Disclaimer: Section 508 of the Rehabilitation Act of 1973 (29 U.S.C. § 794d), as amended in 1998, requires that the information in federal documents be accessible to individuals with disabilities. CHIPS for America, U.S. Department of Commerce, has made every effort to ensure that the information in the Micron Semiconductor Manufacturing Project Final Environmental Impact Statement is accessible; however, some Appendix elements may not be fully accessible. Individuals with disabilities are encouraged to contact David Frenkel, Environmental Division Director by phone at (240) 204-1960 or by email at david.frenkel@chips.gov for access to the information contained in this document.

APPENDIX G
BIOLOGICAL RESOURCES

Appendix G-1
Biological Resources Methodology

G-1 Biological Resources Study Area and Methodology

This section defines the study area for biological resources and describes the sources of information used to describe the affected environment. It also explains the evaluation methods used to determine direct and indirect effects on biological resources. Potential cumulative effects on biological resources are described in Chapter 4.

The biological resources study area includes the Proposed Project and Connected Action LODs (where direct effects on ecological communities and wildlife may occur) and habitats adjacent to the LODs (where the Proposed Project and Connected Actions may have indirect effects on habitat and species in the vicinity).

As described in Section 3.4 (Biological Resources), the biological resources analysis relies on the analysis of wetland and surface water effects described in Section 3.3 (Water Resources), where applicable. However, Section 3.4 (Biological Resources) considers effects on ecological communities and wildlife regardless of the extent of Federal or State jurisdiction over wetlands or surface water features. In addition, Section 3.4 (Biological Resources) conservatively assumes that construction effects would occur across all wetland and upland cover types within the Connected Action LODs, even though actual construction effects likely would not occur across the full extent of the Connected Action LODs.

The analysis of the affected environment in Section 3.4 (Biological Resources) relies on the sources of information and evaluation methodologies described below:

- Discussions and correspondence with NYSDEC regarding potential occurrence of State listed rare, threatened, or endangered species in the vicinity of the Proposed Project and Connected Actions.

- Discussions and correspondence with USFWS regarding potential occurrence of species listed or proposed to be listed as Federal threatened or endangered species, and information on critical habitat and other protected resources recorded in the vicinity of the Proposed Project and Connected Actions.

- Site reconnaissance investigations of ecological communities conducted on July 31 through August 2, 2023, at the Micron Campus, Rail Spur Site, and Childcare Site (AKRF, Inc. 2023). Ecologists documented the presence and extent of ecological communities observed via walking meanders throughout the study area while recording dominant plant species and ecological community composition consistent with the categorizations presented in the second edition of *Ecological Communities of New York State* (Edinger, 2014). Incidental wildlife observations were recorded as part of this effort. In addition, ecologists documented any signs of natural or anthropogenic disturbance and conducted tree diameter observations to qualitatively estimate forest stand maturities for each ecological community with tree stands or cover.

- Acoustic bat survey conducted from May 15 to July 7, 2023 for Federally listed bat species at the Micron Campus site that considered USFWS range-wide Indiana bat and northern long-eared bat survey guidelines (USFWS, 2023). The acoustic bat survey is included as part of the BA (Appendix G-4).

- Grassland breeding bird survey conducted from May 15 to July 12, 2023, to evaluate the presence of State listed grassland bird species at the Micron Campus site, using the NYSDEC's Survey Protocol for State listed Breeding Grassland Bird Species (NYSDEC, 2022a) (Appendix G-5).

- Visual encounter wildlife surveys conducted at the Micron Campus site, Rail Spur Site, and Childcare Site on June 23, 2023, and from January 30 through February 1, 2024.

- Qualitative environmental surveys of Youngs Creek conducted by Ramboll (see Appendix G-6 for a summary and copies of the surveys).

- Wetland delineations conducted by Ramboll, GZA, Fisher Associates, and EDR, as described in Section 3.3 (Water Resources) and Appendix F. For the proposed Clay Substation expansion area, uplands were mapped in the context of *Ecological Communities of New York State* (Edinger et al. 2014) based on aerial imagery and wetland delineation data. Uplands for all other Connected Actions were classified into general land cover types by reviewing a combination of aerial imagery and wetland delineation data and mapping.

- Published information identified in literature and obtained from governmental and nongovernmental sources, including: Esri World Imagery Map and Nearmap 2025 aerial imagery; USFWS NWI maps; NYSDEC Informational Freshwater Wetland Mapping for wetlands and surface waters; NYNHP database of State listed threatened or endangered species or species of concern; New York State Breeding Bird Atlas (2000-2005 and 2020-2024); Audubon Christmas Bird Count (2018-2023); NYSDEC Amphibian and Reptile Atlas Project (Herp Atlas) (1990-1999); USFWS IPaC System data on species in Onondaga and Oswego Counties (see Appendix G-7); and NYSDEC Environmental Resource Mapper (ERM) and Environmental Assessment Form (EAF) mapper results (see Appendix G-8).

References

AKRF, Inc. (AKRF). (2023). AKRF ecological communities observations collected on July 31 through August 2, 2023.

Edinger, G. J., D. J. Evans, S. Gebauer, T. G. Howard, D. M. Hunt, and A. M. Olivero (editors). (2014). Ecological Communities of New York State. Second Edition. A revised and expanded edition of Carol Reschke's Ecological Communities of New York State. New York Natural Heritage Program, New York State Department of Environmental Conservation, Albany, NY. https://www.nynhp.org/documents/39/ecocomm2014.pdf

New York State Department of Environmental Conservation (NYSDEC). (2022a). Survey Protocol for State-listed Breeding Grassland Bird Species. March 2022.

U.S. Fish and Wildlife Service (USFWS). (2023). Range-wide Indiana Bat and Northern Long-eared Bat Survey Guidelines. U.S. Fish and Wildlife Service, Region 3, Bloomington, MN. 76 pp Available from: https://www.fws.gov/sites/default/files/documents/USFWS_Range-wide_IBat_%26_NLEB_Survey_Guidelines_2023.05.10_0.pdf (Accessed November 18, 2024).

Appendix G-2
Legal and Regulatory Setting

G-2 Legal and Regulatory Setting

The legal and regulatory setting for Section 3.4 (Biological Resources) includes the authorities described below, in addition to relevant authorities described in Section 3.3 (Water Resources) and Appendix F.

G-2.1 Federal

The Endangered Species Act (ESA) (16 U.S.C. § 1531 *et seq.*) establishes protections for fish, wildlife, and plants that are listed as threatened or endangered, provides for adding species to and removing them from the list of protected threatened and endangered species and preparing and implementing plans for their recovery, and provides for interagency cooperation to avoid take of listed species and for issuing permits for otherwise prohibited activities, among other purposes.

The Migratory Bird Treaty Act (MBTA) (16 U.S.C. § 703 *et seq.*) implements four international conservation treaties between the United States and other nations and is intended to ensure the sustainability of populations of all protected migratory bird species. The MBTA prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by USFWS.

The Fish and Wildlife Coordination Act 16 U.S.C. § 661 *et seq.*) directs USFWS to investigate and report on proposed Federal actions that affect any stream or other body of water and to provide recommendations to minimize impacts on fish and wildlife resources.

G-2.2 State

The New York Fish and Wildlife Law (ECL Article 11) and the NYSDEC Endangered and Threatened Species Regulations (6 NYCRR Part 182) prohibit the taking, import, transport, possession, or selling of any endangered or threatened species of fish or wildlife as listed in 6 NYCRR § 182.5. Under the regulations, activities likely to result in the take of listed endangered or threatened species or adverse modification of occupied habitat are prohibited except as authorized by an incidental take permit issued by NYSDEC.

Appendix G-3
Supplemental Information: Affected Environment

G-3 Supplemental Information: Affected Environment

Appendix G-3 provides supplemental information on the ecological communities and wildlife potentially occurring or documented or observed at the Proposed Project and Connected Action sites based on the sources and methodologies described in Appendix G-2.

G-3.1 Ecological Communities (Micron Campus)

As described in Section 3.4.3.1, the dominant ecological communities at the proposed Micron Campus site include successional old field, successional shrubland, floodplain forest, deep emergent marsh, red maple-hardwood swamp, shallow emergent marsh, and mowed lawn with trees, reflecting the site's general composition as complexes of wetlands and uplands, including previous farmland, in varying stages of succession. As described in Section 3.3 (Water Resources), the site includes approximately 422 acres of wetlands and 8,710 LF of streams. Many of the wetlands were once uplands in agricultural production. A National Grid utility transmission line ROW traverses the northern portion of the site and contains a gravel access road with at-grade and culverted crossings at several locations. The ecological communities on the site to the north of this ROW are primarily forested, swampland, and marshland habitat with varying species composition based on topography, hydrology, and former and current site uses. These communities also are present to a lesser extent on the site to the south of the transmission line ROW.

The floodplain forest ecological communities at the Micron Campus site transition into red maple-hardwood swamp north of the utility ROW and hemlock-hardwood swamp to the south. The red maple-hardwood swamps were observed to have saturated soils, and a dense understory comprised of shrubs and saplings. The floodplain forests adjacent to this ecological community were observed to consist of similar vegetation, but were generally drier, and lacked the same dense shrub understory. South of the utility ROW, the floodplain forest communities are bisected by deep emergent marsh, red maple-hardwood swamp, and other communities present at smaller scales, including shrub swamp and rich mesophytic forest.

The deep emergent marsh community located in the north and eastern portions of the site is the largest marshland community present at the site. Shallow emergent marsh communities were also observed throughout the site, though to a lesser extent than deep emergent marsh. The shallow emergent marsh is present to the south and east of the deep emergent marsh, occurring primarily as a wetland complex throughout the successional old field. The deep emergent marsh community transitions to a floodplain forest to the north and south of the utility ROW and extends off-site to the east. The overstory of the deep emergent marsh and floodplain forest communities includes numerous dead trees (snags) likely created by flooding caused by the beaver dam located in the southern portion of the marsh.

The ecological community along Burnet Road is best characterized as mowed lawn with trees, and the ecological community along the utility ROW is best characterized as mowed roadside/pathway. These ecological communities were observed to have varying levels of succession, with dominant vegetation ranging from mowed herbaceous species to shrublands. A portion of the upland forest in the northwestern corner of the site is best characterized as successional northern hardwood due to the prevalence of early successional and invasive species. South of the utility ROW and west of Burnet Road, red maple-hardwood swamps and floodplain forests transition into beech-maple mesic forest, successional southern hardwood, and maple-basswood rich mesic forest, generally becoming more fragmented by successional old field and shrubland and cropland/field crops.

G-3.2 Connected Action Land Use Cover Types

Figures G-1 through G-23 show the ecological communities (including land cover types and wetlands) for the Connected Actions.

Figure G-1 Clay Substation Expansion Area Ecological Communities

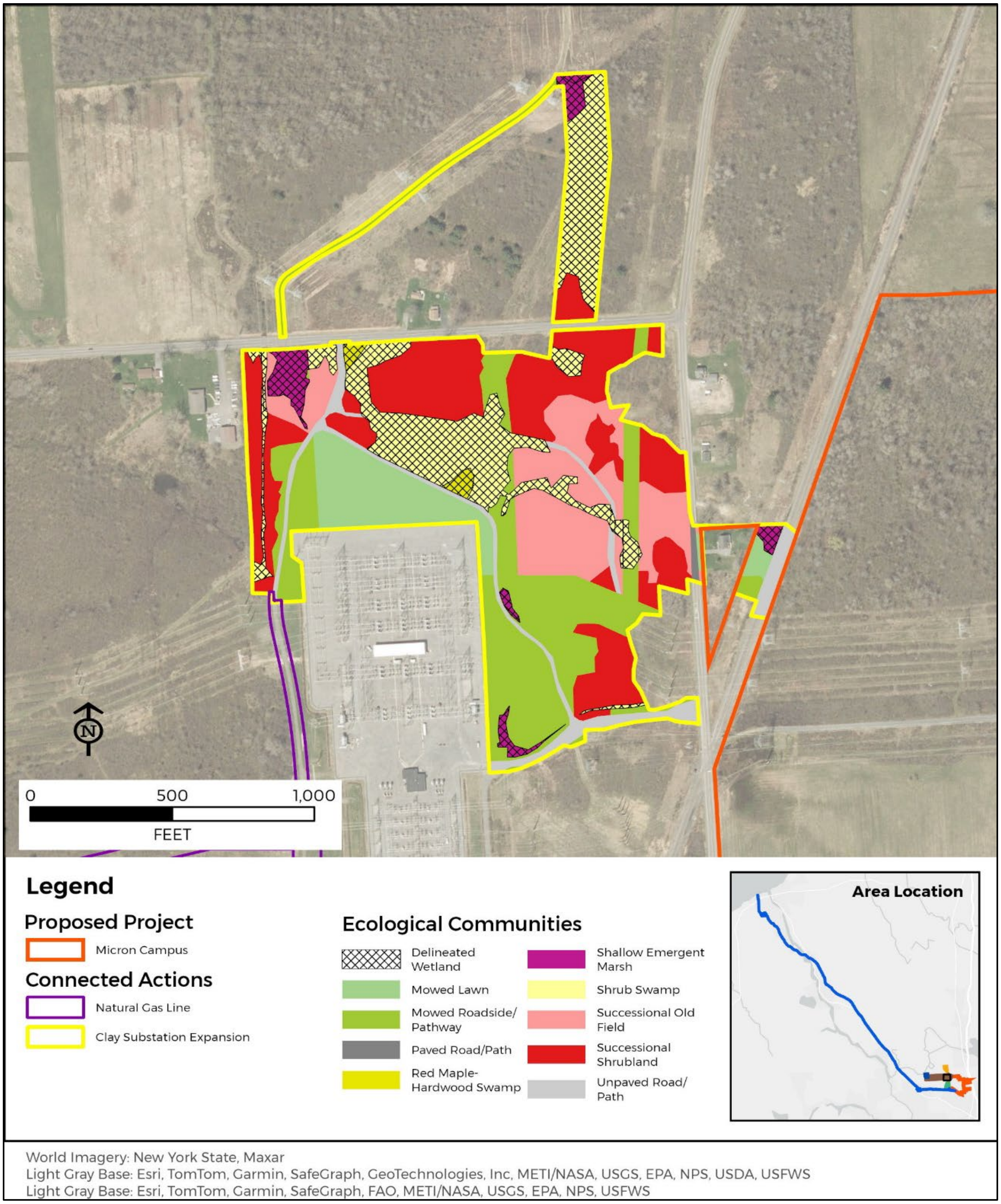


Figure G-2 Natural Gas Improvement Ecological Communities

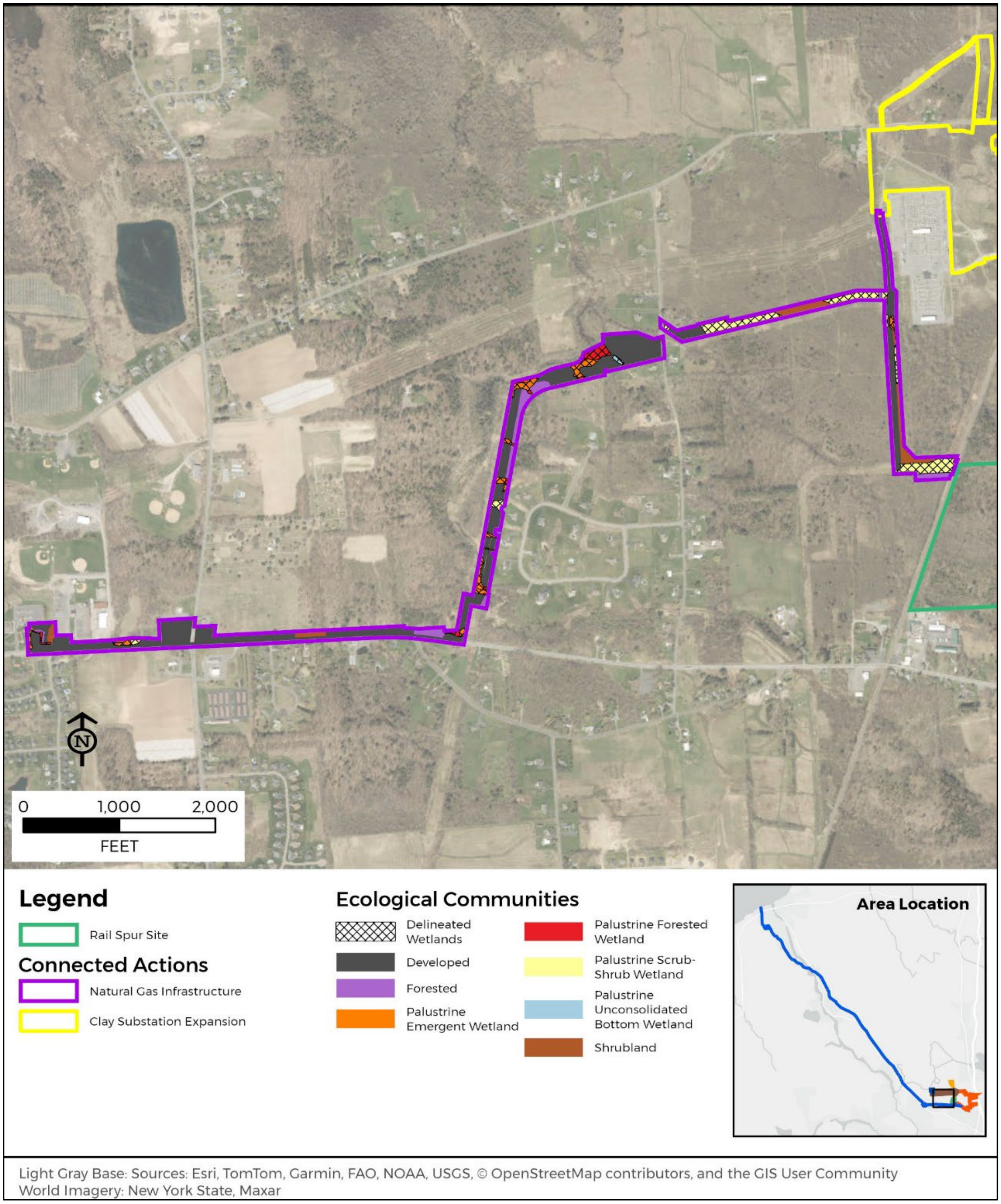
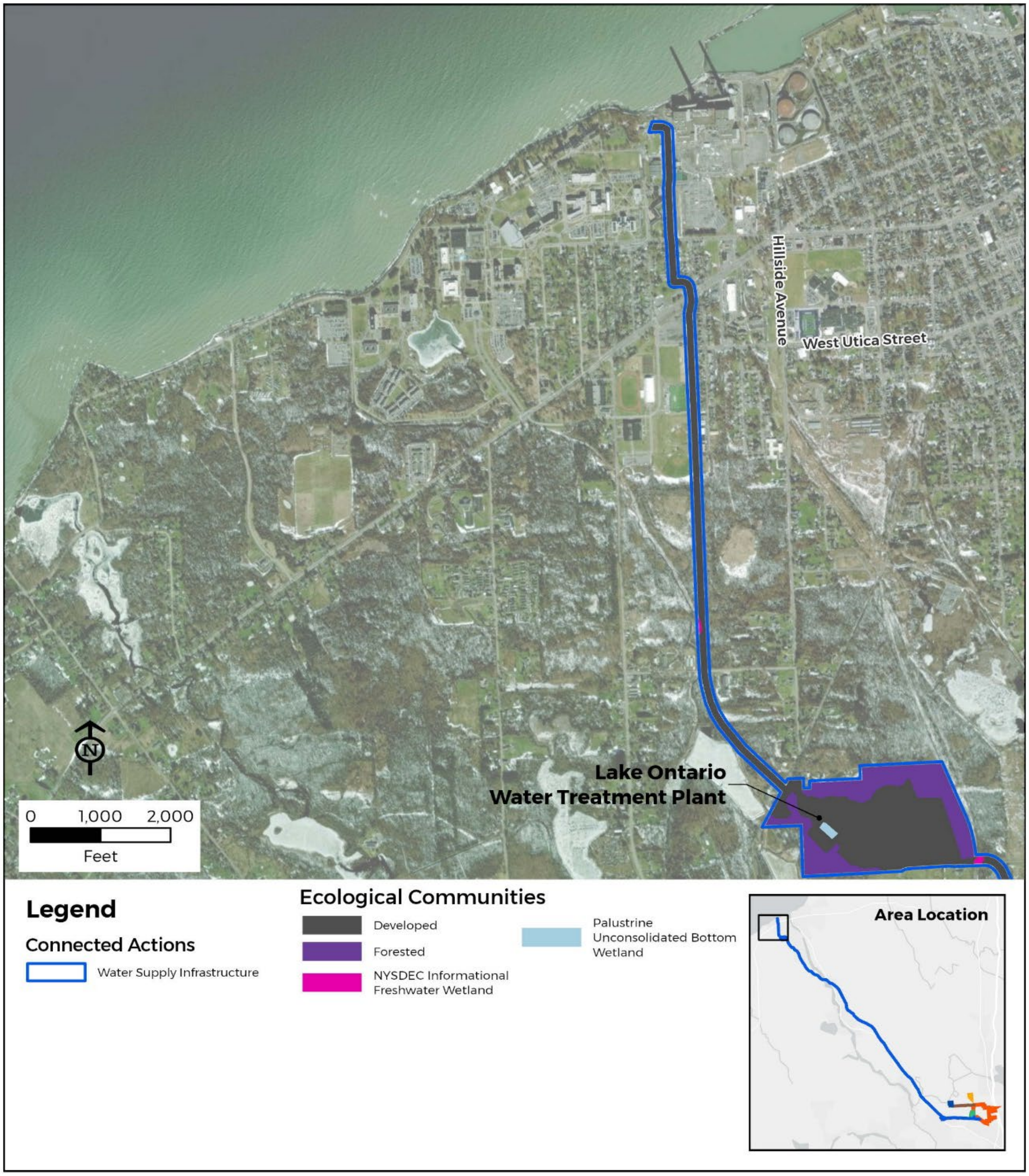
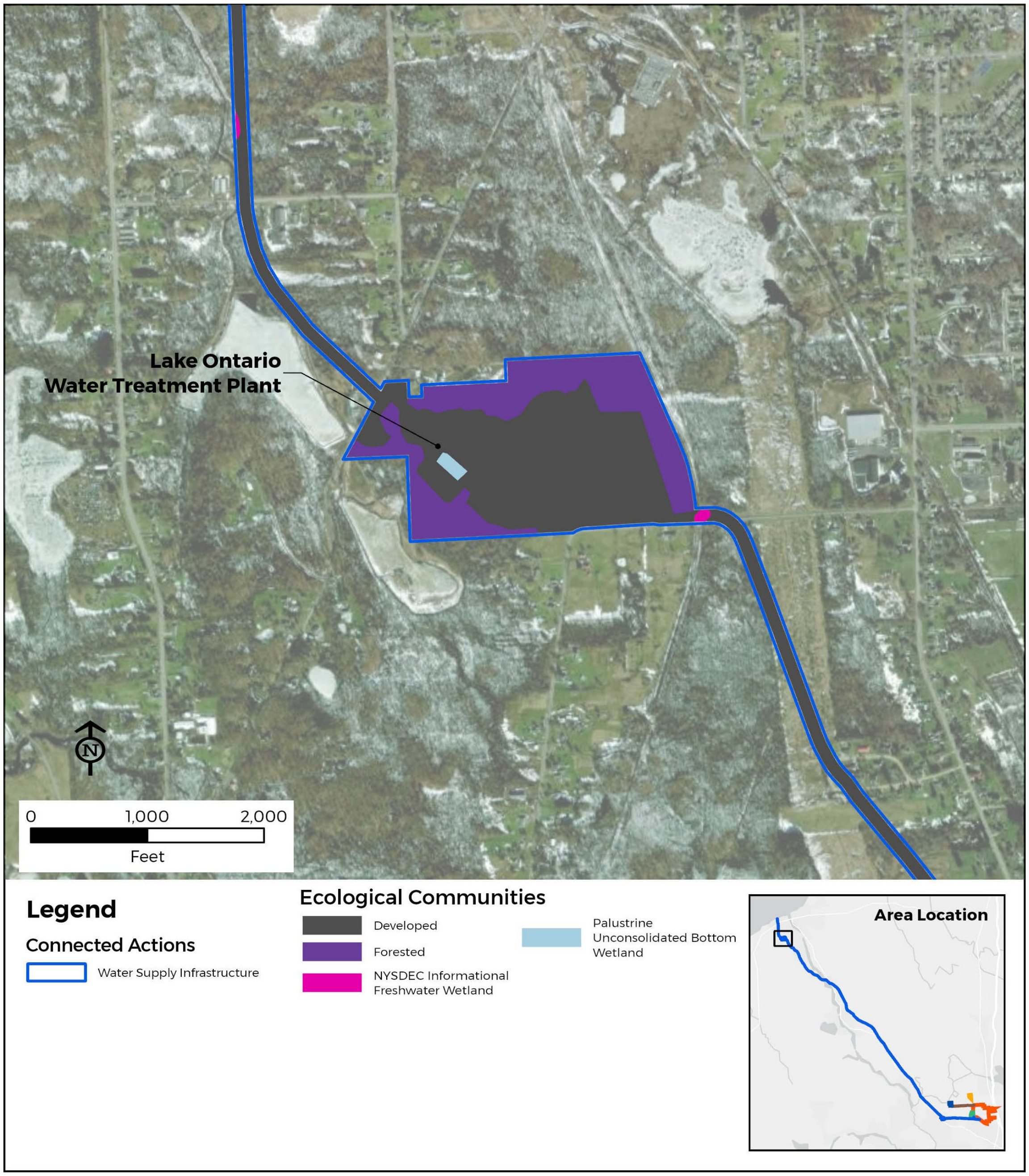


Figure G-3 Water Supply Improvement Ecological Communities



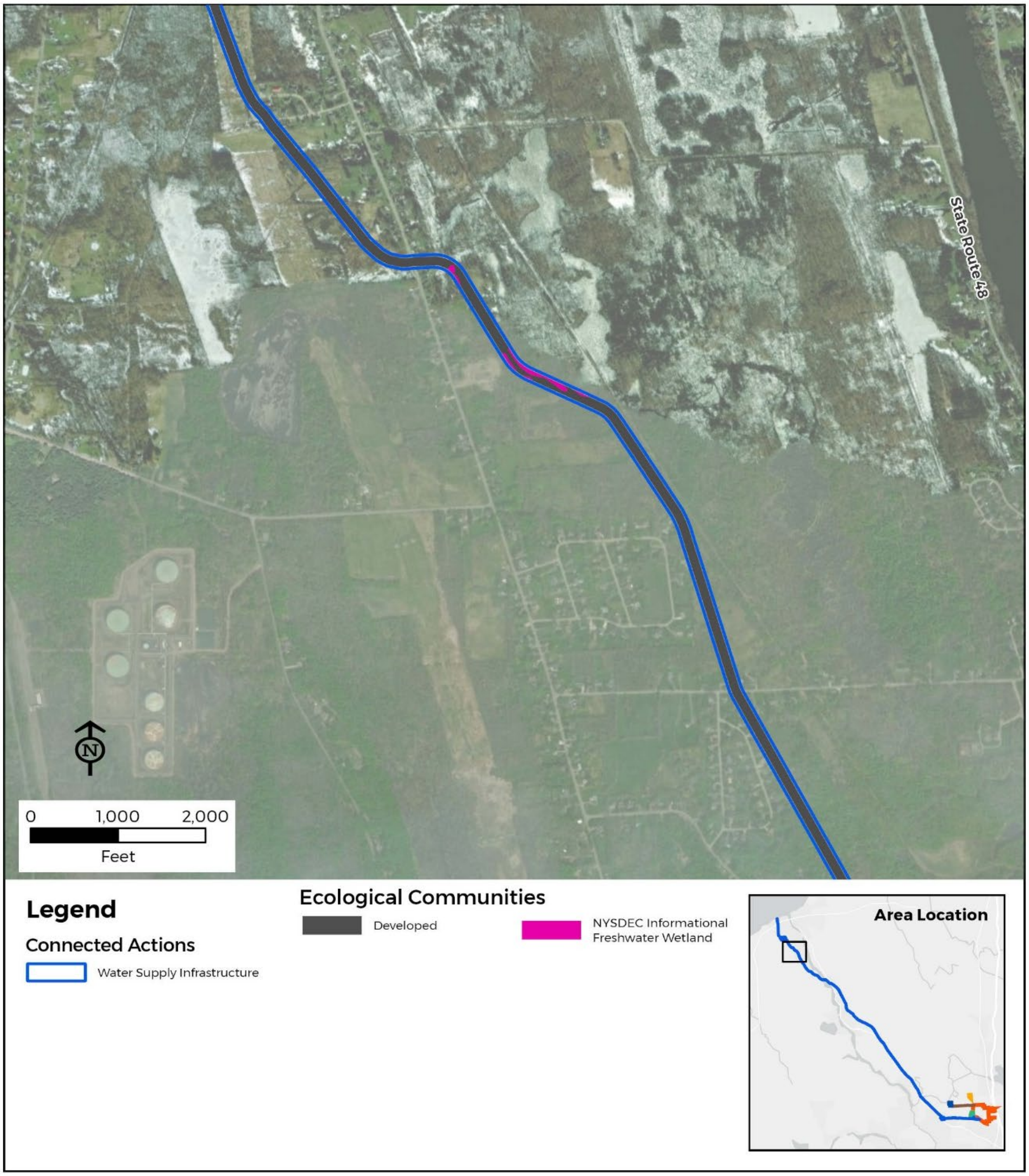
Light Gray Base: Esri, TomTom, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NPS, USFWS
World Imagery: New York State, Earthstar Geographics

