



VALLEY LATERAL PROJECT

RESOURCE REPORT 3 ***Fisheries, Vegetation, and Wildlife***

FERC Docket No. CP16-__-000

November 2015

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RESOURCE REPORT 3 -- FISHERIES, WILDLIFE, AND VEGETATION	
Filing Requirement	Location in Environmental Report
<ul style="list-style-type: none"> Describe commercial and recreational warmwater, coldwater, and saltwater fisheries in the affected area and associated significant habitats such as spawning or rearing areas and estuaries. (§ 380.12 (e) (1)) 	Section 3.1, Table 3A-1 and 3A-2 in Appendix 3A
<ul style="list-style-type: none"> Describe terrestrial habitats, including wetlands, typical wildlife habitats, and rare, unique, or otherwise significant habitats that might be affected by the proposed action. Describe typical species that have commercial, recreational, or aesthetic value. (§ 380.12 (e) (2)) 	Sections 3.2 and 3.3, Tables 3A-3 and 3A-5 in Appendix 3A
<ul style="list-style-type: none"> Describe and provide the affected acreage of vegetation cover types that would be affected, including unique ecosystems or communities such as remnant prairie or old-growth forest, or significant individual plants, such as old-growth specimen trees. (§ 380.12 (e) (3)) 	Section 3.2.3 and Table 3A-3 in Appendix 3A Table 8A-2 in Resource Report 8 and Table 2A-2 in Resource Report 2.
<ul style="list-style-type: none"> Describe the impact of construction and operation on aquatic and terrestrial species and their habitats, including the possibility of a major alteration to ecosystems or biodiversity, and any potential impact on state listed endangered or threatened species. Describe the impact of maintenance, clearing and treatment of the project area on fish, wildlife, and vegetation. Surveys may be required to determine specific areas of significant habitats or communities of species of special concern to state or local agencies. (§ 380.12 (e) (4)) 	Sections 3.1.3, 3.2.3, and 3.3.2
<ul style="list-style-type: none"> Identify all federally listed or proposed endangered or threatened species and critical habitat that potentially occur in the vicinity of the project. Discuss the results of the consultation requirements listed in Sec. 380.13(b) at least through Sec. 380.13(b)(5)(i) and include any written correspondence that resulted from the consultation. The initial application must include the results of any required surveys unless seasonal considerations make this impractical. If species surveys are impractical, there must be field surveys to determine the presence of suitable habitat unless the entire project area is suitable habitat. (§ 380.12 (e) (5)) 	Section 3.4; Table 3A-6 in Appendix 3A Resource Report 1, Appendix 1D
<ul style="list-style-type: none"> Identify all federally listed essential fish habitat (EFH) that potentially occurs in the vicinity of the project. Provide information on all EFH, as identified by the pertinent Federal fishery management plans that may be adversely affected by the project and the results of abbreviated consultations with NMFS, and any resulting EFH assessments. (§ 380.12 (e) (6)) 	Section 3.1 Resource Report 1, Appendix 1D
<ul style="list-style-type: none"> Describe site-specific mitigation measures to minimize impacts on fisheries, wildlife, and vegetation. (§ 380.12 (e) (7)) 	Sections 3.1.3, 3.2.3, and 3.3.4
<ul style="list-style-type: none"> Include copies of correspondence not provided pursuant to paragraph (e)(5) of this section, containing recommendations from appropriate Federal and state fish and wildlife agencies to avoid or limit impact on wildlife, fisheries, and vegetation, and the applicant's response to the recommendations. (§ 380.12 (e) (8)) 	Resource Report 1, Appendix 1D

FERC COMMENTS ON DRAFT RESOURCE REPORT 3	LOCATION OR RESPONSE TO COMMENT
OCTOBER 1, 2015 COMMENTS	
<u>Resource Report 3 – General Project Description</u>	
20. In section 3.4.1.2, regarding the federally listed bats discussed:	
a. justify and provide supporting references for the planned tree clearing window (clear between October 15 and March 31) in comparison to those clearing windows recommended by the U.S. Fish and Wildlife Service (FWS) – New York Field Office in its 2012 Indiana Bat Project Review Fact Sheet, which recommends clearing from either October 1 or October 31 to March 31, depending on the distance from hibernacula;	Resource Report 3, Section 3.4.1.2
b. provide the locations, by milepost, of any potential Indiana bat roost trees within the construction workspaces and indicate any intent to salvage such trees;	Resource Report 3, Section 3.4.1.2
c. clarify in section 3.4.1.2 that no trees would be cleared outside the clearing window (between October 15 and March 31), regardless of the status as a potential bat roosting tree, as indicated in section 3.3.4.1 for the protection of migratory birds; and	Resource Report 3, Section 3.3.4.1.
d. discuss any measures proposed to mitigate for the loss of potential bat habitat, as may be required by the FWS.	Resource Report 3, Section 3.4.1.2
21. When providing the available species survey reports, also provide the Phase I Bog Turtle Survey Report for surveys completed in May and July 2015.	Volume III, Privileged and Confidential

LIST OF ACRONYMS AND ABBREVIATIONS

BCR	Bird Conservation Region
BGEPA	Bald and Golden Eagle Protection Act
CFR	Code of Federal Regulations
CPV	CPV Valley, LLC
ECS	Millennium's Environmental Construction Standards
EFH	Essential Fish Habitat
ER	Environmental Report
ESA	Endangered Species Act
FERC or Commission	Federal Energy Regulatory Commission
HDD	horizontal directional drill
km	Kilometer
MBTA	Migratory Bird Treaty Act
Millennium	Millennium Pipeline Company, L.L.C.
MP	Milepost
NABCI	U.S. North American Bird Conservation Initiative
NHD	National Hydrography Dataset
NMFS	National Oceanic and Atmospheric Administration-National Marine Fisheries Service
NYCRR	New York Codes, Rules and Regulations
NYNHP	New York Natural Heritage Program
NYSDEC	New York State Department of Environmental Conservation
PEM	Palustrine Emergent
PFO	Palustrine Forested
PSS	Palustrine Scrub-shrub
USFWS	U.S. Fish & Wildlife Service
WNS	white-nose syndrome

3.0 FISHERIES, VEGETATION, AND WILDLIFE

Millennium Pipeline Company, L.L.C. (Millennium) is seeking authorization from the Federal Energy Regulatory Commission (FERC or Commission) pursuant to Section 7(c) of the Natural Gas Act¹ to construct, install, own, operate, and maintain the Valley Lateral Project (Project). The Project will provide firm transportation of natural gas to the new 650 megawatt gas-powered CPV Valley Energy Center being constructed by CPV Valley, LLC (CPV) in the town of Wawayanda, New York. The Project, as proposed, includes approximately 7.8 miles of new natural gas pipeline that will extend from Millennium's existing main line pipeline north to the CPV Valley Energy Center, as well as ancillary aboveground facilities. The target in-service date for the Project is April 2017.

The Project consists of the following components and facilities:

- approximately 7.8 miles of new 16-inch diameter pipeline in Orange County, New York;
- one delivery meter station and associated piping at the CPV Valley Energy Center, approximate milepost (MP) 7.8;
- one launcher facility (MP 0.0); and
- one receiver facility at the CPV Valley Energy Center (MP 7.8).

Resource Report 3 details the existing fisheries, wildlife, and vegetation resources present within the Project area, potential impacts on those resources from construction and operation of the Project and proposed methods to minimize or mitigate possible impacts. Consultations with the U.S. Fish and Wildlife Service (USFWS), the New York State Department of Environmental Conservation (NYSDEC), and the New York Natural Heritage Program (NYNHP) were conducted to determine the presence of federally- or state-listed threatened, endangered or candidate species, and/or significant or critical wildlife habitat along the proposed Project route (see Appendix 1D of Resource Report 1). Field surveys, including wetland and waterbody delineations, were conducted commencing in May 2015 and through October 31, 2015 within a 300-foot wide survey corridor to accommodate the construction workspace areas. Rare species habitat evaluations and rare species-specific surveys were completed in August 2015. Field data collected through October 31, 2015 has been included in this Environmental Report (ER) filing.

3.1 FISHERY RESOURCES

This section discusses fishery resources and fish species of special concern in the Project area, assesses potential construction and operational impacts on these resources, and identifies measures proposed to avoid, minimize and/or mitigate for such impacts.

Significant fisheries resources are defined by the FERC as waterbodies that (1) provide important habitat for foraging, rearing, or spawning of fish species; (2) represent important commercial or recreational fishing

¹ 15 U.S.C. § 717f(c) (2012).

areas; or (3) support large populations of commercially or recreationally valuable fish species or species listed for protection at the federal, state, or local level. The Project will not be located near any marine environments or saltwater bodies and, therefore, will not affect anadromous or catadromous species or marine or estuarine habitats. Resource Report 2 contains a detailed characterization of the waterbodies crossed or affected by the proposed Project route as listed on Table 2A-1 in Appendix 2A.

3.1.1 Fisheries Classification

Physical data on identified water features were collected commencing in May 2015 and through October 31, 2015 during the biological and civil field surveys. Desktop data sources, including the National Wetlands Inventory, the National Hydrography Dataset (NHD) and aerial photography, were utilized on no-access properties to identify potential fishery resources and aquatic habitats. United States Geological Survey 7.5-minute series topographic maps were used to identify waterbody names, tributaries, and flow regimes. Water quality classifications are derived from New York's surface water quality regulations (6 NYCRR 701). The name, location, crossing distance, flow regime (i.e., perennial, intermittent, ephemeral), and fishery classification of each waterbody in the Project area are provided in Table 2A-1 in Resource Report 2. Table 3A-1 lists common fish species known to occur in the Project area.

Warmwater streams and rivers are typically slow-moving bodies of water with soft substrates of sand and silt, and are less oxygenated than coldwater streams and rivers. These waterbodies are not suitable for the propagation of trout and are not capable of supporting a stocked trout population. No warmwater fisheries were identified in the vicinity of the Project area.

Coldwater fisheries require water temperatures lower than 70 degrees Fahrenheit (°F) for growth and reproduction, and usually are associated with waters having high oxygen content. Millennium has initiated consultation with the NYSDEC Bureau of Fisheries to identify waterbodies crossed by the proposed Project route supporting fisheries resources, and any in-stream construction timing restrictions for the identified waterbodies. The NYSDEC Bureau of Fisheries has confirmed receipt of the request for consultation; however, no response in regard to resources present has been received to date (Flaherty, 2015). Millennium will continue to consult with the NYSDEC Bureau of Fisheries to determine appropriate impact avoidance, minimization and mitigation measures for waterbodies potentially affected by the Project identified to contain fishery resources.

Waterbodies in New York State are assigned a letter classification that denotes their best use(s). Saline surface waters are given a letter class of S and groundwater resources are given a letter class of G. The letter classifications and associated best uses are described in 6 New York Codes, Rules and Regulations (NYCRR) Part 701 and are summarized below:

- Classification AA or A indicates waters used as a source of drinking water.
- Classification B indicates a best usage for swimming and other contact recreation, but not for drinking water.

- Classification C indicates waters supporting fisheries and which are suitable for non-contact activities.
- The lowest classification and standard is D.

Waters with classifications A, B, and C also may have a standard of (T), indicating that they may support trout populations, or (TS), indicating that they may support trout spawning (NYSDEC, 2012a). Special requirements apply to sustain these waters that support these fisheries resources. Streams and small waterbodies that are designated as C(T) or higher (i.e., C(TS), B, A or AA) are referred to collectively as "protected streams," and are regulated by NYSDEC under its Protection of Waters Program (6 NYCRR Part 608; NYSDEC, 2012a). New York State water quality classification criteria are described further in Section 2.2.4 of Resource Report 2.

Review of the New York State Water Quality Classifications Geographic Information Systems data layer identified the proposed Project route crosses streams classified as B, C, and C(T). These waterbodies are further discussed in Section 3.1.2. None of the proposed aboveground facilities associated with the Project (e.g., delivery meter station, and launcher/receiver sites) will affect any waterbodies. No access roads will cross waterbodies with designations of C(T) or higher.

3.1.2 Fisheries of Special Concern

Information from federal and state agencies was reviewed to determine if the Project would cross any waterbodies containing fisheries of special concern. Waterbodies with fisheries of special concern include those that have fisheries of exceptional recreational value (such as those that support coldwater fisheries), those that provide habitat for protected species, and/or those that are assigned special state fishery management regulations. Waterbodies that may support trout populations or trout spawning are considered "sensitive" fisheries and, therefore, are included in this section as fisheries of special concern.

Millennium consulted with the USFWS, National Marine Fisheries Service (NMFS), and NYSDEC to identify waterbodies that may contain federal or state-listed threatened, endangered, or candidate species and their habitat, and essential fish habitat (EFH). A discussion of threatened and endangered species is included in Section 3.4.

3.1.2.1 Essential Fish Habitat

The NMFS administers the Magnuson-Stevens Fishery Conservation and Management Act for marine and anadromous species. A consultation letter was sent to the NMFS on May 19, 2015. In a response received on June 16, 2015, the NMFS stated that no EFH has been designated in the Project area (Alvarez, 2015). As a result, no additional consultation is required for the Project.

3.1.2.2 Trout Populations

The Project will cross two (2) waterbodies classified as C(T) streams (see Table 3A-2). Additionally, there are seven (7) Class C waterbodies crossed by the proposed Project route that may contain trout habitat

and/or trout spawning but are not designated as such by the NYSDEC. Therefore, these waterbodies are also listed on Table 3A-2. Millennium will continue to consult with NYSDEC Bureau of Fisheries to confirm waterbodies containing trout populations that may be crossed by the Project. Any correspondence received after submittal of this final ER will be submitted to FERC as received.

