Environmental Review
of Proposed Transmission Route Alternatives

Final Report

Alternating Current Transmission Upgrades Comparative Proceeding
Public Service Commission Case #13-E-0488

Albany, Columbia, Dutchess, Greene, Rensselaer, Ulster, Orange Counties
New York

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Acronyms and Abbreviations

AOI: Area of Interest

Boundless: Boundless Energy NE, LLC

CC: CC Environment & Planning

DPS: New York State Department of Public Service

GIS: Geographic Information Systems

HDD: Horizontal Directional Drilling

HVSEC: Hudson Valley Smart Energy Coalition

NAT: North America Transmission

NEETNY: NextEra Energy Transmission New York, Inc.

NWI: National Wetlands Inventory

NYNHP: New York Natural Heritage Program

NYSDEC: New York State Department of Environmental Conservation

NYTO: New York Transmission Owners

ROW: Right of Way

SCH: Significant Coastal Habitat

SNC: Significant Natural Community

TRANSCO: New York Transco

USEPA: US Environmental Protection Agency

USFWS: US Fish and Wildlife Service

USGS: US Geological Survey

1.0 Introduction

1.1 Project Background and Purpose

Several alternative routes and technologies have been proposed for alternating current transmission upgrades in a Hudson Valley Smart Energy Coalition (HVSEC) area of interest (AOI) illustrated in Figure 1. This AOI traverses Albany, Columbia, Dutchess, Greene, Rensselaer, Ulster, and Orange Counties in New York State along the Hudson River. The AOI along the Hudson River is of great importance ecologically and to the people who live, work, and visit. In 1996 the Hudson River Valley was designated a National Heritage Area by Congress in recognition of its nationally important historical, cultural, ecological, and aesthetic values (http://www.hudsonrivervalley.com/AboutUS/About.aspx).

An oft repeated phrase taken from the Great Law of the Iroquois states, "In every deliberation we must consider the impact of our decision on the next seven generations." To this end, the HVSEC is interested in protecting the unique ecology of the Hudson Valley which directly supports the resilience of its communities. There is specific concern regarding preservation of the ecosystem services provided by the natural resources of this region and avoiding potential impacts associated with proposed transmission upgrades.

The purpose of this report is to review, summarize, and evaluate proposed transmission routes in the AOI in regards to potential environmental and ecological impacts, specifically land use, natural cover types, wetlands, streams, critical habitats, and wildlife.

2.0 Methods

This report has been developed by CC Environment & Planning (CC) based on the methods and sources of information listed below. Compilation and review of existing data, general site characterizations, field data collection and results (Appendices A and B), reviews, analysis, and report preparation were completed by CC staff including Sheila Hess, Principal Ecologist/CEO, Richard Sutherland, Sr. Environmental Planner, and Liza Norment, Sr. Environmental Scientist/GIS Analyst (See Qualifications in Appendix C).

1. Review of information submitted by four applicants proposing transmission upgrade alternatives. (Listed in Section 8.0)
2. Review of summaries and analysis of applicant information by other entities as provided to CC including review of New York State Department of Environmental Conservation's Comments on Part A Applications and New York State Department of Public Service's Interim Staff Report. (Listed in Section 8.0)
3. Participation in the Alternating Current Technical Conference held on July 20 and July 21, 2015 in Albany, NY. (Presentation included in Appendix D)

4. Review of existing plans and priorities in the Hudson Valley. (Discussion in Section 3.3)
5. A desktop review of ecological information and potential environmental impacts of each proposal conducted using existing GIS datasets for the AOI as listed in Section 8.0 and discussed below.
6. Field assessment of accessible priority sites as described below and in Appendices A and B.

2.1 Desktop Review

The review of wetland, stream, significant coastal habitat (SCH), and significant natural community (SNC) data was conducted in ArcGIS 10.2. Review of threatened and endangered species data was conducted using the results of queries of the US Fish and Wildlife Service (USFWS) Information, Planning, and Conservation System website (http://ecos.fws.gov/ipac/), New York State Department of Environmental Conservation (NYSDEC) Nature Explorer (http://www.dec.ny.gov/animals/57844.html), and consultation with Scenic Hudson and the New York Natural Heritage Program (NYNHP).

Desktop review was also used to identify priority sites for further investigation. These sites were targeted based on mapped intersections of proposed transmission line alternative routes and state-designated Class 1 wetlands, SCHs, SNCs, state and federally-designated threatened and endangered species, stream crossings, protected areas, managed conservation easements and Scenic Hudson-managed conservation easements (Figure 2).

2.2 Field Assessments

Accessible priority sites were visited in June 2015 to confirm the presence of mapped ecological attributes and to collect additional baseline information, including identification of unmapped ecological communities and the presence or likelihood of occurrence of rare, threatened, and endangered species and assessment of site quality and vulnerabilities. Appendix A provides the details of the field assessment plan for site visits and data collection. The intention of the ecological assessments as detailed within the attached plan is to verify and document ecological conditions within the AOI for priority sites.

Several sites were located within existing right-of-ways (ROW). Transco was contacted in an attempt to acquire access to existing ROWs, but the process described by a Transco representative for acquiring access would take months and did not fit within the project's timeline. If priority sites were within existing right-of-ways, sites adjacent to the ROW were visited when possible. If a priority site was inaccessible, one of the following methods was used to provide further assessment:

1. Sites were assessed from the adjacent road if possible;

2. A nearby site with the same mapped ecological community and covertype was visited for reference; or
3. A general assessment was conducted based on existing information and aerial imagery.

3.0 Summary of Environment

The AOI extends along the Hudson River from the Capital District in Albany County, NY to Dutchess County, NY (Figure 1). This area comprises a large part of the Hudson River Valley, renowned for its ecological, scenic, cultural, and recreational resources. Sections 3.1 through 3.3 provide a brief overview of the diversity of ecosystems contained in this area which in turn support diverse and unique plant communities and animal populations, many of which are listed on state and federal threatened and endangered species lists. In response to the ecological value and ecosystem services that the Hudson River Valley provides, multiple public and private agencies and organizations are charged with a mission to protect this unique and important landscape.

3.1 Ecoregions

The AOI is intersected by five Level III ecoregions[1] as defined by the U.S. Environmental Protection Agency (USEPA). These are:

- Eastern Great Lakes Lowlands, an ecoregion of irregular plains. Natural vegetation type is oak-pine forest. Current land use is largely agricultural.
- Northeastern Allegheny Plateau, an ecoregion of rolling hills, open valleys, and low mountains. Natural vegetation types include Appalachian oak forest dominated by white oak and red oak, with some northern hardwood forest at higher elevations.
- Northeastern Coastal Zone, an ecoregion of relatively nutrient poor soils and concentrations of continental glacial lakes. Natural vegetation types include Appalachian oak forests and northeastern oak-pine forests. Current land use is largely forests, woodlands, and urban and suburban development.
- Northeastern Highlands, an ecoregion of hills and mountains with many high-gradient streams and glacial lakes. Natural vegetation types include northern hardwoods (maple-beech-birch), northern hardwoods/spruce, and northeastern spruce-fir forests. Current land use is characterized by recreation, tourism, and forestry.
- Ridge and Valley, a diverse, low-lying ecoregion of roughly parallel ridges and valleys. Typical vegetation types include oak forest, oak-hickory-pine forest, and some northern

[1] Ecoregions as mapped by the U.S. Environmental Protection Agency provide a framework for risk analysis, resource management, and environmental study of U.S. ecosystems. Level III ecoregions provide a scale most appropriate for this report's area of interest (http://www.epa.gov/wed/pages/ecoregions/level_iii_iv.htm).

hardwoods forest. Current land use is characterized by forest, agriculture, and development.

These five Level III ecoregions are further divided into 15 Level IV ecoregions.

The wide variety of ecoregions within the AOI demonstrates the ecological importance of the region; areas with wide varieties of habitat tend to support diverse natural communities and varied wildlife, attract tourism and economic activity, and preserve important natural and cultural heritage features.

3.2 Land Use/Wetlands/Wildlife

As presented in Section 3.1, land use within the AOI includes a diverse mixture of development, forest, open water, and agriculture. Wide varieties of wetlands exist within the AOI. Riverine wetlands associated with the Hudson River, as well as numerous wetlands associated with other rivers and streams, provide a wide variety of ecosystem services, including water filtration, flood mitigation, and wildlife habitat. A disproportionately high number of threatened and endangered species also rely on wetland habitat.

Federally-listed threatened, endangered, and candidate species in the AOI include:

- Atlantic sturgeon (endangered)
- Bog turtle (threatened)
- Chaffseed (endangered)
- Dwarf wedgemussel (endangered)
- Indiana bat (endangered)
- Karner blue butterfly (endangered)
- New England cottontail (candidate)
- Northern long-eared bat (threatened)
- Northern monkshood (threatened)
- Shortnose sturgeon (endangered)
- Small whorled pogonia (threatened)

A full list of state-listed species for the AOI is provided in Appendix E.

3.3 Existing Conservation Plans/Regional Plans/Priorities

The unique values of the Hudson Valley are captured in numerous local, regional, and state conservation and economic development plans and priorities. Priorities are aimed at quality of life issues, all of which are directly supported by the scenic and natural resources of the region. Several of these plans and priorities are summarized below. These strategies lay out a framework for the management of the region in response to climate change, economic growth,

and increasing population. The background and guidance provided by these existing plans and programs also provides important perspective with regards to proposed transmission upgrades.

Scenic Hudson

Scenic Hudson is a 501 c (3) nonprofit that works to protect and restore the Hudson River and its surroundings. According to its website, Scenic Hudson is guided by the following principles:

- Outstanding quality of life is achievable only when a clean, healthy environment is a key component of economic development.
- All citizens have a right to outstanding quality of life, including access to our Hudson River, to open space and to participate in community decision-making.
- Our natural environment is an irreplaceable source of spiritual and artistic vitality and must be preserved forever.

In addition to Scenic Hudson, many other land trusts and nonprofit organizations, including Columbia Land Conservancy, Dutchess Land Conservancy, Preservation League of New York State, Olana Partnership, and the Winnakee Land Trust, focus on preserving the quality of life in the Hudson Valley in a variety of ways. Protecting the region's important natural resources is a shared goal of virtually all of these entities.

Hudson River Natural Heritage Area Management Plan

The Hudson River Valley National Heritage Area is managed by the nonprofit Greenway Heritage Conservancy for the HRV, Inc. to protect, promote, and interpret the nationally significant resources of the Hudson River Valley. The Hudson River Natural Heritage Area Management Plan's goals, principles, and strategies include:

- Safeguard and enhance the Hudson River Valley's natural and cultural heritage through conservation and interpretation of its heritage sites.
- Use the approach of the Hudson River Greenway Plan to preserve the region's natural heritage while sustaining economic viability.

NYSDEC Open Space Conservation Plan

NYSDEC's Open Space Conservation Plan maps a framework for managing NYS's open space and provides a list of priority conservation areas that represent the unique and irreplaceable open space resources of New York that encompass exceptional ecological, wildlife, recreational, scenic, and historical values. There are 18 conservation priority areas located within the AOI. These include:

- Albany Pine Bush
- Coxsackie Flats Grassland Area

- Drowned Lands Swamp Watershed
- Five Rivers Environmental Education Center
- Great Rondout Wetlands
- Great Swamp
- Hand Hollow Conservation Area
- Helderbergs
- Hoosic River Corridor
- Hudson Valley/New York City Foodshed
- Karst Aquifer Region
- New York Highlands
- Oomsdale Farm and Surrounding Landscape
- Plutarch/Black Creek Wetlands Complex
- Region 4 Rail Trail Projects
- Rensselaer Plateau
- Shawangunk Mountains Region
- Wallkill Valley

NYSDEC Hudson River Estuary Program

This program coordinated by the NYSDEC helps people enjoy, protect, and revitalize the Hudson River and its valley by providing information and resources to promote conservation of Hudson Valley's natural resources. Recent publications include the draft "Hudson River Estuary Action Agenda 2015-2020," the "State of the Hudson 2015 Report," and the "Hudson River Estuary Habitat Restoration Plan." Guides created to assist communities and landowners with natural resource conservation include, "Creating a Natural Resource Inventory: A Guide for Communities in the Hudson River Estuary Watershed" and "Conserving Natural Areas and Wildlife in your Community: Smart Growth Strategies for Protecting the Biological Diversity of New York's Hudson River Valley."

Mid-Hudson Regional Sustainability Plan

The region's vision for sustainable development builds on the Hudson Valley's unique social, cultural, and natural history, with the goal of promoting economic development, environmental sustainability, and enhancing quality of life for the more than 2 million residents that call the region home. The vision is:

- A diverse natural environment, containing the Hudson and Upper Delaware rivers, the Catskills, the Hudson Highlands, Long Island Sound, and much more.
- A vibrant economy, home to global brands as well as thousands of small businesses and farms.

- Strong transportation accessibility and connectivity within the region and beyond.
- Exceptional quality of life, due to the region's natural splendor, a long history of social and cultural innovation, and unique historical asset.
- Numerous existing cities, villages, and denser hamlet centers that provide engines of economic growth, containing existing assets around which human settlements can be clustered to provide cost effective job centers, reduce car dependency, and reduce pressure on the environment (Ecology and Environment, Inc., 2013).

