2.5 Water Quality: Environmental Setting

2.5.1 Groundwater

Groundwater qualities such as depth to groundwater, direction of groundwater flow, hydraulic gradient, and hydraulic conductivity are important for characterizing the groundwater conditions within the Project Area. As part of the Environmental Impact Statement (EIS) process, site-specific features including depth-to-groundwater, the location of potential groundwater resources, and the direction of groundwater flow have been identified based on desktop resources. This information will be utilized by Noble to ensure that the potential impacts to geology and groundwater resources do not occur or are minimized to the extent possible.

The following is based on information available from the United States Geologic Survey (USGS) that is related to groundwater in local wells in the vicinity of the Project Site.

Residential Wells

Groundwater is used as the main drinking water supply in the Towns of Wethersfield and Eagle. Within the Town of Eagle, the Hamlet of Bliss utilizes a private groundwater fed water system. The water supply components include water storage reservoirs and a public distribution system serving approximately 235 people in the vicinity of the Project Area (EPA 2006a). The majority of the residences in the Project Area use private groundwater wells as their source of potable water. According to the New York State Department of Health (NYSDOH 2006), there are no known water quality problems or concentrations of pollutants in the groundwater in the Project Area. The main source of the potable groundwater supply is most likely the Cattaraugus Creek Basin Aquifer System, identified by the United States Environmental Protection Agency (EPA) as a sole-source aquifer beneath the southwest portion of the Project Area; it primarily underlies the portion of the Project Area that drains to Cattaraugus Creek (EPA 2006b). Groundwater supply for private wells may also be taken from unconsolidated sand and gravel aquifers associated with East Koy and Wiscoy creeks (USGS 2006b).

Depth to Groundwater

Site-specific groundwater depths have not been determined; however, based on general data gathered from the soils database, Soil Survey Geographic (SSURGO), depth to groundwater ranges from the ground surface to greater than 100 feet below ground surface. According to this data, most of the Project Area has a depth to groundwater ranging between 20 and 30 feet below ground surface (USDA 2005a).

Aquifers

The southwestern portion of the Project Area is located over the Cattaraugus Creek Basin Aquifer System (EPA 2006b), an identified sole-source aquifer. The Cattaraugus Creek Basin Aquifer is approximately 35 miles long, varies from 25 miles wide at its eastern edge to 2 miles at its western edge, and underlies ap-

proximately 325 square miles in Erie, Wyoming, Allegany, and Cattaraugus counties. Groundwater flow is primarily southwest toward Cattaraugus Creek.

A sole-source aquifer is defined by the EPA as an aquifer that is needed to supply 50% or more of the drinking water for a given area and for which there are no reasonably available alternative sources should the water become contaminated. Given the fragile nature of these aquifers, they are given special consideration by the EPA.

2.5.2 Surface Water

The Project Area is located within the Upper Genesee, Cattaraugus, and Niagara watersheds. The watershed boundary locations in relation to Project facilities are depicted in Figure E-7 in Appendix E. The Upper Genesee watershed drains generally north along the Genesee River before emptying into Lake Ontario. The Cattaraugus watershed generally flows west along Cattaraugus Creek to Lake Erie. The Niagara watershed generally flows northwest along a series of waterways, including Tonawanda Creek, to the Niagara River. The Upper Genesee and Cattaraugus watersheds have been designated as Category II watersheds by the New York Unified Watershed Assessment Program. Category II watersheds are defined as those currently meeting water quality goals. The Niagara watershed is a Category I watershed. Category I watersheds are watersheds in need of restoration that do not meet or are in danger of being in violation of clean water and other natural resource goals (NYSDEC 1998). Although there are nine waterbodies within the Niagara watershed on the New York State Section 303(d) List of Impaired Waters, no impaired waters or priority listed waters are located within the Project Area (NYSDEC 2006a).

2.5.2.1 New York State Department of Environmental Conservation (NYSDEC) Stream Classification

Multiple streams were identified and delineated during surveys within the Project Area. Table 2.5-1 provides descriptions of all perennial and intermittent streams that were identified during these surveys. The streams range from well-defined stream channels to poorly defined headwater channels. The locations of these streams are depicted in relation to Project facilities in Figure E-8 in Appendix E, the wetland and waterbodies delineation report.

NYSDEC stream classification data were reviewed to determine whether streams in the Project Area are protected by New York State under Article 15 of the Environmental Conservation Law (ECL). NYSDEC uses a stream classification system in order to identify the value and uses of watercourses in the state. A protected stream is any stream or particular portion of a stream for which there any of the following classifications or standards have been adopted by the department or any of its predecessors: AA, AA(t), A, A(t), B, B(t) or C(t). Streams designated (t)(trout) also include those more specifically designated as (ts)(trout spawning). Disturbance to the bed or banks of protected streams requires a permit under Article 15 of the New York State ECL.

The majority of the watercourses within the Project Area are identified as Class C and C(t), while others are designated as Class C(ts) or A(t) waters. Class C streams support fishing and fish propagation and primary- and secondary-contact recreation. Of these, multiple streams within the Project Area are designated Class C(t) (trout) and one stream is designated Class C(ts) (trout spawning), which are capable of sustaining trout populations, and are considered "protected streams" given special protection by NYSDEC. Class A waters are a source of water supply for drinking, culinary, or food processing; and are also suitable for primary and secondary contact recreation and fishing. Class A waterbodies are designated as such because if subjected to approved treatment for drinking water, they meet or will meet New York State Department of Health Drinking Water Standards. Class A(t) streams in the Project Area are considered "protected streams" given special protection by NYSDEC.

2.5.2.2 Protected Streams

Most of the Project Area lies within the Upper Genesee watershed and includes streams that are tributary to East Koy Creek and Wiscoy Creek. The northeast section of the Project Area is drained by Smith Creek and several unnamed tributaries, all of which are tributary to East Koy Creek (Class C(t)). Smith Creek flows southwest to northeast through the northeast portion of the Project Area. East Koy Creek (Class C(t)) flows through the northeastern portion of the Project Area and continues to flow northwest to southeast outside the Project Area. The central and southeast portions of the Project Area are drained by the North Branch of Wiscoy Creek (Class C(t)), which runs north to south to the east of New York State (NYS) Route 362; Trout Brook, which originates within the southeast section of the Project Area; and several unnamed tributaries, all of which are tributary to Wiscoy Creek. Except for briefly crossing the southern portion of the Project Area north of NYS Route 39, Wiscoy Creek flows in a west to east orientation and is located outside of the Project Area. Streams within the Upper Genesee watershed are Class C or C(t) (see Table 2.5-1).

The northwest portion of the Project Area lies within the Niagara Watershed. It is drained by unnamed tributaries to the East Fork of Tonawanda Creek, which is located to the northwest of the Project Area. These tributaries are Class A(t) streams.

The west and southwest portions of the Project Area are located within the Cattaraugus Creek watershed and are drained by unnamed tributaries to Spring Brook and Cattaraugus Creek. Spring Brook originates within the Project Area and flows off site to the southwest. The headwaters of Cattaraugus Creek are located to the west of the Project Area. Tributaries within this watershed are either Class C, C(t), or C(ts).

2.5.2.3 Surface Water Use

Perennial streams that have been classified by NYSDEC for fishing within the Project Area may provide fishing opportunities for the public. Wiscoy Creek, its North Branch, Trout Brook, and East Koy Creek are listed by NYSDEC as top fishing waters in New York State for brown trout. According to NYSDEC, public fishing right easements are accessible at various locations along most of these creeks in the Project Area (NYSDEC 2006b). The trout streams are considered important local resources by both the Towns of Wethersfield and Eagle.

All of the streams within the Project Area may be used to some extent by animals and livestock as a source of drinking water. However, since many of these streams are intermittent and in headwater areas, water availability is intermittent and may be present only during periods of continuous or heavy precipitation or during the snowmelt period in the spring. Furthermore, the conditions in these streams are usually unsuitable for fish species. This includes several streams that have been classified by NYSDEC for fishing and trout species propagation (Class C Streams S1004, S1023, and S1034, Class C(t) Streams S530, and Class A(t) Stream S94). However, amphibians and macro-invertebrates are likely to inhabit these areas when water is present.

Natural and man-made ponds are scattered throughout the Project Area. Ponds vary in size, but are typically less than 1 acre with depths ranging from 2 to 10 feet. Natural ponds exist in both forests and fields and in some cases result from beaver activity. Man-made ponds used for agricultural purposes are located in farm fields, and recreational ponds are located in open or forested residential areas and private camping areas. Wildlife may also utilize these resources. See Section 2.9, Biological Resources: Environmental Setting, for a discussion of wildlife and aquatic habitat.

Two fish hatcheries exist within the Project Area adjacent to Smith Creek and the North Branch of Wiscoy Creek. Both hatcheries are located on private land. The Town of Wethersfield has requested that impacts of "shadow flicker" on these hatcheries be addressed. The potential impacts of the Project on fish hatcheries will be discussed in Section 2.10, Biological Resources: Impacts and Mitigation, and 2.14, Visual Resources: Impacts and Mitigation.

2.5.3 Storm Water Runoff

The Project Area consists of a mix of predominantly forested land and agricultural lands with several local, state, and county roads found within the Project Area. On most of the Project Area, storm water infiltrates naturally through soils, except on impermeable areas such as paved roads. During heavy precipitation events (such as 1- or 25-year storm events), storm water falling on the soil surface may saturate the soil and subsequently may run off into the numerous naturally occurring and man-made drainage channels in the area. These drainage channels typically connect to the wetlands or small-unnamed intermittent streams in the Project Area. Along some roads, drainage ditches have been installed to collect storm

water runoff from the road surface and direct it to existing natural drainage channels or streams. Some roads or road segments in the Project Area lack significant drainage ditches; in this case, storm water runoff from the road surface simply empties off the road edge via overland flow.

Table 2.5-1 Stream Characteristics, Noble Wethersfield Windpark

Cluster ID*	Stream Name	Bank Height (feet)	Width of Water (feet)	Bank to Bank Width (feet)	Substrate	Flow	NYSDEC Classification	Connection
Streams Identified During Surveys Within the Project Area								
2	S1000	0-3	2-3	3-5	Gravel/Silt/ Clay	Perennial	C(t)	Unnamed Tributary to Cattaraugus Creek
3	S32	3-6	1-2	4-5	Cobbles/ Gravel/Silt/ Clay	Intermittent	C[1]	Unnamed Tributary to North Branch Wiscoy Creek
3	S1004	3-6	1-2	4-6	Cobbles/ Gravel/Silt/ Clay	Intermittent	C	Unnamed Tributary to North Branch Wiscoy Creek
28	S1a	0-3	2-4	15	Gravel/Silt/ Clay	Perennial	C(t)	Unnamed Tributary to Cattaraugus Creek
28	S3	0-3	2-8	10-30	Gravel/Silt/ Clay	Perennial	C(t)	Unnamed Tributary to Cattaraugus Creek
Collection between 1 and 28	S1	0-3	2-3	2-3	Gravel/Silt/ Clay	Perennial	C(t)	Unnamed Tributary to Cattaraugus Creek
Collection between 1 and 28	S1b	0-3	1-2	8-10	Gravel/Silt/ Clay	Intermittent	C[1]	Unnamed Tributary to Cattaraugus Creek
Collection between 1 and 28	S1c	0-3	0.5-2	3-8	Gravel/Sand	Intermittent	C[1]	Unnamed Tributary to Cattaraugus Creek
Collection between 2 and 3	S23	0-3	3	5-8	Cobbles/ Gravel/Silt/ Clay	Perennial	C[1]	Unnamed Tributary to Cattaraugus Creek
Collection between 3 and 5	S133	0-3	3	3	Silt/Gravel	Perennial	C(ts)	Unnamed Tributary to Spring Brook
Collection between 3 and 12	S1056	0-3	2	3	Gravel/Sand/ Silt/Clay	Perennial	C	Unnamed Tributary to North Branch Wiscoy Creek
Collection between 4 and 5	S1059	3-6	3-6	15	Gravel/Silt/ Clay	Perennial	C	Unnamed Tributary to Spring Brook
Collection between 4 and 5	S1532	0-3	3	3	Silt/Clay/ Vegetated	Intermittent	C(ts)	Unnamed Tributary to Spring Brook
7	S1505	0-3	2-5	3-5	Gravel	Perennial	C[1]	Unnamed Tributary to North Branch Wiscoy Creek

Table 2.5-1 Stream Characteristics, Noble Wethersfield Windpark

Cluster ID*	Stream Name	Bank Height (feet)	Width of Water (feet)	Bank to Bank Width (feet)	Substrate	Flow	NYSDEC Classification	Connection
9	S68	0-4	1-2	3-8	Cobbles/Silt/ Clay	Intermittent (at data point)	C[1]	Unnamed Tributary to North Branch Wiscoy Creek
9	S527	0-3	2-4	3-5	Gravel/Silt/ Clay	Perennial	C[1]	Unnamed Tributary to Wiscoy Creek
9	S1017	0-3	1-2	5	Cobbles/ Gravel/Silt/ Clay	Intermittent (at data point)	C[1]	Unnamed Tributary to North Branch Wiscoy Creek
Collection between 6 and 8	S59 (also see S1060)	0-3	3-10	10	Bedrock/ Gravel/Silt/ Clay	Perennial	C	Unnamed Tributary to Spring Brook
Collection between 6 and 8	S1060 (southern portion of S59)	0-3	2-4	6-8	Bedrock/ Gravel/Silt/ Clay	Perennial	C	Unnamed Tributary to Spring Brook
Collection between 7 and 10	S1525	3-6	0.5-1	1-3	Gravel/Silt/ Clay	Intermittent	C[1]	Unnamed Tributary to North Branch Wiscoy Creek
11	S530	0-3	2-5	3-7	Gravel	Intermittent	C(t)	Unnamed Tributary to Trout Brook
Collection between 7 and 10	S556	0-3	8-10	50	Gravel	Perennial	C(t)	North Branch Wis-coy Creek
Collection between 10 and 11	S1023	0-3	4	5-6	Cobbles/ Gravel/Silt/ Clay	Intermittent	C	Unnamed Tributary to North Branch Wiscoy Creek
12	S1513	0-3	0.5-3	2-3	Gravel	Perennial	C[1]	Unnamed Tributary to North Branch Wiscoy Creek
Collection between 3 and 12	S1055	3-6	3	15	Gravel/Sand/ Silt/Clay	Perennial	C	Unnamed Tributary to North Branch Wiscoy Creek
13	S83	0-3	1-2	4-5	Gravel/Silt/ Clay	Intermittent	A(t)[1]	Unnamed Tributary to East Fork Tona-wanda Creek
13	S94	0-3	1-2	2-2.5	Gravel/Silt/ Clay	Intermittent	A(t)	Unnamed Tributary to East Fork Tona-wanda Creek
Collection between 13 and 21	S1052	3-6	1.5	5	Gravel/Cobble s	Perennial	C	Unnamed Tributary to Smith Creek
19	S98	0-6	3-8	4-10	Gravel/Silt/ Clay	Perennial	C(t)	Unnamed Tributary to Trout Brook
19	S1031	0-3	2-4	2-4	Gravel/Silt/ Clay	Perennial	C	Unnamed Tributary to Trout Brook

Table 2.5-1 Stream Characteristics, Noble Wethersfield Windpark

Cluster ID*	Stream Name	Bank Height (feet)	Width of Water (feet)	Bank to Bank Width (feet)	Substrate	Flow	NYSDEC Classification	Connection
Collection between 14 and 15	S552	0-3	3	5	Silt/Clay	Perennial	C[1]	Unnamed Tributary to Smith Creek
22	S547	0-6	3	6	Gravel	Perennial	C(t)	Unnamed Tributary to Smith Creek
23	S116	0-3	1	1	Gravel/Sand	Perennial	C	Unnamed Tributary to Smith Creek
Collection between 13 and 21	S111	3-6	20	20	Boulders/Silt/ Clay	Perennial	C(t)	Unnamed Tributary to Smith Creek
Collection between 13 and 21	S1049	0-6	4	16	Cob-bles/Gravel	Perennial	C	Unnamed Tributary to Smith Creek
Collection between 20 and 21	S126	0-3	4	6	Gravel/Silt/ Clay	Perennial	C	Unnamed Tributary to East Koy Creek
Collection between 21 and 22	S1034	3-6	1	4	Cobbles/ Gravel/Sand	Intermittent	C	Unnamed Tributary to Smith Creek
Collection between 24 and 26	S558	0-3	20	20	Gravel/Sand	Perennial	C(t)	Smith Creek
Collection between 24 and 26	S1040	0-3	3-6	20-50	Cobbles/ Gravel/Sand	Perennial	C	Unnamed Tributary to East Koy Creek
25	S1044	0-6	4-6	6-8	Gravel/Sand/ Silt/Clay	Perennial	C	Unnamed Tributary to East Koy Creek
Collection between 26 and 27	S119	0-3	3	20	Gravel/Silt/ Clay	Perennial	C	Unnamed Tributary to East Koy Creek

[1] Classification assigned to tributaries or sub-tributaries as listed in Article 8 of NYCRR.