3.1.3 Construction and Operation Impacts on Fisheries

Impacts on aquatic communities from construction and operation of the Project will depend on the physical characteristics of the streams (e.g., flow, bottom substrate, channel configuration, and gradient), construction technique utilized, time of year of the crossing, and presence of game fish and federal- or state-listed species. This section describes potential effects and mitigation that will be implemented to minimize effects on fisheries of concern that could potentially occur in the Project area.

3.1.3.1 Pipeline

Millennium will use the dry waterbody crossing method for intermittent or ephemeral waterbodies where there is no discernable flow within the waterbody at the time of crossing. Dry-ditch waterbody crossing methods (i.e., dam and pump and flume) will be used where trenched construction is proposed across waterbodies with flow at the time of construction. No major waterbody crossings (i.e., greater than 100 feet wide) are proposed. Millennium proposes to use HDD construction at five waterbody crossings (three with the Rutgers Creek HDD, one with the Catlin Creek HDD, and one with the I-84 HDD) (see Section 1.6.1.3 of Resource Report 1). Waterbodies will be crossed according to the methods outlined in Resource Report 2.

Installation of the pipeline across surface waters will be completed in accordance with Millennium's Environmental Construction Standards (ECS) (see Appendix 1B of Resource Report 1) which specifies time windows for construction, appropriate additional temporary workspace setbacks, spoil setbacks, equipment bridges, erosion and sedimentation control requirements, and restoration requirements. With the implementation of Millennium's ECS, no long-term, permanent effects on coldwater fisheries or fisheries of concern are anticipated.

Construction impacts on fishery resources may include: (1) direct contact by construction equipment; (2) increased sedimentation, water turbidity, or streambed scour immediately downstream of the construction work area; (3) alteration or removal of aquatic habitat cover; (4) introduction of pollutants; or (5) impingement or entrainment of fish and other biota associated with the use of water pumps at dam-and-pump crossings or for hydrostatic test water withdrawal.

Dam-and-Pump

Where the dam-and-pump crossing technique is used, pump intake hoses will be screened appropriately to prevent the entrainment of fish and minimize the potential for impingement. Fish passage during dam-and-pump crossings will be temporarily restricted during the installation of the pipeline, which typically takes 24 to 48 hours to complete (24 hours to cross the waterbody and 24 hours for restoration). Where

waterbodies are used for hydrostatic test water withdrawals, withdrawal intake hoses will be fitted with intake screen devices to prevent the entrainment of fingerlings and small fish during water withdrawal.

HDD

HDD is the other major crossing technique that will be used to install the pipeline under waterbodies based on site-specific conditions. HDD is a trenchless crossing method that may be used for crossings under roads, railroads, sensitive resources, and waterbodies. The use of HDD can eliminate impacts on water quality from construction activities that would otherwise occur within the waterbody. The length of pipeline that can be installed by HDD depends upon underlying soil and rock conditions, pipe diameters, and available technology, and equipment sizes. An HDD may not be appropriate for every site condition encountered.

The locations where HDDs are proposed are listed in Table 1.6-1 of Resource Report 1. Site-specific plans for the HDDs, including access paths along the path of the drill, are included in Appendix 1C in Resource Report 1. Generally, if the HDD should fail at the proposed location, the HDD entry/exit points will be re-evaluated and relocated to an adjacent area, and the HDD will be attempted again. Millennium will notify all appropriate regulatory agencies and obtain approval to complete the HDD at the new location or to implement the alternate dry-ditch crossing plan should the HDD fail at the second location.

Sedimentation and Turbidity

Increased sedimentation and turbidity from in-stream construction across waterbodies could potentially adversely affect fishery resources. However, these effects will be minimized by installation and maintenance of sediment and erosion controls throughout construction and until revegetation is successful, thus limiting effects during the construction phase. Total suspended solid concentrations may increase during construction, but would decrease soon after as the disturbed stream sediments settle.

Removal of trees and other bank vegetation from the edges of waterbodies at the pipeline crossing location may reduce shading of the waterbody, diminish escape cover, and result in locally elevated water temperatures. Elevated water temperatures can, in turn, lead to reductions in levels of dissolved oxygen. This could reduce availability of habitat for certain fish species. To minimize potential effects associated with loss of riparian shade and vegetation cover, clearing of trees and other vegetation will be restricted to only what is necessary to safely construct and operate the pipeline. Once construction is complete, streambeds and banks will be restored in accordance with the Millennium's ECS, and post construction maintenance (or mowing) will be limited to when necessary to facilitate periodic corrosion/leak surveys or to protect the integrity of the pipeline coating.

Spills

Accidental spills of hydrocarbon-based products (e.g., oil, diesel, or hydraulic fluids) within the Project construction workspace could affect fisheries in adjacent streams, if present. The effects would depend on the type and quantity of the spill, and the dispersal and attenuation characteristics of the waterbody. To

reduce the potential for surface water contamination, Millennium will implement its Spill Prevention and Response Procedures, which include best management practices to minimize the potential for accidental releases and measures that will be implemented to clean up any releases (see Appendix 1B).

3.1.3.2 Aboveground Facilities

Aboveground facilities proposed to be constructed as part of the Project include a pig launcher (MP 0.0), delivery meter station (MP 7.8), and pig receiver (MP 7.8) sites. The delivery meter station and pig receiver are to be located on CPV's property within an area already approved and currently being used for construction of the CPV Valley Energy Center. Millennium has proposed to site the aboveground facilities outside waterbodies. One stream (St-AH) is located within the proposed workspace for the underground meter station piping. Millennium will install erosion controls in accordance with the Project ECS (Appendix 1B) to avoid impacting this stream during construction of the underground meter station piping. Therefore, no direct impacts on fishery resources are expected to result from the installation and operation of these facilities.

3.2 VEGETATION

This section identifies and discusses the major vegetation cover types crossed by the proposed Project route. Characterization of vegetation cover types in the Project area was completed using information gathered from field surveys conducted through October 31, 2015, recent aerial photographs of the Project area, the New York Geographic Information Systems land use data layers, and the natural community classification systems (Edinger et al., 2014). The major cover types along the proposed pipeline route were divided into five (5) broad classifications:

- agricultural land,
- upland forest,
- open land (i.e., existing right-of-way, open fields, non-agriculture),
- wetlands (forested and non-forested), and
- other (non-vegetated areas including residential land, commercial/industrial land, existing roadways, and open water).

A comprehensive list of representative plant species found in the Project area is included in Table 3A-3. Acreages of each vegetative cover type to be temporarily and/or permanently impacted by the Project are included in Table 8A-2 in Resource Report 8 and wetland vegetation acres to be impacted by the Project are further detailed in Table 2A-2 in Resource Report 2.

Proposed aboveground facility sites including the meter station, and pig launcher/receiver sites are located within the same generalized vegetation types as the proposed pipeline route and will be located within and/or directly adjacent to the permanent right-of-way. Vegetation at these sites consists of commercial and agricultural lands. The pig launcher will not be located within the boundaries of an existing facility site, therefore, additional vegetation will be disturbed to construct these facilities. In general, construction

and operation of these facilities will affect upland community types and no wetlands or waterbodies will be affected by the construction of aboveground facilities.

Although public roads and the construction right-of-way will be used for primary access to the right-of-way during construction, several non-public access roads have been identified for potential use during construction and operation of the Project. The temporary and permanent access roads identified have been located within the same generalized vegetation types as the proposed pipeline route. Access roads designated for potential temporary and/or permanent use during construction and operation of the pipeline facilities are listed in Table 1A-3 in Resource Report 1. The majority of the access roads are located through agricultural and open land areas, however other vegetative cover types may also be crossed. The majority of the existing access roads proposed to be utilized as part of the Project will require minor improvements to allow for passage of construction vehicles. New access roads may require temporary modification of existing vegetative cover types associated with the identified access roads during construction and operation. Subsequent to construction, temporary access roads will be restored to their pre-construction condition or allowed to remain in place in accordance with individual landowner agreements.

The proposed pipeyards will be used for equipment, pipe, and material storage, as well as temporary field offices and pipe preparation/field assembly areas. Millennium will negotiate with landowners to secure required land rights for any access roads and the proposed pipeyard CY-1 for use during Project construction. The land for pipeyard CY-2 will be purchased by Millennium.

3.2.1 Existing Vegetation Resources

Upland vegetative communities were classified according to the *Ecological Communities of New York State: Second Edition* (Edinger et al., 2014), which classifies and describes ecological communities representing biological diversity in New York State. Edinger et al., classifies each ecological community as a “variable assemblage of interacting plant and animal populations that share a common environment.” The ecological community types found within the Project area are further described below. Typical upland forested community types in the Project area include Appalachian oak-hickory forest, successional northern hardwoods, and beech-maple mesic forests.

The Project pipeline will traverse forested and open upland communities, as well as palustrine forested, scrub-shrub and emergent wetlands. A list of the vegetative cover types and the species identified within them during the environmental surveys conducted through October 31, 2015 is provided in Table 3A-3. Section 3.2.1.4 provides a description of the wetland types and their typical vegetative species composition, and Table 2.3-1 of Resource Report 2 summarizes the amount of each wetland type potentially affected by the Project. The Wetland Delineation Report (Resource Report 2, Appendix 2C) provides information on each wetland identified within the Project area.

No unique, sensitive or protected vegetation communities have been identified in the Project area. See Section 3.4 for a discussion of federally and state-listed endangered and threatened plant species.

3.2.1.1 Agricultural Land

Agricultural lands include areas used for raising crops, grazing livestock, and tree farms. Agricultural land in the Project area is used predominantly for pasture, hay, and corn production (Brower, 2015). Typical species observed on agricultural lands in the Project area include corn, annual meadowgrass (*Poa annua*), and meadow fescue (*Festuca pratensis*).

3.2.1.2 Upland Forest

Appalachian Oak-Hickory Forest

This forest type is a hardwood forest that occurs on well-drained sites with loams or sandy loams. This broadly defined forest community has several regional and edaphic variants. Dominant tree species common in this forest type include red oak (*Quercus rubra*), white oak (*Quercus alba*) and black oak (*Quercus velutina*). One or more hickory species (*Carya* spp.) are often found at lower densities. Other common species include white ash (*Fraxinus Americana*), red maple (*Acer rubrum*), and American hop hornbeam (*Ostrya virginiana*). The sub-canopy often includes dogwood species (*Cornus* spp.) and lowbush blueberries (*Vaccinium angustifolium*) and is often very diverse in the shrub and ground layers.

Typical tree species observed within this forest community in the Project area include red oak, white oak, red maple, green ash (*Fraxinus pennsylvanica*), American hornbeam (*Carpinus caroliniana*), and shagbark hickory (*Carya ovate*). Appalachian oak-hickory forests were found along the pipeline route, with a significant portion occurring in the southwestern portion of the Project area.

Successional Northern Hardwoods

This forest type is a hardwood or mixed forest located on sites that have been cleared or otherwise previously disturbed. Characteristic trees and shrubs found in this forest type include a mix of species, such as quaking aspen (*Populus tremuloides*), gray birch (*Betula populifolia*), black cherry (*Prunus serotina*), and red maple among others, with lesser amounts of white ash, green ash, and American elm (*Ulmus americana*). This community type is broadly defined and has several regional variants (Edinger et al., 2014).

Successional northern hardwoods were found in small stands throughout the proposed pipeline route, often adjacent to forested wetland communities.

Beech-Maple Mesic Forest

This forest occurs on well-drained acidic soils and often is associated with patches of hemlock-northern hardwood forests. It is dominated by American beech (*Fagus grandifolia*) and sugar maple (*Acer saccharum*). Other species may consist of American hop hornbeam, red maple, white ash, and yellow birch (*Betula alleghaniensis*). There are relatively few shrubs and herbs. Characteristic small trees or tall shrubs include hobblebush (*Viburnum lantanoides*) and witch hazel (*Hamamelis virginiana*) (Edinger et al., 2014).

Typical tree species observed within this forest community in the Project area include American beech, sugar maple, red maple, green ash, and American hop hornbeam. Beech-maple mesic forests were identified primarily in large areas along the northern portion of the proposed pipeline route.

3.2.1.3 Open Land

This cover type category covers all non-forested vegetated areas that are not in agricultural production or landscaped. It includes grasslands, successional old fields and shrublands, and maintained utility right-of-ways (mowed roadside/pathway). Vegetation management within the existing rights-of-way supports early-successional habitat in these areas. Open lands are typically previously disturbed lands that have been cleared for farming, utility construction, or other developments and then abandoned. Grasslands are dominated by grasses, such as orchard grass (*Dactylis glomerata*), poverty grass (*Danthonia spicata*), reed canary grass (*Phalaris arundinacea*), and switchgrass (*Panicum virgatum*). Old fields are dominated by grasses and forbs, such as lance-leaved goldenrod (*Solidago graminifolia*), Queen Anne's lace (*Daucus corota*), ragweed (*Ambrosia artemisiifolia*), and rough-stemmed goldenrod (*Solidago rugosa*). Shrublands have at least 50 percent cover of shrubs and saplings, such as autumn olive (*Elaeagnus umbellata*), gray birch, meadowsweet (*Filipendula ulmaria*), multiflora rose (*Rosa multiflora*), and silky dogwood (*Cornus amomum*). Dense areas of shrubby thickets typically are not found in this cover type, except in localized areas (Zimmerman et al., 2012).