As outlined in the Mid-Hudson Regional Sustainability Plan, the region has a strong foundation for tourism that supports many industries, from agriculture to historic downtowns. According to the plan, investment in natural and cultural infrastructure enhancements will improve the environment and quality of life for everyone who ventures out into the valley. Assets such as the Hudson River, spectacular mountain views, historic estates, wine trails, shopping and outdoor adventures provide a foundation to work from for further sustainable growth.

Hudson Valley Economic Development District Comprehensive Economic Development Strategy

The Hudson Valley Regional Council's 2013 Economic Development Strategy outlines the strategic direction for economic resilience developed by the Mid-Hudson Regional Economic Development Council, and supported by Hudson Valley Regional Council, including four core strategies which have direct relevance to this alternative assessment:

- Invest in technology industries.
- Attract and maintain mature industries.
- Grow natural resource-related sectors.
- Revitalize the region's infrastructure.

These strategies rely, at least in part, on the Hudson River Valley's unique natural and cultural resources. Resources such as the Hudson River itself; state parks such as Walkway Over the Hudson, Clarence H. Fahenstock, and Taconic; and landscape attributes such as agricultural and forest cover contribute to the region's attractiveness and economic success. The importance of preserving the region's character means that decisions on development projects must be made carefully and with all available information.

3.4 Mapped Protected Areas and Priorities

Mapped conservation priorities in the AOI targeted for closer review are listed below. These are illustrated on Figure 2. These areas are considered priority sites because they are intersected by one or more proposed alternatives. There are a total of 50 priority sites, as follows:

- Protected Areas: Protected areas are held by local, state, and federal entities throughout the AOI. Protection is generally aimed at preserving ecological, recreational, cultural, and historical values for the public. Priority sites include:
    - Albany Pine Bush Preserve in Albany County
    - Black Creek Marsh Wildlife Management Area in Albany County
    - Eleanor Roosevelt National Historic Site in Dutchess County
    - Home of Franklin D. Roosevelt National Historic Site in Dutchess County
    - Peach Hill Park in Dutchess County
    - Schodack Island State Park in Rensselaer County
    - Victor C. Waryas Park in Dutchess County

- Scenic Hudson conservation easements: The following Scenic Hudson conservation easements were established to protect a suite of natural resource, cultural, and historical values in the Hudson Valley.
    - Allen Farm
    - Boll Parcel
    - Eichybush Farm
    - Hollow Road Farm
    - Robert and Lewis Allen Farm

- Threatened and Endangered Species: State-listed species with mapped occurrences intersecting with proposed alternatives are listed below. As stated in the Endangered Species Act (1973), these species "are of esthetic, ecological, educational, historical, recreational, and scientific value to the Nation and its people."
    - Bald eagle (state threatened)
    - Blanding's turtle (state threatened)
    - Least bittern (state threatened)
    - Northern harrier (state threatened)
    - Northern long-eared bat (federally and state threatened)
    - Pied-billed grebe (state threatened)
    - Sedge wren (state threatened)

- Significant Natural Communities: SNCs with mapped occurrences intersecting with proposed alternatives are listed below. Significant natural communities are defined by NYNHP as "rare or high-quality wetlands, forests, grasslands, ponds, streams, and other types of habitats, ecosystems, and ecological areas." These communities are generally uncommon and difficult, if not impossible, to replace.
    - Appalachian oak-hickory forest
    - Beech-maple mesic forest

  - Calcareous talus slope woodland
  - Calcareous shoreline outcrop
  - Chestnut oak forest
  - Hemlock-northern hardwood forest
  - Tidal freshwater marsh

- Significant Coastal Habitats: SCHs with mapped occurrences intersecting with proposed alternatives are listed below. Significant coastal habitat refers to natural areas of significance associated with coastal waters and adjacent shoreline in New York State including the Hudson River.
  - Brandow Point Marsh and Flats
  - Catskill Creek
  - Crum Elbow Marsh
  - Kingston-Poughkeepsie Deepwater
  - Schodack and Houghtaling Islands
  - Shad and Schermerhorn Islands
  - South Bay Creek and Marsh

- NYSDEC Class 1 Wetlands: Class 1 Wetlands with mapped occurrences intersecting with proposed alternatives are listed below. Class 1 Wetlands are classified as such primarily based on quality (rare, high quality, difficult to replace) and location/function (floodwater retention, drinking water filtration).
  - CD-6
  - HN-105
  - HN-108
  - HN-301
  - HP-36
  - RC-39
  - SP-21
  - V-19

- Stream Crossings: Waterways intersected by proposed alternatives are listed below. As summarized by NYSDEC in their April 22, 2015 letter in which they reviewed potential impacts of proposed alternatives, stream and river crossings are vulnerable to impacts including soil erosion, increased turbidity, loss of fish and aquatic wildlife, loss of habitat, and increases in flooding and pollution.
  - Catskill Creek
  - Esopus Creek
  - Fall Kill

- Hudson River
- Wallkill River
- Roeliff Jansen Kill
- Little Wappinger

4.0 Review of Transmission Route Alternatives

This section provides a review of each transmission route alternative and associated activities as described by four applicants: North America Transmission (NAT), New York Transco (TRANSCO, referred to as 'NYTO' in other reports), NextEra Energy Transmission of New York (NEETNY, referred to as 'NextEra' in other reports), and Boundless Energy (Boundless). Review of alternatives includes route location, review and summary of applicant information regarding potential environmental impacts, proposed activities, and intersection of proposed alternatives with priority sites (Figure 2).

Table 1 provides an overview and summary of each proposed alternative and potential impacts.

Table 1 - Summary of Environmental Data for Proposed Transmission Route Alternatives and Ranking

	Boundless	NAT			TRANSCO									NEETNY	
		NAT preferred	NAT Thruway	NAT 115kv	KB-PV-1	LD-PV(R)	HA	NS-LD(R)/LD-PV	O-F/ED-PV	ED-NS/KB-PV	ED-NS/NS-LD-PV(R)	ED-NS/HA	ED-NS/NS-LD(R)/LD-PV	NEETNY Thruway	NEETNY other 4 alternatives
NYSDEC Wetlands	23 wetlands	43.22 acres	33.39 acres	22.15 acres	32.06 ac	71.19 ac	0 ac	105.37 ac	32.06 ac	32.06 ac	139.84 ac	0 ac	105.37 ac	34.96 ac	24.38 ac
Temporary Impacts	Not quantified	9.26 acres	6.53 acres	4.62 acres	4.4 ac	5.33 ac	n/a	10 ac	4.4 ac	4.4 ac	10.31 ac	n/a	10 ac	n/a	n/a
Permanent Impacts	Not quantified	0.02 acres	0.02 acres	0.01 acres	0.015 ac	0.028 ac	n/a	0.042 ac	0.015 ac	0.015 ac	0.051 ac	n/a	0.042 ac	0.019 ac	0.005 ac
NWI Wetlands	78 wetlands	47.65 acres	67.53 acres	35.56 acres	53.34 ac	115.54 ac	4.97 ac w/in 500'	99.13 ac	53.34 ac	53.34 ac	157.75 ac	4.97 acres within 500'	99.13 ac	38.41 ac	39.22 ac
Temporary Impacts	Not quantified	10.19 acres	7.78 acres	7.28 acres	6.76 ac	9.23 ac	none	11.2 ac	6.76 ac	6.76 ac	12.85 ac	none	11.2 ac	n/a	n/a
Permanent Impacts	Not quantified	0.02 acres	0.02 acres	0.003 acres	0.022 ac	0.044 ac	none	0.028 ac	0.022 ac	0.022 ac	0.049 ac	none	0.028 ac	0.018 ac	0.007 ac
NYSDEC Streams Crossed	88 streams	74 streams	98 streams	77 streams	59	28	1	60	59	59	50	1	60	193	89
Perm/Temp Stream Impacts	No permanent	4.10 acres	7.70 acres	3.80 acres	n/a	n/a	none	n/a	n/a	n/a	n/a	none	n/a	No permanent	No permanent
NHD Streams	110 streams	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
New ROW	None	85% adjacent to ROW	76% existing ROW	99% existing ROW	None	None	n/a	None	n/a	None	n/a	n/a	n/a	Yes, adjacent to existing.	None
Significant Coastal Habitats (SCH)	Yes	0.56 miles	0.28 miles	0.67 miles	0	1	0	2	0	0	1	0	2	3.57 acres (2 SCHs)	Yes - Marcy Southern Route 2 only
Temporary Impacts (SCH)	Not quantified	Not quantified	Not quantified	Not quantified	Not quantified	Not quantified	n/a	Not quantified	Not quantified	Not quantified	Not quantified	n/a	Not quantified	3.57 acres (2 SCHs)	None
Significant Natural Communities (SNC)	1.25 miles	0.48 miles	0.90 miles	0.26 miles	0	2	0	4	0	0	2	0	4	19.6 acres (7 SNCs)	None
Temporary Impacts (SNC)	Not quantified	Not quantified	Not quantified	Not quantified	Not quantified	Not quantified	n/a	Not quantified	Not quantified	Not quantified	Not quantified	n/a	Not quantified	19.6 acres (7 SNCs)	None
Permanent Impacts (SNC)	Not quantified	Not quantified	Not quantified	Not quantified	Not quantified	Not quantified	n/a	Not quantified	Not quantified	Not quantified	Not quantified	n/a	Not quantified	0.009 acres	None
New Hudson River Crossing?	Yes - 2 underground	Yes - overhead	Yes - overhead	Yes - overhead	No	No	No	Not new, but visible changes	No	No	No	No	Not new, but visible change	Underwater crossing	Yes - Marcy Southern Route 2 only
Cover type conversion NYSDEC wetland	Not quantified	Not quantified	Not quantified	Not quantified	Not quantified	Not quantified	No	Not quantified	Not quantified	Not quantified	Not quantified	No	Not quantified	6.13 ac	0 ac
Cover type conversion NWI wetland	Not quantified	Not quantified	Not quantified	Not quantified	Not quantified	Not quantified	No	Not quantified	Not quantified	Not quantified	Not quantified	No	Not quantified	10.74 ac	0 ac
Many Class I Wetlands/Conservation Areas	No	No	Yes	No	No	Yes	No	Yes	No	No	Yes	No	Yes	Yes	No
SCN/Priority Cons Areas	Yes	Yes	Yes - Several	Yes - 2	No	Yes	No	Yes - Several	No	No	Yes	No	Yes	Yes - Several	No
No. Intersections with Priority Sites by Applicant	15	15	18	15	9	10	0	11	10	10	13	1	12	20	9
No. Intersections of Priority Sites with New or Widened ROW by Applicant	0	15	6	0	0	0	0	0	0	0	0	0	0	20	0
Impact Rank	Low	High	High	Medium	Medium	Low	Low	Medium	Medium	Medium	Low	Low	Medium	High	Medium
DPS Rank	Low/Med	High	High	High	Low	Low	Low	Low	High	Medium	Medium	Medium	Medium	High	Medium/High

Glossary of Terms

NAT	North America Transmission	**PV**	Pleasant Valley	**LD**	Leeds
TRANSCO	New York Transco	**R**	Reconductoring	**O**	Oakdale Substation
NEETNY	NextEra Energy Transmission of New York, Inc.	**HA**	Hurley Avenue	**F**	Fraser Substation
KB	Knickerbocker	**NS**	New Scotland	**ED**	Edic

4.1 Technology

To assist with the review of potential impacts to natural resources associated with each proposed alternative, it was necessary to obtain a greater understanding of the activities being proposed within each alternative. These activities, referred to as "technologies" in this document, include development of new right of ways, widening of existing right of ways, replacing or adding structures in existing right of ways, reconductoring, trenching, aerial and underground crossings of the Hudson, and development of new stations. Limited information was provided by the applicants to assist with the assessment of potential impacts associated with specific technologies. The results of technical studies designed to identify potential environmental impacts specifically associated with construction and operations will be provided by applicants in Part B of the final Article VII Application currently scheduled for 2016. To assist our team in evaluating potential impacts based on the level of information currently available, a limited review of publicly available literature was conducted to provide additional insight. In summary, information used to provide an overview of technologies and potential impacts was collected using the following methods:

1. Review of each application submitted to the Public Service Commission to determine if details association with proposed construction methodologies were provided, and if so, summary of such details.
2. Literature review to understand and summarize typical management practices and details associated with each proposed technology when not apparent in application materials.
3. Review of other summaries and reviews, including the NYSDEC April 22, 2015 letter to the Public Service Commission and the DPS July 6, 2015 Staff Interim Report.
4. Attendance at the July 20th and 21st, 2015 Technical Conference and review of proceedings.
5. Categorization of priority sites by proposed technology. Priority sites are shown on Figure 2 and discussed in Sections 2.0 and 3.3 above. Figure 3 presents these priority sites categorized by proposed technology. Sites where multiple technologies are proposed are categorized by the technology with the greatest likelihood of impacts. The intersection of specific technologies with these priority sites informed our estimation of potential impacts.

