Londonderry switching station. Land use along this portion of the existing ROW includes residential subdivisions and large tracts of conservation lands owned by the Town of Londonderry. Approximately 20 single-family homes abut this section of the existing ROW to the east and west, but the proposed expansion areas avoid the residential subdivisions.

The proposed Londonderry switching station site is located on the west side of the existing ROW adjacent to athletic fields that are part of the West Road Fields/Continental Park complex. The proposed switching station site rises in elevation from north to south and the site is at a higher elevation than the adjacent soccer fields.

Based on an analysis of the New Hampshire conservation lands database and the National Conservation Easement Database (NCED), the existing AC ROW traverses 36 conservation areas for a total distance of approximately 22 miles. The longest crossing is the WMNF for a distance of approximately 9.25 miles in Grafton County.

An analysis was conducted based on the 2011 National Land Cover Database to characterize the land use within 500 feet of the existing NEP ROW for the AC Upgrade project in New Hampshire. The results, shown in Table 3, indicate that more than 70 percent of the adjacent area is forested (deciduous, evergreen and mixed). Less than 7 percent of the adjacent area is developed, with more than half of that located in Hillsborough County.

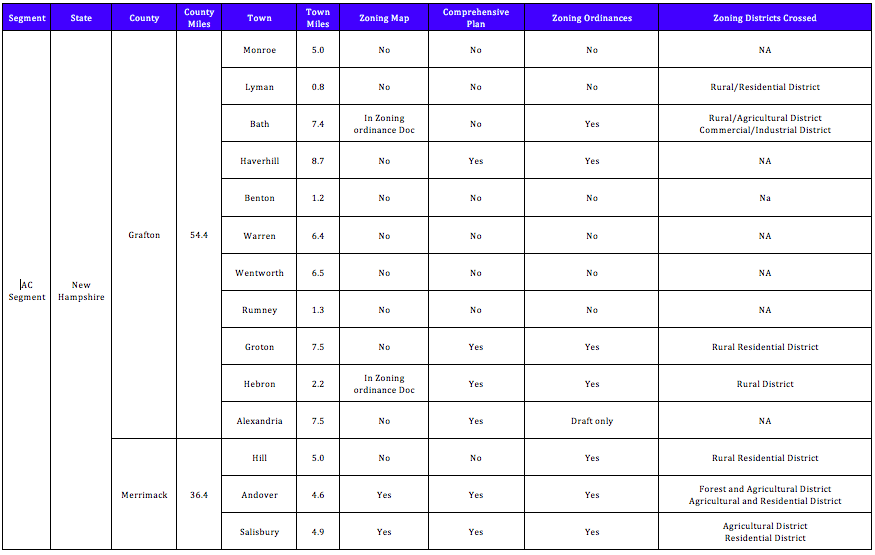
**Table 3: Land Use and Cover Types within 500 Feet of the NEP Right-of-way in New Hampshire**

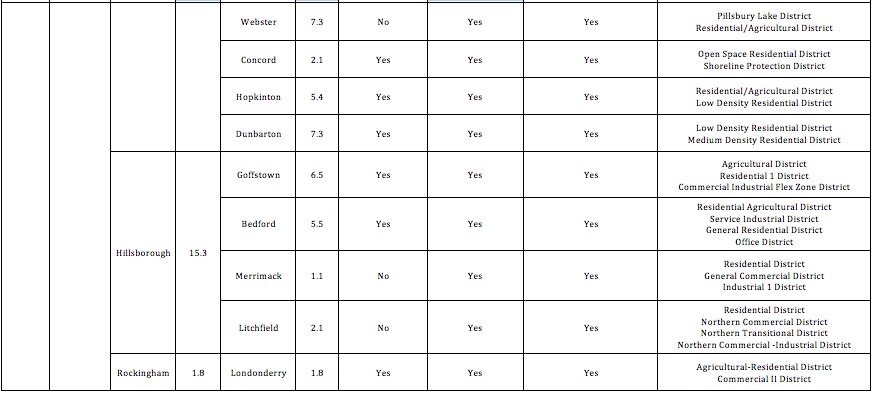


Source: National Land Cover Database, 2011.