Figure G-4 Water Supply Improvement Ecological Communities



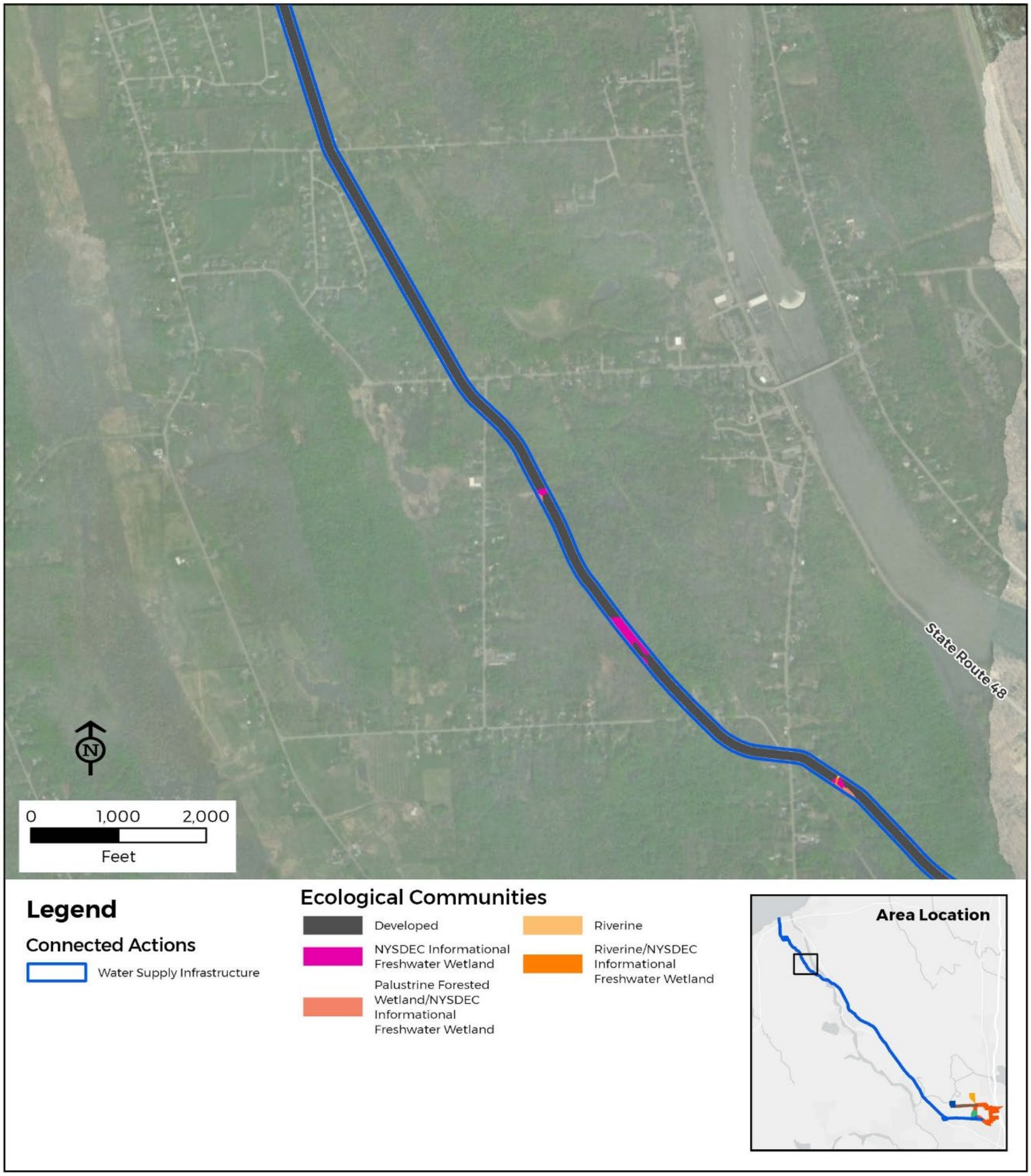
World Imagery: New York State, Maxar
Light Gray Base: Esri, TomTom, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NPS, USFWS

Figure G-5 Water Supply Improvement Ecological Communities



World Imagery: New York State, Maxar
Light Gray Base: Esri, TomTom, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NPS, USFWS

Figure G-6 Water Supply Improvement Ecological Communities



World Imagery: New York State, Maxar
Light Gray Base: Esri, TomTom, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NPS, USFWS

Figure G-7 Water Supply Improvement Ecological Communities

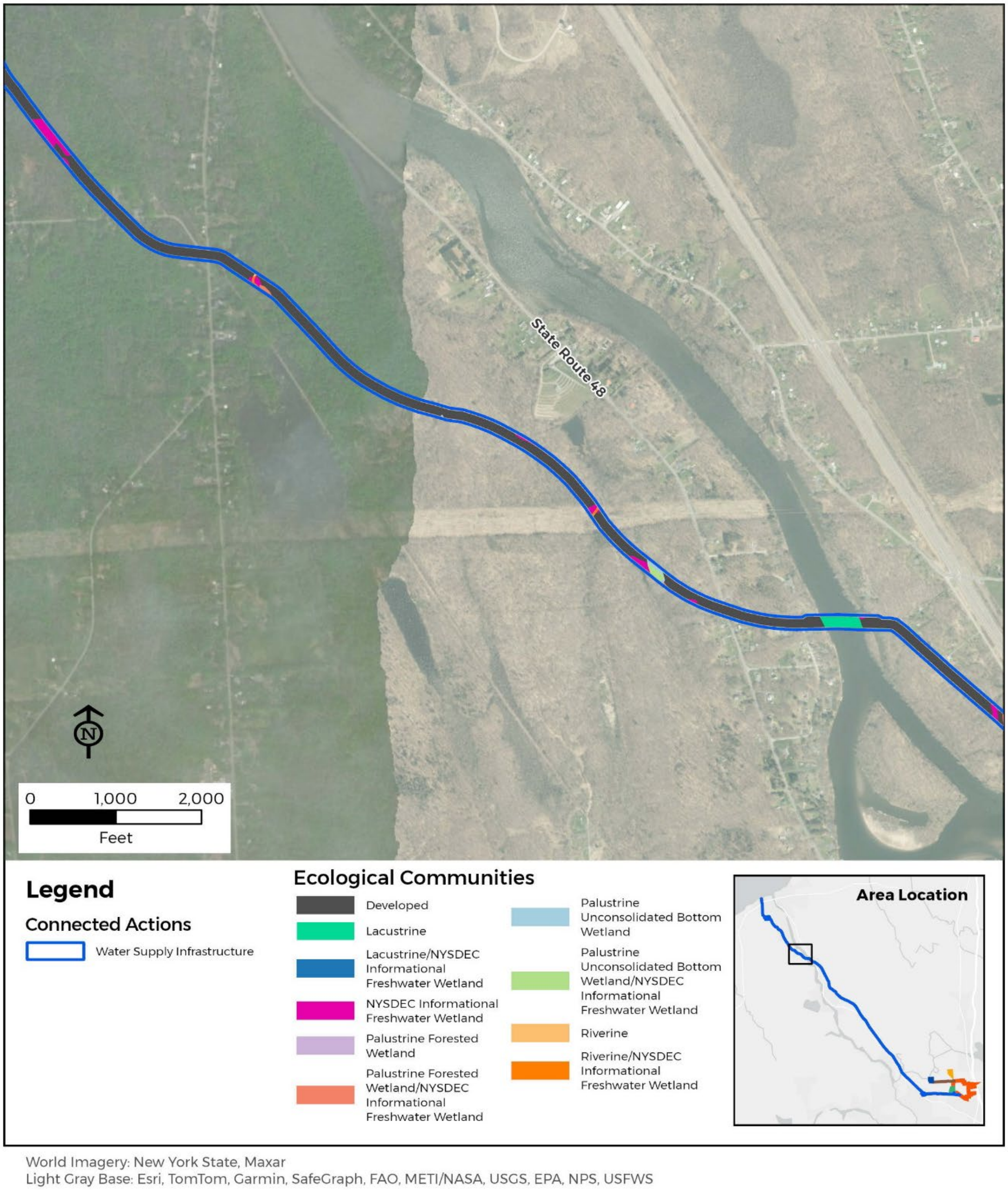
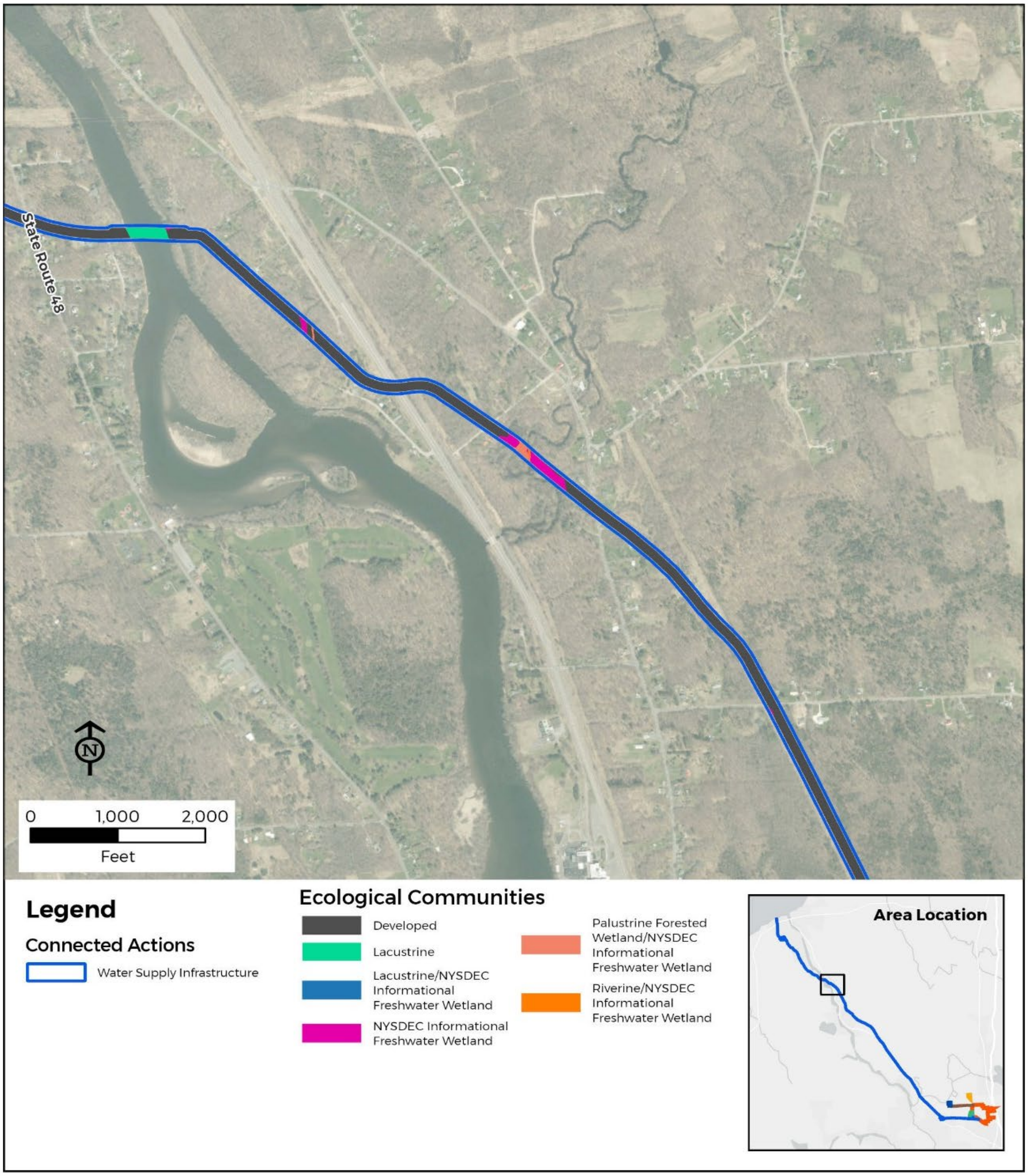
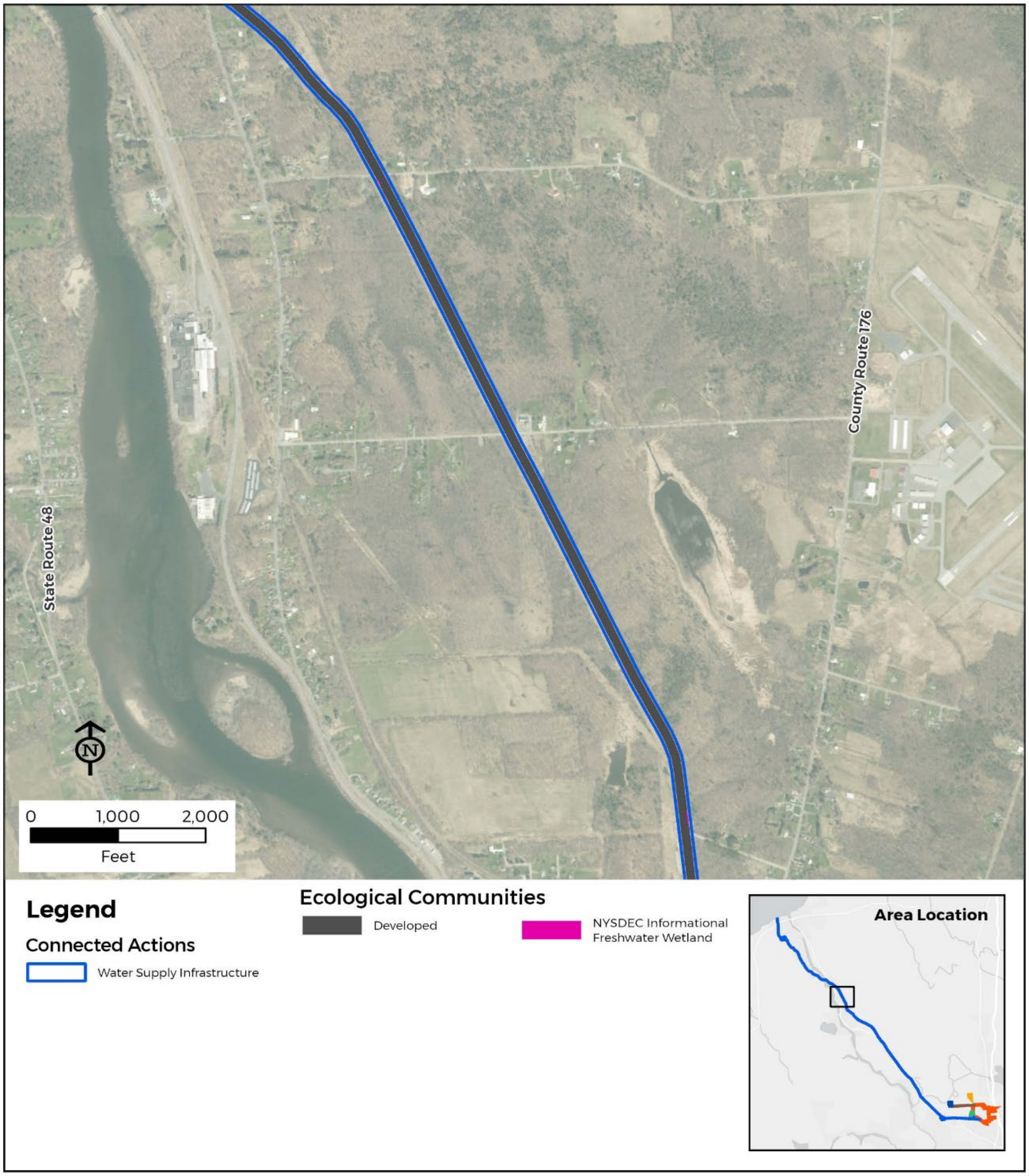


Figure G-8 Water Supply Improvement Ecological Communities



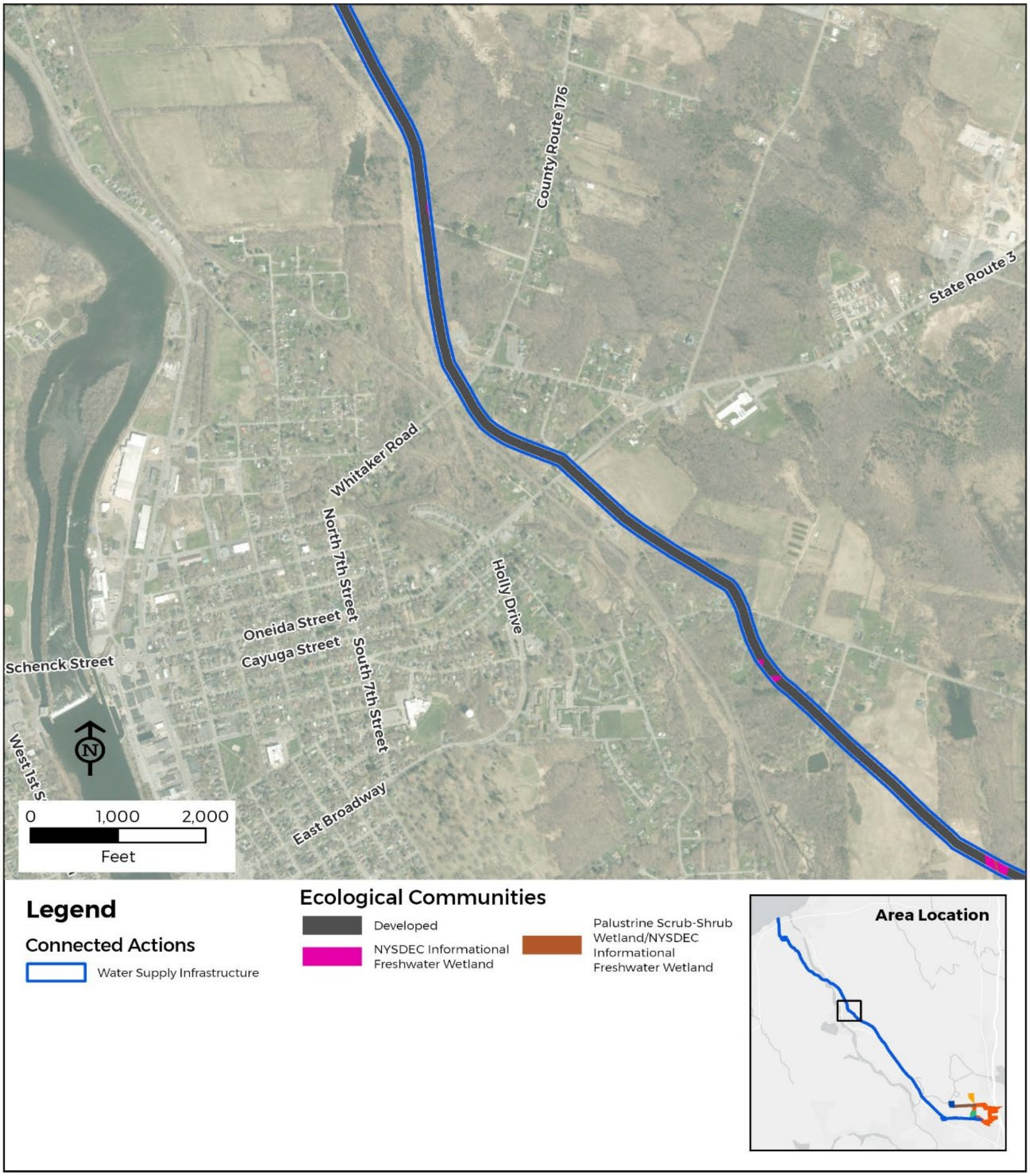
World Imagery: New York State, Maxar
Light Gray Base: Esri, TomTom, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NPS, USFWS

Figure G-9 Water Supply Improvement Ecological Communities



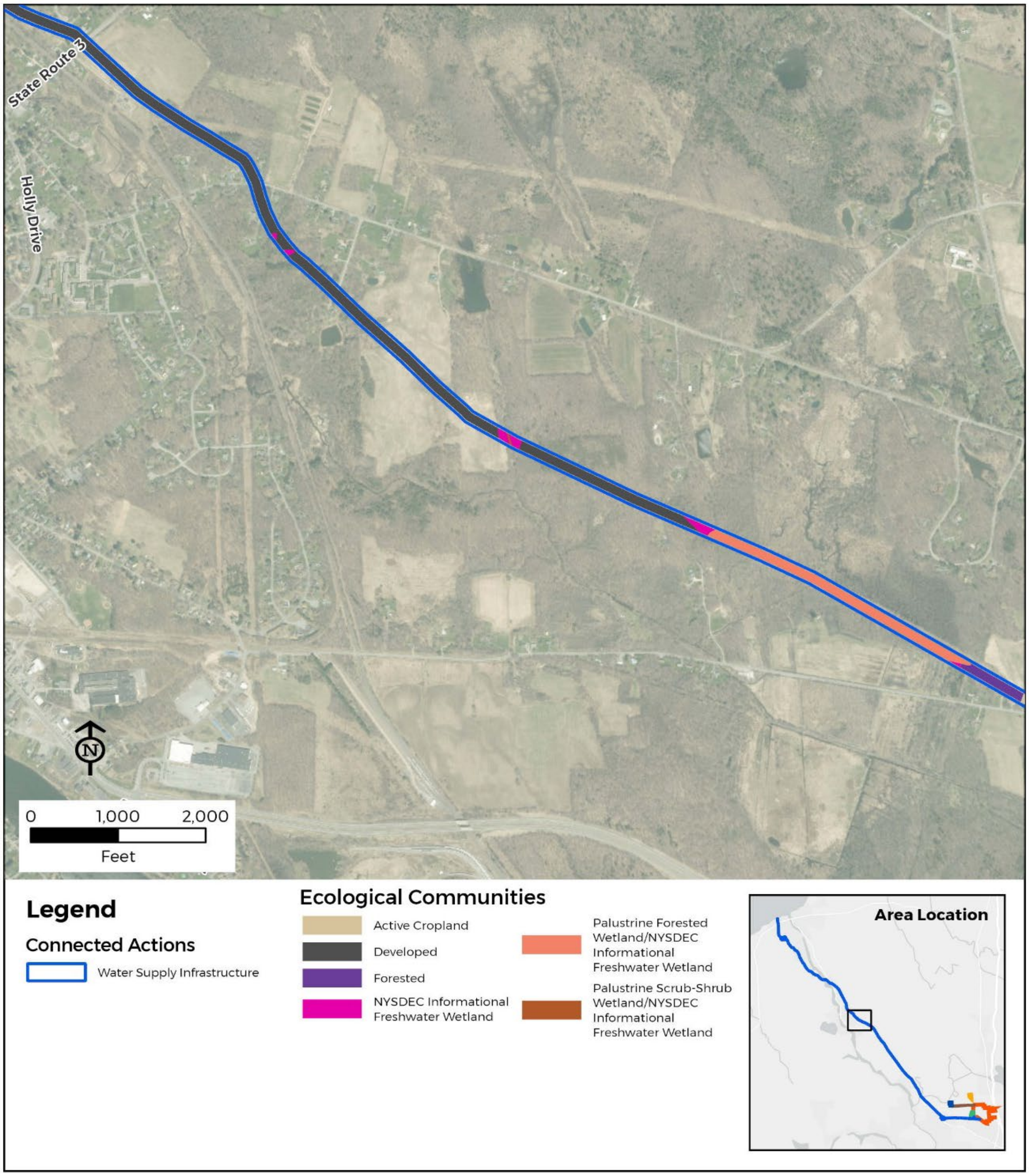
World Imagery: New York State, Maxar
Light Gray Base: Esri, TomTom, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NPS, USFWS

Figure G-10 Water Supply Improvement Ecological Communities



World Imagery: New York State, Maxar
Light Gray Base: Esri, TomTom, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NPS, USFWS

Figure G-11 Water Supply Improvement Ecological Communities



World Imagery: New York State, Maxar
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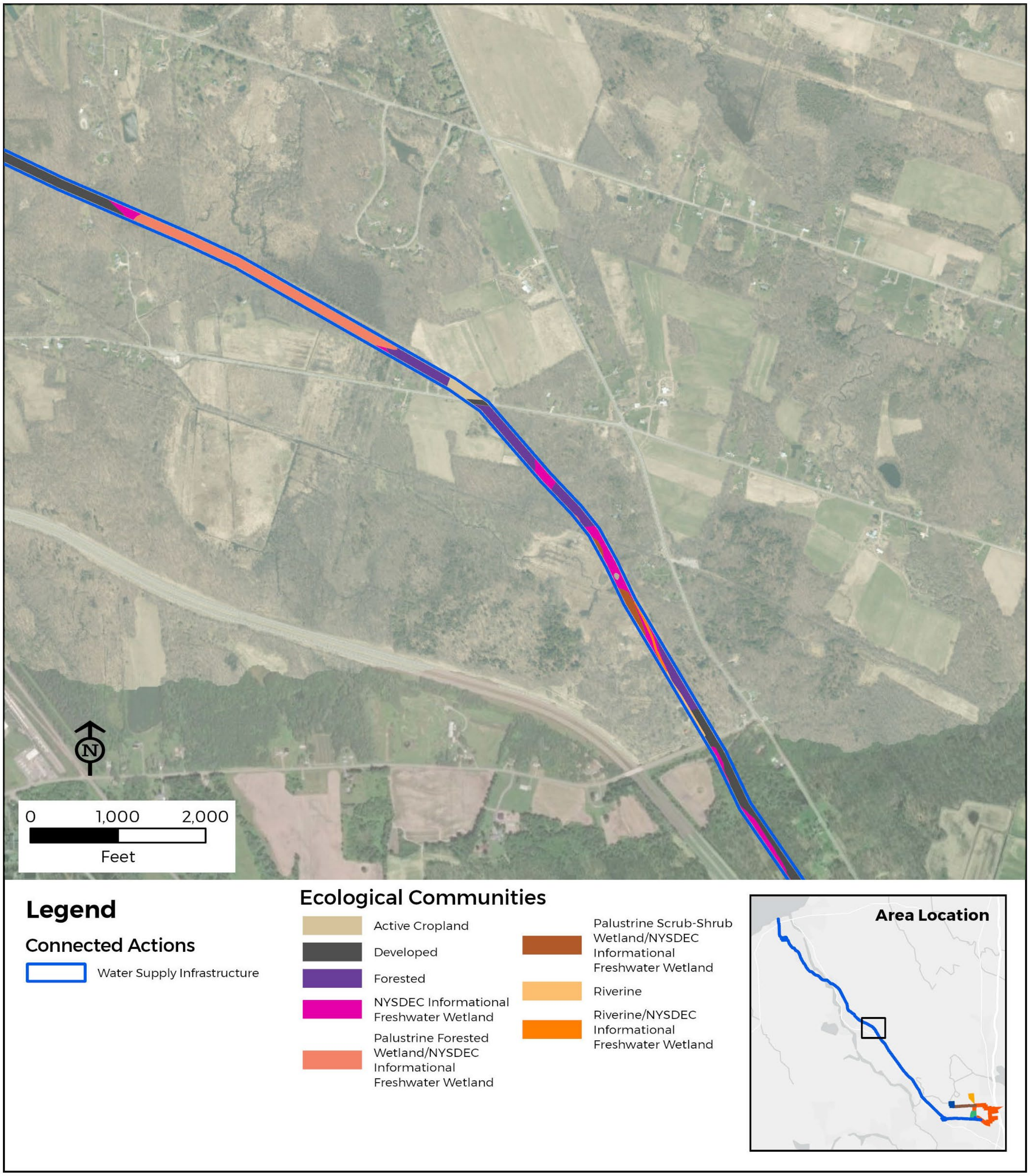
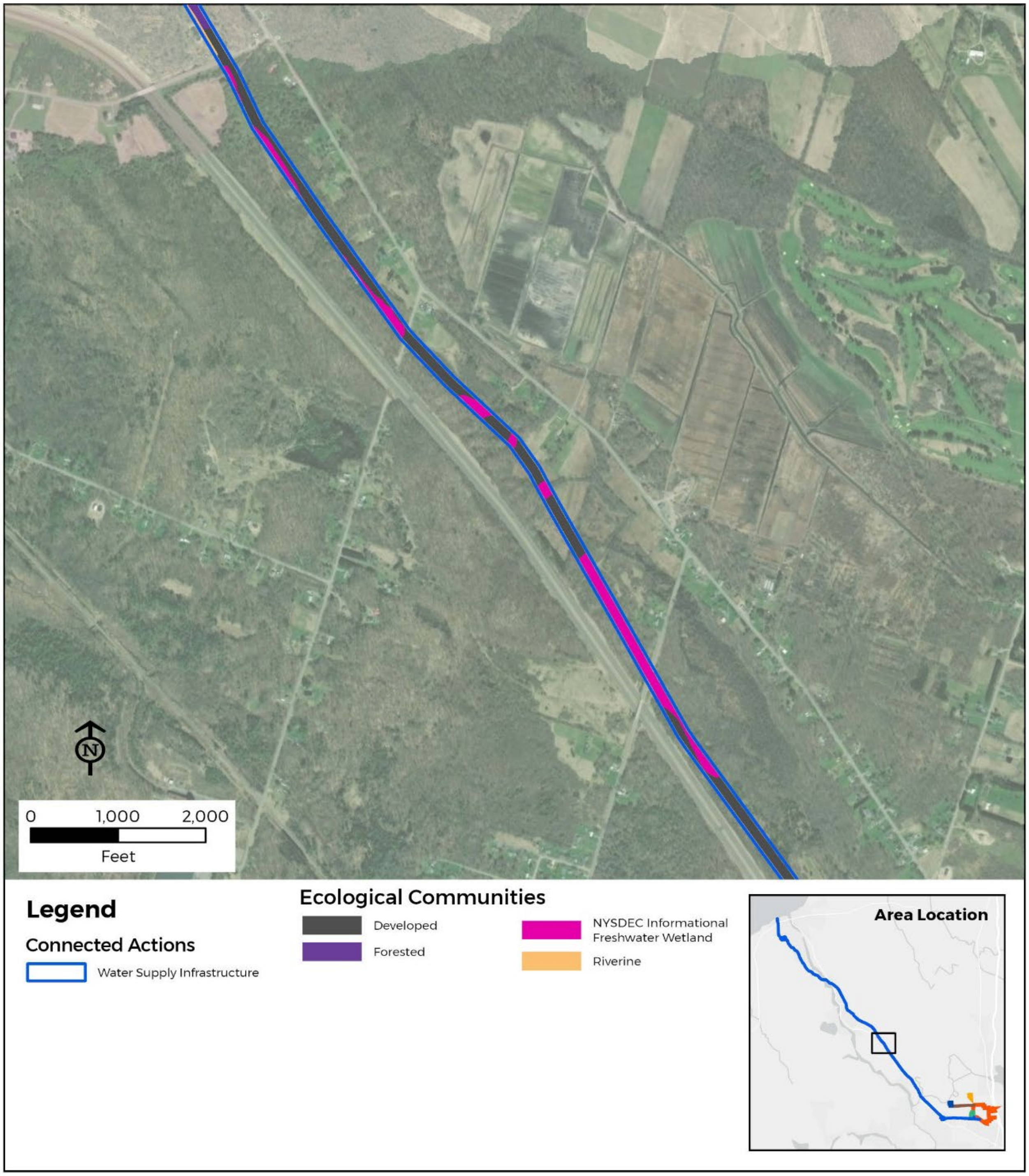
Figure G-12 Water Supply Improvement Ecological Communities