Using this information, potential impacts that could be associated with a particular technology were identified. A summary of proposed technologies and possible disturbances relative to natural resources is provided below. It is understood that at this stage in the application process, exact locations of specific activities and thus potential disturbances have not consistently been identified. The technologies are roughly listed by likelihood of potential

disturbance with the development of new right of ways and widened right of ways listed first, having the most potential disturbance. Remaining technologies, in general order of potential impact include construction of new structures in existing right of ways, trenching, aerial crossings of the Hudson River, reconductoring in existing right of ways, and horizontal directional drilling.

4.1.1 New Right of Way (ROW)

Establishing new ROWs on undisturbed land could have a significant impact on natural resources. There are five priority sites as defined in Sections 2.0 and 3.3 above that are within proposed new ROWs (Figure 3). Examples of activities identified in applications and potential degree of disturbance as understood from literature review are as follows:

- Disturbance associated with clearing and maintaining new ROW
- Disturbance associated with new access ways (12-18 feet wide)
- Disturbance associated with creation of staging areas (potentially 2 acres in size)
- Disturbance associated with creation of crane pads which would be required at each particular structure location (normally about 100 feet by 100 feet)
- Disturbance associated with construction of structure foundations
- Disturbance associated with establishing pulling and tensioning equipment - typically 50 to 100 feet wide and 100 to 200 feet long (The Connecticut Light and Power Company, 2011)

4.1.2 Widened ROW

This technology proposes an increase in the area of existing ROWs on undisturbed land, and construction of transmission lines that could have a significant impact on natural resources. There are 22 priority sites categorized by proposed widened ROWs (Figure 3). The application by NAT proposes widening the existing ROW by 80 to 100 feet. A widening of 80 feet will be utilized where the proposed new transmission lines are adjacent to an existing transmission line, otherwise 100 feet is proposed. The NEETNY proposal notes that widening the Thruway ROW by up to 35 feet along the length of the Thruway route may be necessary where the existing ROW is insufficient.

Outlined in Public Service Commission of Wisconsin (2007), increasing the width of an existing corridor can increase edge effects and barriers to wildlife. Examples of activities identified in applications and potential degree of disturbance as understood from literature review are:

- Disturbance associated with clearing and maintaining widened area of ROW
- Disturbance associated with new access ways (12-18 feet wide)
- Disturbance associated with creation of staging areas (potentially 2 acres in size)

- Disturbance associated with creation of crane pads which would be required at each particular structure location (normally about 100 feet by 100 feet)
- Disturbance associated with construction of structure foundations
- Disturbance associated with establishing pulling and tensioning equipment - typically 50 to 100 feet wide and 100 to 200 feet long (The Connecticut Light and Power Company, 2011)

The degree of disturbance would depend on the scale of infrastructure (e.g. accessways) already in place that could be utilized for the proposed alternatives.

4.1.3 Existing ROW, New Structures

This technology proposes removal of transmission lines (conductors) and associated existing transmission structures and replacement of such infrastructure within an existing ROW. This technology can have differing impacts based on the existing infrastructure in place (e.g. existing access roads) and environmental conditions. Potential impacts on natural resources due to this technology can vary from minimal disturbance (the tear-down and rebuild in place method) to the impacts associated with construction of new infrastructure adjacent to the existing infrastructure.

Examples of activities identified in applications and potential degree of disturbance as understood from literature review are as follows:

- Disturbance associated with new access ways (12-18 feet wide)
- Disturbance associated with creation of staging areas (potentially 2 acres in size)
- Disturbance associated with creation of crane pads which would be required at each particular structure location (normally about 100 feet by 100 feet)
- Disturbance associated with construction of structure foundations
- Disturbance associated with establishing pulling and tensioning equipment - typically 50 to 100 feet wide and 100 to 200 feet long (The Connecticut Light and Power Company, 2011)

The degree of disturbance would depend on the scale of infrastructure (e.g. accessways) already in place that could be utilized for the proposed technology.

4.1.4 Trenching

One applicant (Boundless) is proposing a technology that would install transmission lines underground via open trench. The proposed technology is to dig a single trench 36 to 48 inches deep and 6 feet wide. Notwithstanding this, a view expressed in the DPS Interim Report outlines that Boundless has underestimated the impact this technology may have and indicates that the trench may need to be at least 8 to 10 feet in width and 6 to 8 feet deep to

accommodate a 'duct bank' and 'splice box'. However, Boundless disputed this view at the Technical Conference.

The Boundless application outlines that the New York Power Authority ROW, within which the trenching would occur, has been previously cleared. Boundless proposes due to no clearing of trees, no impact to habitats for particular species such as the northern long-eared bat will occur. Boundless indicates that four state wetlands, seven federal-mapped wetlands, and 10 waterways are located within the existing ROW. Open trenching could result in potential impacts to such natural resources. There is one priority site within the proposed trenching area (Figure 3). Boundless outlines that they will use Best Management Practices to avoid, mitigate, or remedy impacts on the environment. While potential impacts associated with trenching are generally considered temporary, there can be permanent results of temporary disturbance as discussed in Section 5.0 below.

4.1.5 Hudson Crossings – Aerial

North America Transmission proposes alternatives which include two aerial crossing of Hudson River with new transmission lines and structures. This applicant anticipates that no structures will be located within the waterbody. There is the potential for areas of disturbance to be located in close proximity to the river associated with pole installation. TRANSCO, NEETNY (associated with Marcy Southern Route 2), and Boundless propose alternatives that involve aerial crossings of the Hudson River within existing transmission ROW. (Note: NEETNY also proposes a Hudson River crossing at Poughkeepsie potentially using existing bridges – the Walkway Over the Hudson or the Mid Hudson Bridge – or crossing by HDD). There are four priority sites that are within these proposed aerial crossings (Figure 3). In general, waterways are deemed sensitive areas, and activities within or near them require careful environmental assessment. The Hudson River supports threatened and endangered species, including the endangered Atlantic sturgeon and shortnose sturgeon, and has been designated a tidal river SNC by NYNHP. Proposed alternatives include replacement of structures, new structures, and reconductoring. Alternatives that propose reconductoring along with best management practices have a lower probability for significant impact.

4.1.6 New Stations

A few alternatives propose construction and operation of new or expanded substations/switching yards. Based on available information there were no mapped priority sites associated with new or expanded stations. However, limited information was provided by the applicants to assist with the assessment of specific intersections with significant resources and potential impacts associated with this technology. Based on literature review, the development of new stations includes an increase in the area of disturbance associated with existing easements on potentially undisturbed land. Potential disturbances are associated with

the development of accessways, foundations, laydown areas, and crane pads. Depending on the type of natural resources located within the proposed disturbance areas, impacts to natural resources may occur.

4.1.7 Existing ROW – Reconductoring

Reconductoring is the replacement of the existing conductor (wire) on a transmission line with a new conductor. This technology has been proposed by Boundless and TRANSCO. The TRANSCO application does not specify which methods they propose to utilize in association with reconductoring (e.g. helicopter and/or ground method of stringing the conductors).

The Boundless application provides information to assist with the assessment of the scale of potential impact associated with this alternative. Boundless outlines that they envisage no impacts to natural resources due to the method of utilizing helicopters to 'string' the conductors through the existing structures. However, an opinion expressed in the DPS Interim Report raises concern with Boundless reconductoring proposal. The report indicated that due to the type of conductor being proposed and the structural suitability of the existing transmission structures along the route, Boundless assumptions may not be feasible. The DPS report outlines more intensive ground activities may be required resulting in greater potential environmental impacts.

Literature review provides further insight into potential disturbances created by activities associated with each reconductoring method. In addition to temporary impacts associated with noise and visual disturbance during reconductoring, additional impacts could occur if the use of stringing and tensioning equipment to ensure the correct sag of the line is required. The area of impact associated with this type of activity could be 50 to 100 feet wide and 100 to 200 feet long (The Connecticut Light and Power Company, 2011). In addition to the impact associated with directly siting this equipment, other impacts associated with operating this equipment to the site could occur if new accessways and staging areas are required.

4.1.8 Hudson Crossing – Horizontal Directional Drilling (HDD)

This technology proposes installing transmission lines underground with the use of HDD equipment. Typically, HDD involves installation of underground pipes, conduits, and cables just beneath the ground surface along a prescribed path using a steerable surface-launched drilling rig. This technology has been developed, in part, to minimize impacts to the surrounding area. There are four priority sites intersected by the two proposed HDD crossings (Figure 3). Limited information was provided by the applicants to assist with the assessment of potential impact associated with this alternative. Based on literature review, disturbance at the entry and exit points is minimal. It is understood that the distance between entry and exit points can be up to 1,970 yards. According to Lameck Onsarigo et al. (2014), another potential impact on natural

resources associated with HDD is the escape of the drilling fluid from the bore to the surface. Drilling fluid consists primarily of water and bentonite. Bentonite is a naturally occurring clay made up of 1-5 percent active clays, 0-40 percent inert solids, and the remainder being water. Drilling fluid is not a hazardous material; however, an inadvertent release would require mitigation measures to minimize the impact to sensitive areas such as water bodies or other features (CenterPoint Energy, 2013).

4.2 North America Transmission (NAT)

There are several alternative routes proposed by NAT (Figure 4). The routes within the AOI include the three New Scotland-Leeds-Pleasant Valley alternatives.

The proposed (primary) route (NAT Preferred, DPS Scenario = NAT 1/NAT 3) originates at the New Scotland Substation in Albany County and terminates at Pleasant Valley in Dutchess County, a route of approximately 65 miles. Approximately 85% of the route parallels existing transmission lines.

The 83-mile-long NAT Thruway (Alternative 1) alternative route (NAT Thruway, DPS Scenario = NAT 2) begins at the New Scotland substation, but follows the I-87 corridor south for 55 miles on the west side of the Hudson River before running across the river to the Pleasant Valley substation. This alternative follows existing railroad or I-87 ROW for approximately 76% of its length; the remaining length would be new 80-foot wide ROW, which would follow roads and existing features where possible.

The 66-mile-long NAT 115kv (Alternative 2) route (NAT 115kv, DPS Scenario = NAT 4/NAT 5) begins in New Scotland and terminates at the Pleasant Valley substation, following existing railroad, utility, and road ROWS for 99% of its length.

4.2.1 Potential Environmental Impacts

The NAT proposal and summaries/checklists identify the following water resources as occurring within 0.25 miles of the preferred New Scotland to Leeds to Pleasant Valley route:

- 1,208 acres of NYSDEC wetlands, including 519 acres of Class 1 wetlands, 645 acres of Class 2 wetlands, and 44 acres of Class 3 wetlands.
- 1,500 acres of NWI-mapped wetlands.
- 58.55 miles of NYSDEC-mapped streams, including 1.89 miles of Class A streams and 1.69 miles of Class A(t) streams.

Total water resource impact associated with the proposed project is projected to be much lower than the total water resources occurring within 0.25 miles of the proposed route; however, total expected impacts are not calculated.

Federally-listed species identified in the proposal as having the potential to occur along the corridor of the proposed route include:

- Shortnose sturgeon
- Karner blue butterfly
- Indiana bat
- New England cottontail rabbit
- Dwarf wedgemussel
- Bog turtle

A list of plant species identified by the NYNHP as threatened or endangered is also included in the proposal's scoping statement. Which of these may be impacted would be identified during investigations in Part B of the application process.

Desktop analysis of existing data confirms the number and classification of NYSDEC wetlands, NWI Wetlands, and streams. State and federal threatened and endangered species were confirmed to the county level.

An analysis of the presence of SNCs or SCH is provided in the March 2015 update to the NAT proposal. Desktop analysis of SNC within the proposed routes suggested that the following occur within the NAT preferred route and alternatives:

NAT Preferred:

- Freshwater tidal marsh (Brandow Point)
- South Bay Creek and Marsh (Hudson River SCH)
- Tidal river (Hudson River Estuary)

NAT Thruway:

- Calcareous shoreline outcrop (Catskill Creek Austin Glen)
- Calcareous cliff community (Hans Vosen Kill)
- Calcareous talus slope woodland (Hans Vosen Kill)
- Tidal river (Hudson River Estuary)
- Freshwater tidal marsh (Crum Elbow Marsh)
- Vernal pool (Roosevelt Farm and Forest)
- Hemlock-northern hardwood forest (Roosevelt Farm and Forest)
- Appalachian oak-hickory forest
- Limestone woodland
- Catskill Creek (Hudson River SCH)
- Kingston-Poughkeepsie Deepwater (Hudson River SCH)

NAT 115kv:

- Freshwater Tidal Marsh (Schodack State Park)
- Tidal River (Hudson River Estuary)
- Schodack and Houghtaling Islands (Hudson River SCH)
- Shad and Schermerhorn Islands (Hudson River SCH)

In addition, the NAT Thruway route within the AOI includes potential impacts within new proposed ROW in the Town of Lloyd, Ulster County in the Illinois Mountain/Black Creek Corridor. The Black Creek Corridor is an 81.5-acre area with development rights owned by Scenic Hudson. The Corridor is within the Plutarch/Black Creek Wetlands Complex, recognized in the NYSDEC Open Space Plan as a conservation priority project. Illinois Mountain is a 507-acre preserve owned by Scenic Hudson (242 acres) and the Town of Lloyd (265 acres). It is located within the state-recognized Illinois Mountain Biologically Important Area. This route also crosses two SCHs – Catskill Creek and Kingston-Poughkeepsie Deepwater – and 7 SNCs as listed above.