The NEP controlled ROW traverse 23 towns in New Hampshire, and seven of the towns near the northern end of the segment have no zoning ordinance. Table 4 summarizes local zoning for the towns that are traversed by the AC Upgrades. The AC Upgrade traverses 23 towns in New Hampshire; seven of the towns near the northern end of the project have no zoning ordinance. As discussed in Section 6.3, local zoning regulation of the GSPL is pre-empted by state law in New Hampshire.

**Table 4. Town Zoning for the AC Upgrades**





FEMA digital FIRM data was reviewed and Table 5 identifies the flood zones that are crossed by the existing 230 kV transmission lines that would be upgraded to 345 kV as part of the GSPL. The partial rebuild and reconductoring of the 230 kV lines will not have any impact on the FEMA flood zones that are crossed. For the portion of the AC ROW that will be expanded in the town of Londonderry, the new 345 kV transmission lines would span floodplains where possible, and staging areas and access roads would avoid the floodplain area.

**Table 5: FEMA Flood Zones Crossed by the AC Upgrade Right-of-way in New Hampshire**

| **FEMA Flood Zone** | **River/Stream** | **Town** | **County** |
| --- | --- | --- | --- |
| A | Childs Brook | Bath | Grafton |
| A | Childs Brook | Bath | Grafton |
| A | Childs Brook | Bath | Grafton |
| A | Childs Brook | Bath | Grafton |
| AE | Ammonoosuc River | Bath | Grafton |
| A | Unnamed | Haverhill | Grafton |
| A | Unnamed | Haverhill | Grafton |
| A | North Branch Oliverian Brook | Haverhill | Grafton |
| A | Unnamed | Haverhill | Grafton |
| A | Pond Brook | Wentworth | Grafton |
| AE | Baker River | Wentworth | Grafton |
| AE | Tural Brook | Wentworth | Grafton |
| AE | Tural Brook | Wentworth | Grafton |
| AE | Baker River | Wentworth | Grafton |
| A | South Branch Baker River | Wentworth | Grafton |
| AE | Unnamed Tributary to the Cockermouth River | Groton | Grafton |
| AE | Cockermouth River | Groton | Grafton |
| A | Smith River | Hill | Merrimack |
| A | Sucker Brook | Andover | Merrimack |
| A | Unnamed | Andover | Merrimack |
| A | Unnamed | Andover/Salisbury | Merrimack |
| A | Unnamed | Salisbury | Merrimack |
| A | Beaverdam Brook | Salisbury | Merrimack |
| A | Beaverdam Brook | Salisbury | Merrimack |
| A | Beaverdam Brook | Salisbury | Merrimack |
| A | Beaverdam Brook | Salisbury | Merrimack |
| A | Beaverdam Brook | Salisbury | Merrimack |
| A | Beaverdam Brook | Salisbury | Merrimack |
| A | Beaverdam Brook | Salisbury | Merrimack |
| AE | Contoocook River | Concord | Merrimack |
| AE | Unnamed Tributary of Contoocook River | Concord | Merrimack |
| AE | Dolf Brook | Concord | Merrimack |
| A | Unnamed Tributary of Boutwell Mill Brook | Hopkinton | Merrimack |
| A | Boutwell Mill Brook | Hopkinton | Merrimack |
| A | One Stack Brook | Dunbarton | Merrimack |
| AE | Piscataquog River | Goffstown | Hillsborough |
| AE | Bowman Brook | Bedford | Hillsborough |
| AE | Bowman Brook | Bedford | Hillsborough |
| AE | Unnamed Tributary of Bowman Brook | Bedford | Hillsborough |
| AE | Bowman Brook | Bedford | Hillsborough |
| AE | Bowman Brook | Bedford | Hillsborough |
| AE | Bowman Brook | Bedford | Hillsborough |
| AE | Unnamed | Bedford | Hillsborough |
| AE | Pointer Club Brook | Bedford | Hillsborough |
| AE | Merrimack River | Litchfield | Hillsborough |
| AE | Unnamed Tributary of Nesenkeag Brook | Londonderry | Rockingham |

Source: Federal Emergency Management Agency, Flood Insurance Rate Maps.

Higher density residential and commercial development surrounding the southern-most 30 miles of the Project in New Hampshire will create the potential for temporary construction-related disruption and inconvenience such as noise and traffic. The expanded NEP ROW in the town of Londonderry will convert approximately 16.7 undeveloped acres to a maintained utility ROW. Additional consultations by NEP and possibly negotiations will be necessary with various conservation organizations regarding conservation areas that are crossed by the existing NEP AC ROW.