Typical species observed in open lands in the Project area include reed canary grass, field horsetail (*Equisetum arvense*), stinging nettle (*Urtica dioica*), dandelion (*Taraxacum officinale*), red clover (*Trifolium pratense*), curly dock (*Rumex crispus*), Canada goldenrod (*Solidago canadensis*), Kentucky bluegrass (*Poa pratense*), multiflora rose, silky dogwood, gray dogwood (*Cornus racemosa*), downy serviceberry (*Amelanchier arborea*), possumhaw (*Viburnum nudum*), and tartarian honeysuckle (*Lonicera tatarica*).

Mowed roadside/pathways include the narrow strip of vegetation along the site of a road or the mowed pathway through taller vegetation (e.g., meadows, old fields, woodlands, forests) or along utility right-of-way corridors (e.g., powerlines, telephone lines or gas pipelines). The vegetation in these mowed areas may be dominated by grasses, sedges, and rushes or by forbs, vines, and low shrubs that can tolerate infrequent mowing (Edinger et al., 2014). Mowed roadside/pathways within the Project area consist primarily of Kentucky bluegrass, southern crabgrass (*Digitaria ciliaris*), Queen Anne's lace, dandelion, and Canada thistle (*Cirsium arvense*).

3.2.1.4 Wetlands

Wetlands delineated within the survey area were classified according to Cowardin et al. (1979). Identified wetlands were classified as Palustrine Forested (PFO), Palustrine Scrub-Shrub (PSS), and Palustrine Emergent (PEM). Palustrine systems include all non-tidal wetlands that are dominated by trees, shrubs, persistent emergent plants, emergent mosses, or lichens, as well as all wetlands that occur in tidal areas, where salinity due to ocean-derived salts is below 0.5 percent. This system includes ponds and may be

situated shoreward of estuaries, lakes, river channels, river floodplains, in isolated catchments, or on slopes (Cowardin et al., 1979). All of the resource areas identified along the proposed Project alignment are classified as palustrine systems. Wetland types identified within the Project area are further discussed in Resource Report 2 as well as the Wetland Delineation Report (Appendix 2C).

Palustrine Forested Wetlands

Palustrine forested wetlands identified along the proposed pipeline route are characterized by woody vegetation that is approximately 20 feet in height or taller and normally include an overstory of trees, an understory of young trees or shrubs, and an herbaceous layer. Shrubs may be present in these areas, but they do not dominate the community. Herbaceous and non-vascular plant covers also are known to occur in these wetlands. The forested wetland canopy species in the Project area typically are dominated by red maple, green ash and American elm.

Palustrine Scrub-Shrub Wetlands

Palustrine scrub-shrub wetlands identified along the proposed pipeline route generally are dominated by woody vegetation less than approximately 20 feet tall. Scrub-shrub land types may represent a successional stage leading to a forested wetland and include shrubs, young trees, and trees or shrubs that are small and/or stunted due to environmental conditions. Shrub swamps are widespread, highly variable communities, with shrub-dominated wetlands that occur on mineral or mucky mineral soils that are either seasonally or temporarily flooded. They typically are found in flat areas in which the water table is at or above the soil surface for most of the year. Common wetland shrub species observed in the Project area include silky dogwood, arrowwood, white meadowsweet (*Spiraea alba*), pussy willow (*Salix discolor*), bebb willow (*Salix bebbiana*), spicebush (*Lindera benzoin*), tartarian honeysuckle, and winterberry (*Ilex verticillata*).

Palustrine Emergent Wetlands

Palustrine emergent wetlands identified along the proposed pipeline route are characterized by erect, rooted, herbaceous hydrophytes, not including mosses and lichens. These wetlands maintain the same appearance year after year, are typically dominated by non-woody perennial plants, and the vegetation within these wetlands are present for the majority of the growing season. Emergent wetland species that were identified in the Project area include reed canary grass, stinging nettle, fox sedge (*Carex vulpinoidea*), tussock sedge (*Carex stricta*), cinnamon fern (*Osmunda cinnamomea*), narrowleaf cattail (*Typha angustifolia*), and sensitive fern (*Onoclea sensibilis*).

3.2.1.5 Other

Non-vegetated areas to be traversed by the Project include residential land, commercial/industrial land, existing roadways, and open water. These non-vegetated land cover types are discussed further in Resource Report 8.

3.2.2 Vegetative Communities of Special Concern

Vegetative communities of special concern include sensitive or protected vegetation types, natural areas, and unique plant communities. Millennium consulted with federal and state resource agencies to determine if any federally or state-listed threatened and endangered plant species (including federal and state species of concern) or their designated communities occur within the Project area. Correspondence received from the NYNHP did not identify any rare, sensitive, or unique natural communities and/or plant species (Conrad, 2015) and no critical habitats were identified in the Project area through the official species list obtained from the USFWS (USFWS, 2015). Additionally, no rare or sensitive habitats have been identified during field surveys conducted for the Project through October 31, 2015. Copies of agency correspondence are included in Appendix 1D.

3.2.3 Vegetation Impacts and Mitigation

The vegetation impacts associated with the Project area can be classified as short-term temporary, long-term temporary or permanent disturbances. Short-term temporary impacts will be associated primarily with the preparation of the construction workspace and access roads, where impacts will last through construction until the subsequent completion of successful restoration. Potential impacts include compaction of soils by construction equipment, trampling/crushing of herbaceous plants, removal of herbaceous and woody plant cover, and removal of root stock. Areas that are already vegetated with grasses or early successional species will be restored after the conclusion of construction activities. The short-term temporary disturbance areas will provide forage and habitat for wildlife within three years following successful reclamation.

The long-term temporary disturbance areas will be associated primarily with areas where temporary workspace within forested areas will be cleared. These areas will be allowed to revert to their pre-existing conditions; however, they involve slower growing vegetation. The length of recovery time will depend on the sensitivity of the plant communities, the timing and extent of the disturbance, precipitation in the years following construction, and the geographic and topographic locations.

Long-term vegetation impacts associated with operational and maintenance activities will occur primarily within forested wetland and upland forested vegetation types within the permanent right-of-way. Removal of trees will be considered a temporal reduction of associated wildlife habitat. Permanent vegetation loss as a result of construction includes crops and scrub-shrub and open space (meter station, launcher and receiver). Additionally, impacts on wetland areas during operation will include a corridor centered on the pipeline of up to 10 feet wide that will be maintained annually in an herbaceous state to facilitate periodic pipeline corrosion/leak surveys.

3.2.3.1 Operation and Maintenance

Upon the completion of construction, Millennium will routinely maintain its 50-foot-wide permanent right-of-way. Full width vegetation maintenance clearing shall not occur more frequently than every three years.

However, to facilitate periodic corrosion and leak surveys, a corridor not exceeding 10 feet in width centered on the pipeline may be maintained annually in an herbaceous state. Full-width vegetation maintenance clearing will not typically occur between April 15 and August 1 of any year. In wetlands, a 10-foot-wide corridor centered on the pipeline will be maintained in an herbaceous state, and any trees greater than 15 feet in height that are within 15 feet of the pipeline will be selectively cut in accordance with Millennium's ECS.

3.2.3.2 *Noxious Weed and Invasive Species Control*

In an effort to control the spread of noxious weeds and invasive plant species, Millennium will implement the measures described in the Invasive Species Management Plan included herein as Appendix 3B. For aboveground facilities, vegetation (including noxious weeds) will be cleared prior to use of the site. This clearing will help avoid the spread of weeds. Restoration will be monitored post-construction according to Millennium's ECS. Follow up inspections will be conducted of all disturbed areas, as necessary, to determine the success of revegetation and address landowner concerns. At a minimum, follow up inspections will be conducted after the first and second growing seasons. If revegetation is unsuccessful, revegetation efforts will continue until the disturbed area is adequately restored.

3.3 WILDLIFE

This section identifies and discusses the various wildlife species associated with the upland and wetland vegetation cover types to be traversed by the Project and identified in Section 3.3.1. It also identifies designated wildlife habitats, such as wildlife refuges, state forests, and wildlife management areas, or sensitive wildlife areas as identified through consultation. The extent of each land cover type and the areas of transition between cover types were established during biological and physical field surveys completed through October 31, 2015.

Game and non-game wildlife species are regulated and protected through various federal laws and regulations. Federal laws include the Fish and Wildlife Conservation Act of 1980 (16 United States Code 2901-2911), the Fish and Wildlife Coordination Act of 1958 (16 U.S.C. 661-667e), the Bald and Golden Eagle Protection Act (BGEPA) of 1940 (16 U.S.C. 668-668c) and the Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. 703-712, as amended). Migratory birds in the Project area are protected under the MBTA. The MBTA was enacted in 1918 and prohibits the taking of migratory birds, eggs, and nests. A discussion of species under jurisdiction of the MBTA is provided in Section 3.3.3

No significant or sensitive wildlife habitats have been identified to date other than those associated with federally or state-listed species (see Section 3.4).

3.3.1 Existing Resources

The Project will traverse terrestrial and wetland habitats that support a diversity of wildlife species. Vegetative cover is an important environmental component for defining wildlife habitat and wildlife species

distribution. Variations in vegetative community types (e.g., deciduous hardwood and conifer are community types within the forested upland vegetation cover type) and other conditions, such as topography and land use disturbance, provide a variety of wildlife habitat conditions. For the purposes of this report, the wildlife habitats along the proposed pipeline route are described regionally and are representative of the vegetation community structure and composition of the terrestrial and wetland habitats present within the Project areas. Major terrestrial and wetland vegetative cover types were mapped during environmental field surveys and through the review of aerial photography of properties where survey access was not granted. The major cover types along the proposed pipeline routes were divided into five (5) broad classifications: upland forest, open land (existing right-of-way, open fields, non-agriculture), agricultural, other (including residential, commercial/industrial, existing roadways, and open water), and wetlands (forested, scrub-shrub, and emergent). For the purposes of this section, “other” lands, with the exception of open water, were excluded as a wildlife habitat type as these areas typically consist of lands classified as residential, industrial/commercial, and roadways and, therefore, contain minimal vegetation, food and habitat for wildlife species.

Wildlife species likely to occur in each habitat type were determined by direct observation during field surveys, by consultation with applicable regulatory agencies, and by existing available online data. Existing plant communities, as well as aspects of the physical environment (climate, microclimate, hydrology, geology), will influence the wildlife species that are present in a particular habitat. Table 3A-5 lists representative wildlife species within each vegetative cover type.

3.3.1.1 Existing Wildlife Habitat Types

Environmental field surveys and available resource materials were used to identify the different wildlife habitat types located along the proposed Project right-of-way. The habitat types identified include upland forest, open uplands, agricultural areas, forested wetlands, scrub-shrub wetlands, emergent wetlands, and open water. The dominant vegetative species identified within these habitats in the Project area are provided in Table 3A-3.

Agricultural Lands

Agricultural lands include areas actively in use for raising crops, pasture for grazing livestock, or tree farms. Although crops generally provide poor to moderate cover habitat, they often provide forage and nesting for a number of species such as bobolinks (*Dolichonyx oryzivorus*), eastern meadowlarks (*Sturnella magna*), wild turkey (*Meleagris gallopavo*), and mourning doves (*Zenaida macroura*). Pastures also provide grazing habitat for species such as the eastern cottontail (*Sylvagus floridanus*), white-tailed deer (*Odocoileus virginianus*), and woodchuck (*Marmota monax*) (NYSDEC, 2010).

Upland Forest

Upland forests provide cover, food resources, and nesting habitat for a variety of amphibians, birds, invertebrates, mammals, and reptiles. The tree and shrub layers provide food and cover for many bird species and larger mammals such as white-tailed deer. Detritus on the forest floor provides food and cover

for invertebrates, amphibians, and reptiles. Smaller mammals such as the eastern chipmunk (*Tamias striatus*), gray squirrel (*Sciurus carolinensis*), and raccoon (*Procyon lotor*) utilize fallen logs for cover and nest cavities (NYSDEC, 2010).

The presence of oak species is an important habitat component in upland forests in the Project area. Mammals rely directly on oaks which generate seeds and nuts as a food source, while amphibians and invertebrates rely on the soil chemistry of an oak forest. Predatory species such as raptors and coyote (*Canis latrans*), also are attracted to oak-dominated forests and their edges due to the abundance and diversity of prey species.

A variety of songbirds, including migrants and resident species, utilize upland forest habitat. Many migrants feed on the numerous insects occurring within the forest canopy. Breeding birds use a range of different nest sites, with some species nesting on the forest floor, some in understory vegetation and some in the tree canopy. Characteristic bird species in upland forests include red-bellied woodpecker (*Melanerpes carolinus*), wild turkey, northern flicker (*Sitta carolinensis*), downy woodpecker (*Picoides pubescens*), black capped chickadee (*Poecile atricapillus*), yellow warbler (*Setophaga petechia*) and the ovenbird (*Seiurus aurocapillus*) (Edinger et al., 2014).

Open Uplands

The early successional habitat types in the Project area include successional scrub-shrub areas, fields and disturbed and/or maintained areas such as existing utility right-of-way or other open space areas. Grasslands, old fields, and brushy areas can be utilized as foraging and nesting habitat by mammals and songbirds. Shrublands provide sources of food and nesting sites for various birds, as well as cover for invertebrates, reptiles, and amphibians. Shrublands and grassland habitats are attractive to many wildlife species, because they provide protection, nesting, and food sources. Species such as the eastern cottontail, gray squirrel, opossum (*Didelphis virginiana*), raccoon, and red fox (*Vulpes vulpes*) utilize these types of habitats (NYSDEC, 2010).