Based on the location of the proposed alternative routes and priority sites (see Sections 2.0 and 3.3), NAT proposals intersect with a total of 36 priority sites (Figure 4). These are located at intersections with streams, rivers, SCHs, SNCs, mapped locations of threatened and endangered species, protected areas, and Class 1 Wetlands as shown. Of these intersections, 21 include proposed new or widened ROW, making the potential for significant disturbance likely (Table 1).

4.3 New York Transco, LLC (TRANSCO)

TRANSCO provides nine alternatives, all with activities within the AOI. These nine alternatives cross the AOI along five different routes (Figure 5) and include many route segment names and abbreviations. See Table of Acronyms and Abbreviations at the beginning of this document for reference.

1. The Knickerbocker to Pleasant Valley (KB-PV) section involves the construction of a new overhead transmission line in two segments over 54.2 miles in existing ROWs. This new transmission line would replace an existing line.
2. The Leeds to Pleasant Valley reconductoring alternative (LD-PV(R)) involves reconductoring of existing overhead transmission lines and replacement of some structures along the 39.8-mile route.
3. The New Scotland to Leeds (NS-LD) section involves reconductoring an existing transmission line over a 65.7 mile route.

4. The Leeds to Churchtown to Pleasant Valley route involves construction of a new overhead transmission line over 41.2 miles in existing ROW. This new transmission line would replace an existing line.
5. Installation of equipment at the Hurley Avenue Substation in Ulster County, which would involve expansion of the substation footprint.

4.3.1 Potential Environmental Impacts

Three of the TRANSCO alternatives use the Knickerbocker-Pleasant Valley route within the AOI. These include:

- KB-PV (DPS scenario = NYTO 6)
- OF/ED-PV (DPS scenario = NYTO 10)
- ED-NS/KB-PV (DPS scenario = NYTO 11)

According to the TRANSCO documents, checklists and summaries, environmental features associated with the KB-PV section include:

- 32.06 acres of NYSDEC wetland within the existing ROW, with predicted temporary impacts of 4.40 acres and permanent impacts of 0.015 acres.
- 53.34 acres of NWI mapped wetlands within the existing ROW, with predicted temporary impacts of 8.92 acres and permanent impacts of 0.023 acres.
- 59 crossings of NYSDEC-classified streams, with some temporary and permanent impacts expected. Amount of impact was not calculated.
- No SNC or SCH.

According to the TRANSCO documents, checklists, and summaries environmental features associated with the LD-PV(R) section (DPS scenario = NYTO 7) include:

- 71.19 acres of NYSDEC wetland within the existing ROW, with predicted temporary impacts of 5.33 acres and permanent impacts of 0.028 acres.
- 115.54 acres of NWI mapped wetlands within the existing ROW, with predicted temporary impacts of 9.23 acres and permanent impacts of 0.044 acres.
- 28 crossings of NYSDEC-classified streams, with some temporary and permanent impacts expected. Amount of impact was not calculated.
- Intersections with two SNCs – freshwater tidal marsh and tidal river – and one SCH – Brandow Point at the Hudson River.

TRANSCO alternative NS-LD(R)/LD-PV (DPS scenario = NYTO 9) and ED-NS/NS-LD(R)/LD-PV (DPS scenario = NYTO 14) follow a route from New Scotland to Leeds to Churchtown to Pleasant

Valley within the AOI. According to the TRANSCO documents, checklists, and summaries, environmental features associated with this route include:

- 105.37 acres of NYSDEC wetlands, with predicted temporary impacts of 10.00 acres and permanent impacts of 0.042 acres.
- 99.13 acres of NWI wetlands, with predicted temporary impacts of 11.20 acres and permanent impacts of 0.028 acres.
- 60 crossings of NYSDEC-classified streams, with some temporary and permanent impacts expected. Amount of impact was not calculated.
- Intersects with four SNC – freshwater tidal marsh, tidal river, maple-basswood rich mesic forest, and red maple-hardwood swamp - and two SCHs – Brandow Point and the Hudson River.

According to the TRANSCO documents, checklists, and summaries, environmental features associated with the NS-LD-PV section of the ED-NS/NS-LD-PV(R) alternative (DPS scenario = NYTO 12), which runs from New Scotland to Leeds to Pleasant Valley within the AOI, include:

- 139.84 acres of NYSDEC wetland within the existing ROW, with predicted temporary impacts of 10.31 acres and permanent impacts of 0.051 acres.
- 157.75 acres of NWI mapped wetlands within the existing ROW, with predicted temporary impacts of 12.85 acres and permanent impacts of 0.049 acres.
- 50 crossings of NYSDEC-classified streams, with some temporary and permanent impacts expected. Amount of impact was not calculated.
- Intersects with two SNC – freshwater tidal marsh and tidal river – and one SCH – Brandow Point at the Hudson River.

Two of the TRANSCO alternatives, HA (DPS scenario = NYTO 8) and ED-NS/HA (DPS scenario = NYTO 13), involve expansion of the footprint of the Hurley Avenue substation in Ulster County. Environmental features associated with this footprint increase include:

- 4.27 acres of riverine habitat associated with Esopus Creek approximately 190 feet north of the project area.
- One NYSDEC Class B(t) stream, Esopus Creek, approximately 190 feet from the project area.
- No SNC or SCH.

Federally-listed species identified in the proposal as having the potential to occur along the corridor of the proposed routes include:

- Karner blue butterfly

- Indiana bat
- New England cottontail rabbit
- Dwarf wedgemussel
- Bog turtle

Desktop analysis of existing data confirms the approximate number and classification of NYSDEC wetlands, NWI Wetlands, SNCs, SCHs, and streams.

Based on the location of the proposed alternative routes and priority sites (see Sections 2.0 and 3.3), TRANSCO proposals intersect with a total of 23 priority sites (Figure 5). These are located at intersections with streams, rivers, SCHs, SNCs, mapped locations of threatened and endangered species, protected areas, and Class 1 Wetlands (Figure 2). Of these intersections, none include proposed new or widened ROW (Table 1). Many intersections include replacement of structures and reconductoring. Potential impacts to priority sites should be minimized through the use of best management practices.

4.4 NextEra Energy Transmission of New York, Inc. (NEETNY)

There are five alternatives proposed by NEETNY in its Marcy/Edic to Pleasant Valley Project (Figure 6). The proposals within the AOI include the portion of the Thruway Route (NEETNY Thruway, DPS scenario = NextEra 15) extending along the west side of the Hudson River, the Marcy Southern Route 2 which crosses the Hudson at Schodack and proceeds down the east side of the Hudson River (62-mile Knickerbocker Route), and the 62-mile Knickerbocker portion of the remaining three proposed routes (Marcy Southern Route 1, Marcy Northern Route, and Knickerbocker). These last four are referred to collectively as NEETNY Other Alternatives and include DPS scenarios NextEra 16-19 (and NextEra 19a, see discussion in Section 6.1). While largely within or adjacent to existing ROW, the NEETNY proposals include crossing of the Hudson, new ROW, and new substations.

4.4.1 Potential Environmental Impacts

According to NEETNY documents, checklists, and summaries, the NEETNY Thruway alternative within the AOI includes potential impacts within new proposed ROW in the Town of Lloyd, Ulster County in the Illinois Mountain/Black Creek Corridor. In addition to the Illinois Mountain/Black Creek Corridor, the Thruway alternative crosses wetland and stream resources as indicated below. Note – these numbers include wetlands and stream areas outside of the AOI:

- 34.96 acres of NYSDEC-mapped wetlands, and would include 0.019 acres of permanent NYSDEC wetland impact and 6.13 acres of conversion of forested NYSDEC wetland to scrub/shrub. Of the wetlands crossed, 20.04 acres are within the AOI. NYSDEC wetland

CD-6, where 5.33 acres of the cover type conversion would occur, is a Class 1 wetland, defined by NYSDEC as a wetland that provides the highest degree of wetland benefits. Wetland CD-8, where the remaining proposed cover type conversion would occur, is a Class 2 wetland.

- 38.41 acres of mapped NWI wetlands, with projected permanent impact of 0.018 acres and approximately 10.74 acres conversion from forested to scrub/shrub or emergent wetland.
- 193 crossings of NYSDEC-classified streams.

The proposed NEETNY Thruway route also crosses two SCHs:

- Catskill Creek
- Kingston-Poughkeepsie Deepwater

The proposed NEETNY Thruway route crosses 7 SNCs:

- Catskill Creek Austin Glen (calcareous shoreline outcrop)
- Hans Vosen Kill(calcareous cliff community, calcareous talus slope woodland)
- Illinois Mountain (Appalachian oak-hickory forest, beech-maple mesic forest)
- Shaupeneak Mountain (hemlock-northern hardwood forest)
- Hudson River Estuary (tidal river)
- Greater Rosendale(hemlock-northern hardwood forest)
- Albany Pine Bush (pitch pine-oak forest)

The proposed ROW crosses 23.17 acres of these significant communities and would involve 0.009 acres of permanent disturbance.

Federally-listed species identified in the proposal as having the potential to occur along the corridor of the proposed Thruway route include:

- Dwarf wedgemussel
- Karner blue butterfly
- Indiana bat
- New England cottontail rabbit
- Northern long-eared bat
- Bog turtle.

Potential impacts within the AOI associated with the remaining 4 alternatives (Marcy Northern, Marcy Southern 1, Marcy Southern 2, and Knickerbocker) are entirely within existing ROW (Knickerbocker Route). Marcy Southern 2 crosses the Hudson River. Environmental features within the existing ROW include:

- 28.43 acres of NYSDEC mapped wetlands, with a proposed permanent impact of 0.05 acres.
- 39.22 acres of NWI mapped wetlands, with proposed permanent impact of 0.07 acres.
- 89 crossings of NYSDEC-classified streams.

Federally-listed species identified in the proposal as having the potential to occur along the corridor of the proposed Knickerbocker route include:

- Dwarf wedgemussel
- Karner blue butterfly
- Indiana bat
- New England cottontail rabbit
- Northern long-eared bat
- Bog turtle

Desktop analysis of existing data confirms the number and classification of NYSDEC wetlands, NWI Wetlands, streams, SNC, and SCH crossed by the proposed routes. Federal threatened and endangered species were confirmed to the county level.

Based on the location of the proposed alternative routes and priority sites (see Sections 2.0 and 3.3), NEETNY proposals intersect with a total of 30 priority sites (Figure 6). These are located at intersections with streams, rivers, SCHs, SNCs, mapped locations of threatened and endangered species, protected areas, and Class 1 Wetlands (Figure 2). Of these intersections, 20 include proposed new or widened ROW, making the potential for significant disturbance likely (Table 1).

4.5 Boundless Energy NE LLC (Boundless)

There are no new ROW or structures proposed by Boundless. The Boundless proposal (DPS scenario = Boundless 20 and 21) includes reconductoring along two stretches of existing transmission line, one on the west side of the Hudson River from Leeds in Greene County to Hurley Avenue in Ulster County and the other on the east side of the Hudson river from Leeds in Greene County to Pleasant Valley in Dutchess County (Figure 7). This proposal includes construction of two new underground lines from Roseton Substation on the west side of the Hudson River to the East Fishkill Substation on the east side of the river.

4.5.1 Potential Environmental Impacts

The information provided identified potential environmental impacts for the Leeds to Pleasant Valley route. There are potential temporary impacts associated with ground disturbance associated with proposed underground lines in and along the Hudson River. According to the Boundless proposal, there would be no permanent environmental impacts associated with the

project. All impacts are anticipated to be temporary. Natural features within the proposed project route include:

- 13 NYSDEC regulatory freshwater wetlands, including four Class one Wetlands and nine Class two Wetlands.
- 50 wetlands mapped by USFWS's NWI, including 28 forest/shrub wetlands, 15 freshwater emergent wetlands, five freshwater pond or lake wetlands, and two riverine wetlands.
- 36 NYSDEC-regulated streams, including three with a NYSDEC standard of 'A', six with a standard of 'B', 14 with a standard of 'C', 11 with a standard of C(t), and two with a standard of 'C(ts)'.
- 63 streams mapped by the US Geological Survey (USGS) National Hydrography Dataset, including 19 artificial paths (defined by USGS as a feature that represents flow through a 2-dimensional feature, such as a lake or a double-banked stream), 5 connectors, 15 intermittent streams, and 24 perennial streams.

Natural features within the proposed Leeds to Hurley Avenue project route include:

- 6 NYSDEC regulatory freshwater wetlands, including one Class one wetland and five class two wetlands.
- 21 wetlands mapped by USFWS's NWI, including 15 freshwater emergent wetlands, three freshwater forest/shrub wetlands, and three freshwater pond or lakes wetlands.
- 31 NYSDEC-regulated streams, including four with a standard of B, two with a standard of B(t), one with a standard of B(ts), 20 with a standard of C, and four with a standard of C(t).
- 36 streams mapped by the USGS NHD, including four canals/ditches, 14 intermittent streams, and 18 perennial streams.

Natural features crossed by the proposed Roseton to East Fishkill project include:

- 4 NYSDEC regulatory freshwater wetlands, including one Class 2 wetland.
- Seven wetlands mapped by USFWS's NWI, all freshwater forest/shrub wetlands.
- 11 NYSDEC-regulated streams, including one with a standard of A, one with a standard of B, eight with a standard of C, and one with a standard of C(t).
- 11 streams mapped by the USGS NHD, including 10 perennial streams and one canal/ditch.