2.6 Water Quality: Impacts and Mitigation

Construction practices, including the building of access roads and placement of electrical collection lines, may impact the condition of groundwater and surface water resources and, ultimately, water quality, through ground disturbance and runoff. This section will address possible impacts on groundwater and surface water that were identified when planning the construction and operation of the Project. Long-term impacts on surface water quality are expected to be minimal, as water resources were avoided to the extent practicable when siting Project facilities. Whenever possible, Project facilities have been sited in previously disturbed areas. No long-term groundwater impacts are anticipated. Noble will minimize any potential construction impacts to surface or groundwater quality through the implementation of best management practices (BMPs). These measures are discussed in Section 2.6.3.

2.6.1 Construction Impacts

Groundwater

Construction of the Project is not expected to significantly impact groundwater within or outside of the Project Area. Construction activities within any particular location will generally be completed within a relatively short amount of time and any effects on groundwater are expected to be minor and temporary. It is possible that shallow groundwater may be encountered during excavation or that other localized groundwater flow disruptions may take place downgradient of the turbine foundations. However, should this effect occur, it is anticipated that groundwater will rapidly fill in behind the foundation. Any soil compaction that takes place during construction is not expected to extend to the water table; therefore, groundwater movement will not be disrupted by any compaction that takes place. Construction of the Project may increase the potential for introduction of pollutants to groundwater if spills of petroleum or other chemicals were to occur. Spill prevention during construction is discussed in Section 2.6.3.

Construction of the Project is not expected to impact the Cattaraugus Creek Sole Source Aquifer System or private drinking wells within or outside of the Project Site because the depth of excavation will be less than the depth to groundwater. It is possible that perched groundwater lenses will be encountered during construction. If areas of perched water exist, they will be identified during construction or site-specific detailed foundation engineering investigations/evaluations performed in conjunction with the foundation design process. These perched water areas will be documented and reported through the environmental monitoring process with an engineering/quality request for information requesting disposition on specific methods to be utilized to maintain existing hydrology. The resulting information will be provided prior to construction and will be made available the Towns as required by applicable laws. Components of the engineering evaluation (geotechnical study) are listed in Section 2.1, Geology: Environmental Setting.

Surface Water

Stream crossings have been avoided during facility siting to the greatest extent practicable. No streams will be impacted by construction of the turbines. Due to the location and number of streams in the Project Area, it will be necessary to cross streams for installation of access roads and collection lines. Appropriate stream crossing methods for construction will be developed and implemented with United States Army Corps of Engineers (USACE) and New York State Department of Environmental Conservation (NYSDEC) review, and provided to the Towns as part of that review, as discussed in Section 2.6.3.

Construction of the Project will result in minor, short-term impacts on the streams crossed. These impacts could occur as a result of in-stream construction activities or construction on slopes adjacent to stream channels. Clearing and grading of stream banks, in-stream trenching, trench dewatering, and backfilling could result in modification of aquatic habitat, increased sedimentation, turbidity, decreased dissolved oxygen concentrations, releases of chemical and nutrient pollutants contained in stream sediments, and introduction of chemical contaminants such as fuel and lubricants from possible spills. In general, these impacts will be limited to the period of in-stream construction and conditions are expected to return to normal shortly after completion of activities.

Six streams will be crossed by the temporary access road and adjacent collection lines (Streams S32, S1004, S1a, S68, S527 and S94). As previously described, temporary access roads located within sensitive resources will be installed within a narrowed 40-foot-wide construction right of way (ROW) (see Section 1.2, Detailed Description of the Proposed Action). Access roads will cross streams using culverts of an appropriate type and size to maintain sufficient flow at access road locations. Access road and collection lines that cross Streams S32 and S1004 will be installed at existing crossings and will require the replacement of existing culverts. When collocated with the access road, the collection line will be installed within this construction ROW approximately 4 feet below the stream bed. Table 2.6-1 identifies streams that will be crossed by the access road and\or collection system within the Project Site.

In areas where the collection line cannot be collocated with the access roads, the collection lines will be installed within a 22- to 50-foot ROW, depending on the number of circuits and the method used for crossing (i.e., underground or overhead). Fourteen streams will be crossed by either overhead or underground collection lines. Underground collection lines will be installed via trenching of the streams; however, impacts will be minimal since trenching will take place under dry conditions. Streams that are not naturally dry at the time of crossing will either be dammed and pumped or flumed. The equipment that will be used to install the collection lines cuts a trench, places the cable, and backfills the trench in a single pass, thereby reducing the duration of stream disturbance. The collection system will be installed via directional drilling under the North Branch of the Wiscoy Creek. No disturbance to the streambed will be required and no equip-

ment will cross the stream. Underground collection lines will be installed via trenching across Streams S1, S126, S1056, S1059, S59, S1525, S1023, S552, S1049, S1040, S1532, and S119. Other overhead collection lines will be placed over Streams S1049, S111, and Smith Creek (Stream S558).

Protected Streams

Seven of the streams to be crossed by either access roads or the collection system above have been classified as protected streams by NYSDEC. NYSDEC stream classifications are described in Section 2.5, Water Quality: Environmental Setting. One Class A(t) stream, one Class C(ts) stream, and five Class C(t) streams will be impacted by construction of the Project; however, impacts are considered temporary. Permits from NYSDEC will be required to cross these streams under Article 15 of the New York State Environmental Conservation Law (ECL).

Construction of the access road and associated construction ROW will impact stream S94, which is classified as a Class A(t) stream and S1a, which is classified as a C(t) stream. Stream S94, is an intermittent tributary that is currently disturbed by an unimproved logging road. The temporary access road will be constructed within the existing road. Some upgrades will be required to improve the condition of the road at the stream crossing. A new access road will be installed across stream S1a to minimize impacts to wetlands to the east of the crossing and steep topography to the west.

One C(ts) and three C(t) streams will be impacted by collection line crossings. The North Branch of the Wiscoy (Stream S556) will be crossed by underground collection line via directional drilling; therefore, there will be no impacts to the stream bank or bed. Stream S1 will be crossed via trenching to place underground collection lines. Although this stream is designated C(t), it is an intermittent stream at the point of crossing and is not likely to sustain trout populations in this reach. Smith Creek (Stream S558) will be crossed by overhead collection lines; therefore, there will be no impacts to the stream bed or bank. Electrical poles will be placed a minimum of 50 feet from the banks of Smith Creek to avoid impacts. Streams S1532 and S111 will be crossed at existing roadway crossings; therefore, additional disturbance by construction will be minimal.

Stormwater

Construction of the Project could impact the quality of stormwater runoff. Indirect impacts to surface waters could potentially result from construction activities including increased sedimentation and turbidity caused by increased surface runoff from disturbed areas. Stormwater pollution could potentially arise from the release of pollutants or hazardous materials in the event of a spill during construction. Impacts could include the release of fuels or oils to surface water and/or groundwater.

2.6.2 Project Facility Impacts

Groundwater

The Project facilities are not expected to have any permanent impacts on shallow groundwater within the Project Site since the Project will only add small areas of impervious surface (approximately one half acre of impervious surface from the turbine pedestals) to the Project Area. The effect on groundwater recharge will therefore be negligible. The introduction of pollutants to groundwater from spills of petroleum and other chemicals during operation of the Project could impact groundwater. The implementation of BMPs and spill prevention measures set forth in the Storm Water Pollution Prevention Plan (SWPPP) during operation and maintenance activities associated with the Project are expected to eliminate impacts to local aquifers and private residential drinking water wells within or outside the Project Site. See Section 2.6.3 for a full discussion of the proposed mitigation measures.

Surface Water

No significant impacts are expected to streams in the Project Area resulting from the operation of Project facilities. After construction is complete, temporary access roads will be reduced to 12-foot permanent access roads. Access roads will be stabilized with culverts and maintained as necessary. The presence of underground and overhead electrical transmission lines will have no impact on stream ecology or function.

Protected Streams

The permanent access road across Stream S94 will be maintained as necessary. A maintained access road at this location will minimize adverse impacts that are a result of the current condition of the crossing.

Stormwater

A significant increase in impervious surface will not result from the Project facilities. Tower pedestals will add a total of 0.4 acre of impervious surface to the 9,151-acre Project Area. Therefore, no significant changes to stormwater runoff volumes are anticipated. The access roads and turbine sites will be gravel based, which will allow stormwater to continue to infiltrate into the soil.

2.6.3 Mitigation

Several measures will be implemented to ensure surface water quality protection, including the SWPPP, which will require the use of sediment and erosion control measures and BMPs; environmental monitoring of the site, which will occur during construction and site restoration in accordance with Noble's construction plan (see Section 2.27, Description of the Proposed Construction Plan) and the SWPPP; and the Quality Assurance Plan, which will contain permit conditions and other commitments made by Noble during the Project permitting, including those associated with stream disturbance, stormwater management, and erosion control.

The SWPPP will encompass all requirements set forth by the NYSDEC State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activities and will include an erosion and sediment control plan, measures for post-construction runoff control, and a spill prevention plan. Furthermore, sediment and erosion control devices will be monitored weekly (at a minimum) and after precipitation events greater than 0.5 inch, as per SPDES regulations. The SWPPP will be submitted to the Towns for review prior to construction.

Stormwater pollution prevention measures will be implemented via the SWPPP and are identified in Appendix Q. BMPs that will be used during construction to prevent excess stormwater runoff from the construction areas will be described in detail in the SWPPP. The SWPPP will address BMPs that will take place on site to prevent spills and, in the event of a spill, response procedures that will minimize groundwater and surface water impacts. Any spillage of fuels, waste oils, other petroleum products or hazardous materials shall be reported to the NYSDEC's Spill Hotline (1-800-457-7362) within 2 hours. Any increase in stormwater discharges resulting directly from the construction of the Project will be documented in the SWPPP and permitted through a SPDES General Permit for Stormwater Discharges from Construction Activities. Furthermore, measures will be taken to maintain the site with BMPs for post-construction runoff control to ensure that all new facilities consistent with the operation of the Project do not create any additional stormwater runoff than was generated during pre-construction conditions.

Groundwater impacts will be minimized through SWPPP implementation. All surface soils that are temporarily compacted will be de-compacted and/or mitigated as described in the construction plan. Instances of soil compaction will be minimized through SWPPP BMPs, including the segregation of subsoil and topsoil, use of geotextiles to prevent compaction, and soil compaction mitigation where appropriate. Similar activities in wetlands, if encountered, will be governed by NYSDEC and USACE permits.

If shallow groundwater enters the excavation areas during turbine foundation placement, it may be pumped out during installation of the foundation. Any groundwater that is pumped out of a foundation excavation will be discharged to an area (approved by the landowner) that will either direct the flow toward existing waterbodies or temporarily retain the water until it can infiltrate back into the ground. Specific details relating to the pumping of groundwater will be included in the SWPPP. Temporary sediment traps or the controlled release of water over vegetated areas will be utilized during construction to intercept and manage sediment-laden runoff from dewatering of turbine foundations. Based on engineering designs contained in the SWPPP, the control practices will retain the runoff and allow sediment to settle prior to discharge. For dewatering practices, the sediment

traps shall be placed adjacent to the turbine foundations, with the outlet discharging to a swale, a ditch, or vegetated areas.

Surface water impacts have been minimized by siting Project components away from surface water resources to the greatest extent practicable. However, it will be necessary to cross streams for installation of access roads and collection lines. During construction, appropriate erosion control measures (e.g., silt fences or straw bale dikes) will be used to limit the area of impact to surface waters in accordance with USACE and NYSDEC permit requirements. Any sediment runoff or increased turbidity to surface waters as a result of construction will be minimal as a result. Any disturbance within 50 feet of protected stream banks will be permitted by NYSDEC and any resulting impacts will be mitigated. Other measures that will be implemented to minimize impacts to streams during construction include:

- In protected streams, all in-stream work, as well as any work that may result in the suspension of sediment shall not occur during the trout spawning and incubation period commencing October 1 and ending April 30, unless prior approval is obtained by NYSDEC;

- Clearing of natural vegetation will be limited to the material which poses a hazard or hindrance to construction. Snags which provide shelter in streams for fish will not be disturbed unless they cause serious obstructions, scouring, or erosion. Trees will not be felled into any stream or onto the immediate stream bank;

- All culverts will be designed to meet appropriate hydraulic capacity and structural integrity criteria;

- There will be no widening or constriction of the stream channel bed through the road crossing, and no berms will be constructed on the stream banks;

- The elevation of the road will be a minimum of 6 inches higher at the culvert than at 25 feet on either side of the culvert to allow road surface water to exit the roadway and leach through the vegetation before entering the stream;

- If culverts with bottoms are to be used, including round culverts, they will be installed so that at least 20% of the culvert's height is embedded below the existing stream bed at the outlet end of the culvert. The streambed material that is excavated to accommodate culvert placement will then be spread evenly on the bottom of the new culvert. If it is not practical to spread streambed material throughout the entire bottom of the new culvert, material will be spread in the culvert at the inlet and outlet ends gradually up to streambed elevation to promote natural deposition. Culverts with bottoms, including round culverts, will not be used if the streambed is bedrock;

- Road banks within 50 feet of the culvert will be adequately protected with riprap or seeded and mulched within 7 days of completion of the culvert crossing. Road banks sloped steeper than 1 foot vertically to 3 feet horizontally will be protected with clean rock riprap 6 inches in diameter or larger. Mitigation of stream disturbances within 50 feet of protected streams will be coordinated with the applicable agencies. This may include planting of shrubs along the stream bank as would be dictated by NYSDEC and the USACE;

- During periods of work activity, flow immediately downstream of the work site will equal flow immediately upstream of the work site; and

- Additional recommendations identified by NYSDEC or USACE during permitting process.

Access roads and collection lines have been collocated with existing stream crossings whenever possible to avoid creating new disturbances across these resources. In addition, many Project facilities have been placed in areas that are already disturbed in an effort to improve these areas, including placing access roads at existing logging and all-terrain vehicle (ATV) trails that currently disturb stream beds. In most cases, only minor improvements such as replacing culverts will be required. Improvements at these existing crossings may have a positive impact on these streams. For instance, Stream S94 will be crossed by an access road at a location that is currently utilized as a logging road. No defined stream bed or banks are present in this portion of the stream as it is continuously impacted by these vehicles. Construction of a stream crossing will improve the condition of this portion of the stream by providing an alternate route.

In some cases, the crossing of a stream will be required to minimize impacts to other resources. For instance, the crossing of Stream S1a is required to minimize impacts to an adjacent wetland. This was determined as the best access route to Turbine 2 with minimal environmental impact as the road avoids impacts to the wetlands to the east and steep topography to the west. The crossing over Stream S68 was sited to minimize impacts to the agricultural field that borders the stream to the west and to avoid impeding drainage from the agricultural field to the stream. The crossing will be located in an area where the intermittent drainage from the agricultural field becomes channelized and the topography is such that installation of a culvert will result in little or no impact to both the stream and the agricultural field. The crossing of Stream S527 is just south of Stream S68 on the same access road and will be constructed to minimize impacts to the stream and adjacent agricultural field.