Edge habitats, where natural habitats lay adjacent to developed or maintained areas, also create other habitat types which are utilized by a distinct group of wildlife. Open lands can be regularly maintained, cleared, or abandoned for the promotion of successional growth habitats. The areas of existing right-of-ways provide corridors that will be utilized by several species to move between habitats. These species may include coyote, eastern cottontail, white-tailed deer and forest edge bird species, such as the American robin (*Turdus migratorius*), brown thrasher (*Toxostoma rufum*), field sparrow (*Spizella pusilla*), and the northern cardinal (*Cardinalis cardinalis*) (NYSDEC, 2010).

Wetlands

Forested Wetlands

Wetlands can provide a diverse assemblage of vegetation and an abundance of food and water sources for wildlife. These wetlands are important for providing food, shelter, migratory and wintering areas, and

breeding areas for wildlife species, including eastern garter snake (*Thamnophis sirtalis*), red-backed salamander (*Plethodon cinereus*), and wood frog (*Rana sylvatica*). Forested wetlands also provide habitat for white-tailed deer, raccoon, mink (*Neovison vison*), beaver (*Castor canadensis*), wood duck (*Aix sponsa*), and great blue heron (*Ardea herodias*) (NYSDEC, 2010).

Scrub-Shrub Wetlands

Scrub-shrub wetlands typically are not as structurally diverse as forested wetlands due to the lack of taller mature trees. They contain vegetation that is characteristically low and compact. Under normal conditions, the vegetative structure is influenced by surface water inundation or the presence of high groundwater for extended periods of time. Scrub-shrub wetlands also can be maintained by periodic maintenance activities (such as along existing right-of-ways) that remove larger tree species. Scrub-shrub wetlands supply an abundance of food and cover resources for amphibians and mammals, including the American toad (*Bufo americanus*), gray catbird (*Dumetella carolinensis*), white-tailed deer, and muskrat (*Ondatra zibethicus*) (NYSDEC, 2010). The plant species that make up scrub-shrub wetlands can also offer nesting sites for birds. Other representative species found in scrub-shrub wetlands include red-winged blackbird (*Agelaius phoeniceus*), American bullfrog (*Rana catesbeiana*) and the northern green frog (*Rana clamitans*).

Emergent Wetlands

Emergent wetlands are characterized by erect, rooted, herbaceous plants that are used by wildlife closely linked to the aquatic environment. These areas often are associated with areas containing standing water for extended periods of time. These wetlands provide habitat for species, such as wading birds, ducks, and other aquatic and semi-aquatic species. Wildlife use these areas for nesting, feeding, and migratory stopovers. Species found in this habitat type include great blue heron, muskrat, and red-winged blackbird (NYSDEC, 2010). Amphibians and reptiles such as the American bullfrog, common snapping turtle (*Chelydra serpentina*) and northern watersnake (*Nerodia sipedon*) are also common in these areas.

Open Water

Open water includes streams crossed by the proposed Project route that are less than 100 feet wide but visible on aerial photography. No waterbodies greater than 100 feet wide will be crossed by the Project. Open water areas provide habitat for species, such as ducks and wading birds, along with other aquatic species.

3.3.2 Sensitive Habitats

This section reviews sensitive wildlife habitats and lands managed for wildlife that could be affected by the Project. To identify significant and sensitive wildlife habitats, Millennium consulted with the USFWS and NYNHP. No sensitive wildlife habitats, including Wildlife Management Areas, are anticipated to be affected by the pipeline facilities, access roads, or pipeyards (Conrad, 2015). Review of the Bird Conservation Areas – New York State database (NYSDEC, 2005) did not identify any New York State lands that have been officially designated for their value to bird conservation. Review of Important Bird Areas of New York (New York Audubon, 2005) did not identify any Important Bird Areas to be crossed

by the Project. In addition, no National Wildlife Refuges or National Park Service Wilderness Areas are mapped in the vicinity of the Project area. Millennium is currently consulting with the USFWS to confirm that no sensitive habitats will be crossed by the Project. Any determination received subsequent to this filing will be submitted to FERC as received.

3.3.3 Migratory Birds

The MBTA, originally passed in 1918, implements the U.S. commitment to four bilateral treaties, or conventions, for the protection of a shared migratory bird resource, protecting more than 800 species of birds. The list of migratory bird species protected by the MBTA appears in Title 50, section 10.13, of the Code of Federal Regulations (CFR) (50 CFR 10.13). The MBTA states that it is unlawful to pursue, hunt, take, capture, kill, possess, sell, purchase, barter, import, export, or transport any migratory bird, or any part, nest, or egg of any such bird, unless authorized under a permit issued by the Secretary of the Interior. Take is defined in regulations as to: “pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect” (50 CFR 10.13). The USFWS delisted the bald eagle in 2007; however, bald and golden eagles are additionally protected under the Bald and Golden Eagle Protection Act (16 U.S. Code 668-668d).

Executive Order 13186 (January 2001) directs federal agencies to consider the effects of agency actions on migratory birds, with emphasis on bird species of concern. It also prohibits the take of any migratory bird without authorization from the USFWS. On March 30, 2011, the USFWS and the FERC entered into a Memorandum of Understanding that focuses on avoiding or minimizing adverse effects on migratory birds and strengthening migratory bird conservation through enhanced collaboration between the USFWS and FERC by identifying areas of cooperation. This voluntary Memorandum of Understanding does not waive legal requirements under any other statutes (e.g., MBTA, Bald and Golden Eagle Protection Act, Endangered Species Act, Federal Power Act, and Natural Gas Act) and does not authorize the take of migratory birds.

The U.S. North American Bird Conservation Initiative (NABCI) Committee is a forum of government agencies, private organizations, and bird initiatives helping partners across the continent meet their common bird conservation objectives. The species listed as Birds of Conservation Concern by the NABCI are a subset of birds protected under the MBTA and include species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act of 1973. Bird Conservation Regions (BCR) are the smallest geographic scale endorsed by the NABCI and includes species that are protected under the MBTA (the recent list has been revised to also include non-MBTA-protected species) that represent the USFWS’ highest conservation priorities (USFWS, 2008).

The Project will be located within BCR 28, the Appalachian Mountains region (NABCI, 2000). Table 3A-8 lists the Birds of Conservation Concern potentially occurring within the BCR crossed by the Project. Of the 25 bird species listed for BCR 28, only five (5) have documented or confirmed occurrences in Orange County, New York. The NYSDEC 2000-2005 bird inventory identified black-capped chickadee (*Poecile*

atricapillus), Canada warbler (*Cardellina canadensis*), Louisiana waterthrush (*Parkesia motacilla*), wood thrush (*Hylocichla mustelina*), and yellow-bellied sapsucker (*Sphyrapicus varius*) as species with potential to occur within the Project area. All of these species are associated with deciduous and/or coniferous forested habitats, similar to those identified along the pipeline right-of-way.

To date, the Project area has not been identified by any of the applicable agencies as priority or critical habitat for any Birds of Conservation Concern listed in BCR 28 other than the bald eagle (USFWS, 2008).

Bald Eagle (*Haliaeetus leucocephalus*)

Although the bald eagle is no longer a federally listed endangered or threatened species, it still is protected under the BGEPA and the MBTA. Both acts prohibit killing, selling, or harming eagles or their nests. The BGEPA also protects eagles from disturbances that may injure them, decrease their productivity, or cause nest abandonment. Additionally, the bald eagle is state-listed as threatened in New York.

The bald eagle is a large carnivorous bird with a range that covers virtually all of North America. Preferred habitats consist of areas near waterbodies such as coasts, bays, lakes, rivers, and forested wetlands. Bald eagles are opportunistic feeders and will both hunt and scavenge. They breed throughout New York State and prefer areas with large bodies of water that support high fish populations (NYNHP, 2013). Mixed conifer and hardwood forests and woodlands with large, accessible trees typically are used for roosting and nesting. Bald eagles generally avoid areas with human activities and perch in either deciduous or coniferous trees (NYNHP, 2013). They are long-lived in the wild, often with a life span of over 30 years, and return to within 250 miles of the nesting area where they were fledged each year (NYSDEC, 2015d).

Consultation with the NYNHP and USFWS did not identify any known bald eagle nests in the vicinity of the Project area; however, bald eagles are known to occur in Orange County (Conrad, 2015; Rayman, 2015). As of October 31, 2015, none of Millennium's field surveys for wetlands or cultural resources have identified any bald eagle nests. Additionally, correspondence with the NYNHP did not indicate the presence of breeding and/or non-breeding bald eagles in the vicinity of the Project (Conrad, 2015). Therefore, no impacts on the bald eagle are anticipated as a result of the Project.

3.3.4 Impacts and Mitigation

3.3.4.1 Wildlife Habitat

General temporary construction-related impacts on wildlife species will be related to habitat disturbance and human activities (primarily noise and vehicle traffic), while permanent impacts are those associated with the conversion of forest habitats to open or scrub-shrub areas due to construction and maintenance of the permanent right-of-way. Indirect impacts on wildlife include those associated with increased human activity and noise. Noise impacts, specifically, will be localized and temporary.

Construction of the Project likely will result in the temporary displacement of or stress on animals in areas adjacent to construction and cause movement of some wildlife away from the Project area. Stress on

wildlife could affect general health, reproduction, and viability of young, depending on the sensitivity of a particular species, season of the year, and other factors. Other temporary impacts on wildlife species include those from pipeline trenching activities and associated spoil piles, which could result in a short-term barrier to movement to some species. During clearing and grading activities, more mobile wildlife species (e.g., larger birds, mammals, and reptiles) will be able to avoid the construction area, and many are expected to leave the area during construction. Habitat recovery will occur through natural processes, aided by the use of the impact minimization and restoration measures outlined in Millennium's ECS.

Direct and long-term impacts on wildlife habitat resulting from construction and operation of the Project will include the clearing of riparian areas, uplands, and wetlands required for temporary workspace and new permanent easement. Where practicable, Millennium has proposed a pipeline route that follows existing corridors. The direct removal of vegetation has the potential to reduce the amount of available cover, food resources, and habitat. An important effect of vegetation removal is habitat fragmentation. Habitat fragmentation occurs when larger areas of habitat are reduced and/or split into smaller non-contiguous areas by development. Besides the direct loss of habitat, habitat fragmentation can also cause change in habitat vegetation composition (which could include the introduction of noxious and/or invasive species).

It is not anticipated that wildlife populations that utilize the Project area will be permanently adversely affected by the Project. While temporary impacts on cover, food, and water sources may occur, none of the species located within the Project area are specialized in such a way that construction of the Project will inhibit the overall fitness or reproductive output of the populations as a whole.

In wetlands, vegetation maintenance over the full width of the permanent right-of-way is prohibited pursuant to the FERC's (2013) *Wetland and Waterbody Construction and Mitigation Procedures* (FERC Procedures). However, to facilitate periodic pipeline corrosion/leak surveys, a corridor centered on the pipeline up to 10-foot-wide will be maintained annually in an herbaceous state within wetlands. In addition, trees that are located within 15 feet of the pipeline, on either side, that are greater than 15 feet in height may be selectively cut and removed from the right-of-way. Trees and shrubs that become reestablished beyond 15 feet of the pipeline, on either side, will not be disturbed. Vegetation maintenance practices on the construction right-of-way adjacent to waterbodies will consist of maintaining a 25-foot-wide riparian strip along the waterbody, as measured from the mean high water mark. This riparian strip will be allowed to revegetate permanently with native woody plant species.

Following construction, areas cleared for temporary workspace during pipeline construction will be allowed to revert to preconstruction conditions and provide additional early successional habitat to wildlife species. These areas will not be maintained after construction and will revert to forested habitat over time. Permanent loss of trees will occur within the permanent right-of-way that will be maintained by mowing and periodic tree removal. These maintained right-of-ways can provide travel corridors and edge habitat along forested areas for some species.

Millennium will minimize impacts on wildlife habitats to the extent practicable. Temporary disturbance on these areas may affect migrating species, such as warblers. However, while individuals may vacate an area during construction and may expend extra energy finding an alternate location, impacts on migrating species are expected to be minimal overall, since individuals/flocks will pass over areas under active construction and move to other areas in the vicinity suitable for feeding or resting. The individuals/flocks will be able to utilize the construction area in subsequent seasons after construction. Overall disturbance to these areas will be minimized by adhering to Millennium's ECS.

Project Effects on Migratory Birds and Mitigation

Approximately 23 percent of the total length of the pipeline will be adjacent to existing right-of-way (e.g., pipelines, electric transmission lines, roadways, etc.). Construction of the Project pipeline in these areas will limit effects on vegetation by reducing land use change and tree clearing activities associated with the construction of the pipeline. Impacts on vegetation during construction and operation of the Project are listed on Table 8A-2 in Resource Report 8.