According to the Boundless proposal, federally-listed or candidate species that have the potential to occur along the proposed route include:

- Indiana bat (endangered)
- Northern long-eared bat (threatened)
- New England cottontail rabbit (candidate)
- Bog turtle (threatened)
- Dwarf wedgemussel (Endangered)

According to the proposal, state-listed species with the potential to occur within the project area include:

- Bald eagle (threatened)
- Least bittern (threatened)
- Blanding's turtle (threatened)
- Timber rattlesnake (threatened)

Desktop analysis of existing data confirms the approximate number and classification of NYSDEC wetlands, NWI Wetlands, SNCs, SCHs, and NYSDEC streams. Available information confirms that state and federal listed species considered in the proposal are identified as occurring within the counties crossed by the proposed route.

The desktop review suggested that there was one stream crossing missing from the provided analysis of NHD stream crossings. The crossing missing from the NHD-mapped stream is a perennial stream. In addition, a final decision has been made on status of the northern long-eared bat; instead of being proposed endangered, it has been listed as threatened.

Based on the location of the proposed alternative routes and priority sites (see Sections 2.0 and 3.3), Boundless proposals intersect with a total of 16 priority sites (Figure 7). These are located at intersections with streams, rivers, SCHs, SNCs, mapped locations of threatened and endangered species, protected areas, and Class 1 Wetlands (Figure 2). Of these intersections, none include proposed new or widened ROW (Figure 1). Reconductoring is the only activity proposed at 13 of the 16 intersections. Of the other intersections, two are with a proposed HDD Hudson River crossing and one with a proposed trenched transmission line. Potential impacts to priority sites should be minimized through the use of best management practices.

5.0 Field Survey Data

As presented in Section 3.4 above and illustrated on Figure 2, 50 priority sites were identified for further review based on intersections of proposed alternatives with key natural resources. A total of 22 of these priority sites were visited in the field (Figure 8). Field data were collected using the methods outlined in Appendix A.

A site summary for all priority sites is provided in Appendix B. Detailed field survey data collected including species lists, wetland condition assessments, photographs, and ecological assessment forms are provided for the 22 sites visited in the field. A general review of field survey results is provided below.

5.1. Summary of Field Assessment Sites

Nine sites were assessed at protected areas (Table 2). Publically-accessible parks and historic sites visited include Victor C. Waryas Park, Peach Hill Park, Eleanor Roosevelt National Historic Site, Home of Franklin D. Roosevelt National Historic Site, Albany Pine Bush Preserve, Black Creek Marsh Wildlife Management Area, and Schodack Island State Park. Conservation easements visited included Eichybush Farm, Hollow Road Farm, the Boll Parcel, and Allen Farm.

Table 2 - List of Priority Sites Visited During Field Assessments[a]

Site ID	Priority	Highest-impact proposed technology	Field Notes	Intersecting Routes
0	Mapped T&E Species, Class 1 Wetland	Expanded ROW	Very good habitat, high quality wetland	NAT Preferred, NAT Thruway, Transco LD-PV, Boundless
1	Mapped T&E species	Expanded ROW	Possible habitat – surveys recommended	NAT Preferred, NAT Thruway, Transco LD-PV, Boundless
5	Mapped T&E Species	Trenching	Possible but not ideal habitat; surveys required to confirm.	Boundless
7	Mapped T&E Species, Class 1 Wetland	New ROW	High quality wetland, possible but not ideal habitat; surveys required to confirm.	NEETNY Thruway
8	Mapped SNC, Stream Crossing	New ROW	Hemlock-northern hardwood community confirmed	NAT Thruway
9	Protected Area	Replacement structures	Partially forested conservation easement	NAT 115 kV, Transco KB-PV, Transco NS-LD(R)/LD-PV, Transco OF/ED-PV, Transco ED-NS/KB-PV, Transco ED-NS/NS-LD(R)/LD-PV, NEETNY 4 KB Alternatives
10	Protected Area	Replacement structures	Partially forested conservation easement	NAT 115 kV, Transco KB-PV, Transco NS-LD(R)/LD-PV, Transco OF/ED-PV, Transco ED-NS/KB-PV, Transco ED-NS/NS-LD(R)/LD-PV, NEETNY 4 KB Alternatives

Table 2 - List of Priority Sites Visited During Field Assessments[a]				
Site ID	**Priority**	**Highest-impact proposed technology**	**Field Notes**	**Intersecting Routes**
12	Protected Area	Replacement structures	Partially forested conservation easement	NAT 115 kV, Transco KB-PV, Transco NS-LD(R)/LD-PV, Transco OF/ED-PV, Transco ED-NS/KB-PV, Transco ED-NS/NS-LD(R)/LD-PV, NEETNY 4 KB Alternatives
13	Protected Area	Replacement structures	Partially forested conservation easement	NAT 115 kV, Transco KB-PV, Transco NS-LD(R)/LD-PV, Transco OF/ED-PV, Transco ED-NS/KB-PV, Transco ED-NS/NS-LD(R)/LD-PV, NEETNY 4 KB Alternatives
15	Protected Area	Replacement structures	Public park with high bird diversity	NEETNY Thruway
16	Mapped T&E Species, Protected Area	Replacement structures	Publically-accessible wildlife management area, possible habitat for several species of T&E birds	Transco O-F/ED-PV, Transco ED-NS/KB-PV, Transco ED-NS/NS-LD-PV(R), Transco ED-NS/HA, Transco ED-NS/NS-LD(R)/LD-PV, NEETNY 4 KB Alternatives
17	Mapped T&E Species, SNC, Protected Area	Expanded ROW	Publically-accessible nature preserve. Confirmed community and possible habitat for T&E species.	NEETNY Thruway
18	Protected Area, SCH	New crossing	Publically-accessible NYS park; Coastal habitat confirmed.	NAT 115 kV, NEETNY 4 KB Alternatives
20	Mapped SNC	New ROW	Confirmed habitat in adjacent forest. Forest cover is continuous between visited area and proposed new ROW and likely similar.	NAT Thruway, NEETNY Thruway
31	Class 1 Wetland	Replacement structures	Wetland cover confirmed	NAT Preferred, Transco NS-LD(R)/LD-PV, Transco ED-NS/NS-LD-PV(R), Transco ED-NS/NS-LD(R)/LD-PV
33	Mapped SNC	New ROW, new aerial crossing	Community confirmed	NAT Thruway
34	Protected Area	New aerial crossing	Public park confirmed; low-diversity plant cover with high invasive cover.	NEETNY Thruway

Table 2 - List of Priority Sites Visited During Field Assessments[a]				
Site ID	**Priority**	**Highest-impact proposed technology**	**Field Notes**	**Intersecting Routes**
37	Possible T&E Species	Replacement structures	Possible that species may use habitat, but not ideal or likely habitat.	NAT Preferred, NAT 115 kV, Transco KB-PV, Transco NS-LD(R)/LD-PV, Transco O-F/ED-PV, Transco ED-NS/KB-PV, Transco ED-NS/NS-LD(R)/LD-PV, NEETNY 4 KB Alternatives, Transco LD-PV(R), Transco ED-NS/NS-LD-PV(R), Boundless
41	Stream Crossing	Replacement structures	Confirmed stream crossing. Banks not accessible. Vegetated stream buffer with high invasive cover.	NEETNY Thruway
43	Protected Area, Stream Crossing	Expanded ROW	Publically accessible town park. Confirmed stream crossing.	NAT Thruway, NEETNY Thruway
47	Mapped T&E Species	Expanded ROW	Possible habitat – recommend surveys	NAT 115 kV, Transco KB-PV, Transco NS-LD(R)/LD-PV, Transco O-F/ED-PV, Transco ED-NS/KB-PV, Transco ED-NS/NS-LD(R)/LD-PV, NEETNY 4 KB Alternatives
48	Mapped SCH	Replacement structure; aerial crossing.	Confirmed habitat in accessible SCH downstream from proposed replacement structures and Hudson Crossing.	NAT Preferred, NAT 115 kV, Transco NS-LD(R)/LD-PV, Transco ED-NS/NS-LD(R)/LD-PV, Transco LD-PV(R), Transco ED-NS/NS-LD-PV(R), Boundless

[a] Designated priority sites that were not visited during field assessments are not summarized in this table. Ecological information for these sites is provided in Appendix B.

Eight of the 22 priority sites visited are mapped as threatened and endangered species occurrences (Table 2). Species include Blanding's turtle, northern harrier, bald eagle, and golden club. No federally threatened or endangered species were observed during the field surveys. The state-threatened bald eagle was observed at one priority site. Most sites with mapped occurrences were documented to have habitat conditions that supported a possibility of occurrence of the mapped species. Some sites had specific, high quality habitat and had a greater likelihood. A few sites with mapped occurrences of listed species were in areas that

wouldn't necessarily support the species mapped (i.e., along roads, in marginal wetlands, etc.). These could be due to land use changes or dated, low-accuracy reports.

Six of the 22 priority sites visited are mapped locations of SNCs and SCHs (Table 2). Communities observed included freshwater tidal marsh, vernal pool, hemlock-northern hardwood, beech-maple mesic forest, and Appalachian oak hickory forest.

Two of the sites visited acted as "stand-in" sites and were assessed based on the assumption that they represented similar habitats to SNCs and SCHs crossed by proposed transmission upgrades in inaccessible areas or where landowner access permission was not obtained. The first, Illinois Mountain (Site 20), was located in a forested area contiguous to the forested area crossed by new ROW as proposed by NEETNY. Both the stand-in site and the priority site where activity is proposed are mapped as SNCs Appalachian oak-hickory forest, beech-maple mesic forest, and hemlock northern-hardwood forest.

The second stand-in site (Site 26) visited was located in a tidal marsh on the west bank of the Hudson River approximately 4 miles south of a proposed aerial crossing of the river. Both the stand in site and the priority site are tidal marshes mapped as SCHs by NYSDEC.

Field surveys generally confirmed the presence of mapped SNCs. The SNCs assessed over the course of field surveys represent valuable natural assets that contribute to the Hudson Valley's character, ecological value, and ecosystem service value. SNCs also provide habitat for threatened and endangered species.

Three sites were assessed at Class 1 Wetlands and four sites were assessed at stream and river crossings (Table 2, Figure 8). Class 1 Wetlands assessed include HP-36, R-301, SP-21, and V-19. Crossings assessed included Fall Kill, the Wallkill River, and the Hudson River.

5.2 Field Assessment Results and Discussion

5.2.1 Protected Areas

Protected areas visited in the course of field surveys serve a variety of functions, including providing recreational opportunities, preserving rural character, and providing ecosystem and ecological services. Publicly-accessible areas such as Peach Hill Park in the City of Poughkeepsie, Eleanor Roosevelt Historic Site in the Town of Hyde Park, Black Creek Marsh State Wildlife Management Area in Albany County, and Schodack Island State Park in the Town of Schodack should be avoided in the interest of preserving the limited areas available to for outdoor recreation in a heavily developed area. People were observed at these areas birding, bicycling, kayaking, fishing, and enjoying the outdoors. Construction activities and new or expanded ROWs have the potential to alter the cultural and recreational value of these protected areas. For example, site 34, Victor C. Waryas Park, provides opportunities for Poughkeepsie residents

to be outside along the river. It is located in a highly-accessible downtown neighborhood, adjacent to the newly-opened Walkway over the Hudson. Construction around this park would likely disrupt recreational activities within it, and construction of the aboveground portion of an HDD crossing could disrupt aesthetic qualities of the park and the adjacent Walkway over the Hudson. Privately-owned conservation easements visited during field surveys were observed to provide a number of services, including preservation of land for hunting, fostering of existing forest habitat, and preservation of buffers alongside waterways. Disturbance adjacent to or within these protected area has the potential to decrease their environmental and cultural value.

5.2.2 Threatened and Endangered Species

One state-threatened species, the bald eagle (*Haliaeetus leucocephalus*), was observed during field visits. Though the bald eagle was observed at a site with similar habitat to an inaccessible site, it is likely that bald eagles use much of the habitat along the Hudson River. According to NYSDEC, bald eagles use the open water habitat of the Hudson and surrounding forested areas for open water, food, and roosting sites. Bald eagles also nest along the river. NYSDEC also notes that the portion of the river between Kingston, NY and Croton, NY, much of which lies in the AOI, appears to be especially popular with bald eagles. Any activities near, within, or above the Hudson should take bald eagles into consideration and avoid any adverse impacts.

Though no federally endangered species were observed during field visits, many sites had the potential to support populations of these species, and some had NYNHP-documented instances of species occurrence. In addition, databases of species occurrences are far from complete, so a lack of mapped occurrences does not mean that species are absent.

Two NYSDEC-designated species of special concern were observed at field sites, the American bittern (*Botaurus lentiginosus*) and the red-shouldered hawk (*Buteo lineatus*). Species of special concern are either listed as candidate species by USFWS, listed as threatened or endangered in at least three neighboring states, vulnerable due to adverse trends that could lead to it becoming threatened or endangered in New York State, have undergone a serious and non-cyclical decline, or are rare enough in New York that habitat destruction or population destruction could lead to designation as threatened or endangered.