Both overhead and underground collection lines will be installed across streams. To minimize impacts, wetland mats will be used to bridge streams to prevent impacts associated with equipment crossing. Any in-stream disturbance, such as trenching, will take place during dry conditions to minimize downstream impacts. If water is present at the time of crossing, Noble will dewater the area with either

a flume crossing or a dam and pump crossing to minimize stream impacts. To further minimize impacts to streams, any stream crossing trench shall be opened, installation accomplished, and backfilled in one continuous operation, thus limiting the duration of in-stream work. Only the excavated stream bed material shall be utilized as backfill. Poles for overhead collection lines will be placed as far away from riparian areas as possible to avoid or minimize any disturbance to streams. Woody vegetation along the stream bank will be cut in some places, but stumps will be left in place to protect against erosion. Stream crossings will be engineered, designed, and installed to maintain sufficient flow during construction in accordance with applicable regulations. These methods will be provided to the Towns via the Joint Wetland Permit Application upon submittal of the application to NYSDEC and the USACE.

Table 2.6-1 Stream Crossings within the Project Site, Noble Wethersfield Windpark

Cluster ID*	Stream ID	Stream Name	Stream Bank Height (feet)	Width of Water (feet)	Stream Bank to Bank Width (feet)	Substrate	Flow	NYSDEC Classification
3	S32	Unnamed Tributary to North Branch Wiscoy Creek	3-6	1-2	4-5	Cobbles/ Gravel/ Silt/Clay	Intermittent	C[1]
3	S1004	Unnamed Tributary to North Branch Wiscoy Creek	3-6	1-2	4-6	Cobbles/ Gravel/ Silt/Clay	Intermittent	C
28	S1a	Unnamed Tributary to Cattaraugus Creek	0-3	2-4	15	Gravel/Silt/ Clay	Perennial	C(t)
Collection between 1 and 2	S1	Unnamed Tributary to Cattaraugus Creek	0-3	2-3	2-3	Gravel/Silt/ Clay	Perennial	C(t)
Collection between 3 and 12	S1056	Unnamed Tributary to North Branch Wiscoy Creek	0-3	2	3	Gravel/Sand/Silt/Clay	Perennial	C
Collection between 4 and 5	S1059	Unnamed Tributary to Spring Brook	3-6	3-6	15	Gravel/Silt/ Clay	Perennial	C
Collection between 4 and 5	S1532	Unnamed Tributary to Spring Brook	0-3	3	3	Silt/Clay/ Vegetated	Intermittent	C(ts)
9	S68	Unnamed Tributary to North Branch Wiscoy Creek	0-4	1-2	3-8	Cobbles/Silt/ Clay	Intermittent (at data point)	C[1]
9	S527	Unnamed Tributary to Wiscoy Creek	0-3	2-4	3-5	Gravel/Silt/ Clay	Perennial	C[1]
Collection between 6 and 8	S59 (also see S1060)	Unnamed Tributary to Spring Brook	0-3	3-10	10	Bedrock/ Gravel/Silt/ Clay	Perennial	C
Collection between 7 and 10	S1525	Unnamed Tributary to North Branch Wiscoy Creek	3-6	0.5-1	1-3	Gravel/Silt/ Clay	Intermittent	C[1]
Collection between 7 and 10	S556	North Branch Wiscoy Creek	0-3	8-10	50	Gravel	Perennial	C(t)
Collection between 10 and 11	S1023	Unnamed Tributary to North Branch Wiscoy Creek	0-3	4	5-6	Cobbles/ Gravel/Silt/ Clay	Intermittent	C
13	S94	Unnamed Tributary to East Fork Tonawanda Creek	0-3	1-2	2-2.5	Gravel/Silt/ Clay	Intermittent	A(t)
Collection between 14 and 15	S552	Unnamed Tributary to Smith Creek	0-3	3	5	Silt/Clay	Perennial	C[1]
Collection between 13 and 21	S111	Unnamed Tributary to Smith Creek	3-6	20	20	Boulders/ Silt/Clay	Perennial	C(t)

Table 2.6-1 Stream Crossings within the Project Site, Noble Wethersfield Windpark

Cluster ID*	Stream ID	Stream Name	Stream Bank Height (feet)	Width of Water (feet)	Stream Bank to Bank Width (feet)	Substrate	Flow	NYSDEC Classification
Collection between 13 and 21	S1049	Unnamed Tributary to Smith Creek	0-6	4	16	Cobbles/ Gravel	Perennial	C
Collection between 20 and 21	S126	Unnamed Tributary to East Koy Creek	0-3	4	6	Gravel/Silt/ Clay	Perennial	C
Collection between 24 and 26	S558	Smith Creek	0-3	10	20	Gravel/Sand	Perennial	C(t)
Collection between 24 and 26	S1040	Unnamed Tributary to East Koy Creek	0-3	3-6	20	Cobbles/ Gravel/Sand	Perennial	C
Collection between 26 and 27	S119	Unnamed Tributary to East Koy Creek	0-3	3	20	Gravel/Silt/ Clay	Perennial	C

* No streams were identified in Sector D because all turbines have been deleted from that sector. No streams in Sector E will be disturbed.

[1] Classification assigned to tributaries or sub-tributaries as listed in Article 8 of New York Code of Rules and Regulations.

2.7 Wetlands: Environmental Setting

A study was conducted to determine the extent and quality of wetlands within the Project Area that could potentially be impacted by the Project. The study consisted of a desktop review of existing wetland location information and mapping available from New York State Department of Environmental Conservation (NYSDEC) Freshwater Wetland and National Wetland Inventory (NWI) maps, among others, and a wetland delineation survey conducted specifically for the Project.

The desktop review indicated that wetlands under state and federal jurisdiction were likely to exist within the Project Area. Based on the results of the desktop review, field reconnaissance-level surveys were conducted to develop general siting constraints. Additional reconnaissance-level surveys were conducted during the siting process. Detailed wetland delineations were conducted within a defined survey corridor based on preliminary siting of facilities. The survey corridor generally included a 300-foot corridor centered on linear facilities and a circular area with a 250-foot radius surrounding each turbine. In some areas surveys were restricted or expanded (i.e., restricted due to property access or expanded to ensure that regulated buffers adjacent to NYSDEC wetlands were identified). The goal of the delineation effort was to identify and document wetlands that potentially would be temporarily or permanently disturbed as a result of construction or operation of the proposed facilities. This information was then used to adjust the turbine sites, roads, and electrical collection to avoid and minimize impacts to wetlands to the extent practicable. The wetland delineations took place within the approximately 1,370-acre survey corridor and resulted in the delineation of 168 wetlands within the survey corridor, totaling approximately 41 acres. Activities within wetlands with an apparent hydrologic connection to waters of the United States are regulated by the United States Army Corps of Engineers (USACE). Generally, NYSDEC regulates wetlands that are 12.4 acres (5 hectares) or larger. Some small, isolated wetlands may not fall under the jurisdiction of either agency. Final determinations of jurisdiction will be made by the regulatory agencies' subsequent field review.

This section provides a summary of the number, acreage, and potential federal and state protection of existing wetlands delineated within the survey corridor. Section 2.8, Wetlands: Impacts and Mitigation, discusses the wetlands that will be impacted by the Project. The existing wetland habitat is summarized in Section 2.9, Biological Resources: Environmental Setting. Streams and other surface waterbodies were also identified during the field investigation and are discussed in Section 2.5, Water Quality: Environmental Setting, and Section 2.6, Water Quality: Impacts and Mitigation. A more detailed discussion of the existing conditions for wetlands and waterbodies is included in the Wetland and Waterbodies Report included as Appendix E.

2.7.1 Preliminary Data Review

Prior to conducting wetland delineations, information sources were reviewed including color-infrared aerial photographs of the Project Area (see Figure E-3 in Appendix E), USGS 7.5-Minute Series topographic maps (see Figure E-4 in Appendix E), United States Fish and Wildlife Service (USFWS) NWI maps (see Figure E-5 in Appendix E), NYSDEC Freshwater Wetlands maps (see Figure E-5 in Appendix E), and Wyoming County soil surveys (see Figure E-6 in Appendix E).

United States Geological Survey (USGS) topographic maps and aerial photos were used to identify locations in the Project Area where presence of wetlands is possible. NWI maps provided another source for identifying potential wetland locations. Due to the scale of aerial photography (generally 1:24,000) used and other factors, all NWI map boundaries are approximate (USFWS 2006). NWI maps depict 202 wetland complexes occurring throughout the Project Area. NYSDEC Freshwater Wetlands Maps were used to identify NYSDEC-regulated wetlands. These maps were developed by NYSDEC from a variety of resources including aerial photographs, soil surveys, and field verification. Eleven state-regulated wetlands within the Project Area were depicted on NYSDEC Freshwater Wetland Maps. The Wyoming County Soil Survey indicated the presence of hydric soils and soils with potential hydric inclusions throughout the Project Area. Based on the results of the desktop review, it was determined that field surveys would be required to define the extent of wetlands in the Project Area.

Federally Regulated Wetlands

Section 404 of the Clean Water Act authorizes the USACE to issue permits regulating the discharge of dredged or fill materials into the waters of the United States, including wetlands. There is no minimum size for wetlands to be regulated under federal jurisdiction; however, wetlands that do not have a hydrological connection to waters of the United States may not be subject to federal jurisdiction. There are no regulatory maps identifying federally jurisdictional wetlands.

State-Regulated Wetlands

Under Article 24 of the New York State Environmental Conservation Law (ECL), New York State (NYS) regulates wetlands that exceed 12.4 acres (5 hectares) in size, or have unusual local importance. Noble consulted with NYSDEC regarding threatened and endangered and locally significant communities and have utilized NYSDEC mapped regulated wetland layers. No wetlands of unusual local importance were identified by NYSDEC in the Project Area. NYS also regulates a 100-foot upland buffer area surrounding each regulated wetland to protect the wetland. Work within state-regulated wetlands and the regulated adjacent area requires a permit from NYSDEC.

Based on analysis of NYSDEC mapping, 11 wetlands (totaling approximately 356 acres) under the jurisdiction of NYS lie within the Project Area. Table 2.7-1 provides a summary of NYSDEC-mapped wetlands within the Project Area, an indi-

cation of whether any portion of the wetland was delineated in association with the Project, and the delineated wetland identification numbers assigned to those portions of the wetland during delineations. Additional information regarding each delineated wetland is included in Appendix E.

Data provided by NYSDEC indicates that the wetlands within the Project Area range from Class II to Class IV wetlands. According to NYSDEC, Class II wetlands provide important wetland benefits, the loss of which is acceptable only in very limited circumstances. Impacts on these wetlands are permitted but only if it is determined that the proposed activity satisfies a pressing economic or social need that clearly outweighs the loss of or detriment to the benefit(s) of the Class II wetland. Class III wetlands supply wetland benefits, the loss of which is acceptable only after the exercise of caution and discernment. Class IV wetlands provide some wildlife and open space benefits, the loss of which is acceptable if it is determined that the activity is the only practicable alternative which could accomplish the applicant's objectives.

Five mapped NYSDEC Freshwater Wetlands (BL-5, BL-7, PI-9, WW-6, and WW-7) are located within the survey corridor. Relevant portions of these wetlands were delineated. An additional mapped NYSDEC Wetland (BL-6) is directly adjacent to the survey corridor, but was not field delineated due to lack of property access. Because this wetland is adjacent to a public roadway (Maxwell Road), field teams were able to perform roadside surveys to determine the extent of the wetland boundaries and to estimate the adjacent buffer. These surveys confirmed that the wetland boundary extends to the roadside. For the purpose of assessing impacts to the regulated buffer, the east side of Maxwell Road was considered to be the wetland boundary.

The remaining five mapped NYSDEC wetlands were not delineated because no facilities were sited in the vicinity of the wetlands (see Figures E-5 and Appendix J in Appendix E).

2.7.2 Field Delineation

Detailed wetland delineations were conducted in the survey corridor based on preliminary siting of facilities. One hundred and seventy-four wetlands (i.e., areas with hydrophytic vegetation, hydric soils, and wetland hydrology) were delineated within the survey corridor. One hundred and sixteen (116) delineated wetlands have an obvious connection to waters of the United States and are likely to be subject to federal regulation. The remaining 58 wetlands had no apparent connection to waters of the United States. Each wetland that was delineated was assigned a general cover type classification based on the Cowardin Classification System (i.e., Palustrine Forested [PFO], Palustrine Shrub/Scrub [PSS], Palustrine Emergent [PEM]). These are discussed in greater detail in Appendix E.

Table 2.7-2 provides a summary of the number and acreage of delineated wetlands broken down by vegetative cover type and likely federal and state jurisdictional

status. Field verifications by USACE and NYSDEC staff are pending and jurisdictional determinations will be made by each agency subsequent to verifications. Table E-5 in Appendix E provides a summary of the delineated wetlands, vegetative cover type, hydrologic connection to waters of the United States, NYSDEC jurisdictional status, and additional comments regarding the existing conditions at each wetland. Appendix J of the wetland delineation report (Appendix E) depicts the delineated wetlands within the survey corridor. Wetland delineation methods are discussed in Appendix E.

Table 2.7-1 Mapped NYSDEC Wetlands in the Project Area, Noble Wethersfield Windpark

NYSDEC Wetland ID	Class	Delineated Wetland ID
BL-5	II	W556
BL-7	II	W134, W562, and W563
PI-9	IV	W73
WW-6	III	W842
WW-7	II	W558 and W839
BL-6	II	Roadside delineation due to restricted access
BL-8, JO-18, JO-19, PI-1, PI-10	II and III	No portion delineated; no facilities in the vicinity

Table 2.7-2 Delineated Wetland Summary, Noble Wethersfield Windpark

Wetland Community Type	Acreage of Wetland Delineated (No. of Wetlands Delineated)	Acreage of Wetland Under Federal Jurisdiction* (No. of Wetlands Under Federal Jurisdiction)	Acreage of Wetlands With No Apparent Connection to Waters of the United States** (No. of Wetlands With No Apparent Connection to Waters of the United States)	Acreage of Wetlands Under the Jurisdiction of NYSDEC*** (No. of Wetlands Under NYSDEC Jurisdiction)
PFO	0.56 (7)	0.47 (6)	0.09 (1)	0.03 (1)
PEM/PSS/PFO	11.50 (19)	11.42 (18)	0.08 (1)	NA
PEM/PFO1	0.64 (1)	0.64 (1)	NA	NA
PEM/PFO	1.90 (19)	1.61 (14)	0.29 (5)	NA
PSS	0.18 (2)	0.13 (1)	0.05 (1)	NA
PSS/PEM/POW	0.20 (1)	NA	0.2 (1)	NA
PEM/PSS	16.15 (26)	15.71 (19)	0.44 (7)	11.53 (4)

Table 2.7-2 Delineated Wetland Summary, Noble Wethersfield Windpark

Wetland Community Type	Acreage of Wetland Delineated (No. of Wetlands Delineated)	Acreage of Wetland Under Federal Jurisdiction* (No. of Wetlands Under Federal Jurisdiction)	Acreage of Wetlands With No Apparent Connection to Waters of the United States** (No. of Wetlands With No Apparent Connection to Waters of the United States)	Acreage of Wetlands Under the Jurisdiction of NYSDEC*** (No. of Wetlands Under NYSDEC Jurisdiction)
PEM	9.93 (93)	7.65 (53)	2.28 (40)	2.36 (3)
Total Wetlands Delineated Within the Survey Corridor	(168)	(112)	(56)	(8)
Total Acreage of Delineated Wetlands Within the Survey Corridor	41.06	37.63	3.43	13.92

* Includes wetlands for which a surface water connection to waters of the United States was identified during field surveys. It is likely that these wetlands will be determined to be federally jurisdictional. The jurisdictional determination will be made by the USACE.