Construction activities that occur during the bird nesting season (generally April 1- August 31) could result in direct and indirect effects on bird species. Examples of potential effects include habitat loss, disruption of foraging adults, and abandonment or destruction of active nests. The Project may have a short-term impact on migratory bird species that may nest in or near the construction areas. However, to minimize effects on migratory birds during the construction of the Project, the following measures have been incorporated into the pipeline design:

- Clearing will be conducted between October 1 and March 31 to avoid bird nesting season as well as federally-listed bats (see Section 3.4);
- The new pipeline will be installed adjacent to existing right-of-way for 23 percent of its total length (see Table 1.3-1 in Resource Report 1).
- The construction right-of-way width and temporary land requirements for installation of the new pipeline will be limited and range between 135 feet in agricultural land with severe side slope and 75 feet in forested wetlands (see Resource Report 1).
- Approximately 78 percent of the new pipeline system will be installed in non-forested areas (i.e., agricultural, open land, residential, industrial/commercial, and open water habitats), thereby minimizing impacts on forested habitat (see Table 8A-2 in Resource Report 8).
- Millennium will use HDDs that will cross under certain waterbodies and associated forested riparian habitats in conjunction with these crossings, further minimizing or eliminating impacts (e.g., habitat fragmentation) to migratory birds that utilize riparian habitat (see Resource Report 2).
- Millennium has proposed to reduce the construction right-of-way to a maximum of 75 feet in wetlands to minimize construction related impacts (see Resource Report 2).
- Construction activities will be confined to the Project designated construction work areas and the pipeyards. One of the pipeyards (CY-1) will be located approximately 0.5 mile northwest of MP 6.3 on primarily existing commercial/industrial land (see Table 8A-2 in Resource Report 8). A second pipeyard (CY-2) is proposed at MP 0.0 and will be located entirely on agricultural land to

be purchased by Millennium. These areas will be staked and marked prior to clearing and the markings will be maintained throughout construction. The pipeyard at MP 0.0 (CY-2) will be seeded with grass post-construction.

- Millennium will require all personnel working on the Project to attend environmental training sessions. This training will focus on implementation of best management practices contained in the Project Compliance and Mitigation Plans in Appendix 1B. This training will include instructions on construction work area limits, permit requirements, and other mitigation measures.
- The Project construction work areas will be stabilized to protect soil resources and aid in returning disturbed areas to migratory bird habitat.

In addition to these measures, Millennium will conduct routine vegetation maintenance within the permanent easement at a frequency necessary to maintain the 10-foot corridor in an herbaceous state; however, mowing and clearing activities will not occur between April 15 and August 1 of any year to minimize effects to ground nesting birds. In wetlands, Millennium will not conduct vegetation maintenance over the full width of the permanent right-of-way and will allow a riparian strip of at least 25 feet wide as measured from the waterbody's mean high water mark to permanently revegetate. However, to facilitate periodic pipeline corrosion/leak surveys in these areas, a corridor centered on the pipeline and up to 10-feet-wide may be maintained in an herbaceous state. In addition, trees and shrubs that are located within 15 feet of the pipeline that have roots that could compromise the integrity of the pipeline coating may be cut and removed from the right-of-way. Project effects on migratory birds are expected to be short-term and further minimized by clearing outside of the active breeding season and siting the Project within edge forest thereby avoiding fragmentation of large, contiguous blocks of forest. Millennium is currently consulting with the USFWS regarding the protection of migratory birds. Potential clearing restrictions due to the presence of migratory bird habitat will be determined through consultation with the USFWS and will be provided to FERC upon receipt.

3.4 THREATENED, ENDANGERED, AND CANDIDATE SPECIES

The Endangered Species Act (ESA) of 1973 protects fish, wildlife, plants and invertebrates that are federally listed as threatened and endangered, as well as species-specific critical habitat. A federally listed endangered species is one that is in danger of extinction throughout all or a significant portion of its range. A federally listed threatened species is likely to become endangered in the foreseeable future throughout all or a significant portion of its range. "Critical habitat" is defined as specific areas both within and outside the geographic area occupied by a species on which are found those physical and biological features essential to its conservation.

Millennium has conducted informal consultations with the USFWS and NMFS, as well as the New York State agencies charged with managing state-listed rare, threatened, endangered, or special concern species. Based on the information received from these agencies, Millennium has identified areas of the proposed Project alignment where the potential exists for occurrence of federally and/or state-listed species. Any additional or continued correspondence with the USFWS and state agencies relative to listed species after the filing of this final ER will be submitted to FERC as received. Information contained in the agency

consultation letters and biological survey reports completed as of the date of this resource report is summarized below.

Baseline environmental surveys to identify potential protected species habitat were completed commencing in May 2015 and through October 31, 2015 in association with the wetland and waterbodies delineation. The Phase I Bog Turtle Survey Report (Appendix 3C) is included in Volume III, Privileged and Confidential. The Phase I Bog Turtle Survey Report will be submitted to federal and state agencies concurrent with the filing of this final ER.

3.4.1 Federally Listed Species

Section 7 of the ESA (16 United States Code Annotated §§ 1531-1543, P.L. 93-205) requires each federal agency to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of federally listed threatened or endangered species or result in the destruction or adverse modification of the designated critical habitat for any federally listed threatened or endangered species. The Commission, as the lead agency in the review of the Project, is required to consult with the USFWS to determine whether federally listed species, species proposed for listing, or their designated critical habitat may occur in the Project area and to determine the Project's potential effects on these species and critical habitats. However, in accordance with Section 380.13(b) of FERC's Order 603, the Project sponsor is designated as FERC's non-federal representative for purposes of informal consultation with the USFWS. Results of this consultation are presented in the following sections.

A consultation letter regarding federally listed and proposed endangered or threatened species was sent to the NMFS, as they administer the ESA for marine species. The NMFS stated that no threatened or endangered species under its jurisdiction are expected to be in the Project area (Alvarez, 2015) and that no further consultations with that agency is required under Section 7 of the ESA. The New York Field Office of the USFWS issued a response stating that federally listed species under their jurisdiction may occur in the vicinity of the Project area. The identified federally listed species are provided in Table 3A-6. Millennium will continue to consult with the USFWS regarding the results of species-specific surveys and federally listed species within the Project area.

Continued consultation with the USFWS New York Field Office will occur prior to Project construction to ensure that no impacts on federally listed species will occur in the vicinity of the aboveground facilities.

3.4.1.1 Plants

Small whorled pogonia (*Isotria medeoloides*)

The small whorled pogonia is a federally listed threatened species and was assumed to be extirpated in New York State until a small population was found in Schunnemunk State Park in Orange County in 2010 (Adamovic, 2014). The Schunnemunk State Park location is more than 20 miles from the proposed Project alignment. Most sites outside of New York State are typically small, with populations rarely exceeding 20 plants (USFWS, 2015a). These plants grow well in a second or third growth successional stage forest. The

forest types can range from mixed deciduous to mixed deciduous/coniferous. Beech, birch, maple, oak and hickory are hardwood species that will support the growth of this plant under the right conditions (USFWS, 2001).

Site conditions for this plant include relatively open canopy forests, with acidic soils that have a thick layer of dead leaves. It grows well near streams, at the base of a slope, or a slope between 11 and 17 percent (NYSPARKS, 2011). Small whorled pogonias prefer Arnot Complex Soils which are located in Orange County; however, the Project area does not contain these soils, nor is it adjacent to them. Therefore, no impact on the small whorled pogonia is anticipated as a result of the Project. Millennium has initiated consultation with the USFWS and will submit any additional correspondence or concurrence to FERC as received.

3.4.1.2 Mammals

Indiana bat (*Myotis sodalis*)

The Indiana bat is a federally listed and New York State-listed endangered species. Across the species range, the population (as recorded from counts in hibernacula) has declined dramatically since the late 1950s. In 1960, the Indiana bat population was estimated at more than 800,000 individuals. The most current total available as of August 2013, reflects surveys completed in early 2013, estimates the population at 534,239 individuals, apparently rebounding moderately from a population low in 2001 of 451,554 (USFWS, 2013). There are 15 known hibernacula located in eight counties in New York (USFWS, 2007). Additionally, summer occurrence records, both maternity and non-maternity, are located in 10 counties, including eight (8) maternity colony records in Orange County (USFWS, 2007). Given the sensitive nature of endangered species records, the exact locations of both hibernacula and summer occurrence records are not known. However correspondence from the NYNHP indicate that multiple maternity colonies and a bachelor colony are located within five (5) miles of the proposed Project alignment, and some records are within 0.5 miles (Conrad, 2015).

The Indiana bat population decline between 2007 and 2011 was pronounced in the northeastern United States, where a nearly 70 percent decrease was documented. Much of this decline is thought to be the result of an ailment called white-nose syndrome (WNS). Bats suffering from WNS were first observed in New York in the winter of 2006-2007, and affected bats have now been observed in 26 states and five Canadian Provinces (USFWS, 2015b). In New York, WNS is known or suspected in 21 counties (USFWS, 2015). Prior to the discovery of WNS, New York Indiana bat populations were increasing, reaching a maximum of 52,779 individuals in 2007 (USFWS, 2013). The most recent census of Indiana bat hibernating populations documented 17,772 individuals, representing an approximate 66 percent decline within the state.

Indiana bats require specific habitat conditions during hibernation and for summer roosting and foraging. Hibernation habitat consists of caves or mine shafts that provide a narrow range of climatic conditions. Occupied hibernacula have stable temperatures typically below 10 degrees Celsius, above freezing, and

generally from 3 to 7.2 degrees Celsius (Tuttle and Kennedy, 1999). Warmer temperatures may increase metabolic rates and cause fat depletion during hibernation (Richter et al., 1993). Relative humidity for occupied hibernacula is typically between 70 and 100 percent (Hall, 1962; Humphrey; 1978, LaVal et al., 1977; Tuttle and Kennedy, 1999). Preferred hibernacula also have noticeable airflow (Henshaw, 1965).

Summer maternity habitat was originally thought to consist of mature trees in riparian or floodplain forest adjacent to small-to medium-sized streams (Cope et al., 1974; Humphrey et al., 1977). However, recent studies have revealed that upland forest provides important maternity, roosting, and foraging habitat (Gardner et al., 1991a). Maternity roosts are often found under exfoliating bark or in crevices of trees with exposure to direct sunlight. Average diameter at breast height of roost trees ranges from 23 centimeters (9 inches) to 58.4 centimeters (23 inches) (Callahan et al., 1997; Gardner et al., 1991b). Snags (standing dead trees) are most commonly used, but some maternity colonies have been found in live trees. Snags providing suitable habitat for roosting Indiana bats are an ephemeral resource. Maternity colonies often use numerous (10 to 20) roost trees, including one to three primary roosts which are used by many adult females and young, and alternate roost trees which support fewer individuals and are used intermittently (Callahan et al., 1997). Females are philopatric and often use the same roosts in successive summers if the trees remain standing and retain exfoliating bark (Callahan et al., 1997; Gumbert et al., 2002; Gardner et al., 1991b; Kurta and Murray, 2002). If the primary roost tree is destroyed, surviving members of the maternity colony may move to one of the alternate roosts. A maternity colony may use several roosts up to 3.7 kilometers (km) (2.3 miles) apart (Kurta and Murray, 2002).

Adult male and non-reproductive female Indiana bats roost separately from maternity colonies and often use several different roost trees in an area from night to night (Gardner et al., 1991b; Rommé et al., 1995) and have also been documented using caves, mines, and artificial roost structures (Butchkoski and Hassinger, 2002; Salyers et al., 1996; Wilhide et al., 1998).

Correspondence with the USFWS has indicated that the entire length of the proposed Project is located within the radius of historic Indiana bat capture locations. Therefore, no bat surveys will be performed as part of the Project. The USFWS requires seasonal tree clearing restrictions to minimize potential adverse effects to Indiana bats (USFWS, 2009). The USFWS's 15 October - 31 March clearing window (USFWS, 2009) is standard across the range of the Indiana bat, though some states use different dates. Millennium currently proposes to conduct clearing activities from 1 October to 31 March, as no hibernacula for either species are known in the vicinity of the Project, based on NYNHP review. Millennium has consulted with the USFWS regarding federally listed bats and associated timing restrictions and will provide the FERC with the USFWS's determination when received. As Millennium will only conduct tree clearing during the clearing window, salvage of potential roost trees is not anticipated. Millennium will provide FERC with the USFWS's determination as received. Additionally, Millennium has taken measures to minimize the loss of potential bat habitat by co-locating the Project with existing roadways and utilities and by locating the Project in open areas to the extent practicable. Approximately 23 percent of the Project is co-located with existing infrastructure and approximately 78 percent of the new pipeline facilities will be installed in non-forested areas (i.e., agricultural, open land, residential, industrial/commercial, and open water habitats).

Northern long-eared bat (*Myotis septentrionalis*)

The northern long-eared bat was listed as threatened under the ESA in April 2015. Currently, no definitive population estimate across the range of the northern long-eared bat exists. While recorded opportunistically during biannual counts of Indiana bat hibernacula, no effort has been made to systematically enumerate the species population across the range. However, drastic declines have been observed in the eastern portion of the species range. Turner et al. (2011) compared the most recent pre-WNS hibernacula counts to the most recent post-WNS counts for six cavernicolous bat species from 30 hibernacula in five states including New York. The northern long-eared bats experienced a 98 percent decline in these hibernacula. The USFWS conducted a similar analysis using data from 12 additional hibernacula in three additional states. The combined overall decline in hibernation count data from these eight states is approximately 99 percent (Federal Register, 2015).