Habitat that could support the state-threatened Blanding's turtle was located at several sites. According to NYNHP, Blanding's turtles use multiple habitat types, and prefer shallow wetlands; habitat types associated with Blanding's turtles include shrub swamps, marshes, and shallow ponds. A 2009 Hudsonia report on wetland characteristics associated with Blanding's turtle habitat in Dutchess county lists the following characteristics: include shrubby cover, particularly cover of buttonbush; deep organic sediments; open canopy or canopy of less than 50%; no

significantly flowing water; abundant neuston (especially duckweed and floating liverworts); a surrounding tree fringe; water less than 30cm deep in spring and early summer; and open water moats or moat-like areas. The reports note that not all characteristics need to be present for a wetland to provide high-quality habitat. Blanding's turtles will frequently travel through uplands and cross roads, especially during the nesting period or when moving between wetlands, so areas surrounding ideal habitat should be protected from significant disturbance to decrease the likelihood of adverse effects.

High quality habitat particularly suitable for spotted turtles, a NYSDEC-designated species of special concern, was observed during field assessments. According to NYSDEC, spotted turtles use marshy meadows, bogs, swamps, ponds, ditches, or other small bodies of still water.

Species presence surveys should be conducted at all sites likely to support threatened, endangered, or special concern species.

Sensitive species not currently designated as threatened, endangered, or special concern were observed at several priority sites. Many species of amphibians, including spring peepers, northern leopard frogs, wood frogs, spotted salamanders, slimy salamanders, red-backed salamanders, grey tree frogs, and eastern newts were observed at priority sites. Worldwide, amphibian populations are declining; many of these declines are due to effects from occurrences such as forest fragmentation, habitat alteration, and loss and barriers to movement. Construction of transmission upgrades has the potential to cause declines in amphibian populations in areas directly and indirectly affected by construction.

5.2.3 Significant Natural Communities and Significant Coastal Habitats

Several mapped SNCs and SCHs were assessed in the field. The occurrence of a freshwater tidal marsh SNC was confirmed under a proposed new ROW. According to NYNHP, endangered, threatened, and special concern species associated with freshwater tidal marshes include heartleaf plantain, least bittern, king rail, golden chub and northern harrier.

Hemlock northern hardwood forest SNC was confirmed under proposed new ROW. According to NYNHP, endangered, threatened, and special concern species associated with hemlock northern hardwood forest include the Indiana bat, northern long-eared bat, bald eagle, New England cottontail, and nodding pogonia. Hemlock northern hardwood forest is threatened by the hemlock wooly adelgid, which is more likely to occur around disturbed areas, and by forest fragmentation.

Pitch pine-oak forest SNC was confirmed adjacent to NEETNY’s Thruway route, which may require the addition of up to 35 feet of new ROW adjacent to the existing Thruway ROW.

According to NYNHP, pitch pine-oak forest is associated with many threatened, endangered, and special concern species, including the mottled duskywing and Karner blue.

Appalachian oak-hickory forest and beech maple mesic forest SNCs were observed within the Illinois Mountain Corridor. According to NYNHP, these SNCs are vulnerable to land use changes, invasion by invasive species, and forest fragmentation. Threatened and endangered species associated with them include the Indiana and northern long-eared bats.

A vernal pool community was confirmed near proposed new ROW. According to NYNHP, vernal pool SNCs are threatened by development and associated runoff, especially as isolated wetlands are no longer regulated under the Clean Water Act. Threatened and endangered species associated with vernal pools include the false hop sedge, cat-tail sedge, and brown bog sedge. Vernal pools are important for many species, including frogs, salamanders and turtles, which use vernal pools for breeding and feeding.

Schodack Island, a designated SCH, was visited during field surveys. According to the NYS Department of State (DOS), Schodack Island was designated an SCH because it provides important fish and wildlife habitat, and represents a large, intact floodplain area that is rare in the Hudson Valley Region. DOS notes that any activity within the SCH that degraded water quality or altered water depth along shorelines, in wetlands, or in streams would adversely affect habitat values. The construction of transmission lines across Schodack Island has the potential to adversely affect this important habitat.

Brandow Point Marsh and Flats, a designated SCH, was viewed from the road, but similar tidal marsh habitat several miles downstream was visited as a proxy site. According to DOS, Brandow Point Marsh and Flats is a highly productive ecosystem, serving as an important food supply for waterfowl, fish, and reptiles. The site is noted as being particularly vulnerable to increases in common reed infestation. Construction of transmission upgrades has the potential to create disturbance that would allow the existing common reed infestation to expand. Construction also has the potential to disrupt the community in other ways, whether by altering hydrology or plant composition, and could decrease the area's value for fish and wildlife habitat.

5.2.4 Water Resources

Streams and rivers visited in the course of field surveys, including the Hudson River, Wallkill River, and Fall Kill, provide wildlife habitat, recreation, fresh water, and nutrient cycling, among other services. The banks and vegetated buffers of these features are also important, providing water filtration, flood mitigation, and wildlife habitat. Construction near these features could limit or eliminate these services. Possible effects of construction in areas around rivers and streams include disturbance to stream beds and stream banks, elimination or disturbance of vegetated buffers, and increased sedimentation. If crossings are located near the headwaters of

a stream or river, special care should be taken, as these areas can be very vulnerable to disturbance. Invasive species, as discussed below, also pose an increased threat to water resources as a result of disturbance.

In order to minimize potential effects of construction on wetlands, avoidance should be practiced when possible, as mitigation tends to have mixed success in restoring functions lost when wetlands are filled. Wetland functions recorded during field studies, including flood mitigation and water filtration, efficiently provide necessary services and should be avoided whenever possible.

Field delineation of all streams and wetlands located in the project area will be necessary for adequate review in Part B and prior to permitting of any transmission upgrades. Existing wetlands and streams may not be mapped on datasets such as the Fish and Wildlife Service's National Wetlands Inventory, NYSDEC's wetland maps, and USGS's National Hydrologic Dataset. Small streams and wetlands are vulnerable to disturbance, but can have a significant negative impact on downstream water quality if disturbed.

5.2.5 Invasive Species

Increased cover of invasive species could be a consequence of disturbance associated with transmission upgrades. For example, site 8 (Appendix B) had almost no invasive species cover, though some small invasive species colonies were observed around existing trails. Invasive species colonies already in the area of site 8 could expand to colonize areas opened up by disturbance associated with clearing of new ROW, or could be introduced by people or equipment traveling through the site.

After a disturbance, invasive species are able to quickly colonize areas of bare ground, outcompeting native species, decreasing biodiversity, and altering the function of the ecosystem. Significant cover of invasive species was observed at the majority of field sites. The most common invasive species observed at field sites were common reed (*Phragmites australis*), purple loosestrife (*Lythrum salicaria*), reed canary grass (*Phalaris arundinacea*), Japanese knotweed (*Fallopia japonica*), honeysuckle (*Lonicera spp.*), buckthorn (*Rhamnus spp.*), tree of heaven (*Ailanthus altissima*) and multiflora rose (*Rosa multiflora*). Best management practices such as reestablishing native cover after disturbance and ensuring invasive species aren't introduced by fill or construction vehicles, should be implemented during construction to prevent the spread of invasive species in the vicinity of priority sites.

6.0 Discussion

This section provides a relative comparison of potential environmental impacts associated with proposed transmission routes and technologies in the AOI. Review of potential environmental impacts in Sections 4.0 and 5.0 along with further analysis of impacts in this section are based largely on potential intersections of proposed alternatives with priority sites as described and discussed in previous sections, and disturbances likely associated with proposed technologies (see Section 4.1).

Evaluation of potential impacts helps identify relative risks to the environment for each alternative. This analysis acknowledges that information provided by applicants has not yet been refined to the detail necessary to make definitive and final statements about environmental impacts. A refined analysis of potential impacts is anticipated in Part B of the application process. Environmental impacts identified in application materials were reviewed along with additional data and references collected independently (see Section 2.0 and 8.0) to identify potential impacts for further consideration. Our review process, results, and discussion provide a relative comparison of alternatives based on potential environmental impacts and informs future technical studies that will be required in Part B of the application process.

6.1 Comparison of Environmental Impacts

The table below lists each alternative evaluated within the AOI (identified by proposal and route or combined route name) and a relative ranking (primarily spatial and qualitative) of potential environmental impacts (low, medium, or high). This relative ranking is based on the data reviewed and presented in Sections 4.0 and 5.0 above and as summarized in Tables 1 and 2. In general, proposed routes with less potential impact to critical resources such as wetlands and streams, fewer intersections with priority sites, and that included proposed technologies with less disturbance (see Section 4.1), were rated as low or medium. Routes with the most potential impacts in these areas were rated as high. These ranks provide a comparison of potential impacts to ecological resources based primarily on the quantity and quality of resources intersected by proposed transmission routes and associated technologies.

Priority sites are considered most vulnerable to potential negative effects or impacts associated with disturbance. This vulnerability was confirmed by field assessments. Some areas crossed by proposed transmission upgrades have high concentrations of native species, have the potential to provide important habitat to vulnerable species, provide high-value ecosystem services, or provide the Hudson Valley region with a sense of place. Even temporary disturbances to such important communities can have immediate and long-term negative effects including a higher likelihood of negative impacts to sensitive plant and animal species and an elevated risk of introducing invasive species. Additional stressors beyond those already present at many of

these sites (incompatible adjacent land use, encroachment of invasive species, climate change, etc.) can have significant, cumulative, and therefore disproportionately large negative effects. Furthermore, these areas are communities that are connected and interdependent within larger ecosystems, watersheds, and ecoregions. Indirect impacts are important considerations.

Construction of transmission upgrades also has the potential to increase landscape fragmentation in a region that is already heavily developed. In its Hudson River Estuary Wildlife and Habitat Conservation Framework, NYSDEC identifies habitat fragmentation as a major concern of land managers in the Hudson Valley. Habitat fragmentation can lead to decreases in biodiversity and increases in edge effects such as predation, pollution, invasive species, and erosion. Disturbance associated with the construction of transmission upgrades or the clearing of new or widening of existing ROW could increase the amount of forest exposed to edge effects.

Table 3 - Relative rank of potential environmental impacts for alternative routes.

Alternative Name	Rank [a]
Boundless	LOW
TRANSCO ED-NS/HA	LOW
TRANSCO ED-NS/NS-LD-PV(R)	LOW
TRANSCO HA	LOW
TRANSCO LD-PV(R)	LOW
NAT 115kv	MEDIUM
NEETNY (4 KB Alternatives)	MEDIUM
TRANSCO KB-PV	MEDIUM
TRANSCO O-F/ED-PV	MEDIUM
TRANSCO ED-NS/KB-PV	MEDIUM
TRANSCO NS-LD(R)/LD-PV	MEDIUM
TRANSCO ED-NS/NS-LD(R)/LD-PV	MEDIUM
NEETNY Thruway	HIGH
NAT Preferred	HIGH
NAT Thruway	HIGH

[a] Relative rank of low, medium, and high based on combined review of potential environmental impacts identified in proposals, checklists, summaries, and through independent desktop review. Note that ranks provided for this final review are assigned irrespective of overall practicability of proposals, logistics, cost efficiencies, and benefits/impacts to other social and economic issues outside environmental impacts associated with water, natural habitats, and wildlife. Alternatives that were assigned 'LOW' rankings were those with the fewest overall reported and identified impacts to priority sites – which were typically projects that did not propose any new towers or clearing of new ROW. Alternatives that were assigned "HIGH" rankings generally tended to be those with greater reported and identified impacts to priority sites, and which proposed new structures in new ROW. See Table 1.

Likelihood of disturbance associated with proposed technologies was considered in the ranking provided by this final report. However, as mentioned previously, it is recognized that information provided at this stage of the application process was not always specific nor spatially detailed enough to identify individual impacts associated with alternatives. The likelihood of potential impacts associated with each technology, as summarized in Section 4.1, was used to help inform the analysis of potential impacts to the intersections discussed above. It is important to note that proposed alternatives are often comprised of more than one technology. For example, Boundless proposes reconductoring with no new structures which suggests minimal impact throughout but their proposal also acknowledges impact minimization requirements associated with trenching. In addition, there is question regarding the validity of the reconductoring proposal by Boundless by the Staff Interim Report which suggests that structures will in fact need to be replaced and trenching will have greater impacts than estimate. Other reconductoring proposals (e.g. TRANSCO "R" alternatives) identify structure replacements and other construction associated with the reconductoring segments. Our approach was to base our ranking primarily on proposed technologies as described by the applicant. When these technologies were not spatially defined in applications, the technology with the highest likelihood of disturbance was assumed.

In its Interim Report, Staff also ranks proposed transmission upgrades based on potential impacts. Table 1 provides the DPS rank for comparison with the ranks provided here. DPS ranked alternatives based on factors including the amount of new or expanded ROW; possible environmental impacts, including impacts to wetlands, river corridors, and forest; possible visual impacts; possible cultural/historical resource impacts; and possible auditory impacts. Differences between the comparative ranking given here and the comparative ranking in the Staff Interim Report are primarily due to the following differences in approach:[2]

- Staff considers possible impacts over the entire project area, while the above ranking considers only impacts within the seven-county AOI.
- Staff considers other factors in addition to ecological factors, including visual, cultural, and historical factors.
- Staff did not map and assess priority sites as conducted here.
- Staff believes reconductoring will have a greater impact on environmental features than the applicants indicated in their application materials.