** Includes wetlands for which no apparent surface water connection to waters of the United States was identified during field surveys. These wetlands may not be federally jurisdictional. The jurisdictional determination will be made by the USACE.

*** Includes delineated wetlands that overlap/correspond with NYSDEC mapped freshwater wetlands that are assumed to be under the jurisdiction of the state. The jurisdictional determination will be made by NYSDEC.

Key:

NA = Not applicable.

2.8 Wetlands: Impacts and Mitigation

This section discusses impacts to wetlands as a result of construction and operation of the Project. Project facilities have been sited to minimize or avoid wetland impacts to the greatest extent practicable, although to meet the Project objectives, some unavoidable wetland impacts will occur. Section 2.8.3 provides a discussion of measures to avoid, minimize, and mitigate for unavoidable wetland impacts. A detailed discussion of wetlands within the Project Area is provided in the wetland delineation report in Appendix E.

One hundred and sixty-eight wetlands (168), totaling approximately 41 acres were identified and delineated within the approximately 1,370-acre survey corridor. Activities within most of the delineated wetlands are subject to federal and/or state regulations. Noble will file appropriate permit applications with the United States Army Corps of Engineers (USACE) and New York State Department of Environmental Conservation (NYSDEC). A summary of USACE and NYSDEC regulations pertaining to wetlands is provided in Section 2.7, Wetlands: Environmental Setting.

The wetland impact discussion provided in this section is broken down by impacts during construction and impacts resulting from operation of the Project facilities. Impacts during construction include all areas to be disturbed during construction activities, as such; they include all temporary and permanent impacts related to clearing, grading and placement of fill. Temporary impacts are defined as wetlands that will be affected by filling or excavation where the Project Site will be restored to preconstruction contours and elevation; therefore, the temporary nature of these impacts relates to grading and placement of fill and does not take the loss of forest cover into consideration. Permanent loss of forest cover is discussed under operation impacts along with permanent placement of fill and potential future impacts due to maintenance activities.

Construction of the access roads, collection lines, and turbine sites will result in disturbance of a total of 0.96 acre of wetlands, of which, approximately 0.09 acre will be permanently impacted by placement of fill for the 12-foot gravel access roads required for operation of the Project. The remaining 0.87 acre of wetland impacted during construction will be returned to preconstruction contours and allowed to revegetate to shrub/scrub or emergent cover; as such, these impacts are reported as temporary impacts. In addition, operation of the Project facilities will result in permanent conversion of 0.25 acre of forested wetland to shrub/scrub or emergent wetland as a result of periodic removal of woody vegetation adjacent to access roads and within collection system corridors.

Of the 0.96 acre of wetlands disturbed during construction, 0.64 acre is federally jurisdictional. The remaining 0.32 acre may not be federally regulated because they have no apparent connection to waters of the United States. Of the 0.64 acre of wetlands under federal jurisdiction, 0.19 acre is also under the jurisdiction of New York State (NYS). Construction of the Project will also result in impacts to

2.11 acres of upland buffer regulated by NYS adjacent to the state jurisdictional wetlands. Jurisdictional determinations will be confirmed by the USACE and NYSDEC in the spring of 2007. Tables 2.8-1 and 2.8-2 provide a summary of the temporary and permanent impacts and likely federal and state jurisdiction, respectively.

2.8.1 Construction Impacts

During Project construction, wetlands will be disturbed to provide sufficient access to accommodate construction equipment and staging areas at each turbine location, access road, and collection line, to safely and efficiently erect and construct the facilities. Impacts during construction include all temporary and permanent impacts related to clearing, grading and placement of fill. The majority of the wetlands impacted during construction (0.87 acre) will be returned to pre-construction contours, as such, these impacts are reported as temporary impacts. Use of the 5-acre temporary laydown area will not result in temporary or permanent impacts to wetlands, as no wetlands were identified within the laydown area during field delineations.

Turbines

Construction of the turbines will result in a total impact of 0.05 acre to wetlands; all of which are temporary impacts. Of the 0.05 acre of impacts, 0.01 acre contains temporary impacts to federally jurisdictional wetlands and 0.04 acre contains temporary impacts to isolated wetlands. No NYSDEC wetlands or regulated adjacent buffers will be impacted by construction of turbines. Each turbine will require a staging area of 200 by 200 feet to stage turbine parts and position construction equipment around the turbine site. Sufficient space is needed around the turbine base to maneuver equipment and avoid safety hazards for construction workers. The staging areas were sited around the turbines to avoid impacts to wetlands as much as possible, while still providing a safe and functional work space to erect the towers. Turbines were sited considering this construction condition; however, required setbacks and minimization of impacts to agricultural uses and forestlands constrained the location of four turbine staging areas. Unavoidable temporary impacts will occur to isolated wetlands within the turbine staging areas for Turbines T7, T21 and T89. The temporary staging area associated with Turbine T42 will result in impacts to an emergent wetland located in a depressional area within an active agricultural field that is repeatedly subjected to disturbance associated with farming activities. Turbine T42 was sited within an active agricultural field to avoid impacts to wetland and upland communities in the adjacent forest.

Within the temporary turbine staging areas, vegetation will be cleared, and, if necessary, it will be graded to be nearly level. The site contours of the turbine staging areas have been designed to utilize the existing base contours rather than importing significant fill volumes. After construction, the contours within wetland areas will be restored to the extent possible while maintaining the integrity of the tur-

bine base. The staging areas will also be revegetated. Construction of the turbines will not result in impacts to forested wetlands.

Access Roads

Construction of access roads will result in impacts to 0.31 acre of wetlands; of which, 0.22 acre contains temporary impacts and will be restored to preconstruction contours. Of the 0.22 acre of wetlands that will be temporarily impacted by construction of access roads, 0.13 acre has been determined to be federally jurisdictional during field surveys and the remaining 0.09 acre of impacts will be to isolated wetlands (Note: this is a preliminary determination subject to final verification by the USACE). The temporary access road construction right of way (ROW) will not impact state-regulated wetlands. However, construction of Access Road 3 (serving Cluster 3) will result in impacts to 0.14 acre of the adjacent buffer associated with NYSDEC Wetland BL-6; of which 0.10 acre will be restored to pre-construction contours and, therefore, considered a temporary impact.

Construction of access roads will result in impacts to 0.03 acre of mixed emergent/shrub-scrub/forested wetlands that contain a forest component. These areas will be maintained to prevent reestablishment of trees.

Construction impacts within wetlands will include the clearing of vegetation and grading within a 40-foot construction road ROW. The actual temporary access road width for construction will be 30 feet. While a 60-foot corridor will be utilized in upland areas to provide safe egress and ingress of construction vehicles to the turbine sites, the narrower 40-foot disturbance corridor will be used in wetland areas to minimize impacts. Culverts and fords will be installed during road construction in appropriate areas to maintain wetland hydrology while the roads are in place. Typical design drawings of these methods are included in Appendix B. Noble will require a permanent access road of 12 feet in width to each turbine. In wetlands and other low-lying areas, a 2-foot shoulder on either side of the road may be required. After construction is completed the additional road width required for construction will be removed.

Collection Lines

Construction of both overhead and underground collection systems will result in impacts to 0.60 acre of wetlands; all of which are temporary impacts and will be restored to pre-construction contours. Of the 0.60 acre of temporary impacts, 0.46 acre will be to federally jurisdictional wetlands and the remaining 0.14 acre of impact will be to isolated wetlands. Construction of the collection system will result in temporary impacts to 0.19 acre of wetland that is under the jurisdiction of NYSDEC (note: this is included in the 0.46 acre reported as federally jurisdictional) and 2.11 acres of upland buffer. Additionally, installation of overhead collection lines will result in negligible impacts to wetlands under federal and state jurisdiction, due to the placement of one to three poles within a wetland along Wolcott Road. While the final pole layout has not been designed at this time,

poles will be installed from Wolcott Road in order to minimize impact to the wetlands.

Construction of collection lines will result in impacts to 0.22 acre of mixed emergent/shrub-scrub/forested that contain a forest component. These areas will be maintained to prevent reestablishment of trees. Construction of the collection system will not result in impacts to forested NYSDEC wetlands or adjacent areas.

Impacts on wetlands located within the electrical collection system corridors include the clearing of forested and woody vegetation and trenching to install underground collection lines. The clearing is necessary for equipment movement and pole plants. These areas will be returned to preconstruction contours and will be allowed to revegetate to an emergent or scrub-shrub community where feasible. Where possible the electrical collection lines will be installed below ground immediately adjacent to the operational access roads. Where collection lines cannot be installed adjacent to an access road, the lines will be installed within a corridor ranging between 22 feet wide for one circuit and up to 50 feet wide for four circuits. The lines will be placed inside a narrow trench with an impervious bedding material and backfilled with native material. The narrow collection system trenches will not create an impervious boundary and therefore will not cause any alteration in the subsurface hydrology of wetlands. Pre-existing contours will be restored after the trench is backfilled and the area is revegetated. No permanent filling of wetlands will occur.

One wetland under federal and state jurisdiction (NYSDEC Wetland BL-5) that is associated with the North Branch of the Wiscoy Creek, will be crossed by underground collection installed by horizontal directional drilling (HDD), to protect the wetland and stream. Installation equipment will be located outside of the wetland, resulting in no impact to the wetland. However, there is also a potential for additional impacts to the wetland should a release of drilling fluids occur during installation utilizing HDD.

2.8.2 Project Facility Impacts

Project facilities will have minimal impacts on wetlands. Of the 0.96 acre of wetland disturbed during construction, 0.09 acre will be permanently impacted by the 12-foot gravel access roads required during the Project operations. The Project facilities may result in minimal impacts (<0.01 acre) to NYSDEC wetland WW-6 associated with installation of up to three electric utility poles. Access Road 3 (serving Cluster 3) will result in permanent impacts to 0.04 acre of the adjacent buffer associated with NYSDEC Wetland BL-6.

In addition, maintenance of Project facilities will result in permanent conversion of 0.25 acre of forested wetland to shrub/scrub or emergent wetland as a result of periodic removal of woody vegetation adjacent to access roads and within collection system corridors. Additional impacts to wetlands under federal and state jurisdiction may result from maintenance activities during operation of the Project.

Maintenance activities associated with the operation of the Project may include routine maintenance of turbines, electrical line service, and selective vegetative pruning.

Turbines

There will be no permanent impacts on wetlands from the turbines.

Access Roads

The 12-foot wide permanent access roads will result in 0.09 acre of permanent impact to wetlands associated with wetland fill. Of this, 0.04 acre is federally jurisdictional, and 0.05 acre may not be federally regulated because these wetlands have no apparent connection to waters of the United States. No impacts to wetlands under state jurisdiction will result from access roads. However, when complete, Access Road 3 (serving Cluster 3) will result in permanent impacts to 0.04 acre of the adjacent buffer associated with NYSDEC Wetland BL-6.

Construction of access roads will result in impacts to 0.03 acre of wetlands with a forest component (these wetlands also contain emergent and shrub-scrub components). The corridor used during construction will be maintained during operation of the Project to prevent reestablishment of trees. These areas will be periodically maintained to retain an herbaceous or shrub-scrub cover. Therefore, maintenance of the access roads will result in the permanent conversion of 0.03 acre of wetlands with a forest component to herbaceous or shrub-scrub wetlands.

Collection Lines

There will be no permanent impacts to wetlands under federal or state jurisdiction associated with fill resulting from the underground collection lines. The overhead collection lines will result in negligible impacts to wetlands under federal and state jurisdiction along Wolcott Road (NYSDEC wetland WW-6), due to the placement of one to three poles.

Four delineated wetlands that correspond to mapped NYSDEC wetlands, BL-5, BL-7, WW-6, and WW-7, will be crossed by overhead or underground collection lines. However, permanent impacts to wetlands under state jurisdiction and the associated adjacent buffers will be limited to the area occupied by one to three poles for overhead collection within wetland WW-6 and additional poles adjacent to wetlands WW-6 and WW-7 resulting in a negligible impact to wetlands and the associated adjacent areas. The pole layout has not yet been designed.

Maintenance of collection lines will result in impacts to 0.22 acre of wetlands with a forest component within mixed emergent/shrub-scrub-forested wetlands. The corridor used during construction will be maintained during operation of the Project to prevent re-establishment of trees. These areas will be periodically maintained to retain an herbaceous or shrub-scrub cover. Therefore, maintenance of the collection system will result in the permanent conversion of 0.22 acre of wetlands with a forest component to herbaceous or shrub-scrub wetlands. Con-

struction of the collection system will not result in impacts to forested NYSDEC wetlands or adjacent areas.

2.8.3 Mitigation

As part of the detailed alternatives analysis presented in Section 1.3, Noble completed an intensive multi-phased siting process considering factors that included topography, location of wetlands and other sensitive resources, availability of sufficient wind resources, proximity to existing roads and transmission lines, locations of residential dwellings, and landowner access agreements. Each of these factors imposed limitations on the amount of flexibility available during the turbine siting process. Once these factors were considered, turbines and ancillary facilities (i.e., roads and collection system) were sited to minimize environmental impacts. Where possible, Noble made every effort to co-locate electrical lines and roads within the same corridor; optimize the use of previously disturbed areas such as farmlands and roads; and avoid crossings of wetlands and streams. Despite an extensive effort to entirely avoid wetland impacts, because of other constraints and the linear nature of some Project components, it was not possible to design the Project without minimal impacts on wetlands while still meeting Project objectives. The process undertaken by Noble to minimize wetland impacts in the design of this Project is described below.

Wetland Study and Siting

A wetland study was conducted to determine the extent and quality of wetlands with the potential to be impacted by the Project. The wetlands study consisted of a desktop review of existing wetland location information and mapping, reconnaissance level wetland surveys, and detailed wetland delineations. Each phase of the wetland study was used to refine siting for the Project facilities to minimize impacts to wetlands while balancing impacts to other resources.

The desktop review indicated that wetlands under state and federal jurisdiction were likely to exist within the Project Area. Based on the results of the desktop review, field reconnaissance-level surveys were conducted to develop general siting constraints. The general locations of large wetlands were identified, wetlands and streams were buffered, and these areas were blocked for consideration for turbine siting. Wetlands were considered along with other constraints and a preliminary turbine layout was developed.

A second round of reconnaissance-level wetland surveys was conducted based on the preliminary turbine layout. The primary purpose of the surveys was to refine the preliminary turbine locations to ensure that each site had sufficient space to locate the turbine and associated workspaces outside of wetlands. Additionally, preliminary access road routes were identified during this field effort. Project engineers conducted an initial desktop review of the preliminary access roads and a wetland delineation field survey corridor was established.

Detailed wetland delineations were conducted in the Project Site based on preliminary siting of facilities. The goal of the detailed wetland delineations was to identify and document wetlands that would potentially be temporarily or permanently disturbed as a result of construction or operation of the proposed facilities. The Project Site, or survey corridor, generally included a 300-foot corridor centered on linear facilities and a circular area with a 250-foot radius around each turbine location. In some areas, the Project Site was restricted by property access or other factors, in other areas it was expanded (i.e., additional areas were examined to ensure that regulated buffers adjacent to NYSDEC regulated wetland were accounted for). The delineated wetland boundaries were added to facility mapping and used to further refine the location of turbine sites, roads, and electrical collection to avoid and minimize impacts to wetlands to the extent practicable.

Minimization of Impacts during Construction and Operation of the Project

Every effort was made to avoid wetlands with Project components, and all turbine structures were located outside of wetland boundaries. However, because of the linear nature of the access roads and electrical collection system as well as various engineering constraints, wetland impacts were unavoidable. Access roadways and electrical collection facilities were co-located to the extent practicable to minimize wetland impacts. Additionally, impacts have been minimized by utilizing existing log roads, existing farm roads, and areas disturbed in association with silviculture activities and by utilizing the shortest crossing where possible.