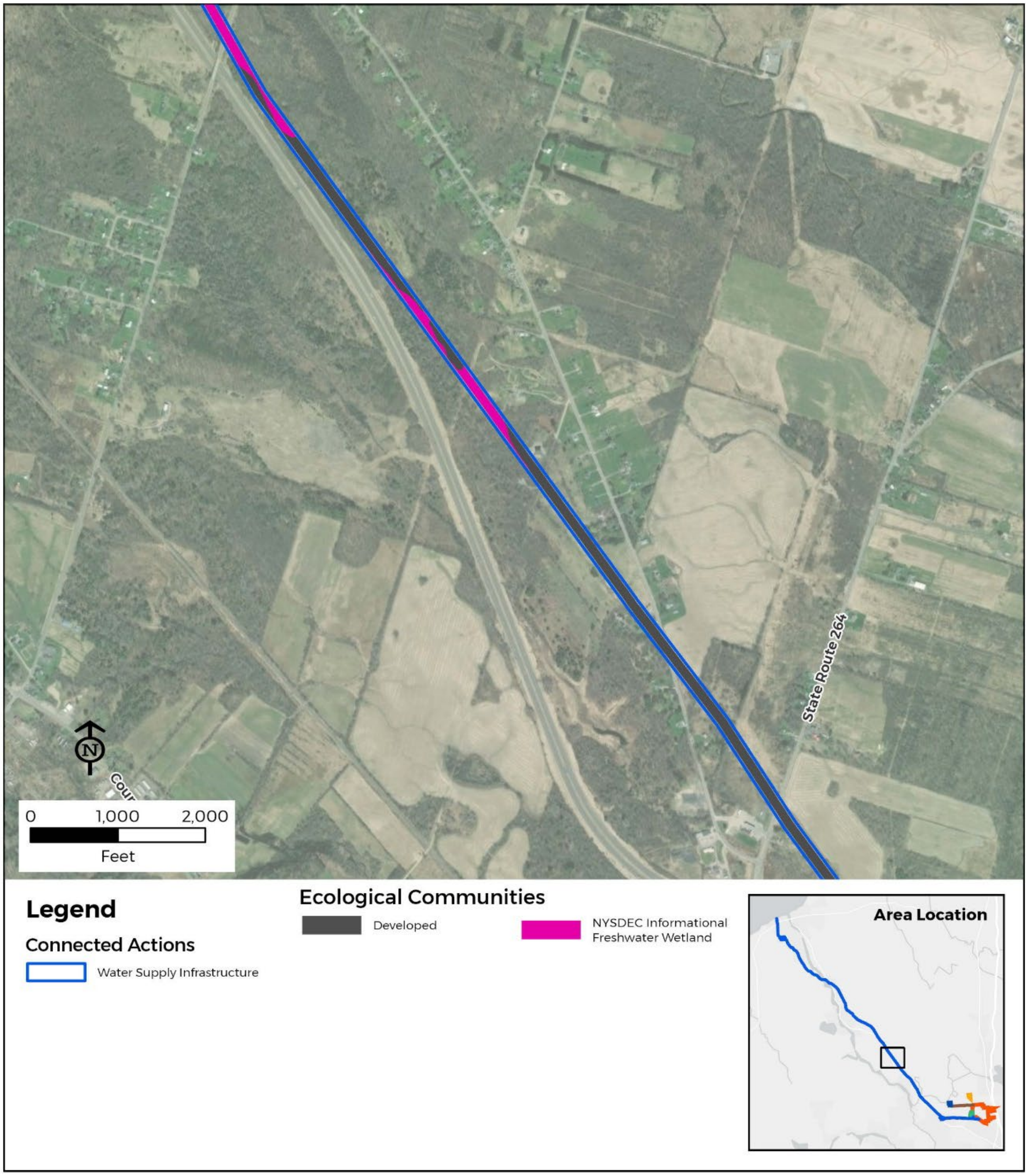
World Imagery: New York State, Maxar
Light Gray Base: Esri, TomTom, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NPS, USFWS

Figure G-13 Water Supply Improvement Ecological Communities



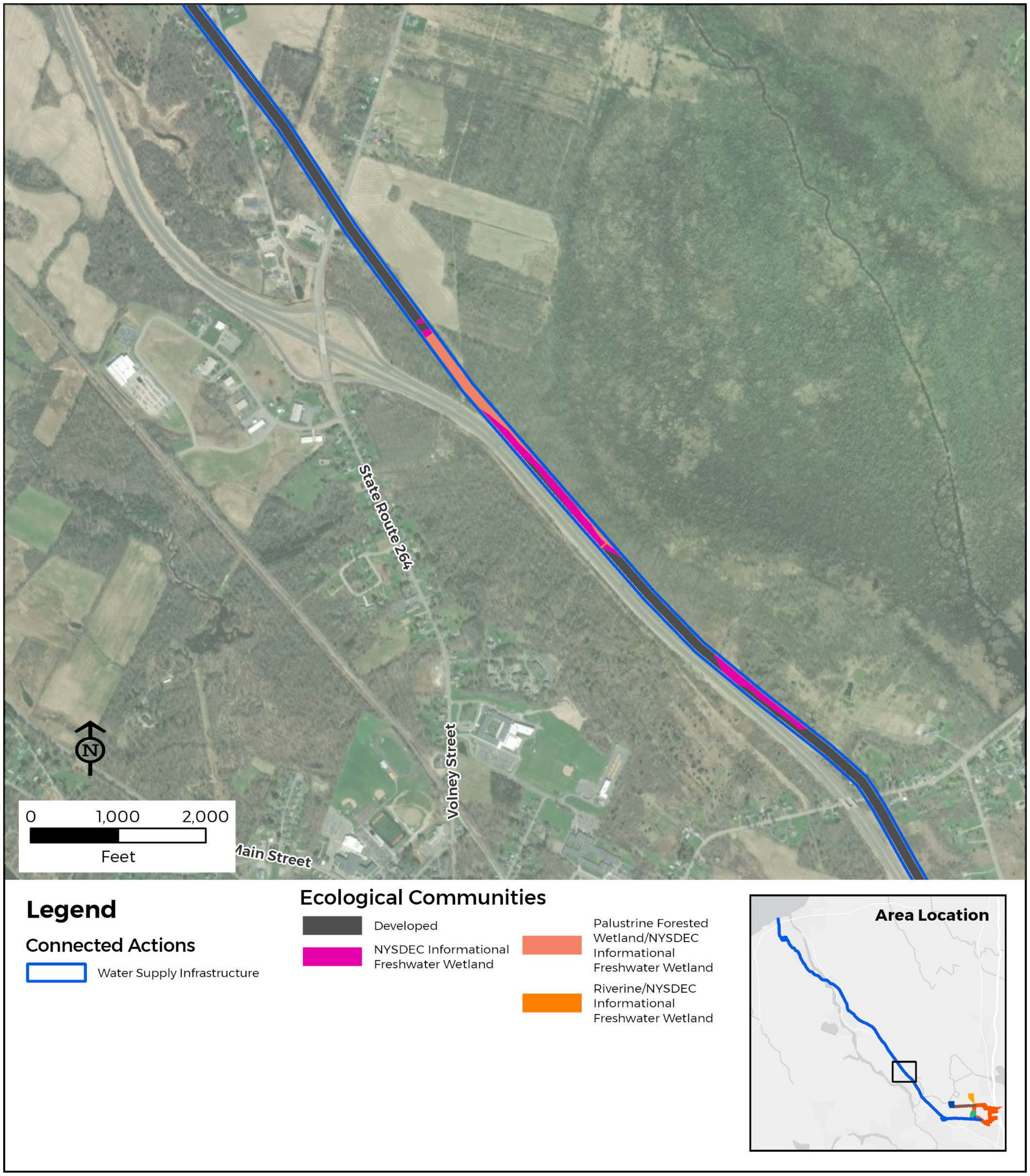
World Imagery: New York State, Maxar
Light Gray Base: Esri, TomTom, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NPS, USFWS

Figure G-14 Water Supply Improvement Ecological Communities



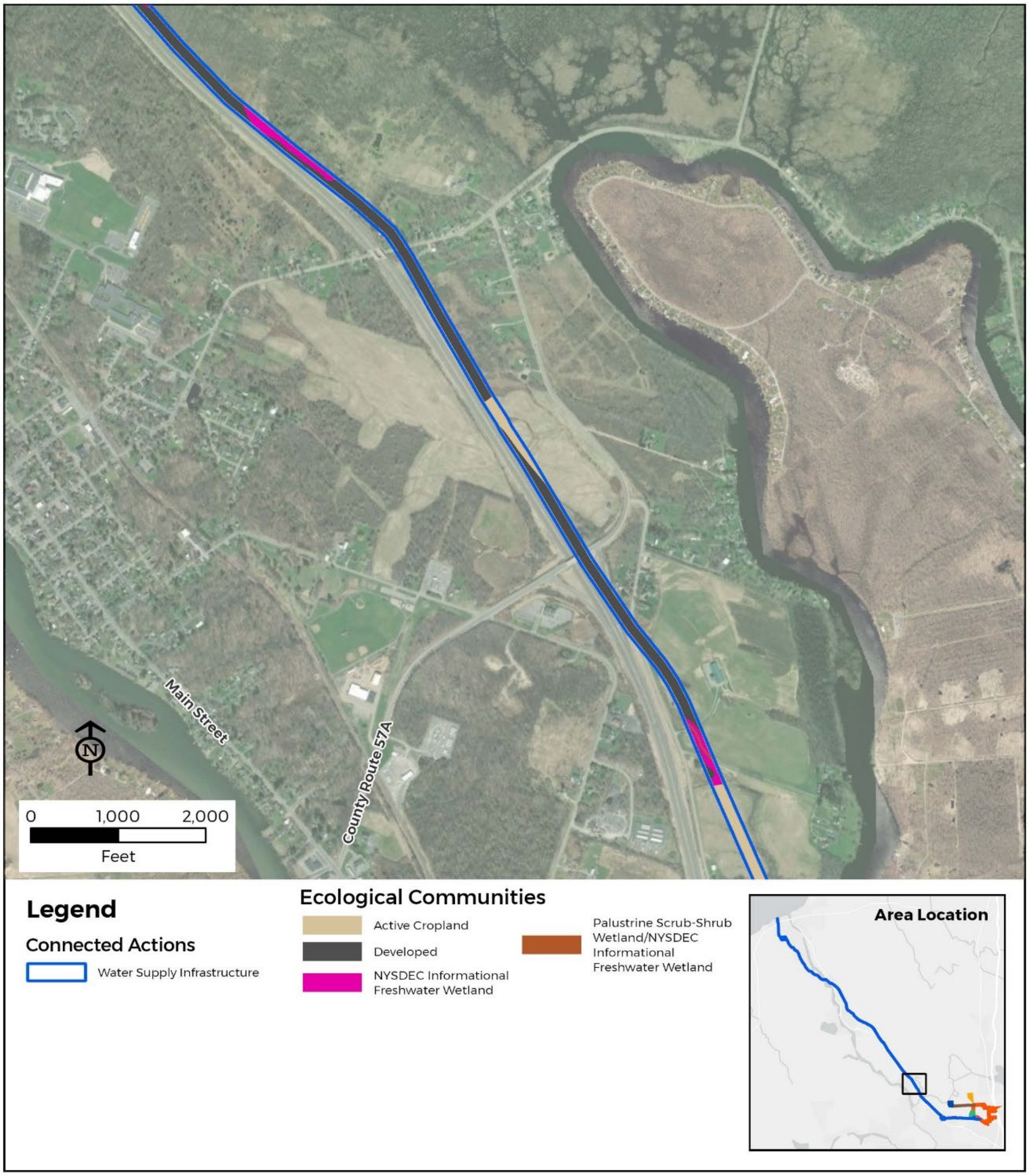
World Imagery: New York State, Maxar
Light Gray Base: Esri, TomTom, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NPS, USFWS

Figure G-15 Water Supply Improvement Ecological Communities



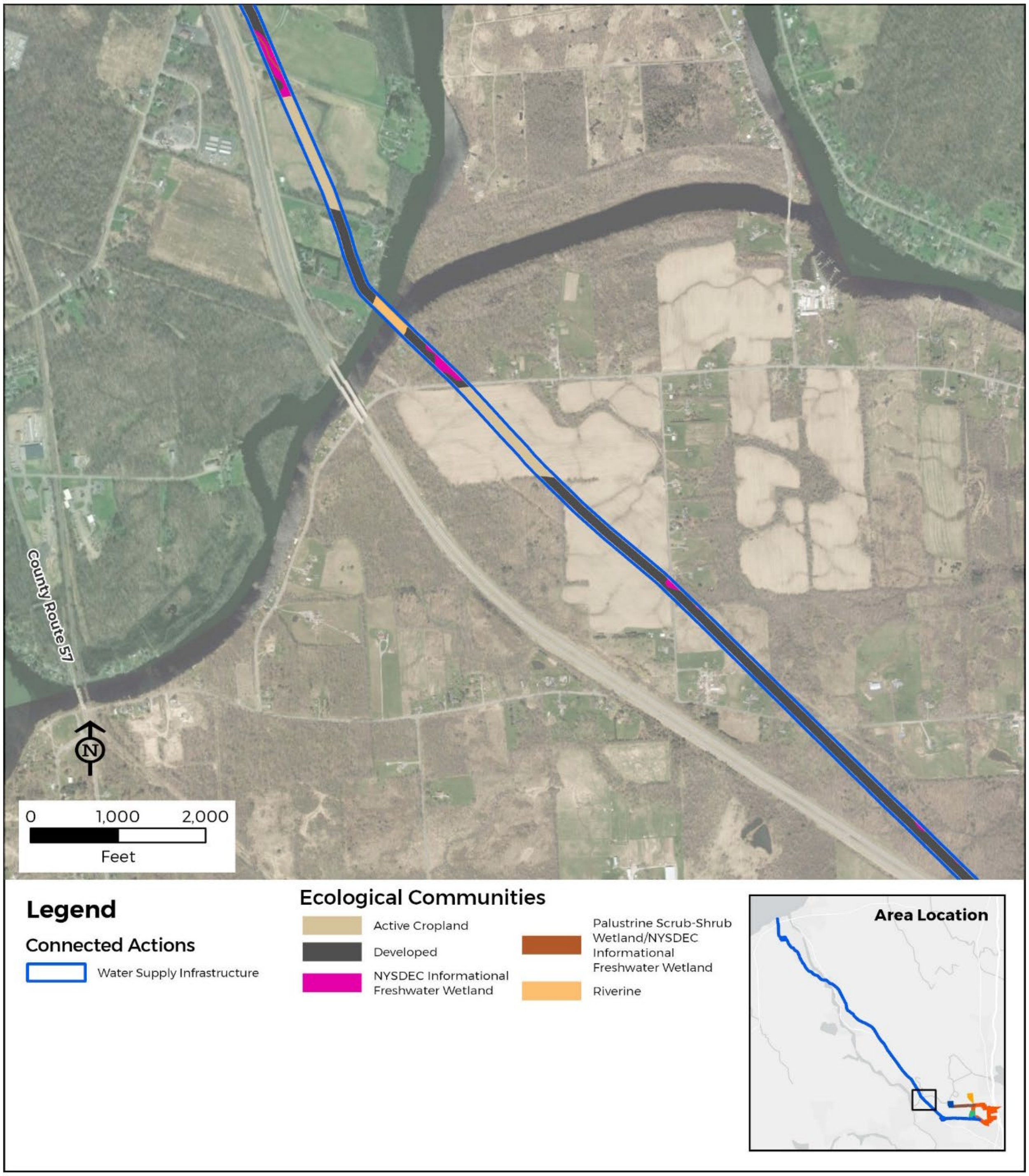
World Imagery: New York State, Maxar
Light Gray Base: Esri, TomTom, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NPS, USFWS

Figure G-16 Water Supply Improvement Ecological Communities



World Imagery: New York State, Maxar
Light Gray Base: Esri, TomTom, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NPS, USFWS

Figure G-17 Water Supply Improvement Ecological Communities



World Imagery: New York State, Maxar
Light Gray Base: Esri, TomTom, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NPS, USFWS

Figure G-18 Water Supply Improvement Ecological Communities

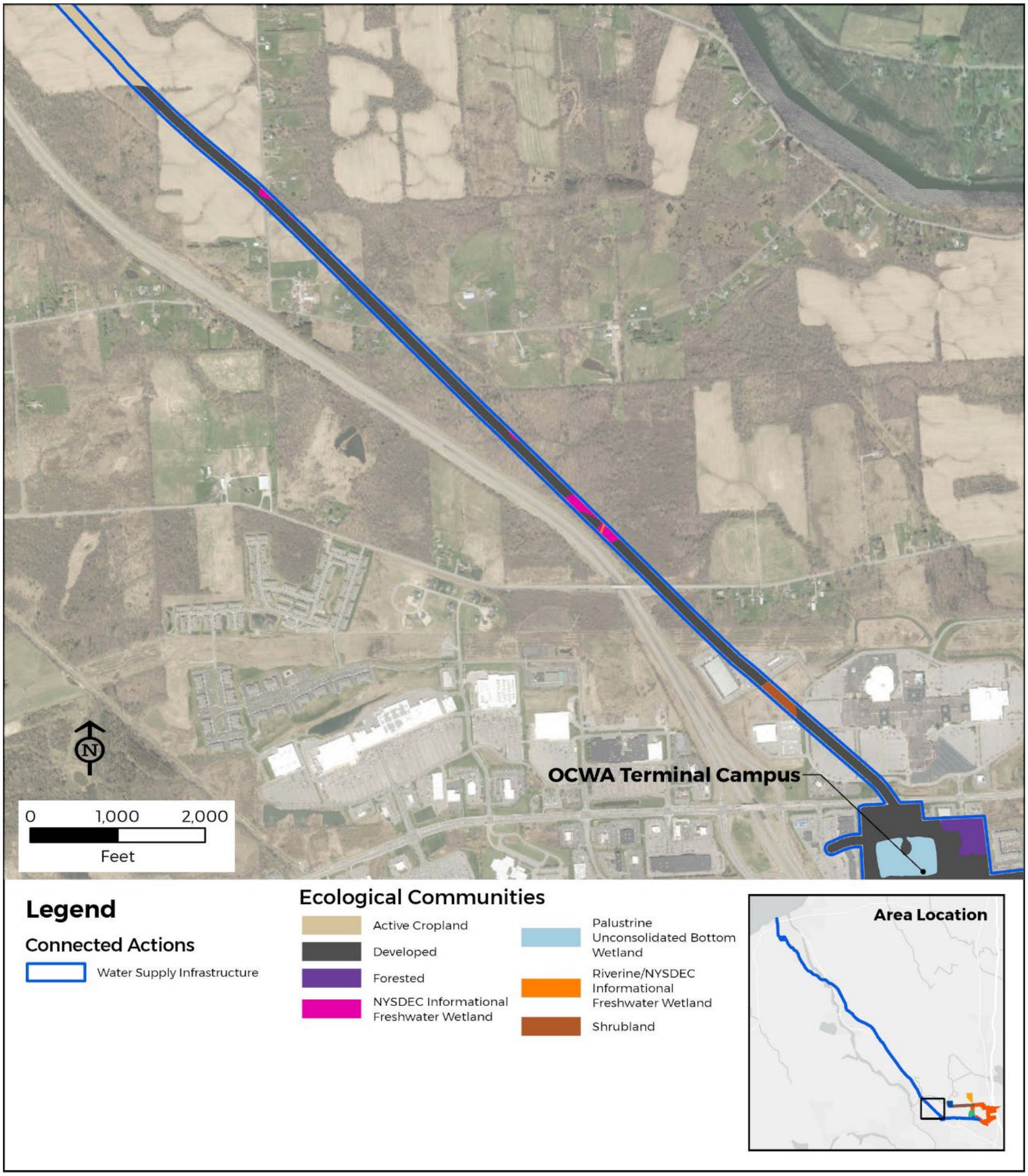


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Figure G-19 Water Supply Improvement Ecological Communities

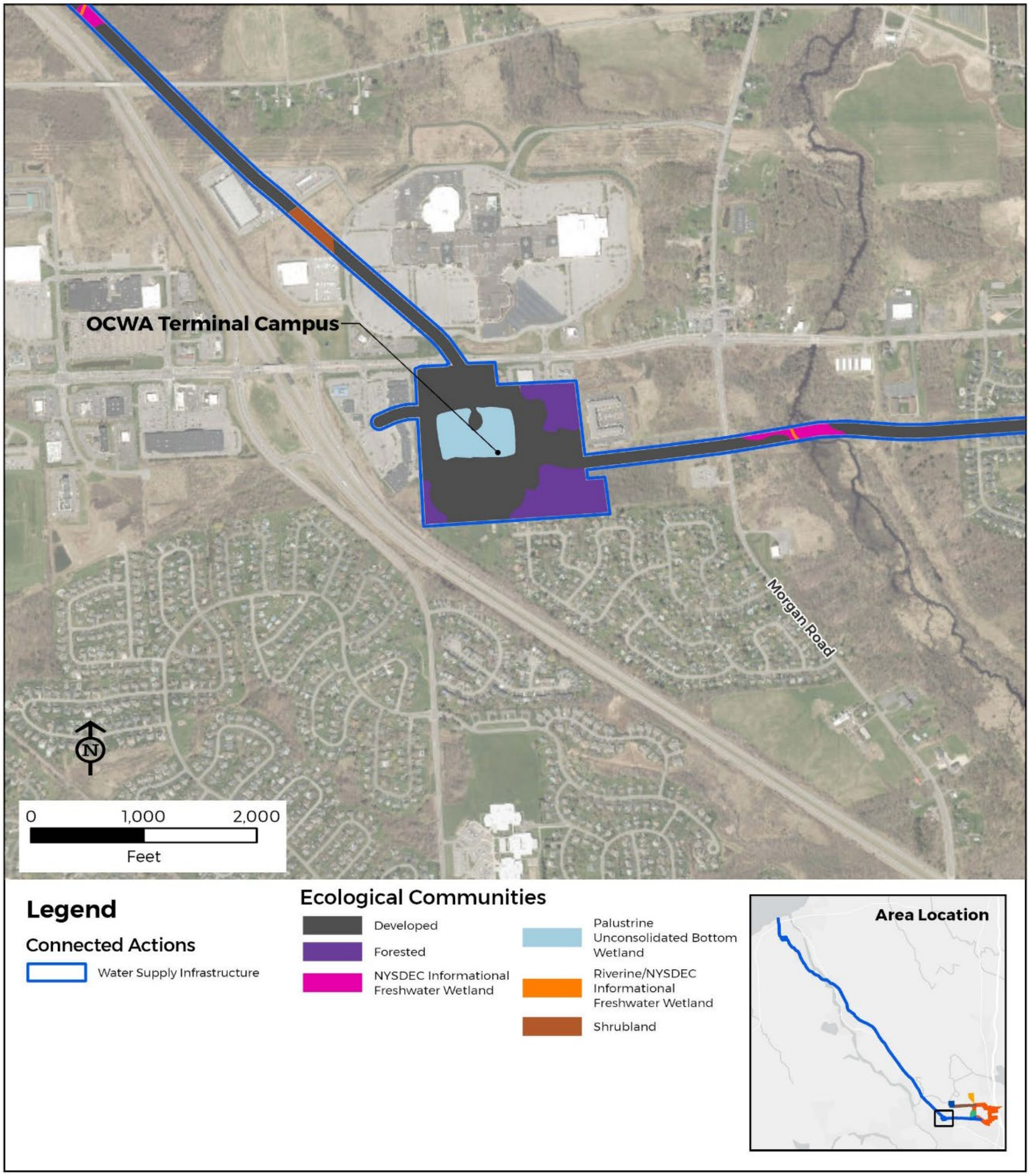

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Figure G-20 Water Supply Improvement Ecological Communities

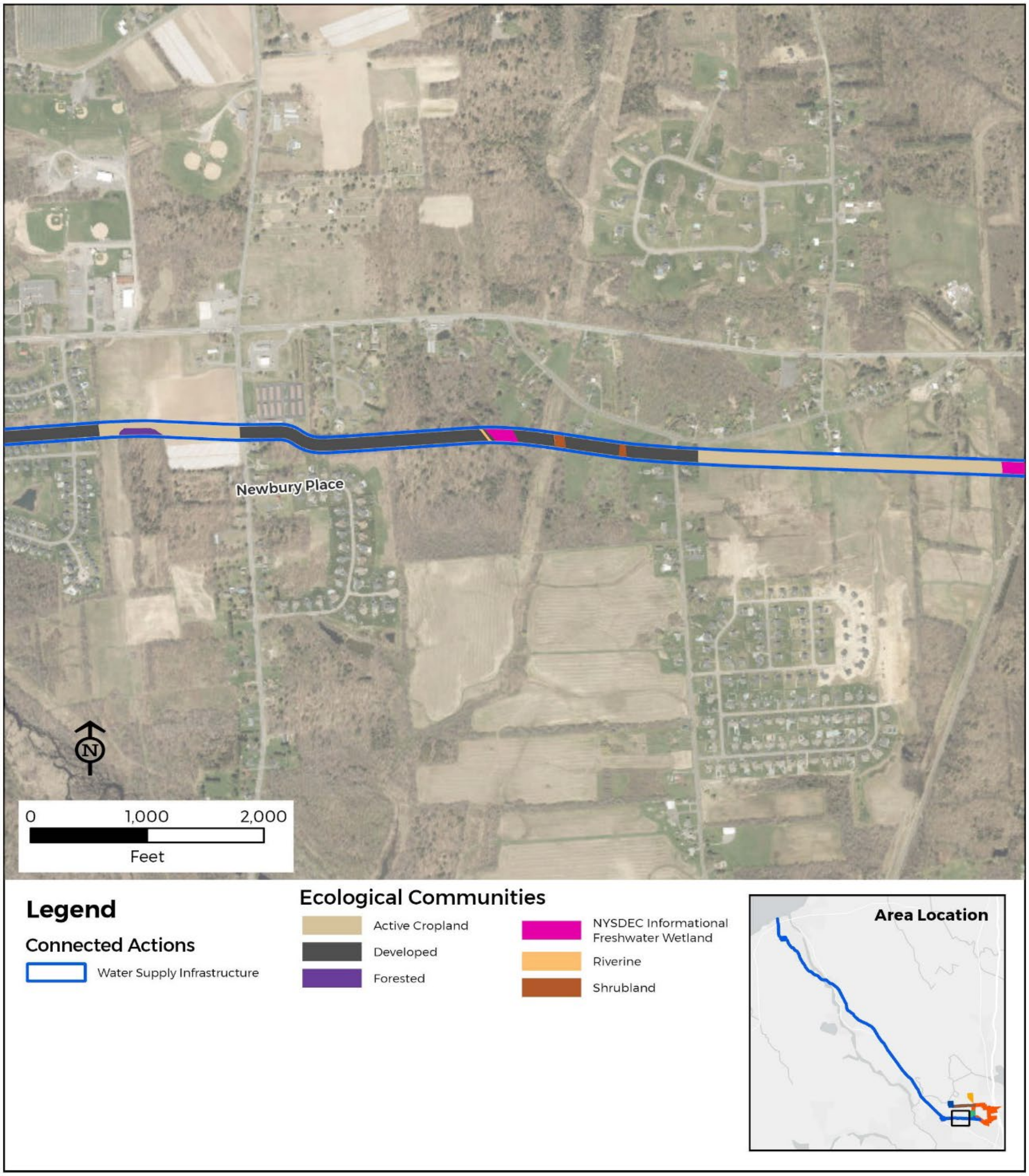

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Figure G-21 Water Supply Improvement Ecological Communities