Northern long-eared bats exhibit an annual cycle that includes winter hibernation, spring staging, spring migration, summer birth of young, fall migration, and fall swarming and mating. Hibernacula are generally large caves or mines with large passages and entrances (Raesly and Gates, 1987), cool, stable temperatures between 0-9 degrees Celsius (Brack, 2007; Caceres and Pybus, 1997; Raesly and Gates, 1987) with high humidity and no air currents (Caceres and Pybus, 1997; Fitch and Shump, 1979; Raesly and Gates, 1987; Van Zyll de Jong, 1985). Northern long-eared bats are often overlooked during hibernacula counts due to their propensity for roosting singly or in small groups in crevices and cracks in cave or mine walls with only the nose and ears exposed (Barbour and Davis, 1969; Caceres and Pybus, 1997; Caire et al., 1979; Griffin, 1940; Van Zyll de Jong, 1985; Whitaker and Mumford, 2009). Similar to Indiana bats, events that interrupt hibernation and result in increased metabolic rates during periods of arousal pose a substantial risk to hibernating northern long-eared bats (Thomas, 1995; Thomas et al., 1990).

From approximately mid-May through mid-August, northern long-eared bats occupy summer habitat. Reproductively active females form maternity colonies consisting of 30-60 individuals (Foster and Kurta, 1999; Lacki and Schwienjohann, 2001; Menzel et al., 2002; Perry and Thill, 2007; Sasse and Perkins, 1996) and give birth to a single pup each year (Barbour and Davis, 1969). Northern long-eared bats appear to be somewhat opportunistic in roost selection and have been documented roosting under bark and in cavities or crevices of both live and dead trees (Foster and Kurta, 1999; Owens et al., 2005; Perry and Thill, 2007; Sasse and Perkins, 1996), as well as anthropogenic structures (Amelon and Burhans, 2006; Barbour and Davis, 1969; Cope and Humphrey, 1972; Mumford and Cope, 1964; Timpone et al., 2010, Whitaker and Mumford, 2009).

Northern long-eared bats exhibit a high degree of roost-switching, typically every 2-3 days (Carter and Feldhamer, 2005; Foster and Kurta, 1999; Owen et al., 2002; Timpone et al., 2010). Suitable summer habitat not only includes roosting habitat, but also foraging habitat. Most foraging occurs from 1 to 3 meters off the ground, between the understory and canopy (Nagorson and Brigham, 1993), with a preference for forested hillsides and ridges over riparian areas (Brack and Whitaker, 2001; LaVal et al., 1977), though foraging has been documented along roads and over water and forest clearings (Van Zyll de Jong, 1985).

Mean travel distances from occupied roosts to foraging areas range from 0.6 to 1.7 km (.37 to 1.1 miles), with a range of 0.07 to 4.8 km (0.04 to 3.0 miles) (Sasse and Perkins, 1996; Timpone et al., 2010).

Due to the fact that the entire length of the proposed Project is located within the radius of historic Indiana bat capture locations, the area may also be inhabited by northern long-eared bats. The same tree clearing restrictions (clearing of potential roost trees only between October 1 and March 31) will be put into place to minimize potential impacts to the northern long-eared bat in these locations. Therefore, no bat surveys will be performed as part of the Project. Measures proposed to minimize impacts on northern long-eared bats are the same as those discussed above for Indiana bats.

3.4.1.3 Reptiles and Amphibians

Bog Turtle (*Clemmys muhlenbergii*)

The bog turtle is a federally listed threatened species and is a New York State-listed endangered species. The bog turtle's main habitat is primarily found in the eastern United States, extending from New York to Georgia (USFWS, 2015c). The preferred habitat for this species is slow-moving water with deep muck soils and tussock-forming herbaceous vegetation (NYSDEC, 2015c).

In New York State, this vegetation largely consists of *Carex* spp. or sphagnum moss which both require generally open areas. Their cold-blooded nature requires the bog turtle to bask out in the sunlight in these open areas. They have a very specific habitat climate which includes ample sunlight, high humidity, high evaporation rates, and perennial saturation (NYSDEC, 2015c). For this species to become active, the air and water temperature must exceed 50 degrees Fahrenheit (NYSDEC, 2015c). Although the Project area is largely compromised of agricultural land and open upland habitat, wetlands were identified during field surveys completed through October 2015. Based on correspondence with the USFWS, Millennium conducted a Phase 1 Survey over the Project area in July and September 2015 to determine the presence/absence of bog turtle habitat. Millennium will coordinate with the USFWS to determine whether Phase 2 Surveys are warranted for the Project.

3.4.1.4 Mussels

Dwarf wedge mussel (*Alasmidonta heterodon*)

The dwarf wedge mussel is a federally and New York State-listed endangered species. This particular mussel is found at 17 different sites in seven drainages along the Atlantic Coast (NYSDEC, 2015a). These mussels prefer slow moving waters from small brooks to large rivers. The substrate of these rivers can be comprised of silt to sand and gravel which can be in relatively small patches in a cobble-boulder river bottom. In New York, the extent of this species is limited to a small area within the Delaware River watershed (NYNHP, 2015). A relatively short length of the Neversink River in Orange County, which is over ten (10) miles northeast of the Project area, is the only known site in New York State that supports a population of these mussels. The Neversink River population in New York, at 20,000 individuals, is one of the largest known, but it dropped by an estimated 60,000 individuals between 1990 to 1994 (80,000

individuals to 50,000 in 1991, then to 20,000 in 1994) and continues to be vulnerable to a myriad of stressors that affect aquatic systems (Strayer et al., 1996). The Project area does not include streams that directly connect to the Neversink River; therefore, no impacts on the dwarf wedge mussel are anticipated as a result of the Project. Additionally, correspondence from the NYNHP did not identify any documented dwarf wedge mussel populations in the vicinity of the Project (Conrad, 2015). Millennium has initiated consultation with the USFWS to confirm and will submit additional correspondence or concurrence to FERC as received.

3.4.2 State Listed Species

In New York, state-listed species are protected under 6 NYCRR Part 182, which is administered by the NYSDEC. One (1) endangered species, the Indiana bat (*Myotis sodalis*), was identified by the NYNHP as having been documented within 2.5 miles of the whole length of the proposed Project alignment, and as close as 0.5 mile in some locations.

3.4.3 Impacts and Mitigation

The Phase I Bog Turtle Survey Report (Appendix 3C) is included in Volume III, Privileged and Confidential. The Phase I Bog Turtle Survey is the only planned survey for listed species and sensitive habitat for the Project (see Table 3A-7). Millennium will submit its Phase I Bog Turtle Survey Report to the USFWS and NYSDEC concurrent with the filing of this final ER. No potentially suitable bog turtle habitat was identified within the 300-foot survey corridor for the Project; therefore no Project-related impacts on bog turtles are anticipated, and no further Phase II presence / absence investigations are anticipated to be required. Any concurrence from the USFWS and NYSDEC will be submitted to FERC as received. If required by the USFWS or state resource agencies, additional surveys for listed species and their sensitive habitats will be conducted by qualified or approved biologists, when applicable, during the prescribed survey timeframe.

Millennium will adhere to applicable work restriction periods in locations identified to contain listed or protected species. Millennium will also implement its ECS, and other construction and restoration plans included in Appendix 1B, to avoid and minimize effects on listed species and their critical habitats potentially caused by the Project.

Millennium is continuing consultations with applicable regulatory agencies to identify species of concern and appropriate minimization, conservation, and avoidance measures. Copies of agency correspondence are included in Appendix 1D.

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APPENDIX 3A

Supplemental Tables

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TABLE 3A-1
Representative Fish Species that May Occur in the
Project Area

Common Name	Scientific Name
Brown Bullhead	<i>Ameiurus nebulosus</i>
White Perch	<i>Morone americana</i>
Chain Pickerel	<i>Esox niger</i>
Blue Gill	<i>Lepomis macrochirus</i>
Largemouth Bass	<i>Micropterus salmoides</i>
Pumpkinseed	<i>Lepomis gibbosus</i>
Rock Bass	<i>Ambloplites rupestris</i>
Smallmouth Bass	<i>Micropterus dolomieu</i>
Brook Trout	<i>Salvelinus fontinalis</i>
Brown Trout	<i>Salmo trutta</i>
Rainbow Trout	<i>Oncorhynchus mykiss</i>
Slimy Sculpin	<i>Cottus cognatus</i>

**TABLE 3A-2
Potentially Sensitive Fisheries Crossed by the Proposed Project Alignment**

MP	Waterbody ID	Waterbody Name	Town	Crossing Length (feet)	Water Quality Standard ^a	Fisheries Classification	Proposed Crossing Method ^b
0.1	St-A	Tributary to Rutgers Creek	Minisink	<3	C	TBD	Dry waterbody, Dam and Pump, or Flume
1.3	St-E	Rutgers Creek	Minisink	95	C(T)	coldwater	HDD
1.8	St-G	Rutgers Creek	Minisink	42	C(T)	coldwater	HDD
2.6	St-I	Indigot Creek	Minisink/Wawayanda	73	C	TBD	Flume or Dam and Pump
2.8	St-J	Catlin Creek	Wawayanda	26	C	TBD	Flume or Dam and Pump
3.6	St-R	Tributary to Catlin Creek	Wawayanda	<3	C	TBD	Dry waterbody, Dam and Pump, or Flume
3.9	St-S	Catlin Creek	Wawayanda	10	C	TBD	Flume or Dam and Pump
4.1	St-S	Catlin Creek	Wawayanda	19	C	TBD	Flume or Dam and Pump
PAR-001	St-A	Tributary to Rutgers Creek	Minisink	<3	C	TBD	Use existing culvert

Notes:

a: Water Quality Standard: C = Fresh Surface Water (6 NYCRR Part 701). Water quality standards are based on the classification and best use of the waterbody as determined by the NYSDEC. T = trout habitat (6 NYCRR Part 701.25)

b: Where a trenched crossing is proposed, streams containing discernible flow at the time of construction will be crossed using a dry crossing method (i.e., dam and pump or flume). HDD = Horizontal Directional Drill.

**TABLE 3A-3
Vegetation Community Types and Representative Plant Species
Identified in the Survey Corridor**

Common Name	Scientific Name
Upland Forests	
Appalachian Oak-Hickory Forest	
red oak	<i>Quercus rubra</i>
white oak	<i>Quercus alba</i>
red maple	<i>Acer rubrum</i>
green ash	<i>Fraxinus pennsylvanica</i>
American hop hornbeam	<i>Carpinus caroliniana</i>
shagbark hickory	<i>Carya ovata</i>
Successional Northern Hardwoods	
black cherry	<i>Prunus serotina</i>
red maple	<i>Acer rubrum</i>
river birch	<i>Betula nigra</i>
green ash	<i>Fraxinus pennsylvanica</i>
eastern cottonwood	<i>Populus deltoides</i>
Beech-Maple Mesic Forest	
American beech	<i>Fagus grandifolia</i>
sugar maple	<i>Acer saccharum</i>
red maple	<i>Acer rubrum</i>
green ash	<i>Fraxinus pennsylvanica</i>
American hop hornbeam	<i>Carpinus caroliniana</i>
Open Land and Mowed Roadside/Pathway	
reed canary grass	<i>Phalaris arundinacea</i>
field horsetail	<i>Equisetum arvense</i>
stinging nettle	<i>Urtica dioica</i>
dandelion	<i>Taraxacum officinale</i>
red clover	<i>Trifolium pratense</i>
curly dock	<i>Rumex crispus</i>
Canada goldenrod	<i>Solidaga canadensis</i>
Kentucky bluegrass	<i>Poa pratense</i>
multiflora rose	<i>Rosa multiflora</i>
silky dogwood	<i>Cornus racemosa</i>
gray dogwood	<i>Cornus amomum</i>
downy serviceberry	<i>Amelanchier arborea</i>
possumhaw	<i>Viburnum nudum</i>
tartarian honeysuckle	<i>Lonicera tatarica</i>

**TABLE 3A-3
Vegetation Community Types and Representative Plant Species
Identified in the Survey Corridor**

Common Name	Scientific Name
southern crabgrass	<i>Digitaria ciliaris</i>
Queen Anne's lace	<i>Daucus carota</i>
Canada thistle	<i>Cirsium arvense</i>
Agricultural Lands	
corn	<i>Zea mays</i>
annual meadowgrass	<i>Poa annua</i>
meadow fescue	<i>Festuca pratensis</i>
Wetlands	
Palustrine Forested Wetlands	
red maple	<i>Acer rubrum</i>
green ash	<i>Fraxinus pennsylvanica</i>
American elm	<i>Ulmus americana</i>
Palustrine Scrub-Shrub Wetlands	
silky dogwood	<i>Cornus racemosa</i>
arrowwood	<i>Viburnum dentatum</i>
white meadowsweet	<i>Spiraea alba</i>
pussy willow	<i>Salix discolor</i>
bebb willow	<i>Salix bebbiana</i>
spicebush	<i>Lindera benzoin</i>
tartarian honeysuckle	<i>Lonicera tatarica</i>
winterberry	<i>Ilex verticillata</i>
Palustrine Emergent Wetlands	
reed canary grass	<i>Phalaris arundinacea</i>
stinging nettle	<i>Urtic dioica</i>
fox sedge	<i>Carex vulpinoidea</i>
tussock sedge	<i>Carex stricta</i>
cinnamon fern	<i>Osmunda cinnamomea</i>
narrowleaf cattail	<i>Typha angustifolia</i>
sensitive fern	<i>Onoclea sensibilis</i>