Furthermore, the size of access road and collection line corridors within wetlands has been restricted to the width necessary to safely and effectively construct and transport equipment to the tower sites. The size and weight of the wind turbine components require a stable road surface free of obstructions, thus dictating the amount of woody vegetation that must be cleared and the size of the construction access roads. Roads will be gravel-based and not require any impermeable top coating. Appropriately sized culverts will be used to maintain the hydrologic connectivity of the wetlands. Where possible, these crossings have been co-located with existing crossings; therefore, the opportunity may exist to improve the connectivity of wetland areas currently being crossed without culverting or bridging.

Best Management Practices (BMPs) will be implemented during construction and restoration to minimize impacts on wetland hydrology. These practices include segregation of topsoil and subsoil, use of geotextiles and crane mats where necessary to prevent compaction, and soil compaction mitigation where appropriate. Noble will follow NYSDEC and USACE recommendations in restoration of wetlands to pre-existing contours and vegetated condition. Areas where underground collection lines have been installed will be returned to preconstruction contours, and these areas will then be maintained in an herbaceous or shrubby state, similar to other transmission line corridors.

Appropriate measures will be taken to prevent the introduction of invasion species in the wetland areas disturbed during construction. An invasive species management plan will be developed with consultation from NYSDEC and USACE prior to construction within wetland areas that will include measures to prevent the spread of invasive species, control measures, and monitoring procedures. Maintenance activities associated with the Project facilities may include routine maintenance of turbines, electrical line service, and selective vegetative pruning. No herbicides will be used in the maintenance of any facilities located within or near wetlands.

Noble will utilize BMPs while installing underground collection either with trenching or where HDD is proposed. Trench plugs will be used as required and installed immediately after trench excavation, in order to maintain hydrological conditions. Overhead transmission lines will be installed from existing roadways where possible, limiting wetland impacts to pole placement where necessary.

Noble will implement a SWPPP which will include an erosion control plan and BMPs designed to minimize impacts on wetlands from erosion and sedimentation. During construction in wetland areas, BMPs such as silt fences and hay bale barriers will be used to limit the area of impact. Stormwater pollution prevention measures are provided in Appendix Q.

Mitigation for Unavoidable Impacts

For those wetland impacts that cannot be avoided, mitigation will be required as a condition of the wetland disturbance permits that will be required prior to construction. Within the NYSDEC and USACE permitting requirements, compensatory mitigation can only be considered after the Project proponent demonstrates avoidance and minimization to the extent possible. A Conceptual Wetland Mitigation Plan is provided in Appendix R.

Based on USACE guidance, mitigation can be completed either financially, in the form of in-lieu-fee mitigation, land acquisition for preservation purposes, regional mitigation banking, or in the form of a specific wetland restoration, creation, or enhancement project developed in conjunction with the Project. Depending on agency input and local availability of existing mitigation opportunities, the mitigation may also take the form of a consolidated mitigation plan combining several of the available mitigation options.

Mitigation will be required for unavoidable, permanent impacts on regulated wetlands. The Conceptual Mitigation Plan, provided in Appendix R, takes into account the permanent and temporary loss of wetland functions and values provided by the impacted wetlands. The goal of the mitigation plan is to restore, create, and/or enhance wetland hydrology, and hydric soil conditions to adequately offset the loss of function and value to the jurisdictional wetlands on the site resulting from Project implementation. A final mitigation plan will be developed in conjunction with NYSDEC and the USACE as part of their permitting process. The

final mitigation plan will take into account the site-specific cumulative loss of biological function provided by the impacted wetlands, as well as any identified public value.

Table 2.8-1 Impacts to Federally Jurisdictional Wetlands, Noble Wethersfield Windpark

Facility	Acreage of Wetlands Impacted during Construction (Total Impacts)	Acreage of Wetlands to be Restored to Pre-Construction Contours Following Construction (Temporary Impacts)		Acreage of Wetlands Impacted by Permanent Fill For Project Facilities (Permanent Impacts)	
		Wetlands under Federal Jurisdiction[1] (acres)	Wetlands with No Apparent Connection to Waters of the United States[2] (acres)	Wetlands under Federal Jurisdiction[1] (acres)	Wetlands with No Apparent Connection to Waters of the United States[2] (acres)
Turbine Staging Area	0.05	0.01	0.04	0	0
Road/Collection	0.31	0.13	0.09	0.04	0.05
Underground Collection	0.60	0.46	0.14	0	0
Overhead Collection	0.00	0.00	0.00	0	0
Subtotal Acreage of Wetlands Impacted by Jurisdiction	0.96	0.60	0.27	0.04	0.05
Subtotal Acreage of Impacts during Operation (permanent impacts) and Impacted Areas to be Restored (temporary impacts)	0.96	0.87		0.09	

[1] Includes wetlands for which a surface water connection to waters of the United States was identified during field surveys. It is likely that these wetlands will be determined to be federally jurisdictional. The jurisdictional determination will be made by the USACE.

[2] Includes wetlands for which no apparent surface water connection to waters of the United States was identified during field surveys. These wetlands may not be federally jurisdictional. The jurisdictional determination will be made by the USACE.

Table 2.8-2 Impacts to Wetland Under State Jurisdiction, Noble Wethersfield Windpark

Facility	Acreage of State Jurisdictional Wetlands Impacted during Construction (Total Impacts) (acres)	Acreage of Wetlands under NYSDEC Jurisdiction[1, 2] to be Restored to pre-construction Contours Following Construction (Temporary Impacts) (acres)	Acreage of Wetlands under NYSDEC Jurisdiction[1] Impacted By Project Facilities (Permanent Impacts) (acres)	Acreage of Adjacent Area to be Impacted During Construction (Total Impacts) (acres)	Acreage of Adjacent Buffer under NYSDEC Jurisdiction[1] to be Restored Following Construction (Temporary Impacts) (acres)	Acreage of Adjacent Buffer under NYSDEC Jurisdiction[1] Impacted During Operation (Permanent Impacts) (acres)
Turbine Staging Area	0.00	0	0	0.00	0	0.00
Road/Collection	0.00	0	0	0.14	0.10	0.04
Underground Collection	0.19	0.19	0	1.59	1.59	0.00
Overhead Collection	0.00	0	0	0.52	0.52	0.00
Acreage of Impacts during Operation (permanent impacts) and Impacted Areas to be Restored (temporary impacts)	0.19	0.19	0	2.25	2.21	0.04

[1] Includes delineated wetlands that overlap/correspond with NYSDEC mapped freshwater wetlands that are assumed to be under the jurisdiction of the state. The jurisdictional determination will be made by NYSDEC.

[2] All delineated wetlands included have an obvious surface water connection to waters of the United States and as such, are also under federal jurisdiction.

2.9 Biological Resources: Environmental Setting

This section provides an overview of upland and wetland vegetative communities, aquatic habitat, and wildlife associated with these communities. A discussion of threatened and endangered plant and animal species is also provided.

General land use within the Project Area includes active and inactive agricultural land, forested areas, and residential areas (see Section 2.23, Land Use: Environmental Setting for a detailed land use discussion). The general population pattern in the area is rural residential, consisting of scattered residences along roads. Within the Project Area, active agricultural areas are used for row crops, field crops, and pasture; inactive agricultural areas are in successional stages, including old-field and shrub communities. The dominant woodland communities are successional northern hardwood forest, beech-maple mesic forest, and hemlock-northern hardwood forest. Timbering activities occur throughout the area.

The mosaic of uplands and wetlands within the Project Area offers a variety of habitats and ecozones beneficial to a broad wildlife assemblage. The community structure found within the Project Area is typical of other western New York areas with similar significant agricultural production, ranging from woodlots to old fields. Wildlife associated with these communities throughout the Project Area is typical of what would be found throughout much of western New York State (NYS).

2.9.1 Vegetation

This section provides a discussion of existing vegetative communities and habitat conditions in the Project Area. Section 2.9.1.1 describes upland vegetative communities found in the Project Area. Section 2.9.1.2 discusses wetlands and Section 2.9.1.3 discusses threatened and endangered plant species in the Project Area.

2.9.1.1 Upland Vegetative Communities

Vegetation cover types are presented on Figure 2.9-1, Ecological Communities. Three climax communities are represented, beech-maple mesic forest, hemlock-northern hardwood forest, and maple-basswood rich mesic forest. Most of the stands representing these climax communities are impacted to some degree by human disturbance, specifically silviculture. The remaining communities are in various stages of succession following agricultural or silvicultural disturbance.

Upland communities in the Project Area were categorized according to Edinger et al. (2002), which was developed as part of the New York State Natural Heritage Program (NHP) to provide a standard classification system for environmental impact statements. The classification system in Edinger incorporates the NHP's global (G) and state (S) rarity ranking system, which was developed by the Nature Conservancy. The global rank reflects the rarity of the community throughout the world, and the state rank reflects its rarity within the state of New York. The system is based on a scale of 5 to 1, in which 5 represents secure habitats and 1

represents those that are most vulnerable. Global ranks for communities are not currently standardized by the Nature Conservancy; thus, the ranks listed in the community descriptions are estimated global ranks (Edinger et al. 2002).

Based on field observations and using the classification system presented by Edinger, 11 general ecological communities were identified in the Project Area: beech-maple mesic forest; hemlock-northern hardwood forest; maple-basswood rich mesic forest; pine plantation; successional northern hardwood forest; successional shrubland; successional old field; cropland/row crops; cropland/field crops; pasturelands; and mowed land. Due to the likelihood of crop rotation and the indistinct differentiation between field crops and row crops, these agricultural uses (cropland/row crops, and cropland/field crops) have been combined into a single category in the discussion below and on Figure 2.9-1. Mowed land also includes other human-induced land alterations such as unpaved roads/paths and cleared roadsides. Due to the scale of the mapping, these are not depicted on Figure 2.9-1.

A detailed description of vegetation associated with each community type, as observed during field surveys, is provided below. To give a more complete overview of the communities, a list of typical wildlife associated with each community type is included in Section 2.9.2. A general discussion of land use and land cover is presented in Section 2.23, Land Use: Environmental Setting.

Beech-Maple Mesic Forest

Rank: (G4) (S4)
Status: Secure

Description. This hardwood forest occurs on moist, well-drained, acidic soils. Small patches of hemlock-northern hardwoods are often associated with large tracts of beech-maple mesic forests.

Distribution. Beech-maple forest occurs throughout the Project Area and is the predominant forest type in the Project Area.

Vegetation.

- Overstory: Sugar maple (*Acer saccharum*) and beech (*Fagus grandifolia*) are codominants, with black cherry (*Prunus serotina*) and eastern hop hornbeam (*Ostrya virginiana*) as common associate tree species. Less common tree species are ash (*Fraxinus sp.*), basswood (*Tilia americana*), eastern hemlock (*Tsuga canadensis*), American elm (*Ulmus americana*), and red maple (*Acer rubrum*).

- Understory/Shrub Layers: The understory layer consists primarily of witch hazel (*Hamamelis virginiana*), ironwood (*Carpinus caroliniana*), northern ar-

rowwood (*Vibrnum recognitum*), eastern hop hornbeam, and Juneberry (*Amelanchier canadensis*).

- Herbaceous Layers: The herbaceous layer consists of wild leek (*Alllium tricoccum*), white wood aster (*Aster divaricatus*), blue cohosh (*Caulophyllum thalictroides*), wood fern (*Dryopteris sp.*), and jack-in-the-pulpit (*Arisaema triphyllum*).

Hemlock-Northern Hardwood Forest

Rank: (G4) (G5) (S4)
Status: Secure

Description. This mixed forest type typically occurs on middle to lower slopes of ravines, on cool, mid-elevation slopes, and on moist, well-drained soils along the margins of swamps. A broadly defined community with many variations, hemlock is codominant with one to several hardwood species. In association with white pine (*Pinus strobus*), this is considered the ultimate climax community for most of western New York.

Distribution. Hemlock-northern hardwood forests were noted in multiple locations throughout the Project Area, typically on hilltops or within larger tracts of beech-maple forest.

Vegetation.

- Overstory: Eastern hemlock is codominant with beech, black cherry, yellow birch, red maple, and basswood.

- Understory/Shrub Layers: The understory layer consists of eastern hop hornbeam, ironwood, witch hazel, and Juneberry.

- Herbaceous Layers: The herbaceous layer consists of white wood aster, and common wood fern (*Dryopteris intermedia*).

Maple-Basswood Rich Mesic Forest

Rank: (G4) (S3)
Status: Moderately Secure

Description. This diverse forest occurs on well-drained, moist soils and is dominated by sugar maple, basswood, and white ash.

Distribution. Maple-basswood forest occurs in a few locations within the central portion of the Project Area.

Vegetation.

- Overstory: Aside from the dominants, ironwood, yellow birch, American beech, and American hornbeam.

- Understory/Shrub Layers: The understory consists of northern arrowood, dogwood (*Cornus sp.*), hawthorn, multiflora rose (Rosa multiflora), and Juneberry.

- Herbaceous Layer: The herbaceous layer consists of wild leek (*Alllium tricoccum*), trout lily (*Erythronium americanum*), Jack-in-the-pulpit, and a variety of ferns.

Pine Plantation

Rank: (G5) (S5)
Status: Secure

Description. These communities consist of stands of pine planted for the cultivation or harvest of timber products or to provide wildlife habitat, erosion control, windbreaks, or landscaping. These plantations may be a monoculture with more than 90% of the canopy consisting of one species or may be mixed strands with two or more codominant species (in which case more than 50% of the cover consists of one or more species of pine).

Distribution. Pine plantations occur in several locations throughout the Project Area. These areas range from one to several rows of trees planted as windbreaks or for erosion control (which are not depicted on the ecological communities map), to larger tracts of trees planted for commercial or habitat purposes.

Vegetation.

- Overstory: Pine plantations were predominantly red pine (*Pinus resinosa*), and scotch pine (*Pinus sylvestris*), but also included white pine (Pinus strobus), blue spruce (*Picea pungens*), and Norway spruce (*Picea abies).*

- Understory/Shrub Layers: None

- Herbaceous Layers: Speedwell (*Veronica officinalis*)

Successional Northern Hardwoods

Rank: (G5) (S5)
Status: Secure

Description. These hardwood or mixed forests occur on sites that have been cleared or otherwise disturbed. A broadly defined community dominated by light-requiring, wind-dispersed species, it is well adapted to disturbed conditions. The

shrub and herbaceous layer may still comprise species typical of successional old-field and shrubland communities. Successional hardwoods can follow any previously disturbed forest community.

Distribution. Successional northern hardwood forests occur in small areas throughout the Project Area where logging activities and prior clearing have impacted forest communities and at forest/field margins.

Vegetation.

- Overstory: The overstory consists of red maple, trembling aspen (*Populus tremuloides*), eastern cottonwood (*Populus deltoides*), black cherry, sugar maple, yellow birch (*Betula alleghaniensis*), apple (*Malus sp.*), black locust (*Robinia pseudoacacia*), and green ash (*Fraxinus pennsylvanica*).

- Understory/Shrub Layers: This layer is composed of seedlings of the overstory tree species and honeysuckle (*Lonicera tatarica*), hawthorn (*Crataegus sp.*), northern arrowwood, raspberry, multiflora rose (Rosa multiflora), and dogwood (Cornus sp.).

- Herbaceous Layers: These layers are composed of seedlings of the overstory tree species and successional old field communities.

Successional Shrubland

Rank: (G4) (S4)
Status: Secure

Description. These communities occur on lands that were cleared or disturbed for agricultural, silvicultural, or development purposes but are no longer actively used. This habitat is generally a successional stage between successional old field and successional northern hardwood.

Distribution. Successional shrublands occur in small areas throughout the Project Area where agricultural land has been abandoned for 3 to 5 years.

Vegetation.

- Overstory: None

- Understory/Shrub Layers: The understory consists of predominantly of northern arrowwood but also included multi-flora rose, raspberry, dogwood, nannyberry (*Viburnum lentago*), hawthorn, honeysuckle, willow (Salix sp.), and apple, as well as green ash, eastern cottonwood, trembling aspen, and red maple saplings.

- Herbaceous Layers: These layers are composed of raspberry, Canada goldenrod, bluegrasses, orchard grass, common chickweed, old-field cinquefoil, New England aster, strawberry, Queen Anne's lace, hawkweeds, and dandelion.