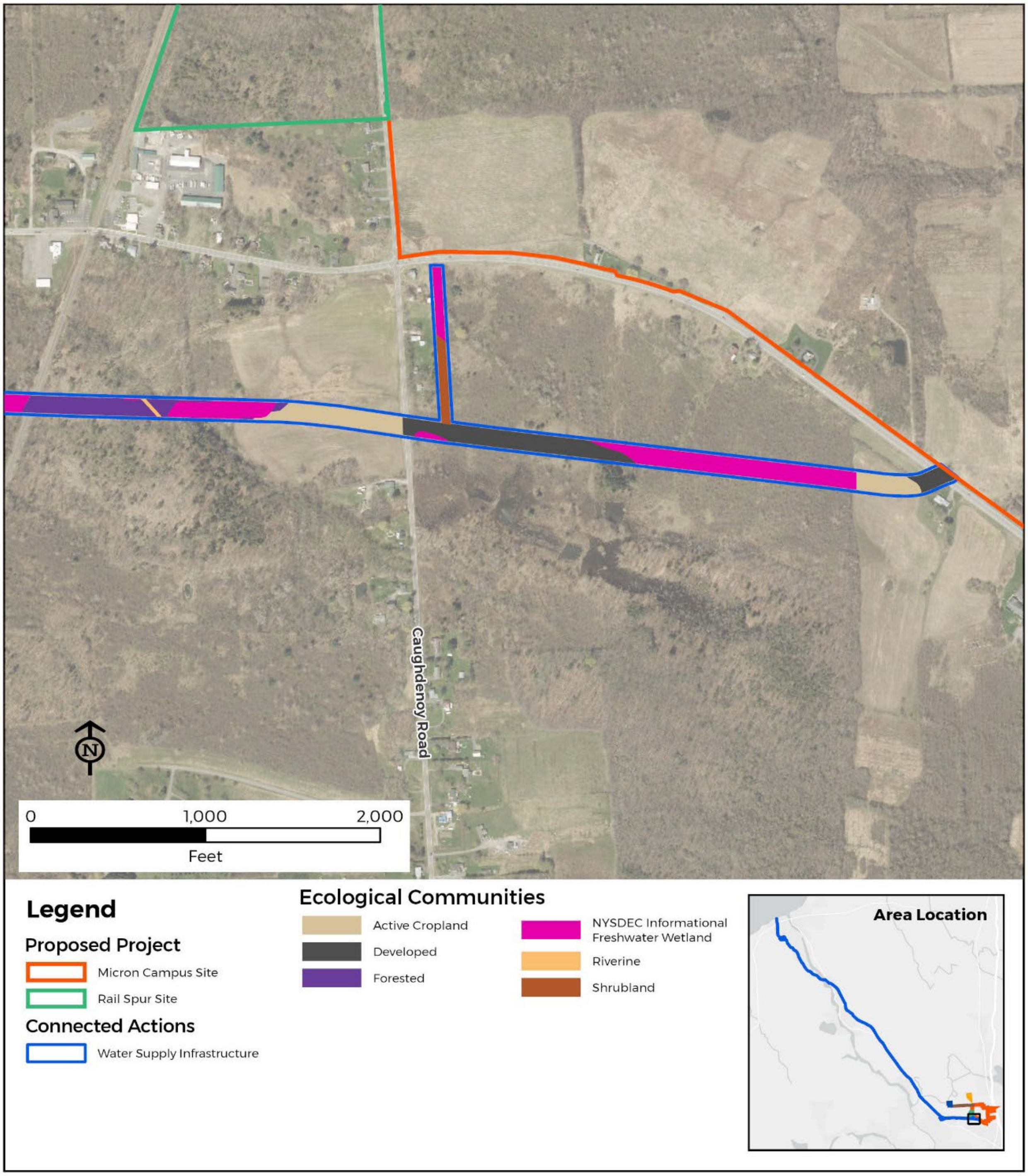

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Figure G-22 IWWTP and Wastewater Conveyance Ecological Communities

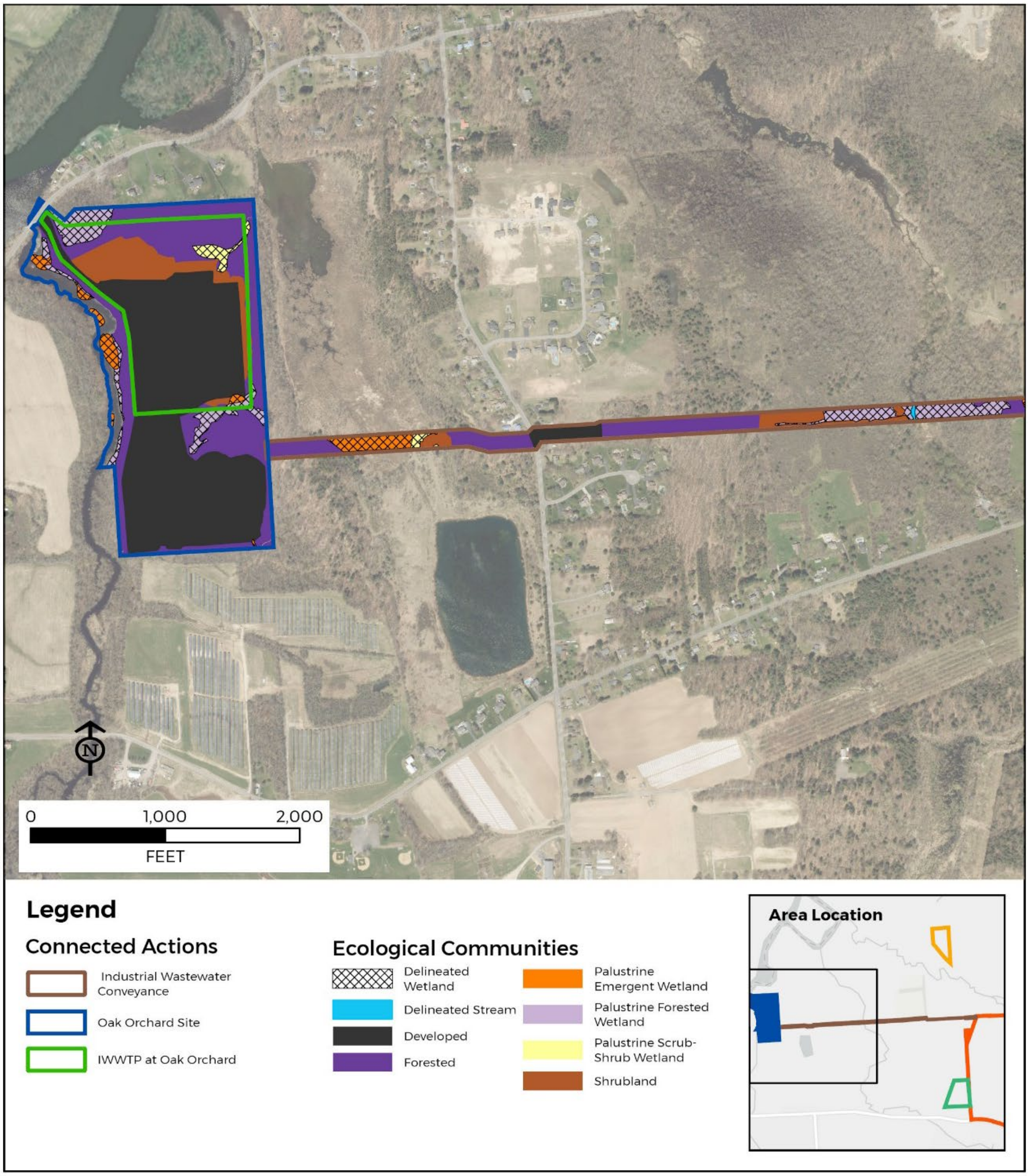

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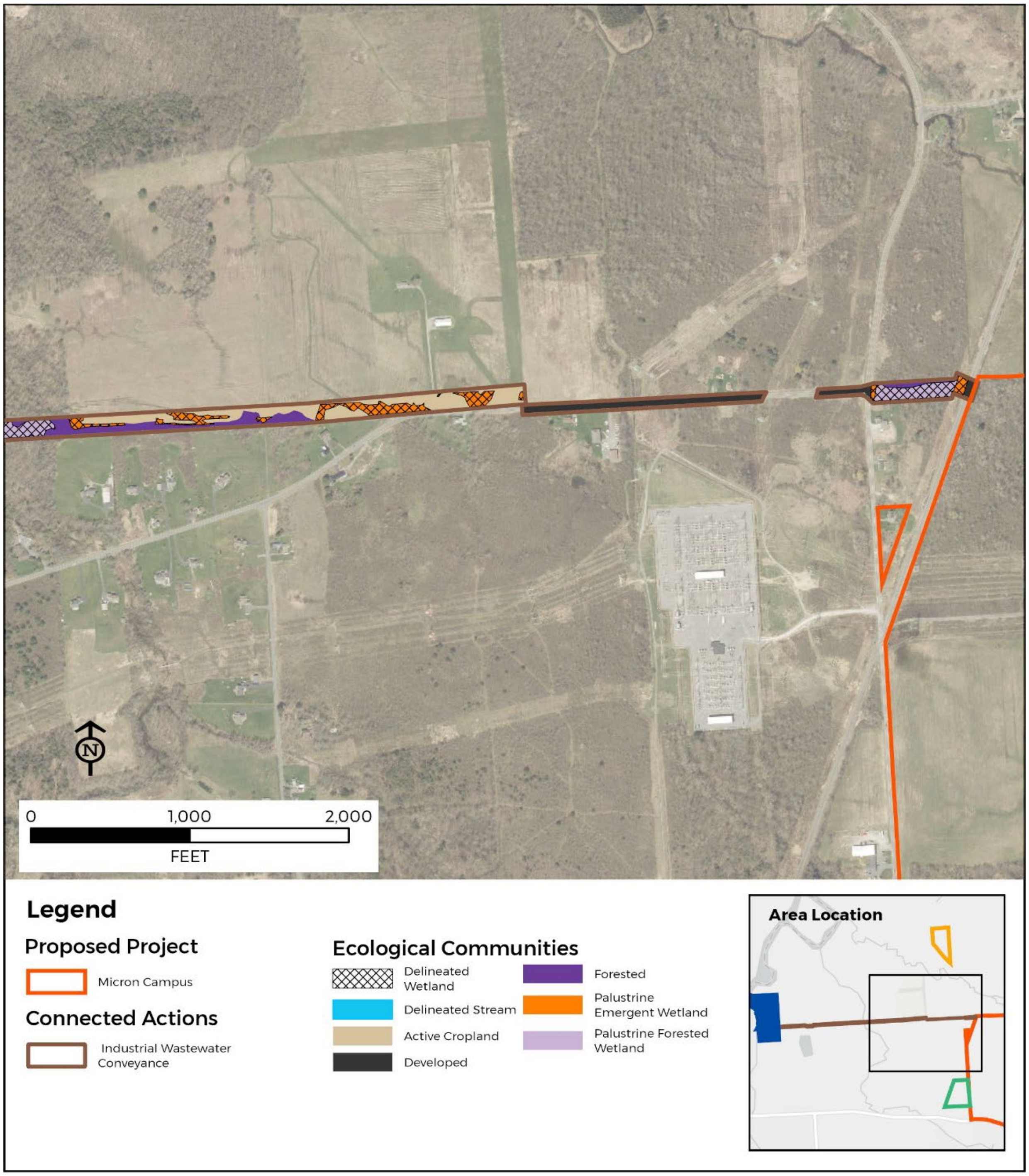
Figure G-23 Wastewater Conveyance Ecological Communities



World Imagery: New York State, Maxar
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G-3.3 Observed Plant Species (Proposed Project)

Table G-1 lists the plant species observed in the Proposed Project study area.

Table G-1 Observed Plant Species (Proposed Project)

Common Name	Scientific Name	Stratum	Native?	Invasive?
Box-elder maple	*Acer negundo*	Tree	Native	
Norway maple	*Acer platanoides*	Tree	Non-native	X
Red maple	*Acer rubrum*	Tree	Native	
Silver maple	*Acer saccharinum*	Tree	Native	
Sugar maple	*Acer saccharum*	Tree	Native	
Yellow birch	*Betula alleghaniensis*	Tree	Native	
Paper birch	*Betula papyrifera*	Tree	Native	
Gray birch	*Betula populifolia*	Tree	Native	
Musclewood	*Carpinus caroliniana*	Tree	Native	
Bitternut hickory	*Carya cordiformis*	Tree	Native	
Pignut hickory	*Carya glabra*	Tree	Native	
Shagbark hickory	*Carya ovata*	Tree	Native	
Northern catalpa	*Catalpa speciosa*	Tree	Native	X
Eastern redbud	*Cercis canadensis*	Tree	Native	
Hawthorne	*Crataegus crus-galli*	Tree	Native	
American beech	*Fagus grandifolia*	Tree	Native	
White ash	*Fraxinus americana*	Tree	Native	
Green ash	*Fraxinus pennsylvanica*	Tree	Native	
Honeylocust	*Gleditsia triacanthos*	Tree	Native	X
Black walnut	*Juglans nigra*	Tree	Native	
Tulip tree	*Liriodendron tulipifera*	Tree	Native	
Saucer magnolia	*Magnolia × soulangeana*	Tree	Non-native	
Crabapple	*Malus* sp.	Tree	-	-
White mulberry	*Morus alba*	Tree	Non-native	X
Hophornbeam	*Ostrya virginiana*	Tree	Native	
Norway spruce	*Picea abies*	Tree	Non-native	
White spruce	*Picea glauca*	Tree	Native	
Blue spruce	*Picea pungens*	Tree	Native	

Eastern white pine	*Pinus strobus*	Tree	Native	
Scotch pine	*Pinus sylvestris*	Tree	Non-native	
American sycamore	*Platanus occidentalis*	Tree	Native	
Eastern cottonwood	*Populus deltoides*	Tree	Native	
Quaking aspen	*Populus tremuloides*	Tree	Native	
Purple leaf plum	*Prunus cerasifera*	Tree	Non-native	
Black cherry	*Prunus serotina*	Tree	Native	
Callery pear	*Pyrus calleryana*	Tree	Non-native	X
Swamp white oak	*Quercus bicolor*	Tree	Native	
Weeping willow	*Salix babylonica*	Tree	Non-Native	
Pussy willow	*Salix discolor*	Tree	Native	
Black willow	*Salix nigra*	Tree	Native	
American basswood	*Tilia americana*	Tree	Native	
Eastern hemlock	*Tsuga canadensis*	Tree	Native	
American elm	*Ulmus americana*	Tree	Native	
Gray dogwood	*Cornus racemosa*	Shrub	Native	
Red osier dogwood	*Cornus sericea*	Shrub	Native	
Autumn olive	*Elaeagnus umbellata*	Shrub	Non-native	X
Witch hazel	*Hamamelis virginiana*	Shrub	Native	
Tartarian honeysuckle	*Lonicera tatarica*	Shrub	Non-native	X
European buckthorn	*Rhamnus cathartica*	Shrub	Non-native	X
Staghorn sumac	*Rhus typhina*	Shrub	Native	
Multi-flora rose	*Rosa multiflora*	Shrub	Non-native	X
Dappled willow	*Salix integra* 'Hakuro-nishiki'	Shrub	Non-native	
Elderberry	*Sambucus nigra*	Shrub	Native	
Arrowwood viburnum	*Viburnum dentatum*	Shrub	Native	
White snakeroot	*Ageratina altissima*	Herb	Native	
Bugleweed	*Ajuga reptans*	Herb	Non-native	
Garlic mustard	*Alliaria petiolata*	Herb	Non-native	X
New York fern	*Amauropelta noveboracensis*	Herb	Native	
Ragweed	*Ambrosia artemisiifolia*	Herb	Native	
Hemp dogbane	*Apocynum cannabinum*	Herb	Native	
Greater burdock	*Arctium lappa*	Herb	Non-native	X

Common mugwort	*Artemisia vulgaris*	Herb	Non-native	X
Common milkweed	*Asclepias syriaca*	Herb	Native	
Butterfly milkweed	*Asclepias tuberosa*	Herb	Native	
Asparagus	*Asparagus officinalis*	Herb	Non-native	
Common daisy	*Bellis perennis*	Herb	Non-native	
Bladder sedge	*Carex intumescens*	Herb	Native	
Eggbract sedge	*Carex leporina*	Herb	Native	
Fox sedge	*Carex vulpinoidea*	Herb	Native	
Black knapweed	*Centaurea nigra*	Herb	Non-native	X
Common chickory	*Cichorium intybus*	Herb	Non-native	
Bull thistle	*Cirsium vulgare*	Herb	Non-native	X
False nutsedge	*Cyperus strigosus*	Herb	Native	
Orchard grass	*Dactylis glomerata*	Herb	Non-native	
Queen Anne's lace	*Daucus carota*	Herb	Non-native	
Horsetail	*Equisetum* sp.	Herb	Native	
Daisy fleabane	*Erigeron annuus*	Herb	Native	
Joe-pye weed	*Eutrochium purpureum*	Herb	Native	
Wild strawberry	*Fragaria vesca*	Herb	Native	
Bedstraw	*Galium aparine*	Herb	Native	
White avens	*Geum canadense*	Herb	Native	
Jewelweed	*Impatiens capensis*	Herb	Native	
Canada rush	*Juncus canadensis*	Herb	Native	
Soft rush	*Juncus effusus*	Herb	Native	
Path rush	*Juncus tenuis*	Herb	Native	
Purple dead nettle	*Lamium purpureum*	Herb	Non-native	
Butter and eggs	*Linaria vulgaris*	Herb	Non-native	
Spicebush	*Lindera benzoin*	Herb	Native	
Cardinal flower	*Lobelia cardinalis*	Herb	Native	
Purple loosestrife	*Lythrum salicaria*	Herb	Non-native	X
Musk mallow	*Malva moschata*	Herb	Non-native	
Sweet white clover	*Melilotus albus*	Herb	Non-native	
Mint	*Mentha* sp.	Herb	-	
Common evening primrose	*Oenothera biennis*	Herb	Native	

Smooth yellow false foxglove	*Aureolaria flava*	Herb	Native	
Sensitive fern	*Onoclea sensibilis*	Herb	Native	
Royal fern	*Osmunda regalis*	Herb	Native	
Cinnamon fern	*Osmundastrum cinnamomeum*	Herb	Native	
Switch grass	*Panicum virgatum*	Herb	Native	
Arrowleaf arum	*Peltandra virginica*	Herb	Native	
Virginia jumpseed	*Persicaria virginiana*	Herb	Native	
Reed canary grass	*Phalaris arundinacea*	Herb	Native	X
Timothy grass	*Phleum pratense*	Herb	Non-native	X
Common reed	*Phragmites australis*	Herb	Non-native	X
Pokeweed	*Phytolacca americana*	Herb	Native	
Clearweed	*Pilea pumila*	Herb	Native	
English plantain	*Plantago lanceolata*	Herb	Non-native	
Mayapple	*Podophyllum peltatum*	Herb	Native	
Christmas fern	*Polystichum acrostichoides*	Herb	Native	
Meadow buttercup	*Ranunculus bulbosus*	Herb	Non-native	
Japanese knotweed	*Reynoutria japonica*	Herb	Non-native	X
Raspberry	*Rubus* sp.	Herb	-	-
Black-eyed Susan	*Rudbeckia hirta*	Herb	Native	
Curly dock	*Rumex crispus*	Herb	Non-native	
Common rue	*Ruta graveolens*	Herb	Non-native	
Woolgrass	*Scirpus cyperinus*	Herb	Native	
Horse nettle	*Solanum carolinense*	Herb	Native	
Black nightshade	*Solanum nigrum*	Herb	Non-native	
Goldenrod spp.	*Solidago spp.*	Herb	-	
Sow thistle	*Sonchus oleraceus*	Herb	Non-native	
Skunk cabbage	*Symplocarpus foetidus*	Herb	Native	
Poison ivy	*Toxicodendron radicans*	Herb	Native	
Red clover	*Trifolium pratense*	Herb	Non-native	
White clover	*Trifolium repens*	Herb	Non-native	
Wheat	*Triticum aestivum*	Herb	Non-native	
Narrow leaf cattail	*Typha angustifolia*	Herb	Native	X

Stinging nettle	*Urtica dioica*	Herb	Native	X
Common mullein	*Verbascum thapsus*	Herb	Non-native	X
Purple cowvetch	*Vicia cracca*	Herb	Non-native	X
Yellow vetch	*Vicia lutea*	Herb	Non-native	
Hedge bindweed	*Calystegia sepium*	Vine	Non-native	
Field bindweed	*Convolvulus arvensis*	Vine	Non-native	X
Virginia creeper	*Parthenocissus quinquefolia*	Vine	Native	
Mile-a-minute	*Persicaria perfoliata*	Vine	Non-native	X
Common grape vine	*Vitis vinifera*	Vine	Non-native	

Sources: AKRF reconnaissance investigations conducted July 31 through August 2, 2023; NYSDEC, New York State Prohibited and Regulated Invasive Plants (2014), https://www.dec.ny.gov/docs/lands_forests_pdf/isprohibitedplants2.pdf; NYNHP, New York State Invasive Species Tiers (2025), https://www.nynhp.org/invasives/species-tiers-table/. Note: Invasive plants identified in accordance with 6 NYCRR Part 575 and State and Finger Lake PRISM invasive species tier guides (NYNHP, 2025).

G-3.4 Terrestrial Wildlife

This section lists the mammal, bird, and reptile and amphibian species with the potential to occur at or in the vicinity of the Proposed Project sites based on available literature and databases, and identifies species that were observed or documented at or in the vicinity of the Proposed Project sites during the 2023 and 2024 site reconnaissance investigations, visual wildlife encounter surveys, and bat and grassland bird surveys. The section also lists the species with the potential to occur within or adjacent to the Connected Action LODs based on available literature and database search results for the Connected Action study area.

G-3.4.1 Mammals

Table G-2 lists the mammal species with the potential to occur or (in bold) observed in the Proposed Project study area (including direct visual observations or based on observed signs of species presence (e.g., scat and markings).

Table G-2 Mammal Species (Proposed Project)

Common Name	Scientific Name	MC	RSS	CCS
Eastern coyote	*Canis latrans var.*	X	X	X
American beaver	*Castor canadensis*	X		
Star-nosed mole	*Condylura cristata*	X	X	
Virginia opossum	*Didelphis virginiana*	X	X	X
Big brown bat	*Eptesicus fuscus*	X	X	X
Porcupine	*Erethizon dorsatum*	X	X	
Southern flying squirrel	*Glaucomys volans*	X	X	
Silver-haired bat	*Lasionycteris noctivagans*	X	X	

Eastern red bat	*Lasiurus borealis*	X	X	X
Hoary bat	*Lasiurus cinereus*	X	X	X
River otter	*Lontra canadensis*	X		
Bobcat	*Lynx rufus*	X	X	X
Woodchuck	*Marmota monax*	X	X	X
Striped skunk	*Mephitis mephitis*	X	X	X
Meadow vole	*Microtus pennsylvanicus*	X	X	X
Woodland vole	*Microtus pinetorum*	X	X	X
Southern red-backed vole	*Myodes gapperi*	X	X	
Little brown bat	*Myotis lucifugus*	X	X	X
Northern **long-eared bat**	*Myotis septentrionalis*	X	X	
Indiana bat	*Myotis sodalis*	X	X	
Mink	*Neovison vison*	X		
White-tailed deer	*Odocoileus virginianus*	X	X	X
Muskrat	*Ondatra zibethicus*	X		
Tricolored bat	*Perimyotis subflavus*	X	X	
White-footed mouse	*Peromyscus leucopus*	X	X	X
Deer mouse	*Peromyscus maniculatus*	X	X	
Raccoon	*Procyon lotor*	X	X	X
Eastern mole	*Scalopus aquaticus*	X	X	X
Gray squirrel	*Sciurus carolinensis*	X	X	X
Red **squirrel**	*Sciurus vulgaris*	X		
Masked shrew	*Sorex cinereus*	X	X	
Smoky shrew	*Sorex fumeus*	X	X	
Eastern **cottontail**	*Sylvilagus floridanus*	X	X	X
Eastern chipmunk	*Tamias striatus*	X	X	X
Red fox	*Vulpes vulpes*	X	X	X
American black bear	*Ursus americanus*	X	X	

Sources: Observations during wildlife surveys and site reconnaissance investigations; DeGraaf and Yamasaki (2021). Notes: Species in bold were directly observed or observed based on signs (e.g., scat and markings) during visual encounter wildlife surveys (June 23, 2023, and January 30, 2024, through February 1, 2024), site reconnaissance investigations to map ecological communities (July 31 to Aug 2, 2023), and bat and grassland breeding bird surveys conducted during the spring and summer of 2023. Species marked with an X have the potential to overwinter at the site indicated based on their habitat associations. The list in Table G-2 includes species with the potential to occur in the LODs for the telecommunications improvements.

Table G-3 lists the mammals with the potential to occur within or in the vicinity of the Connected Action LODs.

Table G-3 Mammal Species (Connected Actions)

Common Name	Scientific Name
Eastern coyote	*Canis latrans var.*
American beaver	*Castor canadensis*
Star-nosed mole	*Condylura cristata*
Virginia opossum	*Didelphis virginiana*
Big brown bat	*Eptesicus fuscus*
Porcupine	*Erethizon dorsatum*
Southern flying squirrel	*Glaucomys volans*
Silver-haired bat	*Lasionycteris noctivagans*
Eastern red bat	*Lasiurus borealis*
Hoary bat	*Lasiurus cinereus*
Bobcat	*Lynx rufus*
Woodchuck	*Marmota monax*
Striped skunk	*Mephitis mephitis*
Meadow vole	*Microtus pennsylvanicus*
Woodland vole	*Microtus pinetorum*
Southern red-backed vole	*Myodes gapperi*
Little brown bat	*Myotis lucifugus*
Northern long-eared bat	*Myotis septentrionalis*
Indiana bat	*Myotis sodalis*
Mink	*Neovison vison*
White-tailed deer	*Odocoileus virginianus*
Muskrat	*Ondatra zibethicus*
Tricolored bat	*Perimyotis subflavus*
White-footed mouse	*Peromyscus leucopus*
Deer mouse	*Peromyscus maniculatus*
Raccoon	*Procyon lotor*
Eastern mole	*Scalopus aquaticus*
Gray squirrel	*Sciurus carolinensis*
Masked shrew	*Sorex cinereus*

Smoky shrew	*Sorex fumeus*
Eastern cottontail	*Sylvilagus floridanus*
Eastern chipmunk	*Tamias striatus*
American black bear	*Ursus americanus*

Source: DeGraaf and Yamasaki 2001.

G-3.4.2 Birds

Bird species with the potential to occur within the Proposed Project and Connected Action study areas were identified based on a review of the New York State Breeding Bird Atlas (BBA), which conducts a periodic census of the distribution of the State's breeding birds. The review of the BBA included a review of the BBA II census from 2000-2005 and the most recent BBA III census from 2020-2024 for the census blocks containing the Proposed Project sites (BBA II census blocks 4078C, 3978D, and 3978B and the BBA III Brewerton CE and NE census blocks).

The Proposed Project sites contain suitable breeding habitats for a variety of resident and migratory bird species. BBA II documented 105 species as confirmed or probable / possible breeders within the census blocks that include the Micron Campus site and the Rail Spur Site and BBA III documented 99 species as confirmed or probable / possible breeders within the updated census blocks.[21] Based on this information, 103 species have the potential to occur at the Micron Campus site and 41 species have the potential to occur at the Rail Spur Site, and 58 of those species were observed during the site investigations and surveys described above; 31 species have the potential to breed at the Childcare Site and 23 of those species were observed during the site investigations and surveys.

Table G-4 lists the bird species with the potential to occur in the Proposed Project study area based on BBA II and III data or (in bold) observed in the study area during site investigations and surveys, and identifies species with the potential to breed at each site (indicated by an X) based on their habitat associations (Billerman et al. 2022).

Table G-4 BBA Bird Species (Proposed Project)

Common Name	Scientific Name	BBA II	BBA III	MC	RSS	CCS
Cooper's hawk†	*Accipiter cooperii*	X		X		
Sharp-shinned hawk†	***Accipiter striatus***	X	X	X		
Spotted sandpiper	*Actitis macularius*	X	X	X		
Red-winged blackbird	***Agelaius phoeniceus***	X	X	X	X	X
Wood duck	***Aix sponsa***	X	X	X		
Grasshopper sparrow†	*Ammodramus savannarum*	X				

[21] Although the BBA III census was completed in 2024, as of June 13, 2025, the BBA III Brewerton NE Block is still considered incomplete.