[2] Though all alternatives proposed in part A applications are included in this report, DPS recommended in its Interim Staff Report that all except the following alternatives be removed from consideration: Boundless, TRANSCO ED-NS/NS-LD-PV(R), TRANSCO LD-PV(R), TRANSCO NS-LD(R)/LD-PV, TRANSCO ED-NS/NS-LD(R)/LD-PV, TRANSCO KB-PV and NextEra 19a.

Staff also added an alternative (DPS scenario = NextEra 19a) to its evaluation and ranking. The portion of this alternative within the AOI for this review is the same as the NEETNY alternatives that use the Knickerbocker to Pleasant Valley corridor as assessed in this report and would be ranked the same = Medium.

NAT and NEETNY submitted additional information to Staff in response to issues raised at the technical conference. NAT suggested in its July 25, 2015 Post-Technical Conference Comments that any environmental cost associated with upgraded transmission lines be balanced against the environmental benefits of increased transmission capacity, such as increased capability of the grid to support transmission of electricity from renewable sources. NAT also recommends that its proposals be considered portfolios of projects to be compared to projects along equivalent routes in other proposals. Finally, NAT suggests that it will be submitting specific comments in response to statements made in both the HVSEC's interim report and the Staff Interim Report.

NEETNY notes several inaccuracies in the DPS Staff Report in its July 23, 2015 Factual Corrections to the Interim Report filing. These include what NEETNY believes is an improper combination of the Marcy/Edic to Pleasant Valley and Oakdale to Fraser projects. NEETNY suggests that analyzing the Marcy/Edic to Pleasant Valley project separately would result in a lower environmental impact ranking in Staff's Interim Report. NEETNY did not comment on the rankings in the HVSEC Interim Report.

6.2 Inclusiveness of Applicant Environmental Impacts Analysis

Based on review of information provided by applicants, checklists and summaries developed for each proposal, a desktop analysis, and review of comments by NYSDEC, it appears that there is a relatively inclusive and accurate representation of potential environmental impacts to important natural resources which would result from construction of the proposed transmission upgrade alternatives. A few exceptions or areas that need additional clarity are listed below.

- NEETNY proposes to convert 6.13 acres of NYSDEC-regulated Class 1 forested wetland and 10.74 acres of NWI-mapped forested wetland to scrub/shrub or emergent wetland. It is necessary to identify all intersections with Class 1 wetlands that will result in temporary, permanent, direct, and indirect impacts including wetland conversion. This is true for all four applicants.
- A final decision on the listing of the northern long-eared bat was released on April 4, 2015, when the bat was listed as threatened with a 4(d) rule. Clarification regarding approaches to avoiding impacts on northern long-eared bats should be made in light of

the final listing. TRANSCO in particular did not mention the northern long-eared bat in its impacts summary.

- Boundless only provided wetland data for their preferred route. Boundless provides number of wetlands intersected and indicates zero permanent impacts but does not provide an estimate of temporary impacts. Temporary and permanent impacts estimates as provided by NAT, TRANSCO, and NEETNY are necessary to compare overall environmental impacts.
- NEETNY's scoping document did not address two threatened plants, small whorled pogonia and northern wild monkshood, that appear on the New York Nature Explorer list of threatened and endangered species occurring in Ulster County. This may be because consultation with NYNHP and USFWS did not reveal any populations of these plants within the project area or intersection with the route. Recommend clarification.
- Review of the proposals should take into consideration that the majority of wetlands, even lower quality systems, provide important ecosystem services. These services vary by wetland type, size, and proximity to other natural resources and land use features. For example, a wetland located along a river may be more valuable to flood control than a wetland located elsewhere. In addition to spatial delineations of wetlands, assessment of the conditions, services, and relative value of wetlands that are crossed by the proposed routes is necessary to inform and assess those proposals.
- Comments made by NYSDEC on the Part A applications note several concerns about the applicants' proposals, including:
    - Concern about aerial Hudson River crossings - NYSDEC would prefer that any river crossings be made using HDD technology
    - That best management practices be used to the maximum extent possible to limit effects on environmental resources
    - NYSDEC underscores the necessity of field wetland delineation by noting that some state-regulated wetlands are larger than their mapped areas
    - Concern about the impact of new and expanded ROW on environmental assets: in general, according to NYSDEC, impacts associated with transmission upgrades within existing ROW will be lower than impacts associated with construction within a new or expanded ROW.

6.3 Comments on Environmental Review in Scoping Documents

NAT provided an inclusive scope for evaluating potential environmental impacts for land use, aquatic resources, listed species, and habitats.

The scoping statement initially submitted by TRANSCO (Exhibit 4: Environmental Impacts) provided notably less information than those of the other applicants. This was later accounted

for in subsequent submittals but in a format difficult to review and summarize. Additional and/or better organized detail in scoping statement is necessary regarding potential impacts and how they will be evaluated in Part B.

The preliminary scoping statement developed by NEETNY proposes a thorough investigation of potential impacts of each route for land use, aquatic resources, and listed species and their habitats. A baseline database of invasive species along routes is proposed as well. It is recommended that NEETNY clarify why they do not address the two threatened plants in Ulster County listed above.

NEETNY's Part A Filings also state that the proposed Thruway route would require the expansion of the existing Thruway ROW by between 0 and 35 feet along the length of the project. Assessing environmental impacts without knowing exactly where this expansion would occur is difficult. It is recommended that NEETNY calculate the approximate extent and location of these expansions.

In contrast to NEETNY's Thruway proposal, NAT's Thruway proposal states that the existing Thruway ROW is sufficiently wide along the length of the proposed route; it is recommended that both applicants assess this difference.

Boundless provided a detailed scoping statement with clear indication of avoidance/minimization measure of their preferred alternative and an inclusive scope of evaluating potential impacts to land use, aquatic resources, listed species, SNC, and protected areas. An estimate of acres of potential wetland impact is necessary.

In its comments on the Part A filings, NYSDEC notes that the detail of scoping information provided by the applicants varies; it recommends that, where not included in Part A filings, the applicants give detailed and consistent information on all possible impacts, including stream crossings, permanent and temporary wetland impacts, threatened and endangered species, and invasive species. As an addition to this recommendation, review of currently protected areas and stated priorities of existing conservation plans and strategies should be included.

6.4 Key Recommendations

The following list summarizes our key recommendations that result from this review and analysis above.

1. Avoid construction options that require new or widened ROW. The increase in potential impacts is significant. NYSDEC's Comments on Part A Applications laid out NYSDEC's priorities in reaching the best possible decision on transmission line upgrades. According to those comments, NYSDEC would prefer upgrade alternatives with no new ROW or widening of existing ROW, as new ROW has the potential to cause high environmental impacts; however, if widening ROW is necessary, NYSDEC is open to it if it is planned appropriately. If widened ROW does in fact become necessary, the data we provide here may assist in avoiding critical resources.
2. Field delineate all significant environmental resources including habitat with potential to support listed species and particularly wetlands and streams. Include habitat conditions assessments to support impact analysis and mitigation requirements. Existing wetlands and streams may not be mapped on datasets such as the Fish and Wildlife Service's National Wetlands Inventory, NYSDEC's wetland maps, and USGS's National Hydrologic Dataset.
3. Conduct species presence surveys at all sites with mapped occurrences and likely to support threatened, endangered, or special concern species. The NYSDEC emphasizes the importance of species surveys, best management practices, and minimization of impacts to limit the effect of upgrades on populations of listed species. The recent listing of the northern long-eared bat requires that special attention be paid to the location and timing of any tree clearing involved in construction.
4. Avoid all impacts, including temporary and indirect impacts, to protected areas, SNCs, SCHs, Class 1 Wetlands and buffers. These tend to be difficult or impossible to replace systems and mitigation tends to result in mixed success in restoring functions lost.
5. Identify and evaluate all unavoidable temporary, permanent, direct, and indirect impacts and develop fair, high quality, landscape-level compensation strategies.
6. Use best management practices to minimize impacts associated with stream crossings. Avoid aerial crossings of the Hudson River. NYSDEC emphasizes avoidance in the vicinity of falcon or eagle nests or other avian resources.
7. Evaluate all proposals in light of existing plans and priorities identified in Section 3.0.

7.0 Conclusion

In the Hudson River Valley, as is the case worldwide, natural resource conservation, community resilience, and economic vitality are inextricably linked. A basic tenet of sustainability is that all three of these factors must be supported for anyone to truly benefit. The alternating current transmission upgrade proposals reviewed in this report all purport to upgrade the transmission system to relieve congestion, improve reliability of the electric grid, and facilitate increased utilization of renewable and clean energy. As consideration regarding the need and net value of these proposals continues, it is imperative to avoid adverse impacts to the balance between natural resources, community, and economy. Natural resources in particular provide a foundation of critical support for both communities and economy. Ecosystem services provided by forests, fields, streams, and wetlands include water purification, floodwater retention, biodiversity, soil protection, and resilience. These in turn support recreation, education, tourism, agriculture, and quality of life in general. Our field data collection which confirmed and documented the presence of key environmental resources within the AOI that would be impacted by the proposals underscores the necessity of a full review of environmental conditions in the field prior to the finalization of designs and beginning of construction. Informed decisions on the location and degree of necessary disturbance have the potential to minimize environmental effects such as loss of ecosystem services, shifts in the composition of important ecological communities, and adverse impacts to threatened and endangered species.

This report provides an analysis of potential impacts to some of the most important and most vulnerable natural resources in the AOI. Utilizing the information and recommendations contained within this report will help decision makers ensure that these critical resources are protected.

8.0 References

A significant number of documents, maps, correspondence, report, summaries, and checklists were provided in digital format to CC. This report is based on a general review of all information submitted by the four applicants along with proposal checklists and summaries specific to environmental impacts. The checklists and summaries were most often developed by entities other than the applicants but based on applicant submissions. In addition, CC utilized information in existing conservation plans, strategies, agency websites, and GIS data sets. The references listed below include those documents that served as primary sources of information.

Hudson Valley Regional Council, December 2013. 2013–2014 Hudson Valley Economic Development District Comprehensive Economic Development Strategy. Prepared for the Hudson Valley Regional Council. p 132-133

Boundless Energy NE, LLC, March 2, 2015. *Additional Part A Information*. Proposed Leeds Path West AC Transmission Project; New York Energy Highway Initiative. Case No. 13-T-0461.

Boundless, Energy NE, LLC, Updated November 15, 2013. Proposed Leeds Path West AC Transmission Project

Boundless Energy NE, LLC – "Leeds Path West*." Summary and Maps*. Case No. 13-T-0461.

CenterPoint Energy. Appendix G: Horizontal Directional Drill and Contingency Plan – Prepared for the Bureau of Land Management. June 2013

David A. Paterson, Governor, 2009. *New York State Open Space Conservation Plan*. NY.

Ecology and Environment, Inc., March 2013. *Mid-Hudson Regional Sustainability Plan.* Cleaner Greener Communities, NY Works.

Fahrig, L. 2003. Effects of Habitat Fragmentation on Biodiversity. *Annual Review of Ecology, Evolution, and Systematics.* 34: 487-515.

Iseley, T. and Gokhale, S. (1997). "Trenchless installation of conduits beneath roadways." NCHRP Synthesis 242. Transportation Research Board/National Research Council, Washington, D.C., 36.

Jane Clark Chermayeff Associates, LLC. And QL Consulting, Inc., The Secretary of the Interior, Gale A. Norton, April 17, 2002. *Hudson River Valley National Heritage Area Management Plan.* Hudson River Valley Greenway Communities Council and Greenway Conservancy for the Hudson River Valley, Inc.

Lameck Onsarigo, Simon Adamtey, Alan Atalah. Analysis of Horizontal Directional Drilling Construction Risks using the Probability-Impact Model: A Contractor's Perspective. August 2014

Ecology and Environment, Inc., 2013. Mid-Hudson Regional Sustainability Plan. Prepared for Mid-Hudson Planning Consortium. May 2013, p 2-2.

Koch, Frank H, HM Cheshire, HA Devine. 2006. Landscape-scale prediction of hemlock woolly adelgid, Adelges tsugae (Homoptera: Adelgidae), infestation in the southern Appalachian Mountains. Environmental Entomology, 35(5), 1313-1323.

Murcia, C. 1995. Edge Effects in Fragmented Forest: Implications for Conservation. *Trends in Ecology and Evolution*. 10: 58-62.

National Hydrographic Dataset: https://gis.ny.gov/gisdata/inventories/details.cfm?DSID=977. *GIS Dataset*. Accessed date: April 8, 2015.

National Wetlands Inventory; US Fish & Wildlife Service. *National Wetlands Inventory*. GIS dataset.

New York Nature Explorer: http://www.dec.ny.gov/animals/57844.html.

New York State Department of Environmental Conservation. 2006. *Hudson River Estuary Wildlife and Habitat Conservation Framework*.