Successional Old Field

Rank: (G4) (S4)
Status: Secure

Description. Forbs and grasses dominate this community. It occurs on lands that have been cleared and plowed for agriculture or pasture land and have since been abandoned. This community has less than 50% shrub cover and quickly succeeds into successional shrubland and successional hardwoods.

Distribution. Successional old fields occur throughout the Project Area where agricultural land has typically been abandoned for fewer than 3 years.

Vegetation.

- Overstory: None

- Understory/Shrub Layers: The understory is primarily composed of northern arrowwood, raspberry, and multiflora rose.

- Herbaceous Layers: These layers are composed of blackberry (*Rubus* spp.), Canada goldenrod (*Solidago canadensis*), rough-stemmed goldenrod (*Solidago rugosa*), common milkweed (*Asclepias syriaca*), ragweed (*Ambrosia artemisiifolia*), spotted knapweed (*Centaurea maculosa*), common burdock (*Arctium minus*), bluegrasses (*Poa* spp.), timothy grass (*Phleum pretense*), orchard grass (*Dactylis glomerata*), reed canary grass (*Phalaris arundinacea),* common chickweed *(Cerastium arvense*), old-field cinquefoil (*Potentilla simplex*), New England aster (*Aster novaangliae*), New York aster (*Aster novi-belgii*), strawberry (*Fragaria virginiana*), Queen Anne's lace (*Daucus carota*), hawkweeds (*Hieracium* spp.), buttercup (*Ranunculus sp*.), English plantain (*Plantago lanceolata*), yarrow *(Achillea millefolium*), and dandelion (*Taraxacum officinale*).

Agriculture (Cropland/Field Crops and Row Crops)

Rank: (G5) (S5)
Status: Secure

Description. An agricultural field planted with field crops or row crops. Field crops may include hayfields that are rotated to pasture.

Distribution. Cropland/field crops and row crops occur in a variety of locations throughout the Project Area. These fields are typically on hilltops and slopes.

Vegetation.

- Overstory: None
- Understory/Shrub Layers: None
- Herbaceous Layers: Field crops include hay fields that were found to be dominated by Kentucky bluegrass (*Poa pretensis*), orchard grass, cow vetch (*Vicia cracca*), bird's foot trefoil (*Lotus corniculatus*), dandelion, reed canary grass, white clover (*Trifolium repens*), red clover (*Trifolium pretense*), alfalfa (*Medicago sativa*), and Timothy. Other field crops included wheat and oats. Row crops included corn, potatoes, and soybeans.

Agriculture (Pastureland)

Rank: (G5) (S5)
Status: Secure

Description. Agricultural land permanently maintained as pasture area for livestock. In some areas cattle are rotated throughout several fields that may be used for hay production in some years.

Distribution. Pasturelands occur in a variety of locations throughout the Project Area but are typically on the lower slopes and lower elevations.

Vegetation.

- Overstory: None or apple and hawthorn
- Understory/Shrub Layers: None
- Herbaceous Layers: The herbaceous layer consists of Canada goldenrod, Kentucky bluegrass, buttercup, white clover, red clover, orchard grass, English plantain, and yarrow.

Mowed Land

Rank: (G5) (S5)
Status: Secure

Description. This community consists of residential, recreational, or commercial land, dominated by grasses and forbs, trees, and ornamental/native shrubs that are mowed and maintained.

Distribution. Mowed land occurs on residential properties especially along roadways. Mowed/unpaved paths also occur in forests throughout the Project Area.

Vegetation.

- Overstory: Some trees, both native and ornamental.
- Understory/Shrub Layers: Various ornamental and native shrubs that comprise less than 50% of the vegetation.
- Herbaceous Layers: Various grasses and forbs as well as white clover, red clover, English plantain, hawkweeds and yarrow.

2.9.1.2 Wetland Vegetative Communities

Several wetland community types exist within the Project Area. A detailed description of wetlands and waterbodies is provided in the Wetland Delineation Report (Appendix E) and in Section 2.7, Wetlands: Environmental Setting, and Section 2.8, Wetlands: Impacts and Mitigation. Based on field observations and the classification system presented in Edinger et al. (2002), eight general wetland communities were identified in the Project Area: vernal pool, deep emergent marsh, shallow emergent marsh, hemlock-hardwood swamp, red maple hardwood swamp, American elm-ash swamp, and farm ponds. A detailed description of vegetation associated with each community type, as observed during field surveys, is provided below. The descriptions also include the Cowardin classification (in parenthesis), for consistency with wetland characterization in the Wetland Delineation Report.

Vernal Pools (Palustrine Open Water)

Rank: (G4) (S3) (S4)
Status: Secure

Description. These small, shallow ponds typically occur in depressional areas within upland forest and usually have no drain inlets or outlets. They are often flooded in spring or after heavy rainfall, and may dry up during periods of minimal rainfall. Vernal pools provide habitat for amphibians, reptiles, invertebrates, and other animals that depend on temporary ponds for breeding habitat. Fish habitat is not supported.

Distribution. Vernal pools occur throughout within forests in Cluster 2, Cluster 5, Cluster 13, and in the collection corridor between Cluster 14 and Cluster 15. They are often associated with isolated wetlands.

Vegetation.

- Overstory: Trees found in beech-maple, successional northern hardwood and hemlock-northern hardwood forests may occur around pool perimeters, but are generally absent from pools.

- Understory/Shrub Layer: Shrubs such as northern arrowwood viburnum *(Viburnum recognitum)*, red-osier dogwood (*Cornus stolonifera)*, spicebush *(Lindera benzoin),* and willow species *(Salix spp.)* may occur around pool perimeters.

- Herbaceous Layer: Floating and submergent plants may be common. Mannagrass (*Glyceria sp.)*, spikerush (*Eleocharis acicularis*), duckweed *(Lemna minor)*, and bulrush *(Scirpus atrovirens)* are often found in the pools.

Deep Emergent Marshes (Palustrine Emergent Wetland)

Rank: (G5) (S5)
Status: Secure

Description. According to Edinger, these marshes occur on mineral soils or fine-grained organic soils and have less than 50% canopy cover. Standing water between 6 inches and 2 feet deep is common throughout the year for deep emergent marshes within the survey corridor.

Distribution. Multiple deep emergent marshes occur throughout the Project Area. They often occur in combination with other community types.

Vegetation.

- Overstory: Trees found in surrounding forest communities may occur around the deep emergent marsh perimeter, but are not included in the deep emergent marsh component of the wetland.

- Understory/Shrub Layer: Shrubs such as northern arrowwood viburnum *(Viburnum recognitum)*, red-osier dogwood (*Cornus stolonifera)*, spicebush *(Lindera benzoin),* and willow species *(Salix spp.)* may occur around the marsh perimeter.

- Herbaceous Layer: Emergent aquatics such as cattail (*Typha latifolia),* woolgrass (*Scirpus cyperinus*), green-stemmed bulrush (*Scirpus atrovirens*), Joe-pye weed (*Eupatorium maculatum*), Bladder sedge (*Carex intumescens*), fringed sedge (*Carex crinita*), and cinnamon fern (*Osmunda cinnamomea*), are dominant, and floating-leaved species such as pondweed *(Potemogeton natans),* duckweed (*Lemna minor),* and water plantain (*Plantago alisma-aquatica*) were noted in a few wetlands.

Shallow Emergent Marshes (Palustrine Emergent Wetland)

Rank: (G5) (S5)
Status: Secure

Description. These marshes have less than 50% shrub cover and occur on saturated mineral soils or deep-muck soils. They are better drained than deep

marshes. Standing water ranges from 6 inches to 2 feet during flood season, but may disappear completely in the dry season.

Distribution. Shallow emergent marshes occur in shrub/scrub and successional fields throughout the Project Area.

Vegetation.

- Overstory: None
- Understory/Shrub Layer: If present, shrubs may include very small or isolated individual plants of northern arrowwood (*Viburnum recognitum*), red-osier dogwood (*Cornus stolonifera)*, and willows *(Salix spp.).*
- Herbaceous Layer: Mannagrasses (*Glyceria spp.)*, boneset (*Eupatorium perfoliatum*), jewelweed (*Impatiens capensis*), New England aster (*Aster novae-angliae*), sensitive fern (*Onoclea sensibilis*), reed canary grass (*Phalaris arundinacea*), soft rush (*Juncus effusus*), and rough stemmed goldenrod (*Solidago rugosa*).

Shrub Swamps (Palustrine Scrub-Shrub Wetland)

Rank: (G5) (S5)
Status: Secure

Description. These wetlands occur on mineral soil or muck and are dominated by shrubs. They may occur as part of lakes or rivers but also exist in wet depressions that are unassociated with other waterbodies.

Distribution. Shrub swamps occur in shrub/scrub fields throughout the Project Area.

Vegetation.

- Overstory: None
- Understory/Shrub Layer: Northern arrowwood (*Viburnum recognitum*), Dogwoods (*Cornus amomum, Cornus stolonifera*), alders (*Alnus incana, Alnus glutinosa*), and willows (*Salix discolor, Salix fragilis*) are dominant shrubs.
- Herbaceous Layer: Mannagrasses (*Glyceria spp.)*, boneset (*Eupatorium perfoliatum*), jewelweed (*Impatiens capensis*), New England aster (*Aster novae-angliae*), sensitive fern (*Onoclea sensibilis*), reed canary grass (*Phalaris arundinacea*), soft rush (*Juncus effusus*), and rough stemmed goldenrod (*Solidago rugosa*).

Hemlock-Hardwood Swamp (Palustrine Eastern Hemlock Forested Wetlands)

Rank: (G4) (G5) (S4)
Status: Secure

Description. These closed-canopy swamps occur on mineral soils and deep muck in depressions that receive groundwater discharge. Species diversity is poor, and few shrubs and herbs grow beneath the canopy.

Distribution. Hemlock-hardwood swamps were observed in hemlock-northern hardwood communities throughout the Project Area. These communities typically occurred on hilltops within the Project Area.

Vegetation.

- Overstory: Hemlock *(Tsuga Canadensis*), yellow birch *(Betula alleghenien-sis*), and red maple *(Acer rubrum*) dominate these swamps.

- Understory/Shrub Layer: Saplings of canopy trees are common, as are witch hazel *(Hamamelis virginiana*) and raspberry *(Rubus sp.).*

- Herbaceous Layer: Mannagrasses (*Glyceria spp.*), jewelweed (*Impatiens cap-ensis*), and wood fern (*Dryopteris spinulosa*) are dominant and sedges are common.

Red Maple-Hardwood Swamps (Palustrine Broad-Leaved Deciduous Forested Wetland)

Rank: (G5) (S4) (S5)
Status: Secure

Description. These swamps occur in poorly drained depressions usually on inorganic soils. Red maple is usually the dominant tree.

Distribution. Red maple-hardwood swamps occur in beech maple, successional northern hardwood, and hemlock-northern hardwood forests throughout the Project Area.

Vegetation.

- Overstory: Red maple is usually the dominant species, but green ash (*Fraxinus pennsylvanica*), American elm (*Ulmus americana*), and yellow birch are also present.

- Understory/Shrub Layer: The shrub layer, where present, is dominated by alder, spicebush, viburnum, dogwood, and willow.

- Herbaceous Layer: Mannagrasses (*Glyceria spp.*), jewelweed (*Impatiens capensis*), and sensitive fern are dominant and sedges are common.

Farm Ponds (Lacustrine Emergent Wetland)

Rank: (G5) (S5)
Status: Secure

Description. These man-made ponds are constructed in farm fields or on residential properties for agricultural purposes. They may be stocked with fish and contain little or no aquatic vegetation.

Distribution. Some farm ponds occur in agricultural fields throughout the Project Area.

Vegetation.

- Overstory: None
- Understory/Shrub Layer: None
- Herbaceous Layer: Farm ponds may be stocked with aquatic plants such as water lily and cattail, and may become habitat for other emergent and floating-leaved plants over time. Farm ponds are often eutrophic (full of nutrients that stimulate excessive algae growth).

A more complete description of each vegetative community and application of the Cowardin Classification System is provided in the Wetland Delineation Report (Appendix E).

2.9.1.3 Threatened and Endangered Plant Species and Communities

The USFWS and NYSDEC New York NHP were consulted to determine the potential occurrence of federally and state-listed endangered and threatened species and significant natural communities and habitats within the Project Area (see Appendix D). Federally listed threatened and endangered plant and animal species are protected by the Endangered Species Act of 1973, which is administered by the USFWS. State-listed threatened and endangered plant and animal species are protected by the New York State Environmental Conservation Law, Article 9 and Article 11, which is administered by NYSDEC.

The USFWS and NHP provided data detailing the known occurrences of threatened, endangered, species of concern, and rare communities within the Project Area. Existing databases track species that are protected by law as well as unprotected species that are identified as species of concern. The existing databases also track significant community assemblages. Although not specifically pro-

tected by law, these areas are recognized for their rare/unique features as well as their greater likelihood of providing habitat for protected species.

According to the USFWS, no federally listed or proposed endangered or threatened plant species are known to occur in the Project Site (Stilwell 2006). In addition, no federally designated or proposed "critical habitat" exists within the Project Area.

Based on correspondence with the NHP, no state-listed or proposed endangered or threatened plant species or plant communities are known to occur in the Project Area. Additionally, no significant community assemblages were identified within the Project Area. However, a Region 9 NYSDEC biologist expressed concern about the effect of the Windpark on Jefferson salamander, a species of special concern that has been identified within the Project Area (Roblee 2005; see Section 2.9.2.3).

2.9.2 Aquatic Habitat

This section provides an overview of aquatic habitat within the Project Area. Numerous streams and ponds occur in many terrestrial communities throughout the Project Area. Detailed discussion of these waterbodies is presented in Section 2.5, Water Quality: Environmental Setting, Section 2.6, Water Quality: Impacts and Mitigation, and Appendix E. A brief discussion is included here to facilitate understanding of the general ecology of the Project Area.

As detailed in Section 2.5, Water Quality: Environmental Setting, numerous streams were delineated in the Project Area. Due to the occurrence of land uses, these streams are associated with a variety of the habitat types discussed in Section 2.9.1.1. Streams observed in forests have riparian hardwood canopies in various stages of succession, while streams in shrub-scrub fields have low-growing vegetation and no overstory layer. Streams in both communities may have riparian herbaceous growth and are often hydrologically connected to wetlands. Wetlands often occur in the riparian zone. Streams proximal to agricultural fields are often impacted by human activity to a greater degree, and in many cases have been culverted, straightened, or redirected and are routinely maintained. Riparian vegetation in agricultural fields includes grasses and other field crops that may or may not be mowed or grazed. In some cases, shrub cover may be present. Most streams observed are perennial (flowing continuously throughout the year in a well-defined channel) with minimal aquatic vegetation. Observed aquatic organisms included within the Project Area include minnows, water striders, and a diversity of benthic macroinvertebrates keyed to stream substrate. Identified stream substrates include cobble, gravel, sand, silt, and clay. Bank heights range from 0 to 6 feet and stream widths ranged from 0.5 to 20 feet.

Several of these streams are classified as trout and trout spawning streams. A detailed discussion of trout is provided in Section 2.9.2.3. In some cases, a stream's

terrestrial location differed from its NYSDEC mapped location, and some mapped streams, including designated trout streams, did not have a defined bed and bank as far upstream as mapped. A detailed discussion on streams can be found in Section 2.5, Water Quality: Environmental Setting.

Both natural and man-made ponds occur within the Project Area. These ponds vary in size but typically are less than an acre, with depths ranging between 2 and 10 feet. Natural ponds exist in both forests and fields and often times are part of a larger wetland complex. In some cases, natural ponds have been created as a result of beaver activity. Natural ponds may include aquatic vegetation such as duckweed, or may be devoid of vegetation. Man-made ponds are scattered throughout the Project Area. Ponds used for agricultural purposes are located in farm fields, and recreational ponds are located in open or forested residential areas and private camping areas. These ponds typically contain minimal aquatic vegetation and do not typically occur within or adjacent to a wetland.