Mallard	***Anas platyrhynchos***	X	X	X		
Sandhill crane	*Antigone canadensis*		X			
Ruby-throated hummingbird	***Archilochus colubris***	X	X	X	X	X
Great blue heron	***Ardea herodias***	X	X	X		
Tufted titmouse	***Baeolophus bicolor***	X	X	X	X	
Upland sandpiper^	*Bartramia longicauda*	X				
Cedar waxwing	***Bombycilla cedrorum***	X	X	X		
Ruffed grouse	*Bonasa umbellus*	X		X		
American bittern†	*Botaurus lentiginosus*	X	X			
Canada goose	***Branta canadensis***	X	X	X		X
Great-horned owl	***Bubo virginianus***	X	X	X		
Red-tailed hawk	***Buteo jamaicensis***	X	X	X		
Green heron	***Butorides virescens***	X	X	X		
Whip-poor-will†	*Caprimulgus vociferus*	X		X		
Northern cardinal	***Cardinalis cardinalis***	X	X	X	X	X
House finch	*Carpodacus mexicanus*	X	X	X	X	X
Purple finch	*Carpodacus purpureus*	X		X	X	X
Turkey vulture	*Cathartes aura*	X	X	X		
Veery	***Catharus fuscescens***	X	X	X	X	
Brown creeper	*Certhia americana*		X	X	X	
Chimney swift	*Chaetura pelagica*	X	X	X		
Killdeer	***Charadrius vociferus***	X	X	X		X
Northern harrier^	***Circus hudsonius***	X	X	X		X
Marsh wren	*Cistothorus palustris*	X	X	X		
Yellow-billed cuckoo	*Coccyzus americanus*	X		X		
Black-billed cuckoo	*Coccyzus erythropthalmus*	X				
Northern flicker	***Colaptes auratus***	X	X	X	X	
Rock pigeon	*Columba livia*	X	X	X		
Eastern wood-pewee	***Contopus virens***	X	X	X	X	
American crow	***Corvus brachyrhynchos***	X	X	X	X	X
Common Raven	*Corvus corax*		X			
Blue jay	***Cyanocitta cristata***	X	X	X	X	X
Chestnut-sided warbler	*Dendroica pensylvanica*	X	X	X	X	

Yellow warbler	***Dendroica petechia***	X	X	X	X	
Pine warbler	*Dendroica pinus*	X		X		
Black-throated green warbler	*Dendroica virens*	X		X		
Bobolink	***Dolichonyx oryzivorus***	X	X	X		
Pileated woodpecker	***Dryocopus pileatus***	X	X	X		
Gray catbird	***Dumetella carolinensis***	X	X	X	X	X
Alder flycatcher	***Empidonax alnorum***	X	X	X		
Least flycatcher	*Empidonax minimus*	X	X	X		
Willow flycatcher	***Empidonax traillii***	X	X	X		
Rusty blackbird	*Euphagus carolinus*		X			
Merlin	*Falco columbarius*		X			
American kestrel	***Falco sparverius***	X	X	X		
Wilson's snipe	*Gallinago delicata*	X	X	X		
Common gallinule	*Gallinula galeata*		X	X		
Common yellowthroat	***Geothlypis trichas***	X	X	X	X	X
Bald eagle^	*Haliaeetus leucocephalus*		X			
Barn swallow	***Hirundo rustica***	X	X	X		
Wood thrush	***Hylocichla mustelina***	X	X	X		
Baltimore oriole	***Icterus galbula***	X	X	X	X	X
Orchard oriole	*Icterus spurius*	X		X	X	X
Belted kingfisher	*Megaceryle alcyon*	X		X		
Red-bellied woodpecker	***Melanerpes carolinus***	X	X	X		
Wild turkey	***Meleagris gallopavo***	X	X	X		
Swamp sparrow	***Melospiza georgiana***	X	X	X		
Song sparrow	***Melospiza melodia***	X	X	X	X	X
Northern mockingbird	***Mimus polyglottos***	X	X	X	X	X
Brown-headed cowbird	***Molothrus ater***	X	X	X	X	X
Great crested flycatcher	***Myiarchus crinitus***	X	X	X		
Osprey†	***Pandion haliaetus***	X	X	X		
Northern waterthrush	*Parkesia noveboracensis*		X			
House sparrow	*Passer domesticus*	X	X	X		X
Savannah sparrow	***Passerculus sandwichensis***	X	X	X		
Indigo bunting	***Passerina cyanea***	X	X	X	X	X

Cliff swallow	*Petrochelidon pyrrhonota*	X	X			
Ring-necked pheasant	*Phasianus colchicus*	X		X		
Rose-breasted grosbeak	***Pheucticus ludovicianus***	X	X	X	X	
Downy woodpecker	***Picoides pubescens***	X	X	X	X	
Hairy woodpecker	*Picoides villosus*	X	X	X	X	
Eastern towhee	***Pipilo erythrophthalmus***	X	X	X	X	
Scarlet tanager	*Piranga olivacea*	X		X		
Pied-billed grebe^	*Podilymbus podiceps*	X				
Black-capped chickadee	***Poecile atricapillus***	X	X	X	X	
Blue-gray gnatcatcher	*Polioptila caerulea*	X	X	X	X	
Vesper Sparrow†	*Pooecetes gramineus*		X			
Sora	*Porzana carolina*		X			
Purple martin	*Progne subis*	X		X		
Common grackle	***Quiscalus quiscula***	X	X	X		
Virginia rail	*Rallus limicola*	X	X	X		
Ruby-crowned kinglet	*Regulus calendula*	X		X		
Bank swallow	*Riparia riparia*	X		X		
Eastern phoebe	***Sayornis phoebe***	X	X	X	X	X
American woodcock	***Scolopax minor***	X	X	X	X	X
Ovenbird	***Seiurus aurocapilla***	X	X	X	X	
Cerulean warbler†	*Setophaga cerulea*		X			
Prairie warbler	*Setophaga discolor*		X			
American redstart	*Setophaga ruticilla*	X	X	X	X	X
Blackpoll warbler	*Setophaga striata*		X			
Eastern bluebird	***Sialia sialis***	X	X	X		X
Red-breasted nuthatch	*Sitta canadensis*	X		X		
White-breasted nuthatch	***Sitta carolinensis***	X	X	X	X	
Yellow-bellied sapsucker	*Sphyrapicus varius*	X	X	X	X	
American goldfinch	***Spinus tristis***	X	X	X	X	
Clay-colored sparrow	*Spizella pallida*		X			
Chipping sparrow	***Spizella passerina***	X	X	X		X
Field sparrow	***Spizella pusilla***	X	X	X		X
Northern rough-winged swallow	*Stelgidopteryx serripennis*	X		X		

Barred owl	*Strix varia*	X		X		
Eastern meadowlark	***Sturnella magna***	X	X	X		
European starling	***Sturnus vulgaris***	X	X	X		X
Tree swallow	***Tachycineta bicolor***	X	X	X		X
Carolina wren	*Thryothorus ludovicianus*		X	X	X	X
Brown thrasher	*Toxostoma rufum*	X	X	X		
House wren	***Troglodytes aedon***	X	X	X	X	X
American robin	***Turdus migratorius***	X	X	X	X	X
Eastern kingbird	***Tyrannus tyrannus***	X	X	X	X	X
Golden-winged warbler†	***Vermivora chrysoptera***	X		X		
Blue-winged warbler	***Vermivora pinus***	X	X	X	X	
Nashville warbler	*Vermivora ruficapilla*	X		X		
Yellow-throated vireo	*Vireo flavifrons*		X	X		
Warbling vireo	*Vireo gilvus*	X	X	X		
Red-eyed vireo	***Vireo olivaceus***	X	X	X		
Mourning dove	***Zenaida macroura***	X	X	X	X	X
White-throated sparrow	***Zonotrichia albicollis***		X			

Sources: BBA II (census blocks 4078C, 3978D, and 3978B), https://extapps.dec.ny.gov/cfmx/extapps/bba/ (accessed June 13, 2025); BBA III (Brewerton CE and NE census blocks), https://ebird.org/atlasny/home (accessed June 13, 2025); Billerman et al. 2022. Notes: BBA III was conducted using available data uploaded by volunteer citizen scientists and occasionally reviewed by eBird regional reviewers. Census blocks are roughly nine square miles and are a subset of the 7.5' USGS Topo Quad in which the block is located (the USGS Topo Quads are broken up into six smaller blocks). The BBA III blocks do not correlate directly with the BBA II survey blocks. Although the BBA III census was completed in 2024, as of June 13, 2025, the Brewerton NE block is considered incomplete. Table G-4 only includes bird species based on "confirmed", "probable", or "possible" breeding evidence. * = State listed endangered species; ^ = State-listed threatened species; † = State listed species of special concern. Species in bold were observed during visual encounter wildlife surveys (June 23, 2023, and January 30, 2024, through February 1, 2024), site reconnaissance investigations to map ecological communities (July 31 to Aug 2, 2023), and bat and grassland breeding bird surveys conducted during the spring and summer of 2023. Species marked with an X have the potential to breed at the site indicated based on their habitat associations.

Bird species with the potential to occur within the Proposed Project and Connected Action study areas during the winter also were identified based on a review of recent historic data (2018-2022) from the Audubon Christmas Bird Count (CBC), a census organized by the National Audubon Society performed across the United States between December 14 and January 5 by volunteer birdwatchers within 15-mile diameter circles. The 2018-2022 CBCs recorded an average of 83 species in the Syracuse circle (ID 55604), which is centered at the Syracuse Hancock International Airport and includes the Micron Campus site, Rail Spur Site, and Childcare Site within its 15-mile diameter.

Based on this information, 55 bird species have the potential to occur at the Micron Campus site and 40 species have the potential to occur at the Rail Spur Site, and 26 of those species were observed during the site investigations and surveys, indicating that those species are year-round residents at those sites; 45 species have the potential to occur at the Childcare Site and 26 of those species were observed during the site investigations and surveys, indicating that those species are year-round residents at that site.

Table G-5 lists the bird species with the potential to occur at the Proposed Project sites based on 2018-2022 CBC results for the Syracuse circle or (in bold) observed in the study area during site investigations and surveys, and identifies species with the potential to overwinter at each site (indicated by an X) based on their habitat associations (Billerman et al. 2022).

Table G-5 CBC Bird Species (Proposed Project)

Common Name	Scientific Name	MC	RSS	CCS
Common redpoll	*Acanthis flammea*	X	X	X
Hoary redpoll	*Acanthis hornemanni*	X	X	X
Cooper's hawk†	*Accipiter cooperii*	X	X	X
Sharp-shinned hawk†	***Accipiter striatus***	X	X	X
Red-winged blackbird	***Agelaius phoeniceus***			
Wood duck	***Aix sponsa***			
Northern pintail	*Anas acuta*			
American wigeon	*Anas americana*			
Green-winged teal	*Anas crecca*			
Mallard	***Anas platyrhynchos***			
American black duck	*Anas rubripes*			
Gadwall	*Anas strepera*			
Great egret	*Ardea alba*			
Great blue heron	***Ardea herodias***			
Lesser scaup	*Aythya affinis*			
Redhead	*Aythya americana*			
Ring-necked duck	*Aythya collaris*			
Greater scaup	*Aythya marila*			
Canvasback	*Aythya valisineria*			
Tufted titmouse	***Baeolophus bicolor***	X	X	X
Cedar waxwing	***Bombycilla cedrorum***	X	X	X
Canada goose	***Branta canadensis***	X		X
Cackling goose	*Branta hutchinsii*			
Snowy owl	*Bubo scandiacus*	X		X
Great horned owl	***Bubo virginianus***	X	X	X
Bufflehead	*Bucephala albeola*			

Common goldeneye	*Bucephala clangula*			
Red-tailed hawk	***Buteo jamaicensis***	X	X	X
Northern cardinal	***Cardinalis cardinalis***	X	X	X
Turkey vulture	*Cathartes aura*			
Hermit thrush	*Catharus guttatus*	X	X	
Blue jay	***Cayanocitta cristata***	X	X	X
Brown creeper	*Certhia americana*	X	X	X
Snow goose	*Chen caerulescens*			
Bonaparte's gull	*Chroicocephalus philadelphia*			
Northern harrier^	***Circus cyaneus***	X		X
Marsh wren	*Cistothorus palustris*			
Evening grosbeak	*Coccothraustes vespertinus*	X	X	X
Northern flicker	*Colaptes auratus*			
Rock pigeon	*Columba livia*	X		
Black vulture	*Coragyps atratus*			
American crow	***Corvus brachyrhynchos***	X	X	X
Common raven	***Corvus corax***	X	X	X
Fish crow	*Corvus ossifragus*	X	X	X
Tundra swan	*Cygnus columbianus*			
Mute swan	*Cygnus olor*			
Pileated woodpecker	***Dryocopus pileatus***	X	X	X
Gray catbird	***Dumetella carolinesis***			
Merlin	*Falco columbarius*			
Peregrine falcon*	*Falco peregrinus*			
American kestrel	***Falco sparverius***			
American coot	*Fulica americana*			
Common loon†	*Gavia immer*			
Red-throated loon	*Gavia stellata*			
Common yellowthroat	***Geothlypis trichas***			
House finch	*Haemorhous mexicanus*	X	X	X
Purple finch	*Haemorhous purpureus*	X	X	X
Bald eagle^	*Haliaeetus leucocephalus*			
Dark-eyed junco	***Junco hyemalis***	X	X	X

Northern shrike	*Lanius excubitor*			
Herring gull	*Larus argentatus*			
Ring-billed gull	*Larus delawarensis*			
Lesser black-backed gull	*Larus fuscus*			
Glaucous gull	*Larus hyperboreus*			
Great black-backed gull	*Larus marinus*			
Hooded merganser	*Lophodytes cucullatus*			
Belted kingfisher	*Megaceryle alcyon*			
Eastern screech-owl	*Megascops asio*	X	X	X
Red-bellied woodpecker	***Melanerpes carolinus***	X	X	X
Black scoter	*Melanitta americana*			
White-winged scoter	*Melanitta fusca*			
Surf scoter	*Melanitta perspicillata*			
Wild turkey	***Meleagris gallopavo***	X	X	X
Swamp sparrow	***Melospiza georgiana***			
Song sparrow	***Melospiza melodia***	X	X	X
Common merganser	*Mergus merganser*			
Red-breasted merganser	*Mergus serrator*			
Northern mockingbird	*Mimus polyglottos*	X	X	X
Brown-headed cowbird	***Molothrus ater***	X	X	X
House sparrow	*Passer domesticus*	X		X
Savannah sparrow	*Passerculus sandwichensis*			
Double-crested cormorant	*Phalacrocorax auritus*			
Downy woodpecker	***Picoides pubescens***	X	X	X
Hairy woodpecker	*Picoides villosus*	X	X	X
Pine grosbeak	*Pinicola enucleator*	X		
Snow bunting	*Plecctrophenax nivalis*	X		X
Horned grebe	*Podiceps auritus*			
Red-necked grebe	*Podiceps grisgena*			
Pied-billed grebe^	*Podilymbus podiceps*			
Black-capped chickadee	***Poecile atricapillus***	X	X	X
Common grackle	*Quiscalus quiscula*			
Virginia rail	*Rallus limicola*			

Ruby-crowned kinglet	*Regulus calendula*	X	X	
Golden-crowned kinglet	*Regulus satrapa*	X	X	
Eastern phoebe	***Sayornis phoebe***			
Yellow-rumped warbler	*Setophaga coronata*			
Eastern bluebird	*Siala sialis*	X		
Red-breasted nuthatch	*Sitta canadensis*	X		
White-breasted nuthatch	***Sitta carolinensis***	X	X	X
Yellow-bellied sapsucker	*Sphyrapicus varius*	X	X	X
Pine siskin	*Spinus pinus*	X		
American goldfinch	***Spinus tristis***	X	X	X
Chipping sparrow	*Spizella passerina*	X		X
Field sparrow	***Spizella pusilla***	X		X
American tree sparrow	*Spizelloides arborea*	X		
Barred owl	*Strix varia*	X	X	X
European starling	***Sturnus vulgaris***	X		X
Carolina wren	*Thryothorus ludovicianus*	X	X	X
Winter wren	*Troglodytes hiemalis*	X		
American robin	***Turdus migratorius***	X	X	X
Mourning dove	***Zenaida macroura***	X	X	X
White-throated sparrow	***Zonotrichia albicollis***	X	X	X
White-crowned sparrow	*Zonotrichia leucophrys*	X	X	X

Sources: Audubon Christmas Bird Count (2018-2022) for Syracuse Circle ID 55604, https://netapp.audubon.org/cbcobservation/ (accessed June 13, 2025); Billerman et al. 2022. Notes: * = State listed endangered species; ^ = State-listed threatened species; † = State listed species of special concern. Species in bold were observed during visual encounter wildlife surveys (June 23, 2023, and January 30, 2024, through February 1, 2024), site reconnaissance investigations to map ecological communities (July 31 to Aug 2, 2023), and bat and grassland breeding bird surveys conducted during the spring and summer of 2023. Species marked with an X have the potential to overwinter at the site indicated based on their habitat associations.

Table G-6 lists bird species documented during the grassland breeding survey conducted at the Micron Campus site by AKRF field ecologists from May 15 to July 12, 2023, using the NYSDEC Survey Protocol for State listed Breeding Grassland Bird Species.

Table G-6 Grassland Breeding Birds (Micron Campus)

Common Name	Scientific Name
Mallard	*Anas platyrhynchos*
Great blue heron	*Ardea herodias*
Cedar waxwing	*Bombycilla cedrorum*
Canada goose	*Branta canadensis*

Great-horned owl	*Bubo virginianus*
Green heron	*Butorides virescens*
Chimney swift	*Chaetura pelagica*
Killdeer	*Charadrius vociferus*
Northern harrier^	*Circus hudsonius*
Common raven	*Corvus corax*
Blue jay	*Cyanocitta cristata*
Bobolink	*Dolichonyx oryzivorus*
Gray catbird	*Dumetella carolinensis*
Alder flycatcher	*Empidonax alnorum*
Least flycatcher	*Empidonax minimus*
American kestrel	*Falco sparverius*
Common yellowthroat	*Geothlypis trichas*
Barn swallow	*Hirundo rustica*
Baltimore oriole	*Icterus galbula*
Red-bellied woodpecker	*Melanerpes carolinus*
Brown-headed cowbird	*Molothrus ater*
Great-crested flycatcher	*Myiarchus crinitus*
Osprey†	*Pandion haliaetus*
Indigo bunting	*Passerina cyanea*
Cliff swallow	*Petrochelidon pyrrhonota*
Eastern towhee	*Pipilo erythrophthalmus*
Eastern phoebe	*Sayornis phoebe*
American woodcock	*Scolopax minor*
American goldfinch	*Spinus tristis*
Field sparrow	*Spizella pusilla*
Eastern meadowlark	*Sturnella magna*
European starling	*Sturnus vulgaris*
American robin	*Turdus migratorius*
Eastern kingbird	*Tyrannus tyrannus*
Golden-winged warbler†	*Vermivora chrysoptera*
Blue-winged warbler	*Vermivora cyanoptera*
Mourning dove	*Zenaida macroura*

Source: Grassland breeding bird survey conducted at the Micron Campus site by AKRF field ecologists from May 15 to July 12, 2023, using NYSDEC Survey Protocol for State listed Breeding Grassland Bird Species (Mar. 2022). Notes: * = State listed endangered species; ^ = State-listed threatened species; † = State listed species of special concern.

Table G-7 lists the bird species with the potential to occur within or adjacent to the Connected Action LODs based on BBA II and III data for the census blocks containing the Connected Actions (BBA II census blocks 3780A, 3780B, 3780D, 3781C, 3878B, 3879A, 3879B, 3879D, 3880C, 3978A, 3978C, 3978D, and 4078C and the BBA III Baldwinsville CE, Baldwinsville NE, Brewerton CE, Brewerton CW, Fulton CE, Fulton NE, Fulton NW, Oswego East SW, Oswego West CE, Oswego West NE, Oswego West SE, Pennellville CW, Pennellville SE, and Pennellville SW census blocks).

Table G-7 BBA Bird Species (Connected Actions)

Common Name	Scientific Name	BBA II	BBA III
Cooper's hawk†	*Accipiter cooperii*	X	X
Northern goshawk†	*Accipiter gentilis*	X	
Sharp-shinned hawk	*Accipiter striatus*	X	X
Spotted sandpiper	*Actitis macularius*	X	X
Red-winged blackbird	*Agelaius phoeniceus*	X	X
Wood duck	*Aix sponsa*	X	X
Henslow's sparrow^	*Ammodramus henslowii*		X
Grasshopper sparrow†	*Ammodramus savannarum*	X	X
Mallard	*Anas platyrhynchos*	X	X
American black duck	*Anas rubripes*	X	X
Sandhill crane	*Antigone canadensis*		X
Eastern Whip-poor-will	*Antrostomus vociferus*		X
Ruby-throated hummingbird	*Archilochus colubris*	X	X
Great blue heron	*Ardea herodias*	X	X
Tufted titmouse	*Baeolophus bicolor*	X	X
Upland sandpiper^	*Bartramia longicauda*	X	
Cedar waxwing	*Bombycilla cedrorum*	X	X
Ruffed grouse	*Bonasa umbellus*	X	X
American bittern†	*Botaurus lentiginosus*	X	X
Brant	*Branta bernicla*		X
Canada goose	*Branta canadensis*	X	X
Great horned owl	*Bubo virginianus*	X	X
Bufflehead	*Bucephala albeola*		X

Red-tailed hawk	*Buteo jamaicensis*	X	X
Red-shouldered hawk†	*Buteo lineatus*	X	
Broad-winged hawk	*Buteo platypterus*	X	X
Green heron	*Butorides virescens*	X	X
Canada warbler	*Cardellina canadensis*	X	X
Northern cardinal	*Cardinalis cardinalis*	X	X
Turkey vulture	*Cathartes aura*	X	X
Veery	*Catharus fuscescens*	X	X
Hermit thrush	*Catharus guttatus*		X
Brown creeper	*Certhia americana*	X	X
Chimney swift	*Chaetura pelagica*	X	X
Killdeer	*Charadrius vociferus*	X	X
Common nighthawk†	*Chordeiles minor*		X
Northern harrier^	*Circus hudsonius*	X	X
Marsh wren	*Cistothorus palustris*	X	X
Sedge wren^	*Cistothorus stellaris*		X
Yellow-billed cuckoo	*Coccyzus americanus*	X	X
Black-billed cuckoo	*Coccyzus erythropthalmus*	X	X
Northern flicker	*Colaptes auratus*	X	X
Rock pigeon	*Columba livia*	X	X
Eastern wood-pewee	*Contopus virens*	X	X
Ruby-crowned kinglet	*Corthylio calendula*		X
American crow	*Corvus brachyrhynchos*	X	X
Common raven	*Corvus corax*	X	X
Fish crow	*Corvus ossifragus*		X
Blue jay	*Cyanocitta cristata*	X	X
Trumpeter swan	*Cygnus buccinator*		X
Mute swan	*Cygnus olor*		X
Bobolink	*Dolichonyx oryzivorus*	X	X
Downy woodpecker	*Dryobates pubescens*	X	X
Hairy woodpecker	*Dryobates villosus*	X	X
Pileated woodpecker	*Dryocopus pileatus*	X	X
Gray catbird	*Dumetella carolinensis*	X	X

Alder flycatcher	*Empidonax alnorum*	X	X
Least flycatcher	*Empidonax minimus*	X	X
Willow flycatcher	*Empidonax traillii*	X	X
Rusty blackbird	*Euphagus carolinus*		X
Merlin	*Falco columbarius*		X
Peregrine falcon*	*Falco peregrinus*		X
American kestrel	*Falco sparverius*	X	X
Wilson's snipe	*Gallinago delicata*	X	x
Common moorhen	*Gallinula chloropus*	X	
Common gallinule	*Gallinula galeata*		X
Mourning warbler	*Geothlypis philadelphia*	X	X
Common yellowthroat	*Geothlypis trichas*	X	X
House finch	*Haemorhous mexicanus*	X	X
Purple finch	*Haemorhous purpureus*	X	X
Bald eagle^	*Haliaeetus leucocephalus*		X
Barn swallow	*Hirundo rustica*	X	X
Caspian tern	*Hydroprogne caspia*		X
Wood thrush	*Hylocichla mustelina*	X	X
Baltimore oriole	*Icterus galbula*	X	X
Orchard oriole	*Icterus spurius*	X	X
Least bittern^	*Ixobrychus exilis*	X	X
Dark-eyed junco	*Junco hyemalis*	X	X
Herring gull	*Larus argentatus*		X
Ring-billed gull	*Larus delawarensis*		X
Tennessee warbler	*Leiothlypis peregrina*		X
Nashville warbler	*Leiothlypis ruficapilla*	X	X
Hooded merganser	*Lophodytes cucullatus*	X	X
Belted kingfisher	*Megaceryle alcyon*	X	X
Eastern screech-owl	*Megascops asio*	X	X
Red-bellied woodpecker	*Melanerpes carolinus*	X	X
Red-headed woodpecker†	*Melanerpes erythrocephalus*	X	
Wild turkey	*Meleagris gallopavo*	X	X
Swamp sparrow	*Melospiza georgiana*	X	X

Song sparrow	*Melospiza melodia*	X	X
Common merganser	*Mergus merganser*	X	X
Red-breasted merganser	*Mergus serrator*		X
Northern mockingbird	*Mimus polyglottos*	X	X
Black-and-white warbler	*Mniotilta varia*	X	X
Brown-headed cowbird	*Molothrus ater*	X	X
Great crested flycatcher	*Myiarchus crinitus*	X	X
Double-crested cormorant	*Nannopterum auritum*		X
Osprey†	*Pandion haliaetus*	X	X
Northern waterthrush	*Parkesia noveboracensis*	X	X
House sparrow	*Passer domesticus*	X	X
Savannah sparrow	*Passerculus sandwichensis*	X	X
Indigo bunting	*Passerina cyanea*	X	X
Cliff swallow	*Petrochelidon pyrrhonota*	X	X
Ring-necked pheasant	*Phasianus colchicus*	X	X
Rose-breasted grosbeak	*Pheucticus ludovicianus*	X	X
Eastern towhee	*Pipilo erythrophthalmus*	X	X
Scarlet tanager	*Piranga olivacea*	X	X
Pied-billed grebe^	*Podilymbus podiceps*	X	
Black-capped chickadee	*Poecile atricapillus*	X	X
Blue-gray gnatcatcher	*Polioptila caerulea*	X	X
Vesper sparrow†	*Pooecetes gramineus*	X	X
Sora	*Porzana carolina*	X	X
Purple martin	*Progne subis*	X	X
Common grackle	*Quiscalus quiscula*	X	X
Virginia rail	*Rallus limicola*	X	X
Bank swallow	*Riparia riparia*	X	X
Eastern phoebe	*Sayornis phoebe*	X	X
American woodcock	*Scolopax minor*	X	X
Ovenbird	*Seiurus aurocapilla*	X	X
Northern parula	*Setophaga americana*		X
Black-throated blue warbler	*Setophaga caerulescens*		X
Cerulean warbler†	*Setophaga cerulea*	X	X

Hooded warbler	*Setophaga citrina*	X	X
Yellow-rumped warbler	*Setophaga coronata*	X	X
Blackburnian warbler	*Setophaga fusca*	X	X
Magnolia warbler	*Setophaga magnolia*		X
Palm warbler	*Setophaga palmarum*		X
Chestnut-sided warbler	*Setophaga pensylvanica*	X	X
Yellow warbler	*Setophaga petechia*	X	X
Pine warbler	*Setophaga pinus*	X	X
American redstart	*Setophaga ruticilla*	X	X
Blackpoll warbler	*Setophaga striata*		X
Cape may warbler	*Setophaga tigrina*		X
Black-throated green warbler	*Setophaga virens*	X	X
Eastern bluebird	*Sialia sialis*	X	X
Red-breasted nuthatch	*Sitta canadensis*	X	X
White-breasted nuthatch	*Sitta carolinensis*	X	X
Yellow-bellied sapsucker	*Sphyrapicus varius*	X	X
American goldfinch	*Spinus tristis*	X	X
Chipping sparrow	*Spizella passerina*	X	X
Field sparrow	*Spizella pusilla*	X	X
American tree sparrow	*Spizelloides arborea*		X
Northern Rough-winged swallow	*Stelgidopteryx serripennis*	X	X
Common tern^	*Sterna hirundo*	X	X
Barred owl	*Strix varia*	X	X
Eastern meadowlark	*Sturnella magna*	X	X
European starling	*Sturnus vulgaris*	X	X
Tree swallow	*Tachycineta bicolor*	X	X
Carolina wren	*Thryothorus ludovicianus*		X
Brown thrasher	*Toxostoma rufum*	X	X
House wren	*Troglodytes aedon*	X	X
Winter wren	*Troglodytes hiemalis*	X	X
American robin	*Turdus migratorius*	X	X
Eastern kingbird	*Tyrannus tyrannus*	X	X
Golden-winged warbler†	*Vermivora chrysoptera*	X	X

Blue-winged warbler	*Vermivora cyanoptera*	X	X
Brewster's warbler	*Vermivora pinus x V. chrysoptera*	X	
Yellow-throated vireo	*Vireo flavifrons*	X	X
Warbling vireo	*Vireo gilvus*	X	X
Red-eyed vireo	*Vireo olivaceus*	X	X
Blue-headed vireo	*Vireo solitarius*		X
Mourning dove	*Zenaida macroura*	X	X
White-throated sparrow	*Zonotrichia albicollis*		X
White-crowned sparrow	*Zonotrichia leucophrys*		X

Sources: BBA II (census blocks 3780A, 3780B, 3780D, 3781C, 3878B, 3879A, 3879B, 3879D, 3880C, 3978A, 3978C, 3978D, and 4078C), https://extapps.dec.ny.gov/cfmx/extapps/bba/ (accessed June 13, 2025); BBA III (Baldwinsville CE, Baldwinsville NE, Brewerton CE, Brewerton CW, Fulton CE, Fulton NE, Fulton NW, Oswego East SW, Oswego West CE, Oswego West NE, Oswego West SE, Pennellville CW, Pennellville SE, and Pennellville SW census blocks), https://ebird.org/atlasny/home (accessed June 13, 2025). Notes: BBA III was conducted using available data uploaded by volunteer citizen scientists and occasionally reviewed by eBird regional reviewers. Census blocks are roughly nine square miles and are a subset of the 7.5' USGS Topo Quad in which the block is located (the USGS Topo Quads are broken up into six smaller blocks). The BBA III blocks do not correlate directly with the BBA II survey blocks. Although the BBA III census was completed in 2024, as of June 13, 2025, the Baldwinsville NE, Brewerton CW, Fulton NE, Oswego East SW, Oswego West NE, Oswego West SE, Pennellville CW, and Pennellville SE blocks are considered incomplete. Table G-7 only includes bird species based on "confirmed", "probable", or "possible" breeding evidence. * = State listed endangered species; ^ = State-listed threatened species; † = State listed species of special concern.

Table G-8 lists the bird species with the potential to occur within or adjacent to the Connected Action LODs based on 2018-2022 CBC results for the Oswego-Fulton circle (ID 54092) and Syracuse circle (ID 54092), which are the closest CBC circles to the Connected Actions.