**TABLE 3A-4
Non-Native Vegetative Species Identified in the Survey
Corridor**

Common Name	Scientific Name
annual meadowgrass	<i>Poa anna</i>
bird's-foot trefoil	<i>Lotus corniculatas</i>
Canada thistle	<i>Cirsium arvense</i>
common buckthorn	<i>Rhamnus cathartica</i>
common reed	<i>Phragmites australis</i>
common wormwood	<i>Artemesia vulgaris</i>
curly dock	<i>Rumex crispus</i>
garlic mustard	<i>Alliaria petiolata</i>
henbit deadnettle	<i>Lamium aplexicaule</i>
Japanese barberry	<i>Berberis thunbergii</i>
multiflora rose	<i>Rosa multiflora</i>
narrowleaf cattail	<i>Typha angustifolia</i>
narrowleaf plantain	<i>Plantago lanceolata</i>
purple loosestrife	<i>Lythrum salicaria</i>
Queen Anne's lace	<i>Daucus carota</i>
red clover	<i>Trifolium pratensis</i>
reed canary grass	<i>Phlaris arundinacea</i>
Russian olive	<i>Eleagnus angustifolia</i>
spotted knapweed	<i>Centaurea stoebe</i>
tartarian honeysuckle	<i>Lonicera tatarica</i>
white clover	<i>Trifolium repens</i>
wild garlic	<i>Allium vineale</i>

**TABLE 3A-5
Common Wildlife Species Occurring in Habitat Types in the Project Area**

Common Name	Scientific Name	Terrestrial			Wetland		
		Upland Forest	Open Lands	Agriculture	PFO	PSS	PEM
Reptiles and Amphibians							
American bullfrog	<i>Rana catesbiana</i>	--	--	--	--	--	X
American toad	<i>Bufo americanus</i>	--	--	--	--	X	--
eastern garter snake	<i>Thamnophis sirtalis</i>	--	--	--	--	--	X
eastern racer	<i>Coluber constrictor</i>	X	--	--	--	--	--
red backed salamander	<i>Plethodon cinereus</i>	--	--	--	X	--	X
red spotted newt	<i>Notophthalmus v. viridescens</i>	X	--	--	--	--	--
snapping turtle	<i>Chelydra serpentina</i>	--	--	--	--	--	X
Mammals							
Beaver	<i>Castor canadensis</i>	--	--	--	X	--	X
Coyote	<i>Canis latrans</i>	--	X	--	--	--	--
Eastern Chipmunk	<i>Tamias striatus</i>	X	--	--	--	--	--
Eastern cottontail	<i>Sylvilagus floridanus</i>	--	X	X	--	X	--
Gray Fox	<i>Urocyon cinereoargenteus</i>	--	X	--	--	--	--
Gray Squirrel	<i>Sciurus carolinensis</i>	--	X	--	--	--	--
Muskrat	<i>Ondatra zibethicus</i>	--	--	--	X	X	X
Opossum	<i>Didelphis virginiana</i>	--	X	--	--	--	--
Raccoon	<i>Procyon lotor</i>	X	X	--	--	--	--
Red Fox	<i>Vulpes</i>	X	X	--	--	--	--
Star Nose Mole	<i>Condylura cristata</i>	--	--	--	X	--	X
white-tailed deer	<i>Oedicoileus virginianus</i>	X	X	X	--	X	--
woodchuck	<i>Marmota monax</i>	--	--	X	--	--	--
Birds							
American Robin	<i>Turdus migratorius</i>	--	X	--	--	--	--
Bobolinks	<i>Dolichonyx oryzivorus</i>	--	--	X	--	--	--
Brown Thrasher	<i>Toxostoma rufum</i>	--	X	--	--	--	--
Eastern Meadowlark	<i>Sturnella magna</i>	--	--	X	--	--	--
European Starling	<i>Sturnus vulgaris</i>	--	--	X	--	--	--
Field Sparrow	<i>Spizella pusilla</i>	--	X	--	--	--	--
Gray Catbird	<i>Dumetella carolinensis</i>	--	--	--	--	X	--
Great Blue Heron	<i>Ardea herodias</i>	--	--	--	--	--	X
Mourning Doves	<i>Zenaida macroura</i>	--	--	X	--	--	--
Northern Cardinal	<i>Cardinalis</i>	--	X	--	--	--	--

**TABLE 3A-5
Common Wildlife Species Occurring in Habitat Types in the Project Area**

Common Name	Scientific Name	Terrestrial			Wetland		
		Upland Forest	Open Lands	Agriculture	PFO	PSS	PEM
Red-Tailed Hawk	<i>Buteo jamaicensis</i>	--	X	--	--	--	--
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	--	--	--	--	X	X
Wild Turkey	<i>Meleagris gallopavo</i>	--	--	--	X	--	--
Wood Duck	<i>Aix sponsa</i>	--	--	--	X	--	--

**TABLE 3A-6
Federally and State-Listed Threatened and Endangered Species Potentially Present Within the Project Area**

Federal				
Classification	Common Name	Scientific Name	Status	Anticipated Impact
Mussels	Dwarf Wedgemussel	<i>Alasmidonta heterodon</i>	Endangered	None
Flowering Plants	Small Whorled Pogonia	<i>Isotria medeoloides</i>	Threatened	None
Mammals	Indiana Bat	<i>Myotis sodalis</i>	Endangered	TBD
	Northern Long-Eared Bat	<i>Myotis septentrionalis</i>	Threatened	TBD
Reptiles	Bog Turtle	<i>Clemmys muhlenbergii</i>	Threatened	TBD
State				
Classification	Common Name	Scientific Name	Status	Anticipated Impact
Mammals	Indiana Bat	<i>Myotis sodalis</i>	Endangered	TBD

Source:
NYSDEC, 2015.

**TABLE 3A-7
Summary and Status of Pending Surveys**

Species	Survey Time	Reports Issued By
Bog turtle (<i>Clemmys muhlenbergii</i>)	Millennium completed (July and September 2015) a Phase 1 Survey of the Project area.	Further coordination, and determination of need for Phase II Survey, is currently in progress.

**TABLE 3A-8
Birds of Conservation Concern Potentially Occurring in BCR 28**

Common Name	Scientific Name	Occurrences	Habitat*
Bald Eagle	<i>Haliaeetus leucocephalus</i>	N/A	--
Bewick's Wren	<i>Thryomanes bewickii</i>	N/A	--
Black-capped Chickadee	<i>Poecile atricapillus</i>	Confirmed	Deciduous Forests
Blue-winged Warbler	<i>Vermivora cyanoptera</i>	N/A	--
Canada Warbler	<i>Cardellina canadensis</i>	Confirmed	Deciduous and Coniferous Forests
Cerulean Warbler	<i>Setophaga cerulea</i>	N/A	--
Golden-winged Warbler	<i>Vermivora chrysoptera</i>	N/A	--
Henslow's Sparrow	<i>Ammodramus henslowii</i>	N/A	--
Kentucky Warbler	<i>Geothlypis formosa</i>	N/A	--
Loggerhead Shrike	<i>Lanius ludovicianus</i>	N/A	--
Louisiana Waterthrush	<i>Parkesia motacilla</i>	Confirmed	Deciduous Forests - Near flat water
Northern Saw-whet Owl	<i>Aegolius acadicus</i>	N/A	--
Olive-sided Flycatcher	<i>Contopus cooperi</i>	N/A	--
Peregrine Falcon (b)	<i>Falco peregrinus</i>	N/A	--
Prairie Warbler	<i>Setophaga discolor</i>	N/A	--
Red Crossbill	<i>Loxia curvirostra</i>	N/A	--
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>	N/A	--
Rusty Blackbird (nb)	<i>Euphagus carolinus</i>	N/A	--
Sedge Wren (nb)	<i>Cistothorus platensis</i>	N/A	--
Swainson's Warbler	<i>Limnothlypis swainsonii</i>	N/A	--
Upland Sandpiper	<i>Bartramia longicauda</i>	N/A	--
Whip-poor-will	<i>Antrostomus vociferus</i>	N/A	--
Wood Thrush	<i>Hylocichla mustelina</i>	Confirmed	Deciduous and Coniferous Forests
Worm-eating Warbler	<i>Helmitheros vermivorum</i>	N/A	--
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>	Confirmed	Deciduous and Coniferous Forests

NOTES:

*Habitat listed for confirmed occurrences in Bird Conservation Region (BCR) 28.

APPENDIX 3B

Invasive Species Management Plan



VALLEY LATERAL PROJECT

APPENDIX 3B ***Invasive Species Management Plan***

FERC Docket No. CP16-__-000

November 2015

INVASIVE SPECIES MANAGEMENT PLAN

Millennium Pipeline Company, L.L.C. (Millennium) has developed this Invasive Species Management Plan (ISMP) to be implemented during the construction and operation of the proposed Valley Lateral Project (Project) to control the spread of foreign and invasive species in the Towns of Minisink and Wawayanda, Orange County, New York.

The New York State Department of Environmental Conservation (NYSDEC) defines invasive species as those species which are non-native to the ecosystem under consideration and whose introduction causes, or is likely to cause, economic or environmental harm or harm to human health (NYSDEC, 2014). Invasive species outcompete native species, diminish biological diversity, alter community structure and can change natural ecosystem processes (NYSDEC, 2014).

New York State regulates invasive species under 6 New York Codes, Rules and Regulations (NYCRR) Part 575 *Invasive Species Regulations*. These regulations list prohibited and regulated invasive species in New York State. These species lists were developed using the species assessment and listing process outlined by the NYSDEC in its 2010 report “A Regulatory System for Non-Native Species,” which involves a rapid assessment to determine if the species warrants listing, followed by a socio-economic assessment and review by the Invasive Species Advisory Committee and Council. These lists are continually being updated. The most current list of prohibited and regulated invasive species was adopted on September 10, 2014. Regulated invasive species are invasive species which cannot be knowingly introduced into a free-living state, although these species may be possessed, sold, bought, propagated and transported (NYSDEC, 2014). No regulated invasive species were identified within the Project survey corridor during field surveys.

Prohibited invasive species are those which cannot be sold, imported, purchased, transported, introduced or propagated by any person (NYSDEC, 2014). Field surveys conducted in May 2015 identified the presence of ten (10) prohibited invasive plant species within the Project survey corridor. These species include Canadian thistle (*Cirsium arvense*), common buckthorn (*Rhamnus cathartica*), common reed (*Phragmites australis*), garlic mustard (*Alliaria petiolata*), Japanese barberry (*Berberis thunbergii*), mugwort (*Artemisia vulgaris*), multiflora rose (*Rosa multiflora*), purple loosestrife (*Lythrum salicaria*), spotted knotweed (*Centaurea stoebe*), and tartarian honeysuckle (*Lonicera tartarica*).

Although no prohibited invasive terrestrial invertebrates were observed during field surveys conducted in May 2015, Orange County is within a United States Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS) Quarantine Area for the emerald ash borer (*Agrilus planipennis*) and the pine shoot beetle (*Tomicus piniperda*). One additional terrestrial invertebrate, the hemlock woolly adelgid (*Adelges tsugae*), is listed as a prohibited invasive species in New York and is present in Orange County. No tree diseases of concern were identified in the vicinity of the Project.

This plan focuses on controlling the potential spread of the identified listed invasive species during Project construction, particularly within wetland habitats identified along the Project corridor. The listed invasive species identified within the Project survey corridor are further described below.

Terrestrial Plants

Canadian thistle (*Cirsium arvense*)

Canadian thistle is a perennial and persistent spreading weed, most common in pastures. This plant reaches two (2) to six (6) feet in height and is best defined by its unique leaves which are alternate, simple, and oblong to lanceolate. Additionally, these leaves are irregularly lobed and develop into triangular indentations with spiny margins. The upper sides of mature leaves are dark green and hairless, while the lower surface is light green in color and may be hairless. Purple or pink flowers are present from June through August (Cornell, 1997). Canadian thistle is most commonly found in agricultural areas and disturbed sites, including sites that are undergoing restoration (CISEH, 2015). It is most commonly located on the edges of wet habitats (i.e., wetlands and stream banks) and is therefore important to watch for in riparian areas (CISEG, 2015). This species easily crowds out native species and reduces crop yields (USDA, 2015).

Common eradication methods include: shading through rapid closure of vegetative gaps and herbicide application which affect the root system (Ross, 2015).

Common buckthorn (*Rhamnus cathartica*)

Common, or European, buckthorn is a small deciduous tree or large shrub that can grow upwards of 6 meters in height and is found in lightly shaded areas. This plant is tolerant of many soil types from well-drained sand to clay. It has dull green oval or egg shaped leaves and is easily identified by the small thorns at the tip of its branches. The fruit or berries are small and are a dark purplish or black in color. These berries ripen in August and September and can be found still attached to the plant throughout the winter. Common buckthorn is considered an invasive species throughout most of the northeastern and central United States and southeastern Canada because of the dense thickets it forms (NYIS, 2015a).

Common reed (*Phragmites australis*)

Common reed is an aquatic perennial grass which grows up to 18 feet in height and is found in a variety of marshes, swamps, streams, and rivers. It is easily distinguished by its seed heads, tan to brown panicles, which can reach up to a foot in length. These leaves, with long white hairs at the leaf-sheath junction, help in the identification of common reed. Leaf sheaths may reach as much as 10 feet in height. The major concern is that common reed has little wildlife value and its aggressive colonization in a community causes a decline in species diversity (Cornell, 1997).

Common eradication methods include manipulation of water levels and chemical herbicide application. Herbicides should be applied after the plant has flowered (late summer or early fall) and may require multiple years of application to eliminate surviving rhizomes. Mechanical removal of common reed is not known to be effective, as small rhizomes left in the soil can create new plants (NYIS, 2015b).