2.9.3 Wildlife

This section provides a discussion of existing conditions relating to wildlife in the Project Area. Section 2.9.2.1 lists common wildlife associated with each vegetative community found in the Project Area. Section 2.9.2.2 discusses threatened and endangered species in the Project Area, and Section 2.9.2.3 discusses wildlife of local significance.

2.9.3.1 Common Fish and Wildlife Species Associated with Vegetative Communities and Aquatic Habitat

The communities delineated and presented on Figure 2.9-1 are largely determined by the vegetative composition. Section 2.9.1.1 discusses the 11 upland ecological communities in the Project Area, and Section 2.9.1.2 briefly discusses wetlands, with more detailed discussions provided in Appendix D. Typical fish and wildlife species are discussed in association with the upland communities, wetlands, and aquatic habitat. However, many species may have habitat requirements that overlap between community types or may have a respective habitat niche that comprises a small portion of the community. Birds are discussed separately in Section 2.11, Bird and Bat Resources: Environmental Setting.

Table 2.9-1 identifies fauna common to each of the vegetative communities and habitats described in Sections 2.9.1 and 2.9.2, and Appendix E. Several species live adjacent to wetlands and utilize their resources, while other species are typical wetland inhabitants whose survival is dependent upon these communities.

2.9.3.2 Threatened and Endangered Animal Species and Communities

According to the USFWS, except for transient individuals, no federally listed or proposed endangered or threatened animal species is known to occur in the Project Area (Stilwell 2005, Stilwell 2006). In addition, no federally designated or proposed "critical habitat" exists within the Project Area. The USFWS has ex-

pressed concern pertaining to the potential for windparks, in general, to impact migratory birds and threatened or endangered bats (such as the Indiana bat [*Myotis sodalis*]). The potential occurrence of Indiana bat is discussed in detail in Section 2.11, Bird and Bat Resources: Environmental Setting. An assessment of potential impacts on birds and bats is provided in Appendix F and in Section 2.12, Bird and Bat Resources: Impacts and Mitigation, of this report.

In addition to the standard analysis of project areas for potential occurrences of threatened or endangered plant and animal species, the NHP has developed specific criteria for wind power projects. NHP now reports all records of bird species occurring within a 10-mile radius of identified project areas (Ketcham 2005, Seoane 2006). Records of bat colonies and bat species of concern occurring within a 40-mile radius are also reported.

Based on correspondence with the NHP (Ketcham 2005, Seoane 2006), state-listed endangered or threatened animal species that are known to occur within 10 miles of the Project Area include bald eagle (*Haliaeetus leucocephalus*), northern harrier (*Circus cyaneus*), short-eared owl (*Asio flammeus*), upland sandpiper (*Bartramia longicauda*), pied-billed grebe (*Podilymbus podiceps*), and Henslow's sparrow (*Ammodramus henslowii*). These bird species are discussed further in Section 2.11, Bird and Bat Resources: Environmental Setting, and Section 2.12, Bird and Bat Resources: Impacts and Mitigation. No threatened or endangered bat species were specifically identified by NHP. Although no significant bat communities were identified within the Project Area, the NHP identified a bat colony within 10 miles of the Project Area, at Letchworth State Park in the Town of Portage, Livingston County (Ketcham 2005, Seoane 2006).

No significant wildlife communities under federal or state protection were identified within the Project Area.

The NHP also identifies species of special concern which include species of fish and wildlife found by the department to be at risk of becoming either endangered or threatened in New York. Species of special concern do not qualify as either endangered or threatened, as defined in Part 182.2(g) and 182.2(h), at this time and are not subject to the provisions of Part 182. Species of special concern are listed in Part 182.6(c) for informational purposes only. The NHP identified one species of special concern, the eastern small-footed Myotis (*Myotis leibii*), within 10 miles of the Project Area (Seoane 2006). The eastern small-footed Myotis is discussed in detail in Appendix F and in Section 2.11, Bird and Bat Resources: Environmental Setting, and Section 2.12, Bird and Bat Resources: Impacts and Mitigation, of this report due to its status as a "Species of Concern" in New York State and its historic presence within 10 miles of the Project Area. NYSDEC Region 9 identified a second species of special concern, Jefferson salamander (*Ambystoma jeffersonianum*), which is known to occur in the Towns of Eagle and Wethersfield (Roblee 2005). A discussion of the Jefferson salamander can be found in Section 2.9.2.3.

2.9.3.3 Wildlife or Wildlife Communities of Local Significance

This section presents information on species that are not afforded federal or state protection, but are locally important resources or are species of special concern. These species include the Jefferson salamander, white-tailed deer, black bear, and trout.

Jefferson Salamander

The Jefferson salamander and associated hybrid forms are known to have a significant metapopulation within the Towns of Arcade, Eagle, Pike, Orangeville, and Wethersfield in Wyoming County (Roblee 2005). The Jefferson salamander is found under stones or logs or in leaf litter and other underbrush in deciduous forests. They tend to stay close to their wintering burrows and only migrate to fishless ponds or pools for breeding purposes. The Jefferson salamander's breeding period is from March to April, when it lays 150 to 300 eggs on submerged twigs or other supports near the edge of the pond. Once the larvae hatch it takes 2 to 4 months to metamorphose into land-living adults.

Although the known occurrences of the Jefferson salamander in Wyoming County are limited to five towns, the salamander has been reported in many areas throughout New York State, including other counties in Western New York. According to the New York State Amphibian and Reptile Atlas Project (1990 to 1998), the Jefferson salamander has been observed in each of the counties that are adjacent to Wyoming County (NYSDEC 2006c). Based on discussions with the NYSDEC, the salamander has been observed along public roadways within the Project Area during their spring surveys. Concerns for this species include habitat fragmentation, habitat loss, and road mortality (Roblee 2005). Given the rarity of this species, NYSDEC recommends that the construction of a windpark should, to the extent possible, avoid breeding pools and the forest habitat that these salamanders utilize.

White-Tailed Deer

Although not threatened or endangered, the white-tailed deer is valued from a recreational standpoint. Despite having a wide-ranging habitat, dense conifer stands play an important role in deer biology, providing forage and cover during harsh winter conditions. In New York, deer may concentrate into 30% to 60% of their total habitat during mild winters, 13% of their total habitat during moderate winters, and 9.7% of their total habitat during severe winters (Fried et al. 1977). Deer wintering concentration areas are general areas where deer congregate during harsh winter conditions. These areas typically contain a significant coniferous component that offers cover from winter weather.

While hemlock-hardwood mixed forest exists throughout the Project Area, dense coniferous stands within the Project Area are limited. Deer likely congregate in the hemlock hardwood mixed forests and in pine plantations throughout the Pro-

ject Area during the hardest part of the winter. They may also be observed in agricultural areas.

Black Bear

According to NYSDEC, three areas in New York State are considered Core Bear Ranges: the Adirondack Range, the Catskill Range, and the Allegany Range (NYSDEC 2006e). Core Bear Ranges are described as areas sustaining viable black bear populations within their natural habitat. Although not within a Core Bear Range, marginal bear habitat does occur within the Project Area.

Black bears are opportunistic omnivores adapted for living on fruits, nuts, insects, and other small items that are easily digestible and low in cellulose. They prefer forested areas with small clearings and dense understory. Water must be readily available and well distributed throughout their range. For this reason, wetland and riparian habitats are usually associated with suitable bear habitats (Rogers and Allen 1987). Although bears are typically found in large, contiguous forests, they will utilize open and developed areas where thick cover is readily available (NYSDEC 2006e).

Based on these habitat requirements and preferences, the majority of the Project Area can be considered viable black bear habitat. The Project Area contains several large forested areas that potentially provide adequate cover requirements for black bear. Raspberry, blackberry, and apple trees are common in the reverting fields and recently logged forested areas, providing ample food. No evidence of black bears was observed during the summer and fall 2006 field work in the Project Area.

Trout

Similar to the white-tailed deer, trout are valued from a recreational standpoint. Trout can live in habitats, ranging from cool clear streams to large lakes. They generally feed on insects and plankton, and older trout may eat small fish (NYSDEC 2006f). Within the Project Area, there are numerous streams classified as trout or trout spawning streams by NYSDEC because they are capable of sustaining trout populations. Section 2.5, Water Quality: Environmental Setting, includes a discussion on NYSDEC stream classifications and trout fisheries in the Project Area.

NYSDEC has identified Wiscoy Creek, its North Branch, and Trout Brook as one of the most productive watersheds for wild brown trout in NYS. According to NYSDEC, Wiscoy Creek yields an estimated population of 1,406 yearling and older trout. Trout Brook serves as an important nursery stream for the Wiscoy Creek brown trout and also supports wild brook trout populations (NYSDEC 2006b).

Two fish hatcheries exist within the Project Area on private lands. One hatchery is located on Polar Tree Road adjacent to Smith Creek. The second hatchery is

located on NYS Route 362 adjacent to the North Branch of Wiscoy Creek. Both hatcheries raise trout for commercial sale.

Table 2.9-1 Common Wildlife Species Associated with Vegetative Communities and Aquatic Habitat

Beech-Maple Mesic Forest
Bats (*Lasiurus/Myotis* spp.), black bear (*Ursus americanus*), eastern chipmunk (*Tamias striatus*), flying squirrel (*Glaucomys* sp.), gray squirrel (*Sciurus carolinensis*), opossum (*Didelphis virginiana*), porcupine (*Erethizon dorsatum*), raccoon (*Procyon lotor*), and white-tailed deer (*Odocoileus virginianus*). Also American toad (*Bufo americanus*), dusky salamanders (*Desmognathus* spp.), mole salamanders (*Ambystoma* spp.), red eft-phase of red-spotted newt (*Notophthalmus viridescens viridescens*), and woodland salamanders *(Plethodon* spp.)
Successional Northern Hardwood Forest
Black bear, eastern chipmunk, eastern cottontail (*Sylvilagus floridanus*), gray fox (*Urocyon cinereargenteus*), gray squirrel, opossum, porcupine, red bat (*Lasiurus borealis*), red squirrel (*Tamiasciurus hudsonicus*), and striped skunk (*Mephitis mephitis*). Also, northern redback salamander (*Plethodon cinereus*) and northern spring salamander (*Gyrinophilus porphyriticus porphyriticus*)
Hemlock-Northern Hardwood Forest
Bats, black bear, eastern chipmunk, flying squirrel, gray fox, gray squirrel, opossum, porcupine, raccoon, red squirrel, and white-tailed deer. Also, American toad, dusky and woodland salamanders, and red eft-phase of red-spotted newt
Maple-Basswood Rich Mesic Forest
Bats, black bear, eastern chipmunk, flying squirrel, gray squirrel, opossum, porcupine, raccoon, and white-tailed deer. Also, American toad, dusky salamanders, mole salamanders, red eft-phase of red-spotted newt, and woodland salamanders
Successional Shrubland
Eastern cottontail, gray fox, hairy-tailed mole (*Parascalops breweri*), least shrew (*Cryptotis parva*), meadow vole (*Microtus pennsylvanicus*), raccoon, red fox (*Vulpes vulpes*), striped skunk, and white-tailed deer
Successional Old Field
Eastern cottontail, gray fox, hairy-tailed mole, least shrew, meadow vole, raccoon, red fox, striped skunk, white-tailed deer, and woodchuck (*Marmota monax*)
Pine Plantation
Eastern chipmunk, flying squirrel, gray squirrel, red squirrel, and white-tailed deer
Agriculture
Big brown bat (*Eptesicus fuscus*), coyote (*Canis latrans*), eastern cottontail, hoary bat (*Lasiurus cinereus*), red fox, striped skunk, white-tailed deer, and woodchuck
Wetland Vegetative Communities
Beaver (*Castor canadensis*), muskrat (*Ondatra zibethicas*), star-nosed mole (*Condylura ristata*), and water shrew (*Sorex palustris*). Also, mole salamanders, northern water snake (*Nerodia sipedon*), and various frog, salamander, toad and turtle species

Table 2.9-1 Common Wildlife Species Associated with Vegetative Communities and Aquatic Habitat

Aquatic Habitats
Mink (*Mustela vison*), painted turtle (*Chrysemys picta*), snapping turtle (*Chelydra serpentina*), red-spotted newt, and various frogs and toads. Macroinvertebrates and small, warm-water fish species, including blacknose dace (*Rhinichthys atratulus*), creek chub (*Semotilus atromaculatus*), darters (*Etheostoma* spp.), and fathead minnow (*Pimephales promelas*). In addition, trout species may occur in some portions of the Project Area. Class C(t), C(ts), A(t), and A(ts) streams have the potential to contain cold water fish species including brook trout **(***Salvelinus fontinalis***),** brown trout (*Salmo trutta*), and rainbow trout (*Oncorhynchus mykiss*).

Source: NYSDEC 2006a, DeGraaf and Yamasaki 2001, Chambers 1983.

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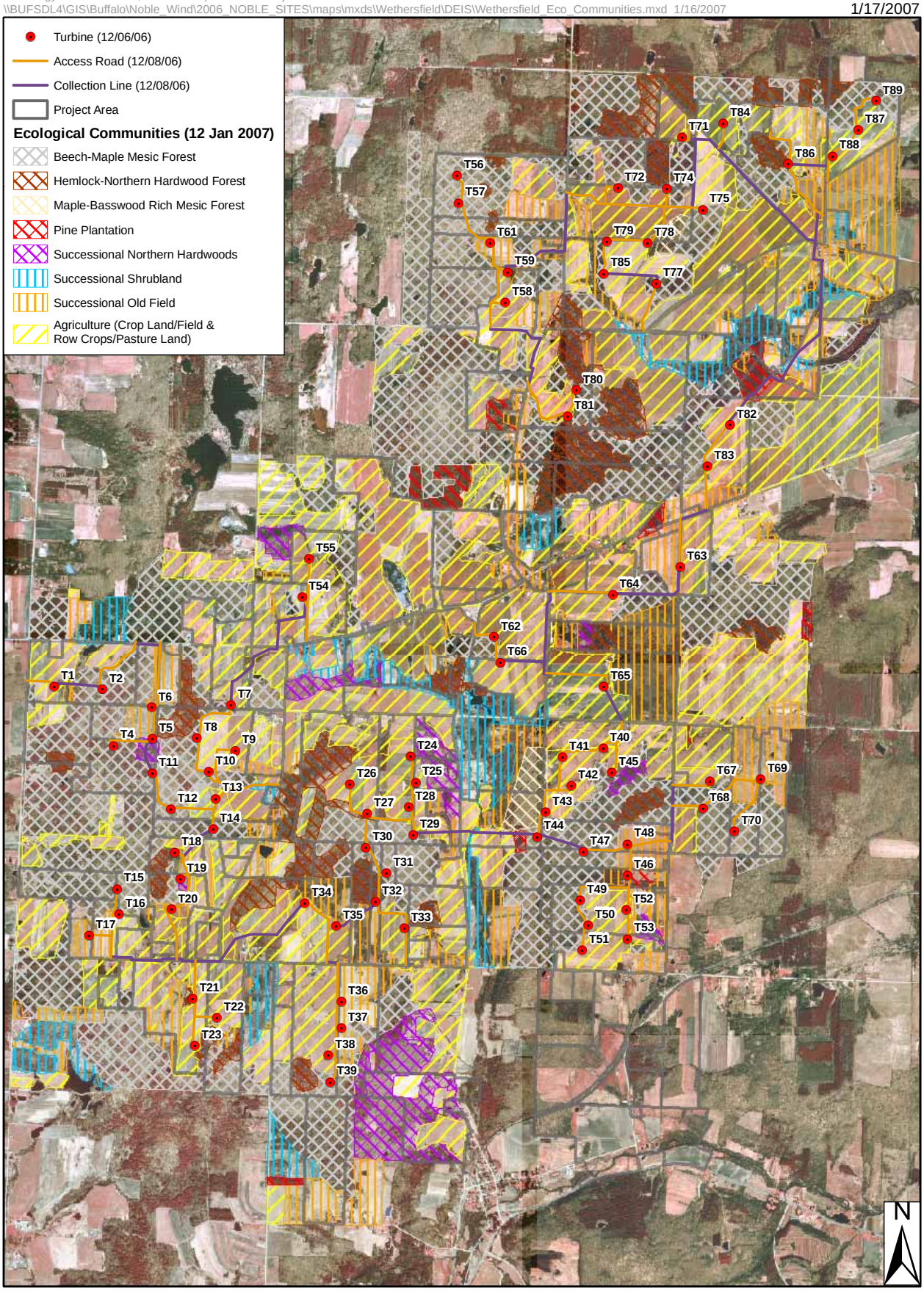

Source: Ecology & Environment, Inc., 2006.
NYS Reverse Color Infrared Orthoimagery 1995.