Table G-8 CBC Bird Species (Connected Actions)

Common Name	Scientific Name
Common redpoll	*Acanthis flammea*
Hoary redpoll	*Acanthis hornemanni*
Cooper's hawk†	*Accipiter cooperii*
Sharp-shinned hawk†	*Accipiter striatus*
Red-winged blackbird	*Agelaius phoeniceus*
Wood duck	*Aix sponsa*
Northern pintail	*Anas acuta*
American wigeon	*Anas americana*
Green-winged teal	*Anas crecca*
Mallard	*Anas platyrhynchos*
American black duck x mallard	*Anas platyrhynchos x rubripes*
American black duck	*Anas rubripes*

Gadwall	*Anas strepera*
Graylag goose	*Anser anser*
Snow goose	*Anser caerulescens*
Great egret	*Ardea alba*
Great blue heron	*Ardea herodias*
Long-eared owl	*Asio otus*
Lesser scaup	*Aythya affinis*
Redhead	*Aythya americana*
Ring-necked duck	*Aythya collaris*
Greater scaup	*Aythya marila*
Canvasback	*Aythya valisineria*
Tufted titmouse	*Baeolophus bicolor*
Cedar waxwing	*Bombycilla cedrorum*
Ruffed grouse	*Bonasa umbellus*
Canada goose	*Branta canadensis*
Cackling goose	*Branta hutchinsii*
Snowy owl	*Bubo scandiacus*
Great horned owl	*Bubo virginianus*
Bufflehead	*Bucephala albeola*
Common goldeneye	*Bucephala clangula*
Red-tailed hawk	*Buteo jamaicensis*
Northern cardinal	*Cardinalis cardinalis*
Turkey vulture	*Cathartes aura*
Hermit thrush	*Catharus guttatus*
Brown creeper	*Certhia americana*
Bonaparte's gull	*Chroicocephalus philadelphia*
Northern harrier^	*Circus cyaneus*
Marsh wren	*Cistothorus palustris*
Long-tailed duck	*Clangula hyemalis*
Evening grosbeak	*Coccothraustes vespertinus*
Northern flicker	*Colaptes auratus*
Rock pigeon	*Columba livia*
Black vulture	*Coragyps atratus*

American crow	*Corvus brachyrhynchos*
Common raven	*Corvus corax*
Fish crow	*Corvus ossifragus*
Blue jay	*Cyanocitta cristata*
Trumpeter swan	*Cygnus buccinator*
Tundra swan	*Cygnus columbianus*
Mute swan	*Cygnus olor*
Pileated woodpecker	*Dryocopus pileatus*
Gray catbird	*Dumetella carolinesis*
Merlin	*Falco columbarius*
Peregrine falcon*	*Falco peregrinus*
American kestrel	*Falco sparverius*
American coot	*Fulica americana*
Common loon†	*Gavia immer*
Red-throated loon	*Gavia stellata*
Common yellowthroat	*Geothlypis trichas*
House finch	*Haemorhous mexicanus*
Purple finch	*Haemorhous purpureus*
Bald eagle^	*Haliaeetus leucocephalus*
Dark-eyed junco	*Junco hyemalis*
Northern shrike	*Lanius excubitor*
Herring gull	*Larus argentatus*
Ring-billed gull	*Larus delawarensis*
Lesser black-backed gull	*Larus fuscus*
Iceland gull	*Larus glaucoides*
Glaucous gull	*Larus hyperboreus*
Great black-backed gull	*Larus marinus*
Hooded merganser	*Lophodytes cucullatus*
White-winged crossbill	*Loxia leucoptera*
Belted kingfisher	*Megaceryle alcyon*
Eastern screech-owl	*Megascops asio*
Red-bellied woodpecker	*Melanerpes carolinus*
Black scoter	*Melanitta americana*

White-winged scoter	*Melanitta fusca*
Surf scoter	*Melanitta perspicillata*
Wild turkey	*Meleagris gallopavo*
Swamp sparrow	*Melospiza georgiana*
Song sparrow	*Melospiza melodia*
Common merganser	*Mergus merganser*
Red-breasted merganser	*Mergus serrator*
Northern mockingbird	*Mimus polyglottos*
Brown-headed cowbird	*Molothrus ater*
Ruddy duck	*Oxyura jamaicensis*
House sparrow	*Passer domesticus*
Savannah sparrow	*Passerculus sandwichensis*
Double-crested cormorant	*Phalacrocorax auritus*
Downy woodpecker	*Picoides pubescens*
Hairy woodpecker	*Picoides villosus*
Pine grosbeak	*Pinicola enucleator*
Eastern towhee	*Pipilo erythrophthalmus*
Snow bunting	*Plecctrophenax nivalis*
Horned grebe	*Podiceps auritus*
Red-necked grebe	*Podiceps grisgena*
Pied-billed grebe^	*Podilymbus podiceps*
Black-capped chickadee	*Poecile atricapillus*
Common grackle	*Quiscalus quiscula*
Virginia rail	*Rallus limicola*
Ruby-crowned kinglet	*Regulus calendula*
Golden-crowned kinglet	*Regulus satrapa*
Eastern phoebe	*Sayornis phoebe*
Yellow-rumped warbler	*Setophaga coronata*
Eastern bluebird	*Sialia sialis*
Red-breasted nuthatch	*Sitta canadensis*
White-breasted nuthatch	*Sitta carolinensis*
Yellow-bellied sapsucker	*Sphyrapicus varius*
Pine siskin	*Spinus pinus*

American goldfinch	*Spinus tristis*
Chipping sparrow	*Spizella passerina*
Field sparrow	*Spizella pusilla*
American tree sparrow	*Spizelloides arborea*
Barred owl	*Strix varia*
European starling	*Sturnus vulgaris*
Carolina wren	*Thryothorus ludovicianus*
Winter wren	*Troglodytes hiemalis*
American robin	*Turdus migratorius*
Mourning dove	*Zenaida macroura*
White-throated sparrow	*Zonotrichia albicollis*
White-crowned sparrow	*Zonotrichia leucophrys*

Sources: Audubon 124th Christmas Bird Count (2018-2022) for Oswego-Fulton Circle ID 5092 and Syracuse Circle ID 55604, https://netapp.audubon.org/cbcobservation/ (accessed June 13, 2025); Billerman et al. 2022. Note: * = State listed endangered species; ^ = State-listed threatened species; † = State listed species of special concern.

G-3.4.3 Reptiles and Amphibians

Reptile and amphibian species with the potential to occur within the Proposed Project and Connected Actions study areas were identified based on a review of the NYSDEC Herp Atlas Project, a statewide survey conducted from 1990 to 1999 to document the geographic distribution of New York's reptile and amphibian species, based on USGS quadrangles.

Table G-9 lists the reptile and amphibian species with the potential to occur within the Proposed Project study area based on Herp Atlas Project data for the quadrangles containing the Micron Campus site (Brewerton and Cicero quadrangles) and the Rail Spur and Childcare Sites (Brewerton quadrangle). Based on this information, 15 species have the potential to occur at the Micron Campus site and the Rail Spur Site. Based on habitat associations (Gibbs et al. 2007), the Micron Campus site has the potential to support all 15 species, and the Rail Spur Site has the potential to support 5 of the species. Reptiles and amphibians observed during the site investigations and surveys include American toad (*Bufo americanus*), common snapping turtle (*Chelydra serpentina*), gray treefrog (*Hyla versicolor*), bullfrog (*Rana catesbeiana*), green frog (*Rana clamitans melanota*), northern leopard frog (*Rana pipiens*), and common garter snake (*Thamnophis sirtalis*). The Childcare Site contains suitable habitat for American toad, gray tree frog, northern red-backed salamander (*Plethodon cinereus*), common garter snake, and northern brown snake (*Storeria dekayi*).

Table G-9 NYS Herp Atlas Reptile and Amphibian Species (Proposed Project)

Common Name	Scientific Name	MC	RSS	CCS
Jefferson Salamander Complex	*Ambystoma jeffersonianum x laterale*			
Blue-spotted Salamander†	*Ambystoma laterale*			

American toad	***Bufo americanus***	X	X	X
Common snapping turtle	***Chelydra serpentina***	X		
Painted turtle	*Chrysemys picta*	X		
Spotted turtle†	*Clemmys guttata*	X		
Wood turtle†	*Clemmys insculpta*			
Gray treefrog	***Hyla versicolor***	X	X	X
Common Mudpuppy	*Necturus maculosus*	X		
Northern water snake	*Nerodia sipedon*	X		
Red-spotted newt	*Notophthalmus viridescens*	X		
Northern redback salamander	*Plethodon cinereus*	X	X	X
Northern spring peeper	*Pseudacris crucifer*	X	X	
Bullfrog	***Rana catesbeiana***	X	X	
Green frog	***Rana clamitans melanota***	X	X	
Pickerel frog	*Rana palustris*	X		
Northern leopard frog	***Rana pipiens***	X		
Wood frog	*Rana sylvatica*	X	X	
Eastern Massasauga*	*Sistrurus catenatus*			
Northern Redbelly Snake	*Storeri occipitomaculata*	X		
Northern brown snake	*Storeria dekayi*	X	X	X
Common garter snake	***Thamnophis sirtalis***	X	X	X

Sources: NYS Herp Atlas (1990-1999) Brewerton and Cicero USGS quadrangles, https://www.dec.ny.gov/animals/7140.html (accessed June 13, 2025); Gibbs et al. 2007. Notes: Species in bold were observed during visual encounter wildlife survey (June 23, 2023), site reconnaissance investigations to map ecological communities (July 31-Aug. 2, 2023), and/or bat and grassland breeding bird surveys conducted during the spring and summer of 2023. Species marked with an X have the potential to occur at the site indicated based on their habitat associations. The list in Table G-9 includes species with the potential to occur in the LODs for the telecommunications improvements. * = State listed endangered species; ^ = State-listed threatened species; † = State listed species of special concern.

Table G-10 lists the reptile and amphibian species with the potential to occur within or adjacent to the Connected Action LODs based on Herp Atlas Project data for the quadrangles containing the Connected Actions (Oswego West, Oswego East, Fulton, Pennellville, Baldwinsville, and Brewerton quadrangles).

Table G-10 NYS Herp Atlas Reptile and Amphibian Species (Connected Actions)

Common Name	Species
Spotted salamander	*Ambystoma maculatum*
American toad	*Bufo americanus*
Common snapping turtle	*Chelydra serpentina*

Painted turtle	*Chrysemys picta*
Spotted turtle†	*Clemmys guttata*
Bog turtle *	*Clemmys muhlenbergii*
Northern two-lined salamander	*Eurycea bisilneata*
Gray treefrog	*Hyla versicolor*
Eastern milk snake	*Lampropeltis triangulum*
Smooth green snake	*Liochlorophis vernalis*
Northern water snake	*Nerodia sipedon*
Red-spotted newt	*Notophthalmus viridescens*
Northern redback salamander	*Plethodon cinereus*
Northern spring peeper	*Pseudacris crucifer*
Western chorus frog	*Pseudacris triseriata*
Bullfrog	*Rana catesbeiana*
Green frog	*Rana clamitans melanota*
Pickerel frog	*Rana palustris*
Northern leopard frog	*Rana pipiens*
Wood frog	*Rana sylvatica*
Common musk turtle	*Stemotherus odoratus*
Northern redbelly snake	*Storeri occipitomaculata*
Northern brown snake	*Storeria dekayi*
Eastern ribbon snake	*Thamnophis sauritus*
Common garter snake	*Thamnophis sirtalis*
Red-eared slider	*Trachemys scripta elegans*

Source: NYS Herp Atlas (1990-1999) Oswego West, Oswego East, Fulton, Pennellville, Baldwinsville, and Brewerton USGS quadrangles, https://www.dec.ny.gov/animals/7140.html (accessed June 13, 2025). Note: * = State listed endangered species; ^ = State-listed threatened species; † = State listed species of special concern.

G-3.5 Special Status Species Profiles

This section provides supplemental information on special status species described in Section 3.4 (Biological Resources). Additional information may be found in Appendix G-4 and Appendix G-5.

G-3.5.1 Indiana Bat

USFWS IPaC system and NYSDEC EAF mapper results (Appendices G-7 and G-8) indicate that the Indiana bat (*Myotis sodalis*), a Federal and State listed endangered species, has the potential to occur in the vicinity of the Proposed Project and Connected Actions. The Micron

Campus site and the Rail Spur Site are within 1 mile of a known Indiana bat maternity roost, within 3 miles of other known Indiana bat roost trees and capture locations, and within 14 miles of a known hibernaculum. Suitable roosting and foraging habitat for Indiana bats may be present at the Connected Action sites in unmaintained portions of existing utility corridors, within proposed new utility corridor routes, and in forested areas within and adjacent to the Clay Substation expansion area and wastewater improvement sites.

The Indiana bat is a temperate, insectivorous bat that emerges from the caves or mines in which it hibernates in early spring; males then disperse and remain solitary until mating season at the end of the summer, and pregnant females form maternity colonies in which to rear their young. Maternity roosts, roosting sites of post-lactating females, and roosting sites of solitary males are usually under loose bark or in the crevices of trees. Indiana bat roosting sites have been documented in numerous species of deciduous trees; tree availability, diameter, height, bark characteristics, and sun exposure appear to be more important factors in roost site selection than tree species (USFWS, 2007). Roost trees in New York (Britzke et al. 2006) and elsewhere (USFWS, 2007) are typically in trees with a diameter at breast height (dbh) greater than 16 inches and a height taller than 52 feet, but roosts in smaller trees are not uncommon (USFWS, 2007). Roosting trees are usually dead or nearly dead and decayed (Menzel et al. 2001; Kitchell, 2008). Indiana bats often roost near forest gaps or edges where trees receive direct sunlight for much of the day (Callahan et al. 1997; Menzel et al. 2001).

Habitats used by Indiana bats during summer are varied and include riparian, bottomland/floodplain, and upland forests (Britzke et al. 2006; Humphrey et al. 1977; Watrous et al. 2006) often within fragmented agricultural landscapes (Murray and Kurta, 2004; Watrous et al. 2006; USFWS, 2007) like that in which the Micron Campus site is located. They will forage in the forest canopy, over open fields, over impounded waterbodies, along riparian corridors, and along forest edges (USFWS, 2007). Maternity colonies are commonly located in areas with abundant natural or artificial freshwater sources (Carter et al. 2002; Kurta et al. 2002; Watrous et al. 2006; USFWS, 2007). Spring and autumn habitats of Indiana bats have not been well described but appear to be largely similar to their summer habitat (Britzke et al. 2006; USFWS, 2007). During autumn, Indiana bats mate and deposit fat stores in preparation for winter hibernation. Hibernacula are typically in caves or abandoned mines where ambient temperatures remain above freezing (USFWS, 2007). Indiana bats can migrate upward of 100 miles between their summer territory and hibernaculum (USFWS, 2011; Winhold and Kurta 2006).

The Indiana bat has recently undergone steep population declines due to an exotic fungal pathogen that has caused an outbreak of white-nose syndrome (WNS)—an infectious disease first documented in the Howe Caverns in New York in 2006 (Cheng et al. 2021; Reeder and Moore, 2013). Bats infected with WNS suffer structural damage to their wing membranes and exhibit aberrant hibernation behavior and physiology, the consequences of which are usually fatal (Reeder and Moore 2013). Indiana bat populations declined by approximately 10 percent per year in the first few years following the discovery of WNS (Thogmartin et al. 2012) and by now have declined by an estimated 84 percent range-wide (Cheng et al. 2021). In New York State, pre- and post-WNS count data on hibernating Indiana bats showed an average statewide population decline of 72 percent between 2006 and 2011 (Turner et al. 2011). Declines in New York State since the introduction of WNS have been among the most severe of all monitored states and are approaching 100 percent (Cheng et al. 2021).

G-3.5.2 Northern Long-eared Bat

USFWS IPaC system results (Appendix G-7) indicate that the northern long-eared bat (*Myotis septentrionalis*), a Federal and State listed endangered species, has the potential to occur in the vicinity of the Proposed Project and Connected Actions. NYSDEC also has documented the northern long-eared bat as occurring in the Town of Clay during the summer (NYSDEC, 2022b). The northern long-eared bat is a temperate, insectivorous species that hibernates in caves and mines during winter and emerges in early spring to disperse to summer habitat, usually no more than 60 miles from its hibernaculum (Caceres and Barclay 2000; USFWS, 2014). As with Indiana bats, the males remain solitary until mating season at the end of the summer and pregnant females form maternity colonies in which they rear their pups. During summer, northern long-eared bats are most closely associated with contiguous, closed-canopy, upland or riparian forests within heavily forested landscapes (Ford et al. 2005; Henderson et al. 2008). The northern long-eared bat prefers interior forest for roosting and foraging and is sensitive to fragmentation (Foster and Kurta 1999; Broders et al. 2006; Henderson et al. 2008; Segers and Broders, 2014). In fragmented, agricultural landscapes, northern long-eared bats avoid open habitats and concentrate where there is greatest forest coverage (White et al. 2017). In addition to interior forest, northern long-eared bats will also use streams, forested wetlands, and other riparian habitats for foraging (Ford et al. 2005, Gorman et al. 2022; Johnson et al. 2010,). The deciduous forest and forested wetlands within the eastern, western, and northern portions of the Micron Campus site include habitat types associated with northern long-eared bat roosting and foraging activity.

Unlike many other bat species in the northeastern United States, northern long-eared bats often feed by gleaning prey from leaves and other surfaces rather than strictly hawking flying insects in the air, and are thereby well-adapted to foraging in cluttered, structurally complex forest interior habitat (Lacki et al. 2007; Owen et al. 2003). Most foraging occurs above the understory and below the canopy (Brack and Whitaker 2001; Harvey et al. 2011; USFWS, 2014) in interior areas with a tall and closed canopy (Adams, 2013; Owen et al. 2003; Patriquin and Barclay, 2003). Northern long-eared bats do not concentrate along riparian corridors or other linear landscape features as much as strictly aerial-foraging species do (Ford et al. 2005; Harvey et al. 2011; Owen et al. 2003; USFWS, 2014), and most radiotelemetry and acoustic studies have found that they typically avoid roads and other sharp forest edges (Carter and Feldhamer, 2005; Morris et al. 2010; Owen et al. 2003; Patriquin and Barclay, 2003; Segers and Broders, 2014).

Roost trees are also usually in intact forest, close to the core and away from large clearings, roads, or other sharp edges (Carter and Feldhamer 2005; Menzel et al. 2002; Owen et al. 2003,). Roosts are usually in cavities or, less often, under exfoliating bark of large-diameter trees that form a high and dense canopy (Carter and Feldhamer, 2005, reviewed by Barclay and Kurta, 2007; Foster and Kurta, 1999; Menzel et al. 2002), but trees as small as 3 inches dbh can be potential roost sites (USFWS, 2023a). Possibly in response to the increased thermoregulatory challenges of roosting alone or in small numbers since the extreme population declines caused by WNS, northern long-eared bats appear to be roosting in small-diameter trees more commonly now than before WNS (Kalen et al. 2022). Males and females will both use many different roost trees throughout the summer, often switching roosts every 1 to 5 days and moving hundreds of feet between successive locations (Johnson et al. 2009; Menzel et al. 2002; Owen et al. 2002).

The northern long-eared bat has experienced the steepest population decline of the six species of bats in the northeast that are affected by WNS, with numbers at monitored hibernacula in several states dropping by an average of 98 percent between 2006 and 2011 (Langwig et al. 2012; Reeder and Moore, 2013; Turner et al. 2011) and approaching 100 percent in the years since (Cheng et al. 2021). Ninety percent of hibernacula where northern long-eared bats are still found contain fewer than 10 individuals (Cheng et al. 2021). In New York State, pre- and post-WNS count data from 18 northern long-eared bat hibernacula showed local population extinction at all but 4 of the sites as of 2011 and suggested an average statewide population decline of 97 percent (Turner et al. 2011). Surveys at these 18 hibernacula in New York State during the winter of 2012-2013 found only 14 northern long-eared bats where there had previously been more than 1,100 before WNS (Niver, 2015). However, in recent years, northern long-eared bats have been increasingly found on Long Island and other coastal islands, which may provide refuge from WNS because the milder winter climate shortens the hibernation period and is less favorable to the fungus that causes WNS. Northern long-eared bats in coastal systems also tend to hibernate solitarily rather than colonially, which reduces disease transmission (Gorman, 2023; Hoff, 2023).

G-3.5.3 Tricolored Bat

USFWS IPaC system results (Appendix G-7) indicate that the tricolored bat (*Perimyotis subflavus*), a species proposed to be listed as endangered under the ESA, has the potential to occur in the vicinity of the Proposed Project and Connected Actions. As with the Indiana bat and northern long-eared bat, the tricolored bat is a temperate, insectivorous species that hibernates through the winter and emerges from its hibernaculum in the spring, with females dispersing to form maternity colonies and males remaining solitary until the end of the summer. The tricolored bat is a forest generalist, inhabiting a variety of forest types across its broad geographic range, which spans most of the continental United States, southeastern Canada, Mexico, and Central America (USFWS, 2022). Tricolored bats roost mostly within leaf clusters on live, dying, or dead hardwood trees, and occasionally in coniferous trees and artificial structures (e.g., barns, porch eves, bridges) (Perry and Thill, 2007; Thames, 2020; USFWS, 2022; Veilleux et al. 2003). Female tricolored bats usually return each year to the same roosting area but switch roost trees frequently (daily to semi-daily) (Poissant et al. 2010; Quinn and Broders, 2007; Veilleux and Veilleux, 2004) over an area of up to a few acres throughout the maternity season (Veilleux and Veilleux, 2004). Tricolored bats forage at or above canopy height, over open water, and along forest edges (Barbour and Davis, 1969; Hein et al. 2009; Mumford and Whitaker, 1982). Foraging areas are usually within 3 miles of roost sites for females and 7 miles for males (Veilleux et al. 2003; Thames, 2020). Wetlands and surface waters are important foraging habitats and sources of drinking water (USFWS, 2022).

The tricolored bat has experienced local population declines of 90-100 percent across 59 percent of its geographic range due to WNS (Cheng et al. 2021). The range-wide population is predicted to decline by 89 percent over the next few years, resulting in a 65 percent reduction in spatial distribution (USFWS, 2021, 2022). Mortality caused by wind energy facilities is the second greatest contributor to tricolored bat population declines (USFWS, 2022), with another 19-21 percent decrease expected to result under current wind energy development scenarios (Wiens et al. 2022; Whitby et al. 2022). In contrast to these stressors, USFWS (2021, 2022) considers the effect of habitat loss on tricolored bat population sizes to currently be low.

Habitat availability is not believed to be currently limiting tricolored bat abundance and is not expected to be a limiting factor in the near future (USFWS, 2022). However, tricolored bat populations are perilously low, and they are vulnerable to local extirpations caused by the cumulative effects of habitat loss and other stressors that compound the broader effects of WNS and mortality from wind energy development (USFWS, 2022).

G-3.5.4 Northern Harrier

NYSDEC EAF mapper results (Appendix G-8) indicate that the northern harrier (*Circus hudsonius*), a State listed threatened species, has the potential to occur at the Micron Campus site. The species was documented in the vicinity of the Micron Campus site in the BBA II census (2000-2005), but not in the BBA III census (2020-2024). and the species was documented by the CBC between 2018 and 2022 and was reported to be observed at the Micron Campus site by the public on eBird for much of the winter of 2022-2023.

The northern harrier is a migratory bird of prey that breeds and winters in open habitats such as grasslands, old fields, pastures, croplands, and salt marshes (MacWhirter and Bildstein, 1996). Harriers are present in northern New York year-round (Post, 2008). Range-wide northern harrier populations appear to have declined slightly over the past half-century mostly due to habitat loss from development, drainage of wetlands, reversion of former agricultural lands into forest, and increases in ground predator abundance (Smith et al. 2020). However, there is uncertainty surrounding population estimates due to large fluctuations in harrier abundance in connection with meadow vole population cycles and the large home ranges of harriers, which can lead to multiple counting of the same individuals (Schimpf et al. 2020; NYNHP, 2024). North American Breeding Bird Survey data from 1966-2003 indicate a non-significant, 3 percent annual decline in range-wide northern harrier populations over that time period. In New York State, there was little change in the number of census blocks occupied between the 1980-1985 and 2000-2005 BBAs (Post, 2008). NYSDEC has proposed delisting the northern harrier from a State listed threatened species to a species of special concern (NYSDEC, 2019).

G-3.5.5 Short-eared Owl

NYSDEC EAF mapper results (Appendix G-8) indicate that the short-eared owl (*Asio flammeus*), a State listed endangered species, has the potential to occur in the vicinity of the Micron Campus site and the Rail Spur Site. In addition, a short-eared owl was documented by NYSDEC and the public as wintering at the Micron Campus site, as described below. Short-eared owls were not documented in the vicinity of the Proposed Project or Connected Actions by the BBA II in 2000-2005 or BBA III in 2020-2024 or the CBC in 2018-2022.

The short-eared owl is a ground-nesting bird that inhabits open fields, marshes, and tundra throughout North America and Europe, as well as parts of South America, Africa, and Asia. Populations in North America and particularly in the northeastern United States have declined in recent decades primarily due to habitat loss and fragmentation caused by various forms of development and the reforestation of abandoned agricultural lands. This includes New York State, where the short-eared owl has experienced steep declines (Wiggens et al. 2020; Schneider, 2008).

Northern New York is at the southern extent of the short-eared owl’s eastern North American breeding range; therefore, short-eared owls occur much more commonly in New York during winter than the breeding period. A satellite tracking study of short-eared owls overwintering in New York found that all birds departed between March and April and migrated 1,751-1,938 km to summer breeding grounds in eastern Canada (Gahbauer et al. 2021). A separate sample of short-eared owls that were radio-tagged as part of the same study also departed New York wintering grounds mostly in March and April (Gahbauer et al. 2021).

As stated above, a short-eared owl was documented at the Micron Campus site by NYSDEC and members of the public on eBird during the winter of 2022-2023. It was last reported there on March 8, 2023, after which point the bird likely migrated to more northern breeding grounds. Because short-eared owls primarily prey on small mammals whose population sizes fluctuate greatly in space and time, they tend to be nomadic and settle wherever they can find habitat with a sufficient prey base in a given year. As such, short-eared owls typically exhibit low fidelity to the same breeding and non-breeding sites from year to year (Johnson et al. 2017; Village, 1987; Wiggens et al. 2020). However, 3 of 5 short-eared owls that were tagged with tracking devices on wintering grounds in New York and tracked until the following winter did not fit this trend and instead returned to the same wintering site or a nearby (≤ 15 km) site (Gahbauer et al. 2021). The likelihood of the short-eared owl that was reported at the Micron Campus site in the winter and spring of 2023 returning to the site the following winter is therefore uncertain. The Micron Campus site is not known to be consistently used by short-eared owls and most likely supports short-eared owls only on occasion, during winters with relatively high prey availability. Short-eared owls are not known or expected to nest at the Micron Campus site and their presence is reasonably assumed to be limited to the non-breeding seasons. Short-eared owls have large area requirements (Booms et al. 2014; Wiggins et al. 2020), with winter home range sizes in New York State averaging 538 acres (Gahbauer et al. 2021); therefore, only the largest fields at the Micron Campus site are likely to be suitable habitat.

G-3.5.6 Sedge Wren

NYSDEC EAF mapper results (Appendix G-8) indicate that the sedge wren (*Cistothorus platensis*), a State listed threatened species, has the potential to occur in the vicinity of the Proposed Project and within or adjacent to the Clay Substation expansion area and the natural gas and wastewater conveyance LODs. According to the NYNHP, sedge wren was documented as breeding within 0.25 miles of the Proposed Project (NYNHP, 2023). Preferred sedge wren habitats include wet meadows with low bushes, grass and sedge bogs, coastal brackish marshes dominated by saltmeadow cordgrass (*Spartina patens*), and hayfields dominated by sedges and grasses (NYNHP, 2025c). Nesting occurs in dense, tall grasses, sedge clumps or hummocks, on the ground, in small bushes, or at the base of small trees. The species is known to abandon sites that become too wet or too dry (NYNHP, 2025c). The sedge wren is area-sensitive (Herkert, 1994) and prefers a moderate density of woody shrubs mixed with herbaceous vegetation for breeding (Herkert et al. 2021). Sedge wrens have been shown to avoid shelterbelts and forest edges for at least 220 meters (771.8 feet) (Tack et al. 2017) and respond negatively to the proximity of roads and amount of forest cover surrounding open habitats (Panci et al. 2017; Thompson et al. 2014,). The sedge wren was not observed during the 8-week grassland breeding bird survey (approved by NYSDEC) conducted at the Micron Campus site, and sedge wren would not occur at the Rail Spur Site due to the site's forest coverage, or at the Childcare Site, as that site's field is generally too small and too close in proximity to roads and shelterbelts to support grassland birds.

G-3.5.7 Bald Eagle

NYSDEC EAF mapper results (Appendix G-8) indicate that the bald eagle (*Haliaeetus leucocephalus*), a State listed threatened species, has the potential to occur along the Oswego and Oneida Rivers in the vicinity of the water supply and wastewater improvements. The bald eagle is a large raptor found throughout Canada and the continental United States. The species experienced significant declines prior to the 1970s, largely due to exposure to pesticides, particularly DDT (NYSDEC, 2025a). In New York, bald eagles were almost eliminated by the 1960s, leading the State to list them as an endangered species. A significant restoration program for the species began in the 1970s, and in 1999 the State downlisted the species from endangered to threatened. Bald eagles are currently experiencing consistent annual population increases in New York (NYSDEC, 2017).

Bald eagles breed and overwinter throughout most of New York. During the breeding season, the species typically occupies undisturbed forest habitat in proximity to lakes, rivers, and wetlands. For nesting, the species shows a preference for white pine (*Pinus strobus*) and cottonwood (*Populus deltoides*) (NYSDEC, 2017). In winter, bald eagles aggregate near large rivers where they can forage on fish, their primary food source (NYSDEC, 2017, 2025a). There are four primary winter aggregation areas in New York: the Upper Delaware River, the St. Lawrence River, the Lower Hudson River, and the Sacandaga River (NYNHP, 2025d).

G-3.5.8 Black Tern

NYSDEC EAF mapper results (Appendix G-8) indicate that the black tern (*Chlidonias niger*), a State listed endangered species, has the potential to occur in the vicinity of the water supply improvements. This waterbird species nests in freshwater marshes, ponds, river mouths, and large lake shores, typically in areas with a mix of emergent vegetation and open water (NYNHP, 2025f; NYSDEC, 2025c). Black tern habitat selection is dependent on marsh size and proximity to other wetlands. Black terns prefer wetlands greater than 20 hectares (49.4 acres), although black terns have sometimes been observed on wetlands as small as 6 hectares (14.8 acres) (Daub, 1993; Dunn and Agro, 1995; McCollough and McDougal, 1996; Provost, 1947). In New York, black terns prefer to nest in wetlands containing greater than 10 hectares (24.7 acres) of habitat characterized by equal proportions of vegetation cover and open water, dense cover at 0.2 meters above the water line, and sparse cover at 0.5 meters above the water line (Hickey, 1997).

The utility corridor associated with the water supply improvements is adjacent to marshland habitat within a large system of forested and emergent wetlands in the vicinity of the Oneida River near County Route 12 and Peter Scott Road. The emergent wetlands within this area are greater than 60 hectares (148.3 acres) and therefore have the potential to provide suitable black tern habitat.

G-3.5.9 Pied-Billed Grebe

NYSDEC EAF mapper results (Appendix G-8) indicate that the pied-billed grebe (*Podilymbus podiceps*), a State listed threatened species, has the potential to occur in the vicinity of the water supply and wastewater improvements.

This small water bird occurs throughout North and South America. Long-term declines in pied-billed grebe populations were observed between the 1960s and 1990s in many portions of its range. These declines are attributed to loss of wetland habitat and exposure to pesticides, including DDT (NYSDEC, 2025b). In New York State, there was a 47 percent increase in distribution of this species between the 1980-1985 records and the 2000-2005 BBA (NYSDEC, 2014b, 2025b). However, significant declines in pied-billed grebe populations in the Lake Ontario marshes were observed between 1996 and 2013 (Tozer 2015).