New York State Department of Environmental Conservation, Division of Environmental Permits & Pollution Prevention. April 22, 2015 letter to the Public Service Commission. *In the Matter of Alternating Current Transmission Upgrades – Comparative Proceeding.*

New York State Department of Environmental Conservation. *Natural Heritage Community Occurrences*: https://gis.ny.gov/gisdata/inventories/details.cfm?DSID=1241. GIS Dataset. Accessed date: April 8, 2015.

New York State Department of Environmental Conservation. *Regulatory Freshwater Wetlands*: https://gis.ny.gov/gisdata/inventories/details.cfm?DSID=1274. GIS Dataset. Accessed date: April 8, 2015.

New York State Department of Public Service. July 6, 2015. DPS Staff Interim Report. New York State Department of Public Service, Albany, NY.

New York Transmission Owners (New York Transco LLC), March 9, 2015. *Alternatives Proposed*.

New York Transmission Owners. *Part B Scoping Statements*. For Authority to Construct and Operate Electric Transmission Facilities in Multiple Counties in New York. Case No. 13-M-0457.

New York Transmission Owners (New York Transco LLC; Central Hudson Gas and Electric Corporation; Niagara Mohawk Power Corporation d/b/a National Grid; and New York State Electric & Gas Corporation). *Summary and Maps*. Case No. 13-M-0457.

New York Transmission Owners (New York Transco LLC; Central Hudson Gas and Electric Corporation; Niagara Mohawk Power Corporation d/b/a National Grid; and New York State Electric & Gas Corporation), March 9, 2015. *ENVTL Impacts by Segment.*

NextEra Energy Transmission New York, Inc. March 2, 2015. *Marcy/Edic to Pleasant Valley Project, Appendix A – Tables*. State of New York Public Service Commission.

NextEra Energy Transmission New York, Inc. *Checklist Analysis.*

NextEra Energy Transmission New York, Inc. March 2, 2015. *Marcy/Edic to Pleasant Valley Project, Part A Supplemental Application – Additional Information*. State of New York Public Service Commission. Case No. 13-T-0455.

NextEra Energy Transmission New York, Inc. July 23, 2015. *Factual Corrections to the Interim Report*.

North America Transmission, January 18, 2015. *New Scotland-Leeds-Pleasant Valley, Scoping Statement and Schedule.* Environmental Impact (86.5 – Exhibit 4) Pages 12-51.

North America Transmission. July 28, 2015. *Post Technical Conference Comments of North America Transmission Corporation and North America Transmission, LLC on Interim Report*.

North America Transmission. *Summary and Maps.* Case No. 13-T-0454.

North America Transmission, March 2, 2015. *Additional Information to be Included in the Part A Materials to be Filed by Applicants for New Scotland-Leeds-Pleasant Valley Component.*

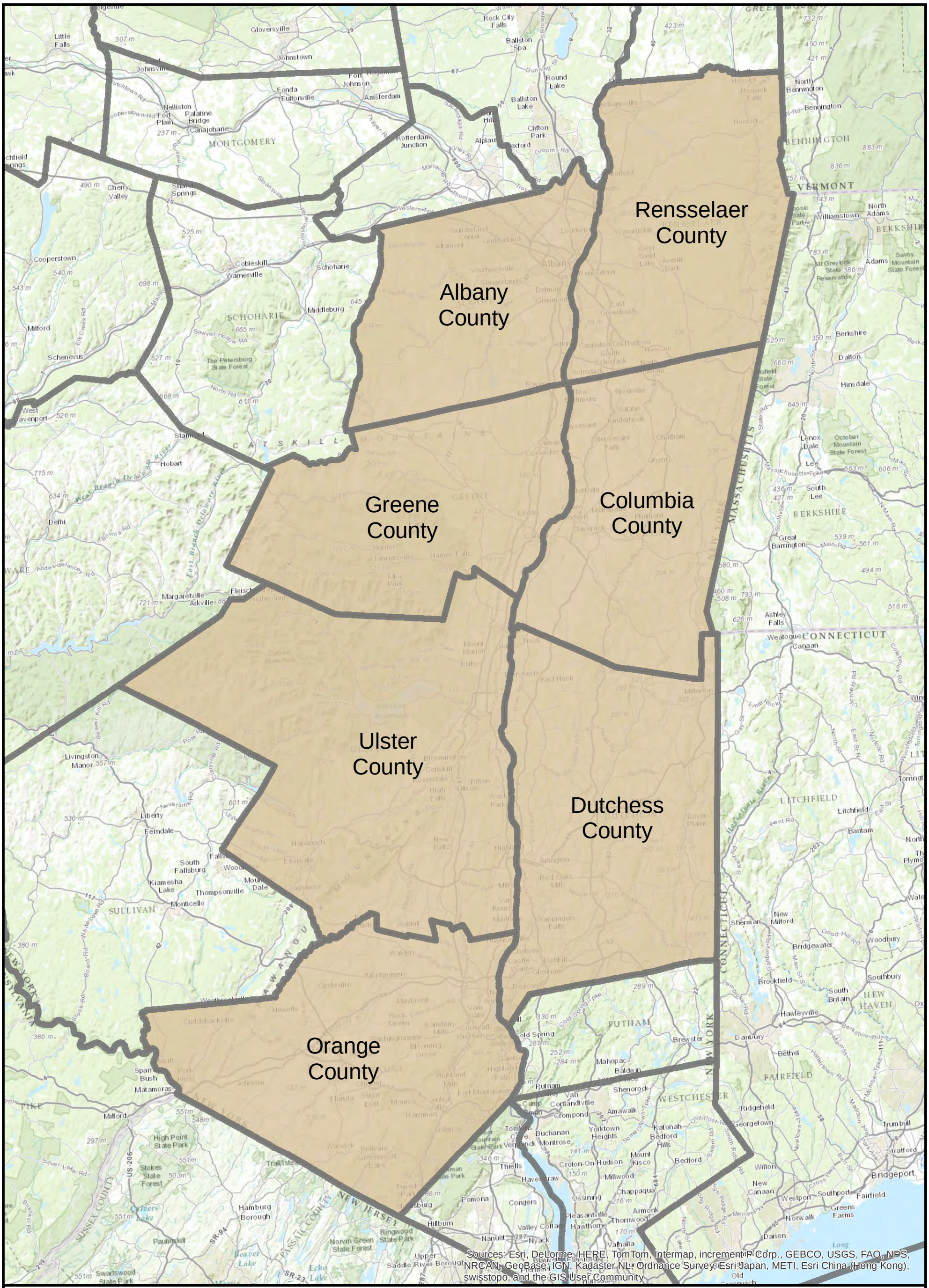
Ramanujan, Krishna. 2014. Invasive Vines Swallow up New York's Natural Areas. *Cornell Chronicle,* Ithaca, NY.

Stroud Water Research Center. 2008. *Protecting Headwaters: The Scientific Basis for Safeguarding Stream and River Ecosystems*. Stroud Water Research Center, Avondale, PA.

The Connecticut Light and Power Company. The Interstate Reliability Project - Supplemental Municipal Consultation Filing; July 2011.

United States Fish and Wildlife Service. Information, Planning, and Conservation System: http://ecos.fws.gov/ipac/.

Figures



N

0 5 10 20 Miles

Data Source: NYS GIS Program Office.

Area of Interest

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New York State

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County Boundaries

Area of Interest

Figure 1

Prepared by: CC Environment & Planning, 08/05/2015

Priority sites were selected based on the intersections of proposed transmission lines with class 1 wetlands, Significant Natural Communities, Significant Coastal Habitats, threatened and endangered species, protected areas, conservation easements, and stream crossings. Mapped locations of T&E Species are confidential and are not shown on this map.

Rensselaer County

Albany County

Columbia County

Greene County

Ulster County

Dutchess County

Orange County

Sources: Esri, [redacted] NRCAN, GeoBase, swisstopo, and

N

0 5 10 20 Miles

Data Sources: USGS, NYNHP, NYSDEC, NYS GIS Program Office, NAT, TRANSCO, NEETNY, Boundless, Scenic Hudson.

Priority Site Locations and Environmental Features

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- Priority Sites
- Proposed Transmission Upgrades
- Protected Areas
- Significant Coastal Habitats
- Significant Natural Communities
- NYSDEC Class 1 Wetlands
- Streams and Rivers
- County Boundaries
- Area of Interest

Figure 2

Prepared by: CC Environment & Planning, 08/05/2015

Priority sites were selected based on the intersections of proposed transmission lines with class 1 wetlands, Significant Natural Communities, Significant Coastal Habitats, threatened and endangered species, protected areas, conservation easements, and stream crossings. Mapped locations of T&E Species are confidential and are not shown on this map.

Rensselaer County

Albany County

Greene County

Columbia County

Ulster County

Dutchess County

Orange County

N

0 5 10 20 Miles

Data Sources: NYS GIS Program Office, NAT, TRANSCO, NEETNY, Boundless, Scenic Hudson.

Priority Sites

- New ROW
- Widened ROW
- New Structures
- Trenching
- Aerial Hudson Crossing
- Reconductoring
- HDD Crossing

- Proposed Transmission Upgrades
- County Boundaries
- Area of Interest

Priority Site Locations by Technology

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Figure 3

Prepared by: CC Environment & Planning, 08/05/2015

Priority sites were selected based on the intersections of proposed transmission lines with class 1 wetlands, Significant Natural Communities, Significant Coastal Habitats, threatened and endangered species, protected areas, conservation easements, and stream crossings. Mapped locations of T&E Species are confidential and are not shown on this map.

Rensselaer County

Albany County

Greene County

Columbia County

Ulster County

Dutchess County

Orange County

N

0 5 10 20 Miles

Data Sources: NYS GIS Program Office, NAT, Scenic Hudson.

Potential Transmission Lines - NAT and Priority Sites

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Priority Sites
Preferred
Thruway
115 kV
County Boundaries
Area of Interest

Figure 4

Prepared by: CC Environment & Planning, 08/05/2015

Priority sites were selected based on the intersections of proposed transmission lines with class 1 wetlands, Significant Natural Communities, Significant Coastal Habitats, threatened and endangered species, protected areas, conservation easements, and stream crossings. Mapped locations of T&E Species are confidential and are not shown on this map.

Rensselaer County

Albany County

Greene County

Columbia County

Ulster County

Dutchess County

Orange County

Sources: Esri, DeLorme, HERE, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community

N

0 5 10 20 Miles

Data Sourves: NYS GIS Program Office, TRANSCO, Scenic Hudson.

Potential Transmission Lines - TRANSCO and Priority Sites

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- Knickerbocker to Churchtown
- Churchtown to Pleasant Valley
- Leeds to Churchtown
- New Scotland to Leeds
- Leeds to Pleasant Valley
- Edic to New Scotland
- Priority Sites
- County Boundaries
- Area of Interest

Figure 5

Prepared by: CC Environment & Planning, 08/05/2015

Priority sites were selected based on the intersections of proposed transmission lines with class 1 wetlands, Significant Natural Communities, Significant Coastal Habitats, threatened and endangered species, protected areas, conservation easements, and stream crossings. Mapped locations of T&E Species are confidential and are not shown on this map.

Rensselaer County

Albany County

Greene County

Columbia County

Ulster County

Dutchess County

Orange County

Sources: Esri, DeLorme, HERE, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community

N

0 5 10 20 Miles

Data Sources: NYS GIS Program Office, NEETNY, Scenic Hudson.

Potential Transmission Lines - NEETNY and Priority Sites

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- Marcy Northern
- Marcy Southern 1
- Marcy Southern 2
- Thruway
- Knickerbocker Only
- Priority Sites
- County Boundaries
- Area of Interest

Figure 6

Prepared by: CC Environment & Planning, 08/05/2015

Priority sites were selected based on the intersections of proposed transmission lines with class 1 wetlands, Significant Natural Communities, Significant Coastal Habitats, threatened and endangered species, protected areas, conservation easements, and stream crossings. Mapped locations of T&E Species are confidential and are not shown on this map.

Rensselaer County

Albany County

Greene County

Columbia County

Ulster County

Dutchess County

Orange County

Sources: Esri, DeLorme, HERE, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community

N

0 5 10 20 Miles

Data Sourves: NYS GIS Program Office, Boundless, Scenic Hudson.

Potential Transmission Lines - Boundless and Priority Sites

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- Leeds to Hurley Ave
- Leeds to Athens to Pleasant Valley
- Roseton to East Fishkill
- East Bank of Hudson River to East Fishkill Underground
- Priority Sites
- County Boundaries
- Area of Interest

Figure 7

Prepared by: CC Environment & Planning, 08/05/2015

Priority sites were selected based on the intersections of proposed transmission lines with class 1 wetlands, Significant Natural Communities, Significant Coastal Habitats, threatened and endangered species, protected areas, conservation easements, and stream crossings. Mapped locations of T&E Species are confidential and are not shown on this map.

Rensselaer County

Albany County

Greene County

Columbia County

Ulster County

Dutchess County

Orange County

Sources: Esri, DeLorme, HERE, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community

N

0 5 10 20 Miles

Data Sources: NYS GIS Program Office, NAT, TRANSCO, NEETNY, Boundless, Scenic Hudson.

Field Assessment Sites

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Priority Sites

- Visited
- Not Visited

Proposed Transmission Upgrades

County Boundaries

Area of Interest

Figure 8

Prepared by: CC Environment & Planning, 08/05/2015