Figure 2.9-1 Ecological Communities
Noble Wethersfield Windpark

0 0.5 1 2 Mile

2.10 Biological Resources: Impacts and Mitigation

This section discusses impacts to biological resources as a result of construction and operation of the Wethersfield Windpark. Where feasible, Noble has sited Project facilities to avoid fragmentation of forested habitat, avoid wetlands and aquatic habitat, and minimize impacts on wildlife. Efforts to avoid, minimize, and mitigate impacts to biological resources are addressed in Section 2.10.3. Impacts to birds and bats are discussed in Section 2.12, Bird and Bat Resources: Impacts and Mitigation, and impacts to wetlands and waterbodies are discussed in Section 2.8, Wetlands: Impacts and Mitigation.

2.10.1 Construction Impacts

Upland Vegetation

Primary impacts on upland vegetation will include the removal of existing vegetation through minimal clearing of forested, shrub/scrub, and herbaceous vegetation as part of construction activities. Secondary effects may include increased soil erosion and a localized reduction in available wildlife habitat. Clearing and grading associated with Project construction has the potential to result in mobilization of soil once the vegetation has been removed. Soil mobilization will be most problematic on slopes, which are more susceptible to erosion. These potential impacts are most likely to occur in conjunction with access roads and the collection system since the turbine sites will be located on relatively level ground.

Construction of the Project will result in a localized reduction in the amount of available forest habitat. Based on field surveys, the largest percentage of forested vegetation impacted by the Project is beech-maple forest. Other forest communities affected include successional northern hardwood forest and hemlock-northern hardwood forest. The reduction in the amount of forested habitat within the Project Site is minor in comparison with the overall acreage of forested land located in the Project Area. Furthermore, this reduction is generally consistent with tree loss that occurs due to logging activities and maintenance of logging roads in these areas. The existing mosaic of land uses within the region, including agricultural lands and early successional stages of forest land, indicate that disturbance is a common occurrence in this landscape.

Other upland communities impacted by Project facilities include successional old fields, pine plantations, and agricultural land (cropland and pastureland). These communities are routinely subjected to disturbance or have been subjected to past disturbance and are a result of re-vegetation following disturbance.

Wetlands and Aquatic Habitat

Impacts from construction on aquatic and wetland communities are discussed in Section 2.6, Water Quality: Impacts and Mitigation; Section 2.8, Wetlands: Impacts and Mitigation; and Appendix E.

Threatened and Endangered Plant Species

No threatened or endangered vegetation or communities were identified within the Project Area during the field survey efforts. Therefore, no impacts on threatened and endangered plant species are expected as a result of construction of the Project.

Common Wildlife

Most wildlife species are not expected to be significantly impacted as a result of construction of the Project. Most species are expected to avoid the Project Site during the active construction period. Some limited mortality may occur to less mobile species during the course of construction. Indirect impacts on wildlife will also occur as a result of habitat alteration in association with construction of the Project; however, these impacts are not expected to be significant. The anticipated loss of habitat is minimal compared with available habitat in the Project Area. In addition, the impacts on habitat are consistent with activities and conditions that regularly occur throughout the Project Area such as ground disturbance and tree removal associated with farming and logging activities. It is anticipated that wildlife in the Project Area is accustomed to disturbance of this nature and will either relocate to other adjacent suitable habitat or, upon cessation of construction, make use of areas temporarily disturbed as revegetation takes place.

Threatened and Endangered Wildlife Species and Species of Special Concern

Based on consultation with the United States Fish and Wildlife Service (USFWS) and the New York State Natural Heritage Program (NHP), except for transient individuals, no non-bird threatened or endangered animal species or communities were identified within the Project Area. Therefore, no impacts on non-bird threatened and endangered animal species are expected as a result of construction of the Project. Potential impacts on bird and bat species are discussed in Section 2.12, Bird and Bat Resources: Impacts and Mitigation.

The NHP and New York State Department of Environmental Conservation (NYSDEC) Region 9 identified two species of special concern within 10 miles of the Project Area: the eastern small-footed Myotis and the Jefferson salamander. An assessment of potential impacts on the Myotis is provided in Appendix F and under Bat Resources in Section 2.12, Bird and Bat Resources: Impacts and Mitigation, of this report. Potential impacts on the Jefferson salamander are discussed below.

Species of Local Significance

As previously discussed in Section 2.7, Wetlands: Environmental Setting, the Jefferson salamander is known to occur in the Towns of Eagle and Wethersfield. No Jefferson salamanders were observed during wetland and habitat field surveys; however, potential habitat for this and other amphibians was noted within the Project Site. Site clearing and subsequent construction activities may reduce terrestrial habitat available to the Jefferson salamander and create temporary barriers to

movement. Additionally, site clearing and an increase in vehicular traffic may result in direct mortality of Jefferson salamanders during construction.

Direct impacts to deer and black bear as a result of construction of the Project will be temporary and limited to discouraging use of the areas where construction occurs. Although the Project will result in the removal of potential forested habitat, the clearing required for construction and operation of Project facilities will result in new understory growth and additional herbaceous/scrub-shrub habitats. Depending on species composition of the regrowth, these habitats could provide new foraging areas for both deer and bear.

According to NYSDEC, deer typically congregate in the hemlock hardwood mixed forests and in pine plantations throughout the Project Area during the hardest part of the winter. Because construction of the Project will impact only a limited amount of hemlock-hardwood forest, the Project is not likely to impact deer wintering concentration areas.

Construction of the Project is not expected to impact black bears. This species is likely only a transient or uncommon visitor in the Project Area and any transient individual will tend to avoid construction activities.

Within the Project Area, several streams are classified as trout or trout spawning streams, because they are capable of sustaining trout populations (see Section 2.5, Water Quality: Environmental Setting). Site clearing and subsequent construction activities could affect trout habitat. In protected streams, all in-stream work, as well as any work that may result in the suspension of sediment, will not occur during the trout spawning and incubation period commencing October 1 and ending April 30, without prior approval from NYSDEC. Trout may be affected by the alteration of water quality through sedimentation and runoff from construction activities, the alteration of riparian resources through the loss of shelter/cover, and the loss of food in the form of plant debris and vegetation invertebrates. Noble will implement a Stormwater Pollution Prevention Plan (SWPPP) in conformance with the NYSDEC State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activities to avoid or minimize runoff and erosion. This and other mitigation measures are described in Section 2.10.3. Any construction or disturbance in or near protected streams must be permitted through NYSDEC and the United States Army Corps of Engineers (USACE). The conditions contained within the permits issued by the agencies will serve to further protect these important natural resources.

2.10.2 Project Facility Impacts

Upland Vegetation

Primary impacts on upland vegetation will result from maintenance of the turbine sites, electrical collection system, and access road rights of way (ROWs) during operation of the facility. Vegetation will be permanently removed from the loca-

tion of the turbine pedestal, turbine crane pad, and 12-foot-wide permanent access road. The remainder of the Project footprint will be allowed to naturally revegetate, although it will be subject to periodic removal of woody vegetation to maintain an herbaceous or scrub-shrub state, especially adjacent to access roads and within collection system corridors. The degree of impact is dependent on the type and amount of vegetation to be cleared, the rate of revegetation, and the frequency of maintenance (clearing/mowing) during operation of the Project.

Noble does not expect to use herbicides or pesticides to control vegetation or pests along access roads and turbine maintenance areas. Generally, these areas are not expected to promote vegetation growth because of the use of geotextile fabric and gravel construction, as well as the periodic use of the access roads by vehicles. In some cases, herbicidal spot control of upland invasive species might be required. If herbicide use should become necessary, Noble will comply with applicable laws and best practices standards.

Wetlands and Aquatic Habitat

Impacts on aquatic and wetland communities are discussed in Section 2.6, Water Quality: Impacts and Mitigation; Section 2.8, Wetlands: Impacts and Mitigation; and Appendix E.

Threatened and Endangered Plant Species

No threatened or endangered vegetation or plant communities were identified within the Project Site through consultation with the USFWS and NHP, or during the field survey efforts. Therefore, no impacts on threatened and endangered plant species are expected as a result of construction of Project facilities.

Common Wildlife

Significant impacts on most wildlife species are not expected as a result of operation of the Project. As recognized from other active wind power projects throughout the United States, operation of the Windpark does have the potential to impact birds and bats. These potential impacts are discussed in Section 2.12, Bird and Bat Resources: Impacts and Mitigation.

The Project facilities are expected to result in minimal loss of habitat as compared with available habitat in the Project Area. In addition, the impacts on habitat are consistent with activities and conditions that regularly occur throughout the Project Area such as mowing of vegetation, access-road use associated with farming and logging activities, and tree removal. It is anticipated that wildlife in the Project Area are accustomed to disturbance of this nature and will either relocate to other adjacent suitable habitat, or adapt to post-construction site conditions.

Threatened and Endangered Wildlife Species

Based on consultation with the USFWS and NHP, except for transient individuals, no non-bird threatened or endangered animal species or communities were identified within the Project Area. Therefore, no impacts on non-bird threatened

and endangered animal species are expected as a result of operation of the Project. Potential impacts on threatened and endangered bird and bat species are discussed in Section 2.12, Bird and Bat Resources: Impacts and Mitigation.

Species of Local Significance

Operation of the Project facilities will not have a significant impact on the Jefferson salamander. Permanent access roads could limit amphibian dispersal and result in direct mortality; however, vehicle traffic along these access roads will be minimal and is not expected to result in a significant increase in salamander mortality.

Operation and maintenance of the Project facilities may slightly increase traffic within deer wintering areas. However, use of the access roads will be infrequent and consistent with current winter use levels throughout the area (i.e., snowmobile trails). While the operation of the Project may slightly increase traffic and human presence in areas where only minimal disturbance occurs, bears would be expected to avoid direct interaction with humans.

In accordance with the Town of Wethersfield Local Law No. 1 of 2006, the potential impact of shadow flicker on trout streams and fish hatcheries located within a half-mile of the Project Area was analyzed. Shadow flicker is defined as alternating changes in light intensity caused by the moving blades casting shadows on the ground and stationary objects and is discussed in greater detail in Section 2.14, Visual Resources: Impacts and Mitigation. Noble retained the services of Saratoga Associates, Landscape Architects, Architects, Engineers, and Planners, PC (Saratoga) to conduct a Shadow Flicker Analysis, which is provided in Appendix G.

Shadow flicker is not a daily event and it is highly dependent on factors such as cloud cover, wind speed, and wind direction. Shadow flicker will not occur on overcast days when daylight is not sufficient enough to cast shadows, nor will it occur on calm days when the rotors are not moving. Additionally, the turbine shadows will depend on the position of the sun and the rotated position of the wind turbine rotor.

Based on Saratoga's analysis, the fish hatchery along New York State (NYS) Route 362 will experience up to 21 hours of shadow per year, however, this will not be a daily event and will be short in duration during each event. It is not anticipated that the hatchery located along Poplar Tree Road will experience any shadow as a result of this Project. It is important to remember that shadows will occur at various times of the year and be limited in time duration. It is not expected that these resources will experience consistent shade conditions lasting for great lengths of time as a result of operation of the Project.

Some NYSDEC mapped trout streams that run adjacent to the proposed turbines will experience shadows to various degrees (see Figure A3 in the Shadow Flicker

Analysis Report provided in Appendix G). Streams located to the west of a turbine will more likely fall within the shadow zone area shortly after sunrise, while streams to the east of a turbine will most likely fall within the shadow zone shortly before sunset. The intensity of the shadow flicker will impact discreet portions of a given stream for a short duration based on the angle of the sun.

Based on Figure A3 in the Shadow Flicker Analysis Report provided in Appendix G, it is anticipated that approximately 4% of the NYSDEC mapped trout streams within a half-mile of the Project Area will experience 30+ hours of shadow per year. However, many of these streams do not actually support trout or may have sufficient shrub\forest cover to screen the streams from the effect of shadow flicker. For instance, the stream located to the northeast of turbine T66a and east of T62a is designated as a trout stream; however field delineations indicated that this stream is actually a drain that supports upland herbaceous vegetation (see Appendix E). Furthermore, the drain has no defined bed and experiences irregular flow, at best; as such, this drain does not provide sufficient habitat for trout.

2.10.3 Mitigation

The overall impact of the Project on vegetation and wildlife is anticipated to be minimal due to careful site planning. To minimize impacts on vegetation, aquatic habitat, and fish and wildlife, facilities have been sited, to the extent practicable, within previously disturbed areas such as reverting farm fields and along existing farm roads and areas where recent logging has occurred. Where possible, the access roads and collection system have been located within areas with minimal tree growth, such as edges of active/inactive farm fields or collocated with existing logging roads.

After initial siting of the facilities, the location of Project components was modified based on field surveys to avoid wetlands and other high quality habitats to the greatest extent practicable. In many cases, turbines, access roads, and collection lines were relocated or eliminated to reduce impacts primarily to forested habitat, potential breeding pools for the Jefferson salamander, and wetland communities (see Section 2.8, Wetlands: Impacts and Mitigation, for a discussion of wetland impacts and mitigation). Specifically, Turbines 18, 19, 62, 61, and 85 were removed from forested communities and relocated to the edge of existing agricultural lands, woodlots, and reverted agricultural fields. Turbine 3 was completely eliminated in large part to avoid forest impacts. Access roads and collection lines were also relocated to avoid forest fragmentation and potential breeding pools, which minimizes impacts to potential Jefferson salamander habitat. Portions of Access Road 2 and 13 that were sited in forested habitat were eliminated to minimize impacts to existing communities. Access Road 5 and Access Road 26 were relocated from a forested area to a reverting agricultural field, and a portion of Access Road 13 was relocated from an undisturbed forested area to an existing private access road which eliminated the need for a new construction ROW.

In addition to the discussion above, potential impacts to Jefferson salamanders and other wildlife have been minimized by co-locating temporary and permanent access roads with existing logging roads, trails, and hedge rows (within the agricultural fields) wherever feasible. In many cases these existing roads have not been adequately maintained and may adversely impact streams and aquatic habitat. Improvements to existing crossings will improve water quality for trout and other aquatic species. Additionally, these access roads may provide alternative routes for all-terrain vehicle (ATVs) and other vehicles that may otherwise use off-road areas, within potential salamander habitat.

The Project layout has been designed to minimize clear cutting of trees and, where possible, impacts in forested areas have been co-located with existing logging roads and trails. Many property owners in the Project Area periodically harvest the trees as part of their land management activities. Where construction activities will require the removal of any trees of economic value, landowners will be compensated in accordance with their individual easement agreements.

Impacts on fish and wildlife will be further minimized through the implementation of best management practices (BMPs). Erosion control structures will be utilized to prevent an off-site migration of soil and minimize impacts to fish and aquatic species. Silt fencing will be installed along the construction ROW in all areas adjacent to wetlands, in accordance with the SWPPP. BMPs that will be used during construction to prevent excess stormwater runoff from the construction areas will be via the SWPPP as discussed in Section 2.6, Water Quality: Impacts and Mitigation. Clearing of natural vegetation adjacent to streams will be limited to the material which poses a hazard or hindrance to construction or Project facilities. Snags which provide shelter in streams for fish will not be disturbed unless they cause serious obstructions, scouring, or erosion. Trees will not be felled into any stream or onto the immediate stream bank.