New York is in the pied-billed grebe's breeding range. Though the species can be found throughout the state, the pied-billed grebe is most abundant in the marshes of the St. Lawrence River Valley and Lake Ontario. The species generally arrives in New York between March and mid-April to breed in floating platform nests within dense stands of deep-water emergent vegetation, such as cattails, that provide cover. These nests are typically located at marsh edges to allow for open-water foraging (NYSDEC, 2025b). Pied-billed grebe forages in open waters, consuming fish, crayfish, and aquatic insects (NYNHP, 2025e; NYSDEC, 2025b). The species leaves New York for southern wintering grounds between September and November (NYSDEC, 2025b), though it is a rare winter visitor along the coast and in open water areas of the Allegheny and Oswego Rivers (NYNHP, 2025e).

G-3.5.10 Monarch Butterfly

USFWS IPaC system results (Appendix G-7) indicate that the monarch butterfly (*Danaus plexippus*), a species proposed to be listed as threatened under the ESA, has the potential to occur in the vicinity of the Proposed Project and Connected Actions. The monarch butterfly is a migratory insect that has experienced recent population declines but remains widespread and ubiquitous across North America and can be found in nearly any open habitat, including within heavily modified urban and agricultural landscapes (Mawdsley et al. 2020). They migrate from eastern and central North America to winter in montane forests in Mexico and then return north in the spring to breed. Overwintering monarchs may also breed before migrating north (USFWS, 2020a). Monarchs are dependent on milkweeds (*Asclepias* spp.) as their larval host plant, which grow in a variety of conditions, including disturbed and degraded habitats such as old fields, roadside margins, residential properties, and city parks. During the breeding season, monarchs lay their eggs on their obligate milkweed host plant and larvae emerge after two to five days. Larvae develop over a period of 9 to 18 days, feeding on milkweed and sequestering toxic chemicals as a defense against predators; the larva then pupates into a chrysalis before emerging 6 to 14 days later as an adult butterfly (USFWS, 2020a). Multiple generations of monarchs are produced during the breeding season, with most adult butterflies living approximately two to five weeks (USFWS, 2020a). After breeding throughout the summer, multiple generations iteratively move southward again to Mexico where they overwinter (Brock and Kaufman, 2003).

G-3.5.11 Bog Buck Moth

USFWS IPaC system results (Appendix G-7) indicate that the bog buck moth (*Hemileuca maia menyanthevora*), a Federal and State listed endangered species, has the potential to occur in the vicinity of the water supply improvements. The bog buck moth occurs exclusively in open, calcareous, low shrub fens containing large amounts of bog buckbean (*Menyanthes trifoliata*). Bog buckbean is a shade-intolerant plant species that is the preferred larval food source of the bog buck moth. In addition to needing ample buckbean for larval feeding, suitable bog buck moth habitat also requires plants with sturdy upright stems for oviposition (NYNHP, 2019). The eggs hatch between April and June, which aligns with the emergence of bog buckbean. Bog buck moths do not feed in the adult stage, which occurs over a 9-12-day period between September and October. Before dying off, the adult moth mates in the fall and lays egg clusters on plant foliage to overwinter (NYNHP, 2019; NYNHP, 2025b). As the adult stage is brief, this species seldom leaves its known habitat and is known to typically fly only short distances of 0.5 kilometers, despite being capable of further travel (NYNHP, 2019).

Known populations of the bog buck moth are restricted to Oswego County in New York State and Ontario, Canada (NYNHP, 2019; NYNHP, 2025b). In New York State, the six known bog buck moth populations are found within what are considered medium fens, which are those fed by moderately mineralized waters, often as a narrow transition between a stream or lake or between a swamp or upland. Five of the known populations within Oswego County are found in the dunes along the eastern shorelines of Lake Ontario, while the sixth population is located within a wetland in a southwest inland portion of the county (NYNHP, 2019).

NYSDEC does not list bog buck moth as present within the vicinity of the water supply improvements, which indicates that these sites do not overlap with the boundaries of the six known populations within New York State. Therefore, the species is not likely present within or adjacent to the water supply improvement LODs. The BA concludes that the Proposed Project and Connected Actions would have “no effect” on the bog buck moth.

G-3.5.12 Eastern Massasauga

USFWS IPaC system results (Appendix G-7) indicate that the eastern massasauga (*Sistrurus catenatus)*, a Federal listed threatened and State listed endangered species, has the potential to occur in the vicinity of the Micron Campus site. The eastern massasauga is a declining, range-restricted rattlesnake that occurs in small, highly isolated populations from central New York State and southern Ontario to south-central Illinois and eastern Iowa. Population declines are primarily attributable to wetland drainage, habitat fragmentation, illegal collection for the pet trade, and the advancement of early successional vegetation into later successional stages in the few areas in which remnant populations persist (Gibbs et al. 2007). Only two populations of the eastern massasauga are known to remain within New York State (Gibbs et al. 2007). One is within a few miles of the WPCP (exact location not disclosed due to the species’ vulnerability to collection); the other is in Genesee County (Gibbs et al. 2007).

At the site near the WPCP, eastern massasaugas are largely restricted to peatland habitat that was created by a fire in the late 1800s (Johnson and Breisch, 1993; Johnson 2000). They have extremely small activity ranges and restricted movements within overlapping territories and have not been found to disperse or emigrate outside of this general area (Johnson 1995, 2000). Moreover, the site is separated from the WPCP by two interstate highways, several other major roads, and an inhospitable landscape of development that collectively represent significant barriers to the movement of eastern massasaugas away from that site. Furthermore, NYSDEC does not list eastern massasauga as having the potential to occur in the vicinity of the Micron Campus site, or any of the Proposed Project or Connected Action sites. Therefore, the eastern massasauga is not likely present within the Proposed Project or Connected Action study areas. The BA concludes that the Proposed Project and Connected Actions would have “no effect” on the eastern massassauga.

G-3.5.13 Lake Sturgeon

NYSDEC EAF mapper results (Appendix G-8) indicate that the lake sturgeon (*Acipenser fulvescens*), a State listed threatened species, has the potential to occur in the vicinity of the wastewater improvements.

Lake sturgeon is found primarily in lakes and large rivers in the northeastern United States, though it occurs in the Midwest and Southeast as well. This large freshwater fish was historically overexploited for caviar and smoked meat (NYNHP, 2025g; NYSDEC, 2025d). Stocking efforts have led to increasing populations in New York, and natural reproduction of stocked fish has been observed (NYSDEC, 2023), though habitat loss, fragmentation, and degradation remain threats to the species. In New York, lake sturgeon have been collected in the St. Lawrence, Niagara, Oswegatchie, and Grasse River systems, as well as Lake Ontario, Lake Erie, Lake Champlain, and the Seneca and Cayuga Canals (NYSDEC, 2025d). Lower reaches of the Oswegatchie, Grasse, Raquette, and Oswego Rivers provide lake sturgeon spawning habitat (NYNHP, 2025g; NYSDEC, 2023).

G-3.5.14 Hairy Small-leaved Tick Trefoil

NYSDEC EAF mapper results (Appendix G-8) indicate that the hairy small-leaved tick trefoil (*Desmodium ciliare*), a State listed threatened plant species, has the potential to occur in the vicinity of the IWWTP.

The hairy small-leaved tick trefoil is perennial herbaceous species found with a range that extends from New York and Massachusetts west to Michigan, Missouri, and Kansas and south to Texas and Florida. The species is found in New York south of the Adirondacks in dry, open habitats and sandy or rocky summit grasslands (NYNHP, 2025h). There are 16 existing populations in the state, most with fewer than 100 plants (NYNHP, 2025h).

Dominant land cover types present at the Oak Orchard site and within and adjacent to the wastewater conveyance LOD include upland and wetland forest, active cropland, non-forested palustrine wetlands, and developed land. In general, these areas contain minimal dry, open habitats, and lack sandy or rocky summit grasslands. The hairy small-leaved tick trefoil occurs in Oswego and Onondaga Counties (NYFA, 2025) and has been documented at and in the vicinity of the Oak Orchard site.

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Appendix G-4
Final Biological Assessment

Biological Assessment

Micron Semiconductor Manufacturing Facility

Onondaga and Oswego Counties, New York

Prepared for:

Micron New York Semiconductor Manufacturing LLC

and

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Version 1.3, June 2025

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1. INTRODUCTION

On August 18, 2023, Micron New York Semiconductor Manufacturing LLC (Micron), a wholly owned subsidiary of Micron Technology, Inc. (Micron Technology), filed an application with the CHIPS Program Office (CPO) for direct funding under the CHIPS Incentives Program's February 28, 2023, Notice of Funding Opportunity (NOFO)[1] for the construction of commercial semiconductor fabrication facilities in Clay, New York. On December 5, 2024, the U.S. Department of Commerce (Department of Commerce) approved Micron's application for an award under the NOFO. On June 14, 2023, Micron submitted an application to the Onondaga County Industrial Development Agency (OCIDA) requesting certain financial assistance within the meaning of New York General Municipal Law § 854(14). Micron's application as amended and restated, includes the lease and eventual purchase of the White Pine Commerce Park (WPCP) in Clay, New York and the undertaking of potential property condemnation pursuant to the New York Eminent Domain Procedure Law.

Micron's proposed activities under Micron's funding applications to CPO and OCIDA, are collectively referred to in this Biological Assessment (BA) as the "Proposed Project." Because CPO and OCIDA determined, during their examination of Micron's respective applications, and in the case of OCIDA, Part 1 of Micron's Environmental Assessment Form, that the proposed activities in the applications have the potential to result in at least one significant adverse effect on the environment, CPO and OCIDA are preparing an Environmental Impact Statement (EIS) to evaluate the potential environmental effects of the Proposed Project pursuant to the requirements of the National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. § 4321 *et seq.*, and the State Environmental Quality Review Act (SEQRA), as codified at N.Y. Envtl. Conserv. Law § 8-0101 *et seq*. and its implementing regulations at 6 N.Y.C.R.R. Part 617. CPO and OCIDA agreed to act as joint lead agencies under NEPA and SEQRA; CPO is also the lead federal agency under Section 7 of the Endangered Species Act (ESA). The Buffalo District of the U.S. Army Corps of Engineers (USACE), and the U.S. Environmental Protection Agency (USEPA) are participating as Cooperating Agencies and the Federal Highway Administration (FHWA) and the U.S. Fish and Wildlife Services (USFWS) are serving as participating agencies in the development of the EIS. USACE is responsible for a decision under the Clean Water Act (CWA) Section 404 permitting process and will rely on this Section 7 consultation process in support of that decision for the Proposed Project. USACE will be responsible for any future Section 7 consultations related to any mitigation sites required as part of the 404 permitting process.

The Proposed Project would involve the construction and operation of a semiconductor manufacturing facility with four semiconductor fabrication buildings ("fabs") at the WPCP location. The Proposed Project would primarily consist of: (1) construction of the Micron Campus, including the four fabs, ancillary support facilities, ingress and egress roads, driveways, and parking, within a site totaling approximately 1,377 acres; (2) construction of a rail spur and construction material conveyance facility on approximately 38 acres west of 8625 Caughdenoy Road in Clay, NY 13041, to support construction of the Micron Campus (the "Rail Spur Site"); (3) construction of a childcare

[1] CPO, CHIPS Incentives Program, Notice of Funding Opportunity (NOFO), Commercial Fabrication Facilities (June 23, 2023), https://www.nist.gov/system/files/documents/2024/04/19/Amended%20CHIPS-Commercial%20Fabrication%20Facilities%20NOFO%20Amendment.pdf.

center, healthcare center, and recreational center on an approximately 31-acre parcel located at 9100 Caughdenoy Road, Brewerton, NY 13029, to support the estimated 9,300 employees who would ultimately work at the completed Micron Campus (the “Childcare Site”); and (4) leasing of 360,000-500,000 square feet (sq. ft.) of existing warehouse space in an industrially zoned area at a location to be determined within 20 miles of the Micron Campus (the “Warehouse Site”). In addition, implementing the Proposed Project would require several utility and infrastructure improvements to meet its electricity, natural gas, water supply, wastewater, and telecommunications needs (the “Connected Actions”).

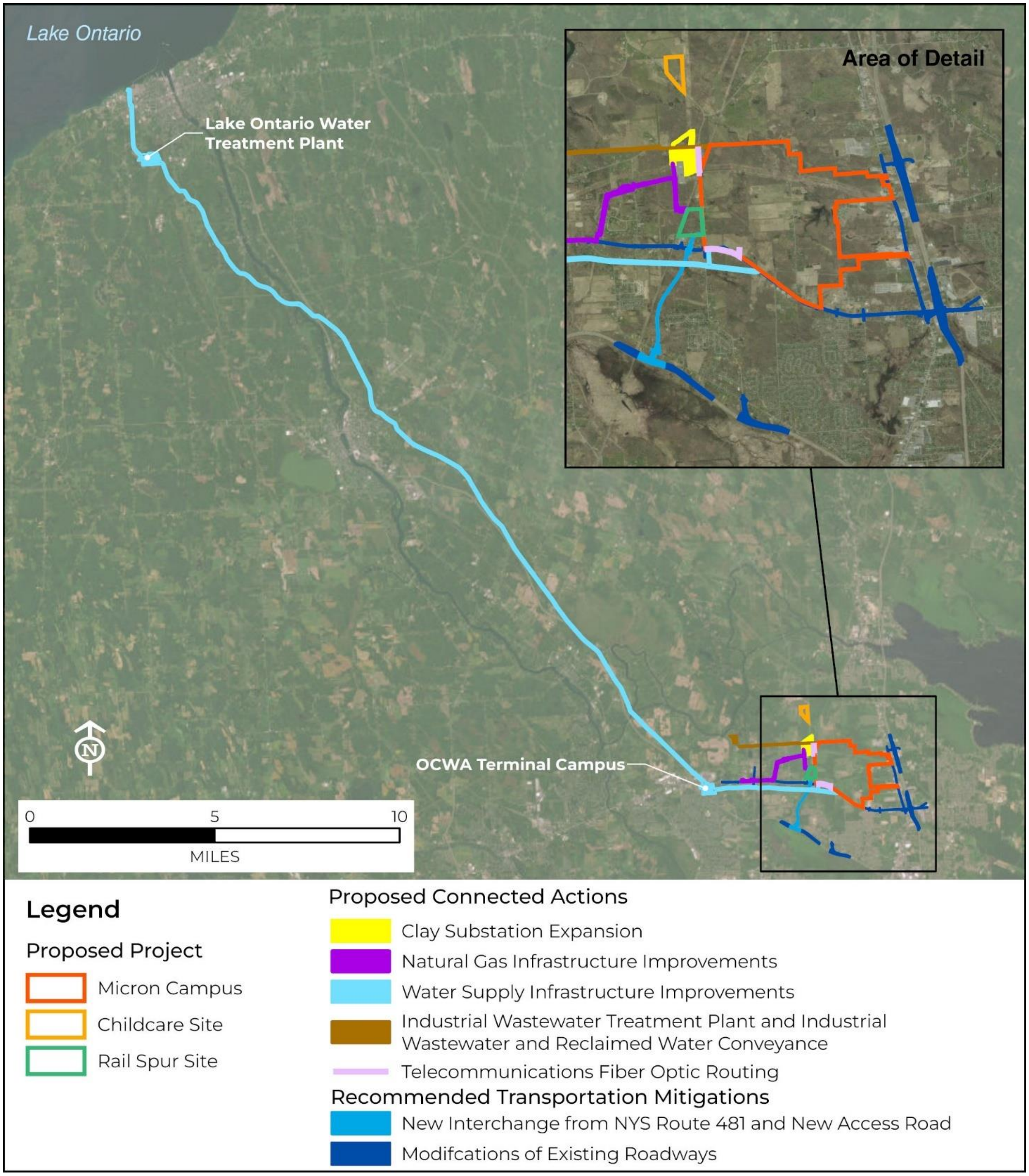
Specifically, the Connected Actions include: expansion of the National Grid Clay Substation and transmission line connection to the Micron Campus, an expanded natural gas regulator station and a new natural gas line to the Micron Campus, two phases of water system capacity and transmission upgrades to supply water to the Micron Campus, a new industrial waste water treatment plant (IWWTP) and water reclamation facility at the existing Oak Orchard site, a new pretreated industrial wastewater/reclaimed water conveyance system between the Micron Campus and the Oak Orchard site, and new fiber optic telecommunication connections to the Micron Campus.

In addition, recommended transportation mitigations have been recommended to mitigate traffic impacts that would result from the Proposed Project. Conceptually, these could include a series of potential modifications to I-81, I-481, and NYS Route 31 interchanges and intersections, a new access road between I-481 and Caughdenoy Road, north of NYS Route 31, and potentially the widening of US Route 11 and NYS Route 31. For the purposes of this BA, these Connected Actions and conceptual recommended transportation mitigations to mitigate traffic impacts are evaluated along with the Proposed Project for their potential to impact federally listed species.

Figure 1 identifies the components of the Proposed Project and the Connected Actions, as well as the conceptual recommended transportation mitigations. The existing warehouse space location is not depicted because it has not yet been identified.

Collectively, the limits of disturbance (LOD) of the Micron Campus, Rail Spur Site, Childcare Site, Connected Actions, and recommended transportation mitigations, and their adjacent areas constitute the “Action Area” analyzed herein. The Action Area represents the areas that would be directly disturbed to construct the Micron Campus, Rail Spur Site, Childcare Site, Connected Actions, and recommended transportation mitigations, resulting in direct loss of potential habitat of federally listed species, as well as adjacent areas that could potentially be affected by fragmentation or exposure to noise and light pollution.

FIGURE 1. LOCATIONS OF PROPOSED MICRON CAMPUS, RAIL SPUR SITE, CHILDCARE SITE, CONNECTED ACTIONS, AND CONCEPTUAL RECOMMENDED TRANSPORTATION MITIGATIONS



World Imagery: Earthstar Geographics

This BA is prepared in accordance with legal requirements set forth under Section 7 of the ESA (16 U.S.C. 1536 [c]) and applicable guidance documents. It assesses the potential for the Proposed Project, Connected Actions, and recommended transportation mitigations to affect federally listed species that have been documented on the Micron Campus and are assumed present in all other portions of the Action Area and/or are listed by the USFWS Information for Planning and Consultation (IPaC) system (as of February 2025) (**Attachment 1**) as occurring in the Action Area. These include the following species (Table 1):

- Indiana bat (*Myotis sodalis*; U.S. endangered)
- Northern long-eared bat (*M. septentrionalis*; U.S. endangered)
- Tricolored bat (*Perimyotis subflavus*; U.S. proposed endangered)
- Eastern massasauga rattlesnake (*Sistrurus catenatus*; U.S. threatened)
- Bog buck moth (*Hemileuca maia menyanthevora*; U.S. endangered)
- Monarch butterfly (*Danaus Plexippus;* U.S. proposed threatened).

No "critical habitat" under the ESA has been designated for any of these species by USFWS except for the Indiana bat, for which there is no critical habitat in New York State.

TABLE 1.
FEDERALLY LISTED SPECIES DETERMINED BY THE USFWS INFORMATION FOR PLANNING AND CONSULTATION SYSTEM TO POTENTIALLY OCCUR IN THE ACTION AREA, AND PRELIMINARY EFFECT DETERMINATIONS[2]

Species	Critical Habitat	ESA Status	Presence	CPO's Preliminary ESA Determination
Indiana Bat *Myotis sodalis*	None (in NY)	Endangered	Suitable habitat present. Species documented within the action area.	May affect, likely to adversely affect
Northern Long-eared Bat *Myotis septentrionalis*	None	Endangered	Suitable habitat present. Species documented within the action area.	May affect, likely to adversely affect
Tricolored Bat *Perimyotis subflavus*	None	Proposed Endangered	Suitable habitat present. Species documented within the action area.	Not likely to jeopardize; may affect, likely to adversely affect
Eastern Massasauga Rattlesnake *Sistrurus catenatus*	None	Threatened	Not present within the action area.	No effect
Bog Buck Moth *Hemileuca maia menyanthevora*	None	Endangered	Not present within the action area.	No effect
Monarch Butterfly *Danaus plexippus*	None	Proposed Threatened	Suitable habitat present.	Not likely to jeopardize

[2] The draft BA listed CPO's preliminary ESA effect determinations for the tricolored bat as "*may jeopardize*" and the monarch butterfly as "*no jeopardy*". Based on informal discussions with USFWS staff, CPO has revised its preliminary ESA effect determination for the tricolored bat to "*not likely to jeopardize; may affect, likely to adversely affect*". CPO notes that if the tricolored bat is listed in the future, based on the BA's analysis of the tricolored bat, CPO would anticipate making a preliminary ESA effect determination for the species of "*may affect, likely to adversely affect*". CPO has revised its preliminary ESA effect determination for the monarch butterfly to "*not likely to jeopardize*".

The Indiana bat, northern long-eared bat, and tricolored bat were each documented on the Micron Campus during an acoustic bat survey conducted in 2023, and for the purposes of the BA, are considered potentially present throughout the Action Area. Activity levels of Indiana and northern long-eared bats recorded during the survey were high enough to suggest potential presence of maternity colonies on the site, whereas the limited detection of tricolored bats suggests their presence is likely limited to the occasional passage of transient individuals. The eastern massasauga and bog buck moth are highly restricted to specific sites in Onondaga or Oswego counties that would not be affected by the Proposed Project, Connected Actions, or recommended transportation mitigations.

1.1 MICRON PURPOSE AND NEED

Micron's purpose and need for the Proposed Project are to construct and operate a state-of-the-art, economically viable semiconductor manufacturing facility. In coordination with CPO and OCIDA, and based on its Sales and Operations Planning (SNOP) process, Micron determined that the only feasible method of establishing an economically viable large-scale memory chip production facility in the United States would be to develop a 4-fab facility on a single site capable of efficiently increasing Micron's U.S.-based dynamic random-access memory (DRAM) production 12-fold from current levels to 52,000 wafers per week, which also would ensure a resilient domestic supply of DRAM chips consistent with CHIPS Incentives Program and New York Green CHIPS Program objectives.

Micron identified the WPCP site as a suitable location for the Proposed Project based on the site's ability to accommodate a 4-fab footprint and its proximity to utility, transportation, and human resources infrastructure necessary to achieve the economies of scale the Proposed Project would require. Accordingly, Micron proposes to lease and ultimately purchase the WPCP from OCIDA and to construct and operate a 4-fab facility at that location.

1.2 PROJECT DESCRIPTION

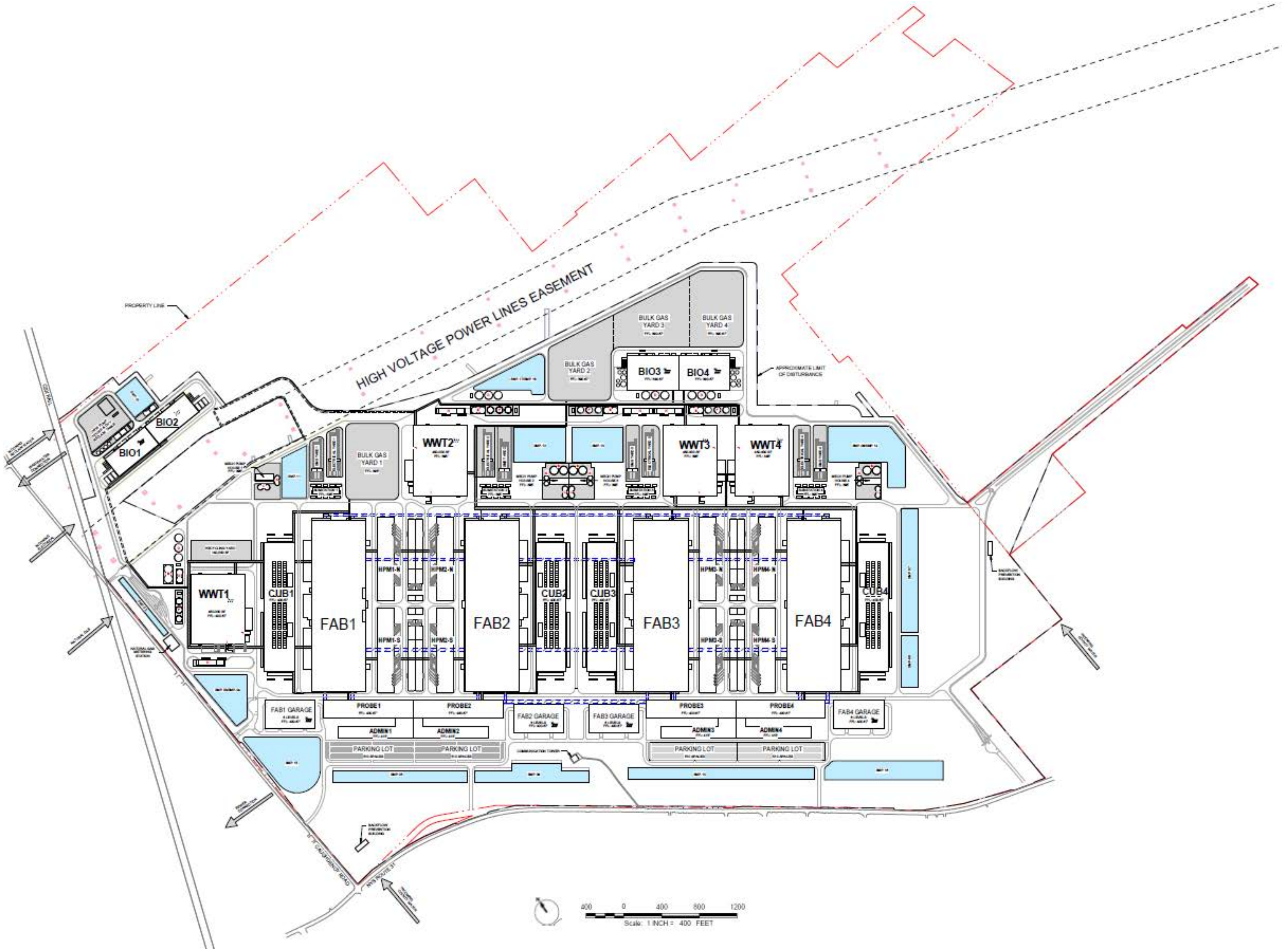
1.2.1 MICRON CAMPUS, CHILDCARE SITE, AND RAIL SPUR SITE

1.2.1.1 MICRON CAMPUS

Micron intends to acquire the WPCP located at 5171 Route 31, Clay, NY 13041, from the Onondaga County Industrial Development Agency (OCIDA) to construct and operate a semiconductor manufacturing facility (Figure 2). The WPCP, in combination with adjacent properties would result in an approximately 1,377-acre site known as the Micron Campus. The WPCP is located primarily in the Town of Clay and is bounded by NYS Route 31 to the south, Caughdenoy Road to the west, a series of National Grid overhead power lines to the north (although the site extends approximately 100 feet [31 meters] beyond the power lines), and generally to the Town of Clay/Town of Cicero boundary line to the east. The northeastern portion of the site and an access driveway that would be constructed from NYS Route 11 extend into the Town of Cicero. The WPCP is accessible from I-81 from an interchange with NYS Route 31. The Micron Campus also would include a site of approximately one acre in size on a parcel to the northwest of the site (Town of Clay tax parcel 048.-01-02.1) that would be used for utility lines.

Each fab would include four floors and would house advanced manufacturing facilities within an approximately 1.2M SF (27.5-acre) footprint, including 600,000 SF of cleanroom space. The completed Micron Campus would total 2.4M SF of cleanroom space within a total fab building footprint of 4.8M SF once fully built-out in 2041. Other on-site elements would include administration buildings, probe buildings, central utility buildings, electrical yards and substations, hazardous process materials buildings, water and wastewater treatment facilities, bulk gas yards, an industrial wastewater facility, biological wastewater treatment facilities, backflow preventions buildings, parking and access roads, rooftop solar energy and stormwater management areas.

FIGURE 2. PROPOSED MICRON CAMPUS SITE PLAN



CONSTRUCTION SCHEDULE AND PHASES

The proposed Micron Campus would be built out over an approximately 16-year period and would primarily consist of the four fabs. Micron expects that the fabs would be built in sequence, with construction of each fab starting as the preceding fab is being fit out with manufacturing equipment and operations begun. The fabs would be built sequentially from west to east. When external construction of a fab building is completed, internal construction would continue as semiconductor manufacturing equipment and tools are installed inside. While internal construction begins on one fab, external construction of the next fab would begin. Construction could not be initiated until the EIS process is complete, but it is anticipated that construction would begin in Q4 2025, with Fabs 1 and 2 completed and operational by Q4 2030, and full build-out of the campus, including Fabs 3 and 4, completed by Q3 2041. Although Fab 4 building construction would end in Q3 2041 and internal equipment fit out continuing in 2042, ramp up to full production would require until 2045. Estimated construction schedules (pending EIS completion) for the four Fabs are as follows:

- Phase 1A – Fab1 – Q4 2025 to Q1 2029
- Phase 1B – Fab2 – Q3 2028 to Q4 2030
- Phase 2A – Fab3 – Q3 2033 to Q4 3035
- Phase 2B – Fab4 – Q2 2039 to Q3 2041

Ingress and egress roads would be constructed to provide transportation access to the Micron Campus: three of the access roads would enter the campus from Caughdenoy Road near the Rail Spur Site, three from NYS Route 31, and one from U.S. Route 11 on the east side of the campus, traversing land area within the Town of Cicero. As the construction phases progress from west to east and fab operations begin, the use of the access roads would shift from construction to permanent employee access. Micron would implement site traffic plans to ensure safety during construction phases of the campus build-out.

1 – SITE PREPARATION

Site preparation activities for Fab 1 at the western limits of the WPCP would start first and would include tree clearing, grubbing, soil excavation and removal, import of fill material, installation of erosion and sediment control, and grading.

Site preparation also would incorporate the following activities:

- Mobilizing contractors to commence the work within the site boundary and preparing contractor areas for future activity.
- Identifying the limits of tree clearing and flagging and staking all buffer areas, sensitive areas, and wetlands prior to the start of construction.
- Installing temporary erosion and sediment controls, stormwater management areas, and stormwater infrastructure.
- Establishing site access points and installing perimeter fencing for security.

- Setting up infrastructure at the site, including contractor offices, laydown areas, precast yards, and personnel parking.
- Constructing haul roads into and out of the site and setting up traffic arrangements.
- Performing site clearing and landscape grubbing work.
- Installing cut-and-fill earthworks to create the necessary level platform areas before foundation work commences.