*vii. Cultural resources*

***Archeological and Historical Resources*** Because the NEP upgrade predominantly involves work on exiting lines within an existing ROW, impacts to archaeological and historical resources are expected to be minor. A review of available online and GIS databases indicated that only two NRHP-listed properties and a small portion of a NRHP-listed historic district are located within one-half mile of the existing NEP AC ROW. As the Project moves forward, a Phase 1 cultural resource review will be prepared that includes a comprehensive desktop assessment, site reconnaissance survey, and archeological investigations (i.e., shovel test program) along the areas planned for expansion. Any areas that are determined to be potentially significant for cultural resources in consultation with SHPOs will require follow up investigation or other form of avoidance or mitigation to be determined on a case-by-case basis.

***Potential Native American Interests*** There are no federally recognized tribes resident in New Hampshire. National Park Service (NPS) and Housing and Urban Development (HUD) databases do not identify any federally recognized tribe as having potential cultural resource interests in New Hampshire. The State of New Hampshire does not formally recognize any Native American tribes, but a list of tribal contacts prepared by the New Hampshire Division of Historic Resources lists two non-recognized groups in New Hampshire:

* Abenaki Nation of New Hampshire
* Cowasuck Band – Pennacook/Abenaki People

Depending upon the results of NEPs Phase 1 cultural resource reviews, the extent or likelihood of tribal interest would be evaluated.

*viii. Previous site use (e.g., greenfield, brownfield, industrial, etc.)*

The proposed NEP AC Upgrade will involve the partial rebuild and reconductoring of existing 230 kV lines within an existing NEP electric transmission ROW in New Hampshire. Required expansion of this ROW for the southern-most 1.8 miles will impact currently vacant, undeveloped land. The proposed Londonderry switching station site is currently forested, undeveloped property adjacent to the existing electric transmission ROW. There are no known liabilities or environmental conditions in the existing or proposed expanded ROW or at the Londonderry switching station site that would cause environmental impacts due to construction of the proposed Project.

*ix. Noise level impacts*

Construction and operational noise associated with the upgrade of the 230 kV lines in New Hampshire will be similar to those described in section 7.3.ix for the GSPL Project. The relatively remote and rural setting for the northern half of the NEP AC upgrade will limit the number of potential sensitive noise receptors and the related noise impacts from construction and operation of the transmission line. Higher density residential and commercial development surrounding the southern-most 30 miles of the Project in New Hampshire will create more potential for construction-related noise impacts but these will be temporary and limited to daytime hours (night construction is not anticipated). Even in the higher density areas, construction noise will be temporary and intermittent since not all construction activities will require the use of noise-producing equipment. The proposed NEP Londonderry switching station will not be a significant source of operational noise. Noise generated during routine inspection and maintenance of the upgraded facilities is anticipated to be minor and consistent with current routine operations at these existing rights-of-way.

*x. Aesthetic/visual impacts*

The potential visual impact of the AC Upgrades are also expected to be insignificant because there will be minimal physical change to the existing conditions resulting from the reconductoring and partial rebuild of the existing 230 kV lines in New Hampshire. The varied topography, predominant forest cover and relatively remote setting will further limit the visual impact of the proposed upgrade of the existing AC lines, and the proposed NEP upgrades will result in only an incremental change that probably will not rise to a significant level.

The additional clearing for the ROW expansion in the southern-most 1.8 miles will further increase a wide ROW that includes multiple electric transmission lines. The short length of the ROW expansion and the limited number of road crossings and viewpoints will minimize potential impacts associated with a perceived increase in visibility of the ROW.

The proposed Londonderry switching station site is located near a public park and soccer fields and will be adjacent to the existing electric transmission ROW. Although the active recreational fields have limited visually sensitivity, efforts will be taken during final design to minimize potential visual impacts.

*xi. Transmission infrastructure impacts*

An interconnection request has been submitted to the Independent System Operator for New England (ISO-NE) by GSPL in accordance with their procedures. A system impact study will be conducted by ISO-NE to determine the additional system upgrades to NEP (and Eversource) that would be needed to enable the interconnection of the GSPL project with the New England electric transmission grid. It is anticipated that the study results will require upgrades, which would improve reliability and capacity on the existing system.

*xii. Fuel supply access, where applicable*

Access to fuel supply is not applicable to the AC upgrade project(s) except for refueling construction equipment.