Garlic mustard (*Alliaria petiolata*)

Garlic mustard is an invasive herb that has spread throughout much of the United States, becoming one of the worst invaders of forests in the American Northeast. This plant can be identified by the dark-green, kidney shaped leaves (6 to 10 cm in diameter) which have round teeth along the edges. This plant produces white flowers in April which die by June. Additionally, when crushed, the leaves of this plant produce a very obvious garlic odor which allows for easy identification. While typically found in the undergrowth of

disturbed woodlots and forest edges, garlic mustard has recently been found to also establish and spread in pristine areas. This spread has allowed it to become the dominant plant in the undergrowth of some forests, greatly reducing the diversity of all species. Garlic mustard is one of very few non-native plants to be able to successfully invade forest understories (NYIS, 2015).

Common eradication methods include manual removal by digging up roots, hand pulling of flowering plants, and cutting while flowering, as well as herbicide application to the foliage (FIPRC, 2015).

Japanese barberry (*Berberis thunbergii*)

Japanese barberry is a dense herbaceous or shrubby plant introduced as an ornamental which is adaptable to a variety of open and wooded habitats. This plant forms dense stands which compete with other native tree and herbaceous plant species, as well as reducing wildlife habitat and forage. Barberry can reach six (6) feet in height and is equally as wide. The bush can be identified by the green leaves, yellow flowers, sharp thorns and red berries that remain through the winter months (USDA, 2002).

Common eradication methods include hand pulling of small plants, mechanical uprooting of larger plants, and herbicide application (PCA, 2009).

Mugwort (*Artemisia vulgaris*)

Mugwort is a woody perennial species that is commonly spread by cultivation equipment and is found in sunny locations with well drained soils. This plant reaches up to five (5) feet in height and is often reddish-brown in color. Leaves are two (2) to four (4) inches long, are deeply lobed, and have a distinctive aroma. Undersides of the leaves are covered with soft, white to gray hairs (Cornell, 1997).

The most common eradication method utilized is herbicide application (NJ Audubon, 2007).

Multiflora rose (*Rosa multiflora*)

Multiflora rose is a vigorous perennial shrub which reaches heights of up to 10 feet. The red to green twigs may have numerous recurved thorns, compound leaves grow alternately with 5, 7, 9 or 11 oval, saw toothed leaflets, and white to pink flowers which bloom in late May or June. The spread of multi flora rose increased in the 1930s, when it was introduced by the U.S. Soil Conservation Service for use in erosion control and as living fences, or natural hedges, to confine livestock. It was also discovered to provide effective habitat and cover protection for pheasant, northern bobwhite, and cottontail rabbit and food for animals such as songbirds and deer. These uses encouraged its distribution, usually via root cuttings, to landowners, through State Conservation departments (NYIS, 2015).

Common eradication methods include digging and/or uprooting of entire plants and application of herbicide to cut stumps or foliage (FIPRC, 2015b).

Purple loosestrife (*Lythrum salicaria*)

Purple loosestrife is an herbaceous exotic which is a perennial that can grow to heights of 6 feet and taller. This plant is easily recognized from a distance by its elongated spike of purple flowers which bloom between July and September. Purple loosestrife prefers highly organic and moist soils, but is tolerant of a wide range of conditions. This adaptability, coupled with lack of predators and high production of viable seeds, allows loosestrife to out-compete native species found in salt marshes, wet meadows and swamps (USDA, 2002).

Common eradication methods include water-level manipulation, cutting and herbicide application on small, localized stands. In addition, there are four (4) host specific insect species which feed on purple loosestrife and can effectively control species proliferation (Blossey, 2002).

Spotted knotweed (*Centaurea stoebe*)

Spotted knotweed is a biennial species that forms a basal rosette during the first year of growth and produces a flowering stem in the second year of growth. This knotweed is associated with pastures, hayfields, roadsides, and turf grass. Leaves form a basal rosette during the first year of growth, are deeply lobed, and are approximately 6 inches long. Leaves that are produced on the flowering stems are alternate and finely dissected. A solitary flower emerges at the ends of branches and is approximately 8 to 15 millimeters wide. Individual flowers are pink to purple in color (Cornell, 1997).

Common eradication methods include hand-pulling of entire plants prior to seed production each year and herbicide application through multiple treatments to eliminate the seed bank (Zouhar, 2001).

Tatarian honeysuckle (*Lonicera tatarica*)

Tatarian honeysuckle is a perennial woody vine shrub species that inhabits a large array of ecosystem types. These species thrive in abandoned fields, pastures, early successional areas, open canopies, along edges of woodlots or planted forests, and disturbed areas including ROWs. This honeysuckle grows up to 15 feet in height and the vines can reach upwards of 30 feet in length. The plant contains egg-shaped leaves (1 to 3 inches in length) and flowers from May to June with an array of white to pink or crimson colored pedals. Red berries are also produced from mid-summer through early fall. This species became so prominent in New York, and much of North America, as it was distributed as a garden plant to stabilize soils and allow for wildlife planning from the 1800s to as recently as the mid-1980s (NYIS, 2015).

Common eradication methods include hand removal of seedlings or younger plants and herbicide application on larger infestations (NYIS, 2015c).

Terrestrial Invertebrates

Emerald ash borer (*Agrilus planipennis*)

Emerald ash borer is an invasive insect native to Asia which feeds on ash trees (*Fraxinus spp.*), eventually killing them. This wood boring insect is thought to have been brought into the U.S. around the 1990's via cargo ships carrying ash pallets and/or shipping containers (NYIS, 2015e). These beetles have an average length of 0.75 inches, and are bright, emerald green as the name suggests. Females lay between 60 and 100 eggs during their lifespan which take 7-10 days to hatch. The larvae can be up to 1.5 inches in length, and make galleries (*i.e.*, marks on the sapwood underneath the bark) in the wood that can span 4 to 20 inches (NYIS, 2015e).

Common prevention of the spread of the emerald ash borer is to limit the movement of firewood. Orange County is within a United States Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS) Emerald Ash Borer Quarantine Area and the movement of firewood is under certain restrictions (NYIS, 2015e).

Pine shoot beetle (*Tomicus piniperda*)

The pine shoot beetle is an invasive insect that attacks the new shoots of pine trees (*Pinus spp.*), which stunts their growth and creates high stress for the species. The beetle normally does not kill the trees, unless the trees are under high stress or the population of beetles is very high. The pine shoot beetle is native to Europe and was first discovered in Ohio which has since expanded to 19 other states, including New York. This wood-boring insect is a dark brown color and creates galleries under the bark on the sapwood. The easiest distinction of the beetle's presence is trees with dying terminals becoming a brown color (USDA APHIS, 2015).

Common prevention of the spread of this species is to limit the distance of pine wood movement. Orange County was designated a USDA APHIS Pine Shoot Beetle Quarantine Area and the movement of pine wood is under certain restrictions (USDA APHIS, 2015).

Hemlock woolly adelgid (*Adelges tsugae*)

Hemlock woolly adelgid is an invasive insect that feeds on hemlock trees (*Tsuga spp.*) and poses a serious threat to hemlock forest stands. This species is often detected through identification of white, woolly clusters of wax (approximately 1/8 inch in size) needles which are produced by females in the late winter and are attached to the base of hemlock. These wax clusters persist throughout the year (NYIS, 2015f).

The hemlock woolly adelgid was first identified in the United States in Richmond, Virginia, in the mid-1950s and is thought to be accidentally introduced from Japan. The hemlock woolly adelgid has spread to 18 eastern states and was first detected in New York in the early 1980s. According to the NYSDEC Division of Lands and Forests, Forest Health Unit, the hemlock woolly adelgid has been detected throughout Orange County, New York, with the first detections starting around 1987 (NYIS, 2015f).

The life cycle of the hemlock woolly adelgid involves wingless forms which remain on hemlock trees and a winged form which utilizes spruce trees as a host. In New York, there are no suitable spruce trees available to the hemlock woolly adelgid and therefore only the wingless form is found in New York. These wingless forms produce two generations, approximately 200 eggs per winter per female, and can kill an adult hemlock tree in as quickly as four years (NYIS, 2015f).

Infested hemlock trees can be treated with a chemical, systemic insecticide applied by a certified pesticide applicator; however, costs of the insecticide, as well as concerns about application near water resources, makes insecticide use less feasible. Common prevention of the spread of hemlock woolly adelgid involves reducing tree stress (e.g., watering during droughts) to decrease their susceptibility to infestation and to limit the movement of hemlock wood and mulch from infested to uninfested areas (NYIS, 2015f).

Construction Phase Mitigation Measures

Preliminary data gathered during the Project's field surveys revealed that multiple populations of multiflora rose, purple loosestrife and tartarian honeysuckle are present within the Project survey corridor. The remaining invasive species identified are present to a much lesser extent. In many cases, the species identified are well established within individual wetlands. As previously mentioned, the purpose of this ISMP is to control the spread of invasive plants to areas where they do not presently occur. Millennium will implement the mitigation measures described below prior to and during construction and restoration of disturbed areas to control the spread of invasive species.

- 1) Prior to construction, environmental inspector(s) will photograph each wetland and document the percentage and location of the listed invasive species or indicators of invasive invertebrates present in the wetland and surrounding area. These measurements will be utilized as a baseline for post-construction monitoring.
- 2) Construction equipment and mats will be kept clean and free of dirt and mud prior to entering wetlands or waterbodies and any regulated Adjacent Area, as invasive species can spread through the transfer of dirt and/or mud in seeds or fragments. Regulated Adjacent Area includes those areas of land or water that are outside an Article 24 Freshwater Wetland and within 100 feet (approximately 30 meters), measured horizontally, of the boundary of the wetland (6 CRR-NY 663.2). Equipment cleaning areas will be designated to ensure that equipment is cleaned to the extent practicable before moving equipment and/or mats between wetland areas. In wetlands, equipment shall be tracked and/or operate on matting to reduce soil disturbance during construction.
- 3) In accordance with New York State stormwater management regulations, erosion and sediment control devices will be installed across construction work area on slopes leading into wetlands and along the edges of the construction work area to prevent material (including spoil, seeds, and plant fragments) from migrating into these areas.
- 4) Except for in areas with standing water or heavily inundated soils, wetland areas will be revegetated by stripping the topsoil from over the trench, which will be stockpiled in accordance with Millennium's Environmental Construction Standards (ECS). This will help maintain the native integrity of the soil and prevent inclusion of invasive species. Once the pipeline is installed, the area will be restored as provided in the ECS and the segregated topsoil shall be replaced as the surficial layer to promote re-establishment of native vegetation. To further promote re-establishment of native vegetation, Millennium will apply an appropriate native seed mix to workspace areas within palustrine forested wetlands and Article 24 Freshwater Wetlands and their regulated Adjacent Areas during restoration. All erosion and sediment controls shall remain in place until the site has achieved final stabilization. This will also help to prevent invasive species from entering the restored wetland area
- 5) In non-wetland areas, the restored right-of-way will be seeded with appropriate seed mixture as provided in the ECS. To the extent permitted by the ECS, the seed mixes will include annual ryegrass to create rapid cover over the disturbed right-of-way. This will help prevent establishment of invasive species, which often heavily colonize disturbed sites.

As described above, disturbed areas present opportunities for invasive species to colonize new areas. Construction in and around wetlands as provided in the ECS will reduce the amount of disturbances and thus the potential for the spread of invasive species. In areas where soil must be disturbed, the use of erosion and sediment control devices and restoration as described in the ECS will minimize opportunities for invasive species to spread to new areas. The Environmental Inspector (EI) on the Project will monitor the use of these practices during construction of the Project.

Post-Construction Monitoring for Invasive Plant Species

To ensure successful revegetation of native wetland species, wetland areas will be monitored as provided in the ECS. It is anticipated that this monitoring will ensure that the establishment of large populations of invasive species do not develop and persist. In the event that nuisance plant species spread into new ROW

areas where it was not documented as occurring prior to construction, Millennium will work with the landowners to implement removal and eradication measures. Although wetland areas throughout the Project will be monitored for invasive species, emphasis will be placed on locations where invasive species were not present prior to construction, as determined through the baseline evaluation.

Control Methods for Invasive Species

Early detection and eradication of invasive species is imperative in preventing their spread. Although many methods are utilized to control invasive plant species, several, such as mowing, burning and flooding, are largely ineffective and can often spread invasive species further.

Millennium will utilize a combination of hand pulling and herbicide application, depending on plant stem density and location of the invasive species, to eradicate invasive plant species within the Project area. These two (2) methods are described in further detail below:

- 1) **Hand pulling:** identify and hand pull entire plant (including roots) before the end of the flowering season if their occurrence is **no greater than 100 stems per acre and in wetland areas**. Plants shall be removed from the ROW and disposed of at an approved waste facility. Care shall be taken to ensure no seeds or plant fragments remain within the Project area.
- 2) **Herbicide:** hand application of Glyphosate (*e.g.*, Rodeo® or Roundup®), or a comparable herbicide, as recommended by the U.S. Army Corps of Engineers (USACE) and appropriate state agencies, will be used by a certified applicator in areas where the invasive plant species population is greater than 100 stems per acre, including in wetland areas to the extent allowed by applicable regulations.

In addition, to avoid the spread of invasive terrestrial invertebrates, Millennium will abide by New York State restrictions on the movement of wood to limit the potential spread of invasive species (6 CRR-NY 192.5). This includes limiting the movement of cut or chipped wood, not including wood being transported to operations or manufacturing facilities as outlined in the regulation, to no more than 50 miles from the source. Where landowner agreements require salvage of wood products, the landowner will be responsible for a self-issued certificate of origin.

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APPENDIX 3C

Phase I Bog Turtle Habitat Survey Report

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