2 –FOUNDATION WORK

Foundation work would require installation of drilled piers into bedrock followed by concrete work to pour and form slabs or “pads” for the fab buildings. At this stage, Micron also would perform any necessary dewatering work and install underground utility lines. After completing foundations and any necessary fill and grading, Micron would place topsoil and seed disturbed areas for regrowth.

Bedrock removal work would require a combination of standard and heavy-duty equipment and techniques depending on the size and extent of bedrock encountered at each of the removal locations. Standard construction equipment (e.g., excavator or backhoe) would be sufficient to excavate most small to medium segments of bedrock. However, larger segments would likely require mechanical devices, such as hydraulic hammers mounted on excavators, to break the bedrock into smaller pieces suitable for excavation and removal. In certain limited locations, blasting operations may be necessary as a last resort to fragment the largest segments of bedrock. All bedrock removal activity, including any blasting operations (if needed as a last resort), would be conducted in accordance with applicable state and local blasting safety regulations, as well as with Micron’s Blasting Plan.

3 – BUILDING ERECTION

At the fab building erection stage, Micron would install pre-cast concrete superstructures and install enclosures beginning from the lower floors and continuing up to the top of the buildings. Interior partitions and dividing walls would be framed concurrently with building enclosure installation. Following the enclosure of each floor, mechanical, electrical, plumbing, and process system rough-ins would be installed. Finally, Micron would complete interior work, including interior finishes, painting, cabinetry, and installation of plumbing fixtures and appliances.

Final sitework would include completing the building rooftops and installing surrounding landscapes, as well as paving work, site lighting work, and remaining landscaping activity.

For each fab, the foundation work, erection of building shells, and other exterior construction would span roughly a 1-year period. A significant portion of the construction activities during the 16-year construction period would occur inside the fab building shells and, with the exception of equipment deliveries, would not be visible or exposed to surrounding residents or the general public.

1.2.1.2 RAIL SPUR SITE

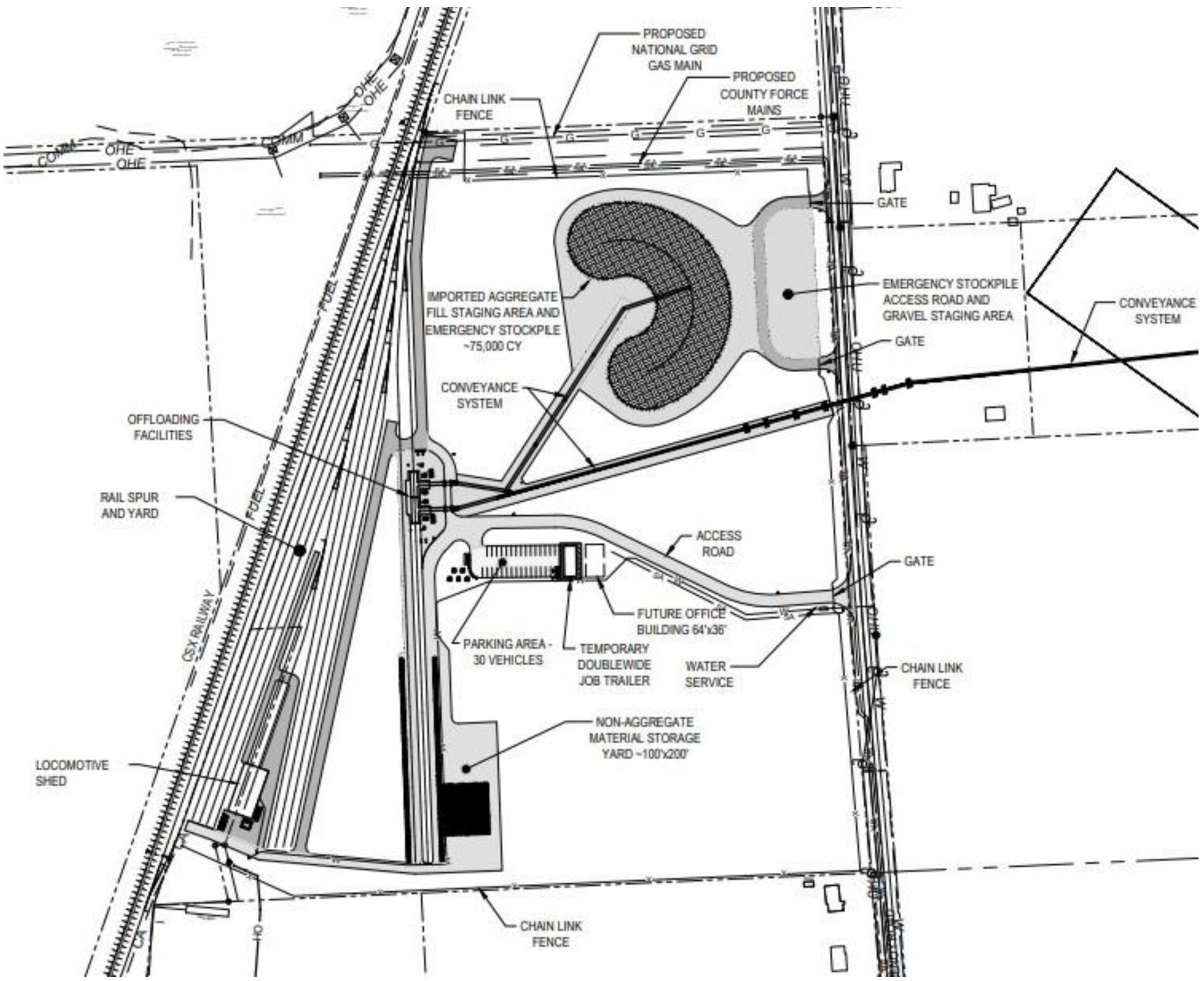
The Proposed Project would also include construction and operation of a rail spur. The Rail Spur Site sits between the CSX Railway on the west and Caughdenoy Road on the east (Figure 3). The Rail Spur Site would include the following components: rail siding, rail yards, and an off-loading track and facility; the aggregate materials conveyance system; an office building and trailer; a locomotive shed; paved access roads and a parking area; paved storage areas; a backup stockpile area; a stormwater management area; and lighting.

Construction of the Rail Spur Site is expected to take approximately seven months; scheduled to commence in Q4 2025 and expected to be completed by Q2 2026 with operations also starting in Q2 2026. All construction staging and activity would be contained within the property boundaries of the Rail Spur Site except for those elements of the conveyance system that extend onto the Micron Campus east of Caughdenoy Road.

Each day, one set of 60 rail cars would be off-loaded at the Rail Spur Site, while another set of 60 rail cars returns to the aggregate supply sources, and a third set of 60 rail cars is in transport from the sources to the Rail Spur Site. This rotating activity would occur until aggregate material is no longer required for a particular construction phase. The Rail Spur Site would operate daily from 6 a.m. to 10 p.m. for receiving arriving and departing rail cars, and off-loading aggregate material from the rail cars onto the conveyor system. Off-loading would continue until aggregate is no longer required for a particular construction phase. The independent contractor would operate two rail off-loaders in rotation to off-load a set of 60 rail cars in a 16-hour period each day, during the 6 a.m. to 10 p.m. daily window.

During the structural stage of construction for each fab, the rail spur would continue to be used to bring off-site manufactured construction materials to the Micron Campus, such as pre-cast concrete and facades. These materials would be trucked a short distance from the Rail Spur Site to the Micron Campus and the Childcare Site. Once a fab becomes operational, the rail spur would also be used to bring in equipment and materials required for semiconductor manufacturing.

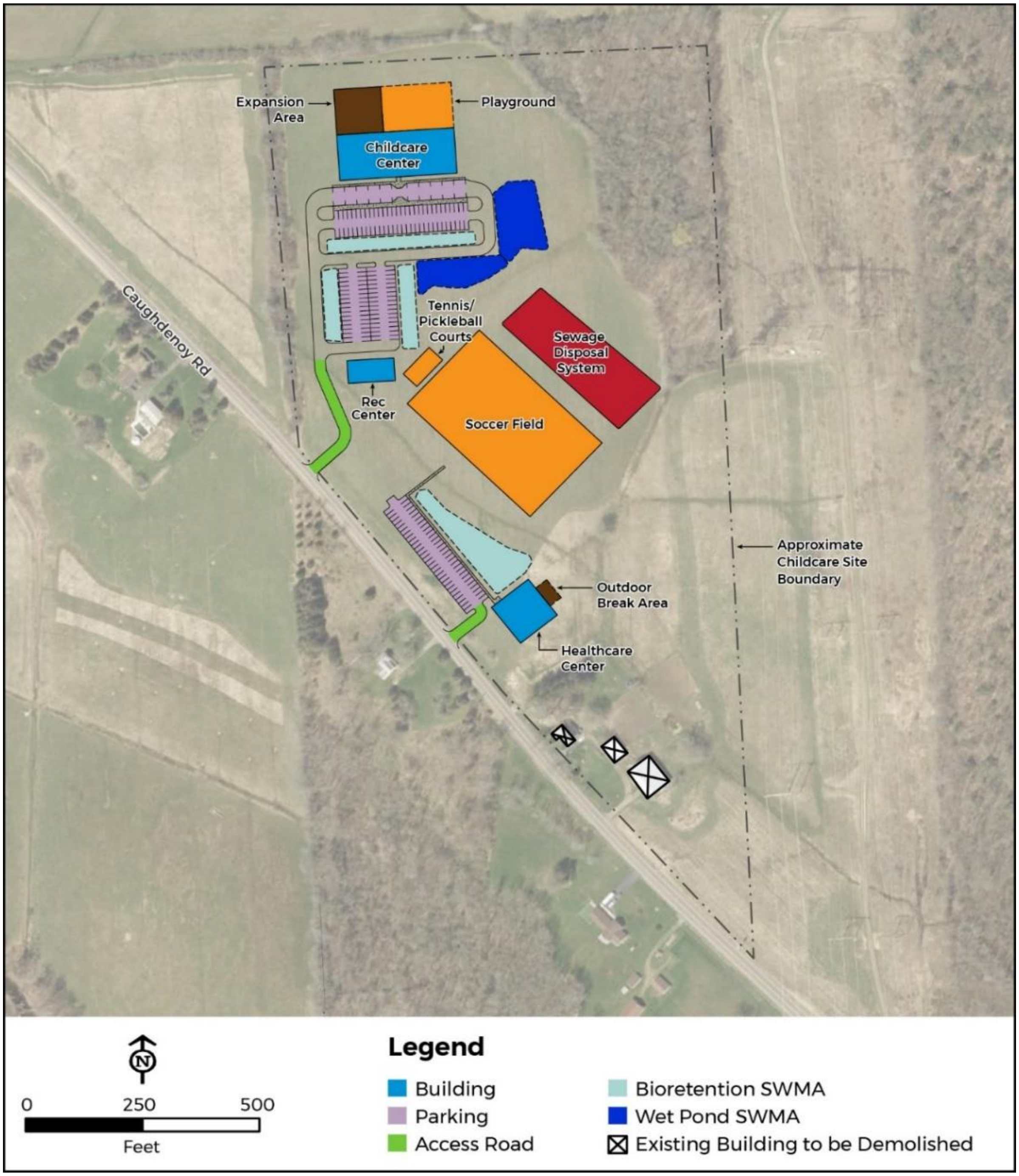
FIGURE 3. PROPOSED RAIL SPUR SITE PLAN



1.2.1.3 CHILDCARE SITE

The Proposed Project includes a Childcare Site on an approximately 31-acre parcel three quarters of a mile northwest of the Micron Campus (the “Childcare Site”) located at 9100 Caughdenoy Road in Clay, NY (tax parcel 042.-01-13.0). The facilities would include a 25,000-square foot (sf) childcare center, a 10,000-sf healthcare center, a 5,000-sf recreation center, a playground, a tennis/pickleball court, a soccer field, a sewage leach field, wet pond and bioretention areas, and parking areas. The Childcare Site has yet to be designed in full detail, but a conceptual design and site plan have been prepared (Figure 4). Construction of the childcare center would start in early Q3 2026 and conclude in 2028, before Fab 1 operations would begin in Q1 2029. Construction of the healthcare and recreation centers would occur later, from Q2 2030 to Q2 2031, and would plan to open in Q2 2031 when the employee base at the Micron Campus would grow large enough to support the need for those facilities. All construction staging and activity would be contained within the Childcare Site property boundaries. Construction of the Childcare Center would occur on predominantly vacant land but would require the removal a vacant former residence and associated barn foundation at the site’s southernmost boundary once all relevant approvals are obtained, followed by construction over time as noted above of the childcare, healthcare, and recreation centers, as well as an athletic field, a sewage disposal system, and 208 surface parking spaces. Site development would require a total area of disturbance of approximately 13 acres with no tree clearing, excavation and removal of 50,000 CY of soil and import of 25,000 CY of fill, and construction of 2.6 acres of impervious surface, which would include 40,000 sq. ft. (0.9 acres) of new buildings and parking spaces. To comply with Town of Clay zoning regulations, all proposed structures would be less than 50 feet in height and all required setbacks would be met. Each building would be equipped with its own septic tank and pump station, with sanitary wastewater directed via piping to a sewage disposal system and leaching field.

FIGURE 4. PROPOSED CHILDCARE SITE PLAN



1.2.2 CONNECTED ACTIONS

Infrastructure improvements are necessary for the Proposed Project to address energy supplies (natural gas and electricity), telecommunications, water, and wastewater. These Connected Actions would be constructed without federal funding, but for the purposes of this BA, they are considered along with the Proposed Project and their potential impacts to federally listed species are evaluated herein. The construction schedule and methods for the Connected Actions have yet to be developed in detail.

1.2.2.1 ELECTRICITY

National Grid is a natural gas and electric transmission and distribution company that provides service to Clay, NY. National Grid owns the Clay Substation located to the northwest of the WPCP across the CSX Railroad line and the electric transmission line and right-of-way (ROW) that runs to the north of the WPCP. To supply the estimated electricity needs of the Micron Campus, National Grid proposes to expand the existing footprint of the Clay Substation toward the north and east.

This expansion would enable the installation of four new 345 kV electric transmission lines that would run from the Clay Substation through eight new underground duct banks to four new 345kV substations on the Micron Campus (one for each fab). Each of the eight duct banks would accommodate one 345kV transmission circuit. The duct banks would be buried a minimum of 6 feet deep within a permanent 110-foot-wide ROW and would extend 1 mile in length on average, depending on the fab. The Clay Substation expansion and construction of the 345kV lines, duct banks, and substations would require approximately 76 acres of ground disturbance.

Construction of the proposed Clay Substation expansion and electricity improvements would start in late 2025 and conclude in early 2027. The electricity improvements that would be required for the proposed Micron Campus are subject to approval under a separate, ongoing regulatory proceeding before the New York State Public Service Commission (NYSPSC) relating to the 345kV electric transmission lines.

1.2.2.2 NATURAL GAS

To supply the estimated natural gas demands of the Micron Campus (174,528 thousand cubic feet (MCF) a month per fab, or 698,112 MCF per month by full build-out in 2041), National Grid proposes to construct an approximately 3.1-mile long, 16-inch diameter below-grade (underground) natural gas distribution line from its existing Gas Regulator Station (GRS) 147 at 4459 NYS Route 31 (tax parcel 029.-01-13.1) to the Micron Campus and to construct a new GRS 147A at the same address.

Construction of GRS 147A would require installing new subsurface infrastructure and above-grade equipment to the northeast of the existing GRS 147 fenced area and a new 34-foot-tall utility pole toward the south end of the fenced area, the same height as the utility poles on NYS Route 31. National Grid would replace the existing fence around the site with a new fence of the same height and appearance extending around the GRS 147A expansion area and a new entrance driveway on the eastern side of the site.

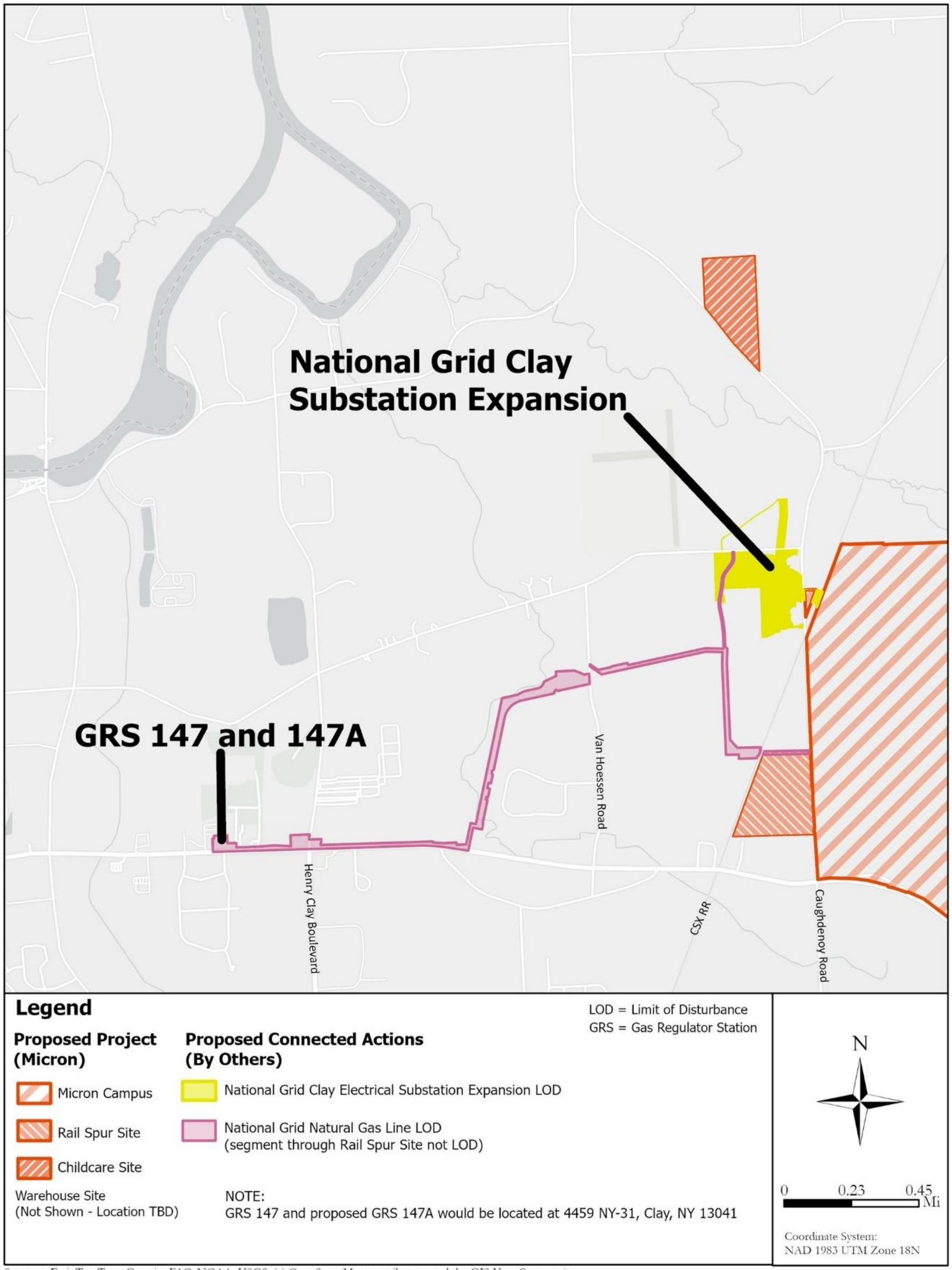
The new natural gas line would extend beneath the west-bound lane of NYS Route 31 from GRS 147A to a point approximately 400 feet east of the west end of Grange Road. At that point, the gas line would extend north and east within a 20-foot-wide easement that runs through several privately owned parcels and wetland areas. The gas line would be co-located within an existing utility ROW containing two 115kV overhead electrical lines, underground electric lines supplying a solar farm, telecommunication lines, and other utility lines. The new natural gas line would extend south and east through the Clay Substation, pass under the existing CSX Railroad line and Buckeye Petroleum pipeline, and enter the Rail Spur Site (tax parcel 046.-02-03.2). From there, the line would pass under Caughdenoy Road and terminate within the Micron Campus (in tax parcel 048.-01-01.0). Construction of the new below-grade gas line would use cut-and-cover and horizontal directional drilling (HDD) methods at depths of 50 to 70 feet or more under Van Hoesen Road and conventional boring under the CSX Railroad line and Caughdenoy Road, with excavation of entry and exit pits at the ends of installation areas.

Construction would require temporary workspace and laydown areas along the entire gas line route but would not require the permanent acquisition of any properties or the alteration or removal of any structures. Temporary workspace in certain non-contiguous areas between GRS 147A and the existing easement east of Grange Road would need to partially extend onto adjacent private properties on either side of the easement, primarily grassy lawns adjacent to the north side of NYS Route 31. The temporary workspace also would include a parcel at 4541 NYS Route 31 at the intersection with Henry Clay Boulevard (tax parcel 029.-01-09.1) that currently includes a paved lot with a single-story brick commercial building dating from the late 20th century, which would not be affected by construction. A temporary workspace that would be located south of the Clay Substation and west of Caughdenoy Road would use an existing access road extending south of Verplank Road and would potentially require improvements to the access road. The limits of disturbance associated with the natural gas infrastructure improvements are depicted in Figure 5.

Temporary workspace and laydown areas would potentially require tree clearing at certain locations to accommodate equipment access or material storage. Tree stumps would be covered with mats to create workable surfaces where feasible, but tree stumps in certain other areas would potentially need to be removed.

Construction of the proposed GRS expansion and gas distribution line would start in late 2025 and conclude in early 2028.

FIGURE 5. PROPOSED NATURAL GAS LINE AND CLAY SUBSTATION EXPANSION



Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, (c) OpenStreetMap contributors, and the GIS User Community

1.2.2.3 WATER SUPPLY

OCWA proposes to undertake two phases of water system capacity and transmission upgrades to supply water to the Micron Campus. Phase 1 would involve upgrading the Raw Water Pump Station (RWPS) and LOWTP in Oswego and the Terminal Campus in Clay and constructing new water transmission mains. Phase 2 would involve additional upgrades and transmission lines based on future needs. None of OCWA's proposed water infrastructure upgrades needed to meet Micron Campus water demands would require land acquisition. OCWA would install new or re-routed transmission mains using standard cut-and-cover trenching or directionally drilled construction techniques as needed based on site conditions.

PHASE 1 WATER SUPPLY IMPROVEMENTS

The Micron Campus would consume 7.85 million gallons per day (MGD) of water in 2029 (Fab 1), 17. 4 MGD in 2030 (Fabs 1-2), 33 MGD in 2035 (Fabs 1-3), and 48 MGD at full build-out in 2041 (Fabs 1-4).

OCWA's existing water supply system would have the capacity to service the 7.85 MGD demand from Fab 1 coming online in 2029 with minor upgrades but would need to undertake further upgrades to service the 17.4 MGD demand when Fab 2 comes online in 2030. OCWA's proposed Phase 1 improvements (for Fabs 1-2) include:

- 2026 to 2027—OCWA would construct an approximately 1,000-foot-long pair of 42-inch water service connections within a 50-foot-wide easement through OCIDA property and terminating within the Micron Campus along Caughdenoy Road to supply potable water for initial Micron Campus construction needs through existing buried water mains.

- 2026 to 2027—OCWA would make minor upgrades to its Terminal Campus in Clay by renovating the Farrell Pumping Station, upgrading existing pumps, adding two new pumps, and constructing a new flow control facility capable of integrating a new water transmission main with site piping and managing future increased water flow to the existing pump station and tanks.

- 2028 to 2031—OCWA would upgrade the RWPS at Oswego by upgrading its pumps and drives to increase the water supply capacity of the LOWTP. The LOWTP capacity is currently subject to a 62.5 MGD permit limit; OCWA would need to obtain a modification to its withdrawal permit for the LOWTP before expanding the LOWTP's capacity above that limit.

- 2028 to 2031—OCWA would construct an approximately 5-mile, 54-inch or larger transmission main running parallel to its existing Eastern Branch Transmission Main that runs from the Terminal Campus in Clay to the WPCP. OCWA also would relocate a portion of the Eastern Branch Transmission Main that is currently on the WPCP.

- 2029 to 2032—OCWA would construct a new, approximately 2.5-mile, 54-inch or larger raw water transmission main from the RWPS to the LOWTP parallel to the existing raw water transmission main for water supply redundancy.

- 2029 to 2033—OCWA would upgrade the LOWTP by replacing an existing backwash storage tank and the plant's existing clearwells with up to 15 MGD of new storage capacity, adding two new filters, installing an additional underground seal weir structure and parallel piping, and installing additional chemical storage space and residual handling (drying bed) facilities.

- 2030 to 2034—OCWA would construct a new, approximately 22-mile, 54-inch or larger clear water transmission main (crossing from Oswego into Onondaga County) running parallel to the existing clear water transmission main that runs from the LOWTP to the Terminal Campus, within current 99-foot-wide easements.

PHASE 2 WATER SUPPLY IMPROVEMENTS

Phase 2 would involve additional water infrastructure improvements based on further evaluation of Micron Campus demand as Fabs 3 and 4 would start operations in 2035 and 2041. At this stage of the Proposed Project and Connected Actions, OCWA would tentatively propose to undertake the following improvements to build in further water supply redundancy for Fab 2 and accommodate the projected demand for Fabs 3-4:

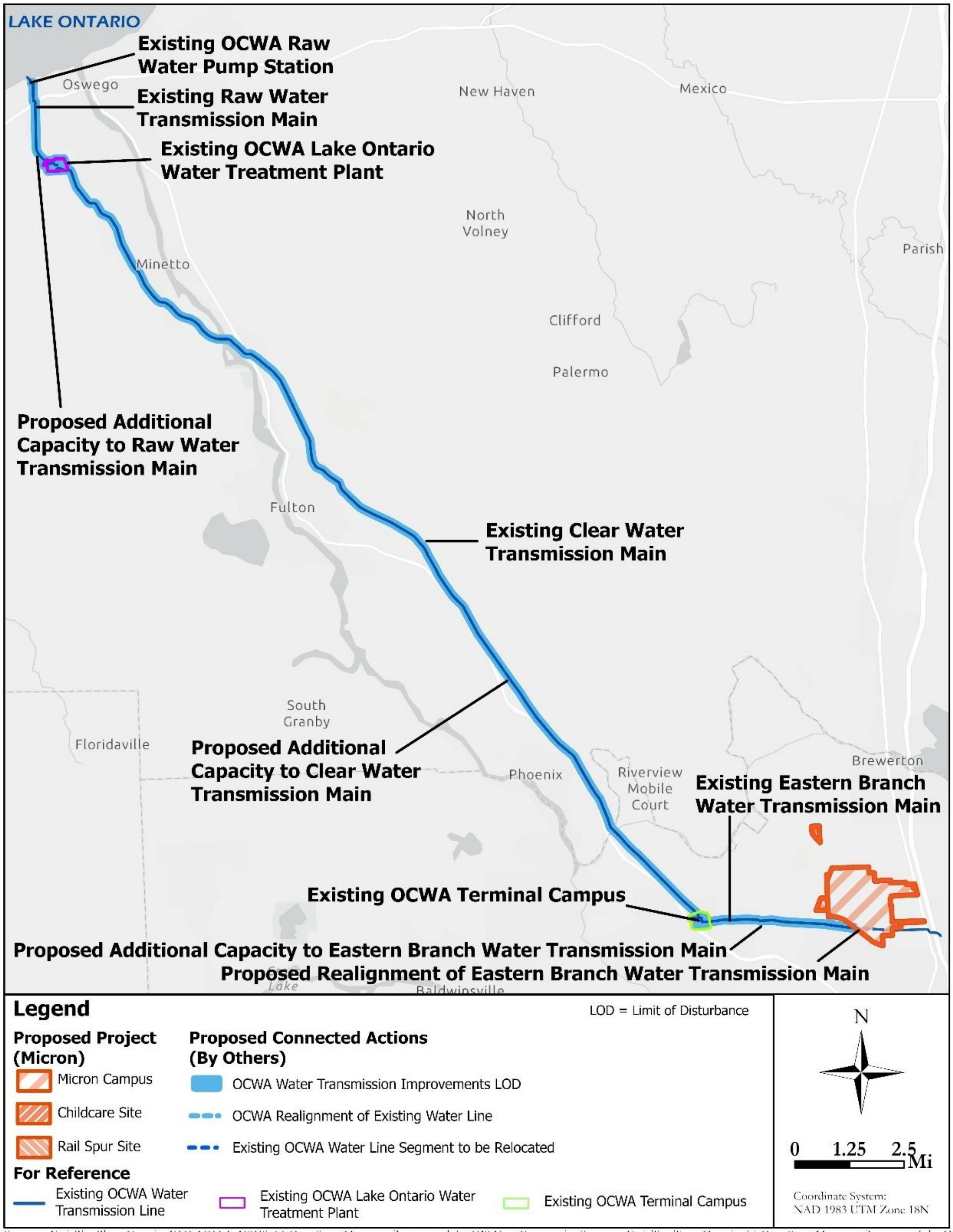
- 2034 to 2037—OCWA would make additional upgrades to the Terminal Campus, including up to two new 15 MG tanks, a new parallel Farrell Pumping Station, associated piping work, and expansion of the existing substation.

- 2036 to 2040—OCWA would make additional upgrades to the LOWTP, installing at least two new filters and contact basins in a new filter wing, an additional clearwell tank, a second clear water pump station, and additional chemical storage space and residual handling facilities. These upgrades would require relocation of an existing solar field on a portion of the LOWTP property; OCWA would relocate and re-install the solar panels to avoid a reduction in their generation capacity. Alternatively, OCWA is considering upgrade layouts that would potentially avoid the need to relocate the solar panels and preserve as much of the site footprint as possible for future needs. OCWA also would potentially construct a third approximately 22-mile, 54-inch clear water transmission main parallel to the existing and Phase 1 transmission mains discussed above within the current 99-foot-wide easements. Finally, OCWA would construct a new 5,000 sq. ft. Clear Water Pumping Station within the LOWTP footprint to accommodate the additional projected demand for Fabs 3 and 4.

- 2038 to 2040—OCWA would construct a third approximately 5-mile, 54-inch or larger Eastern Branch transmission main parallel to the existing and Phase 1 Eastern Branch transmission mains discussed above.

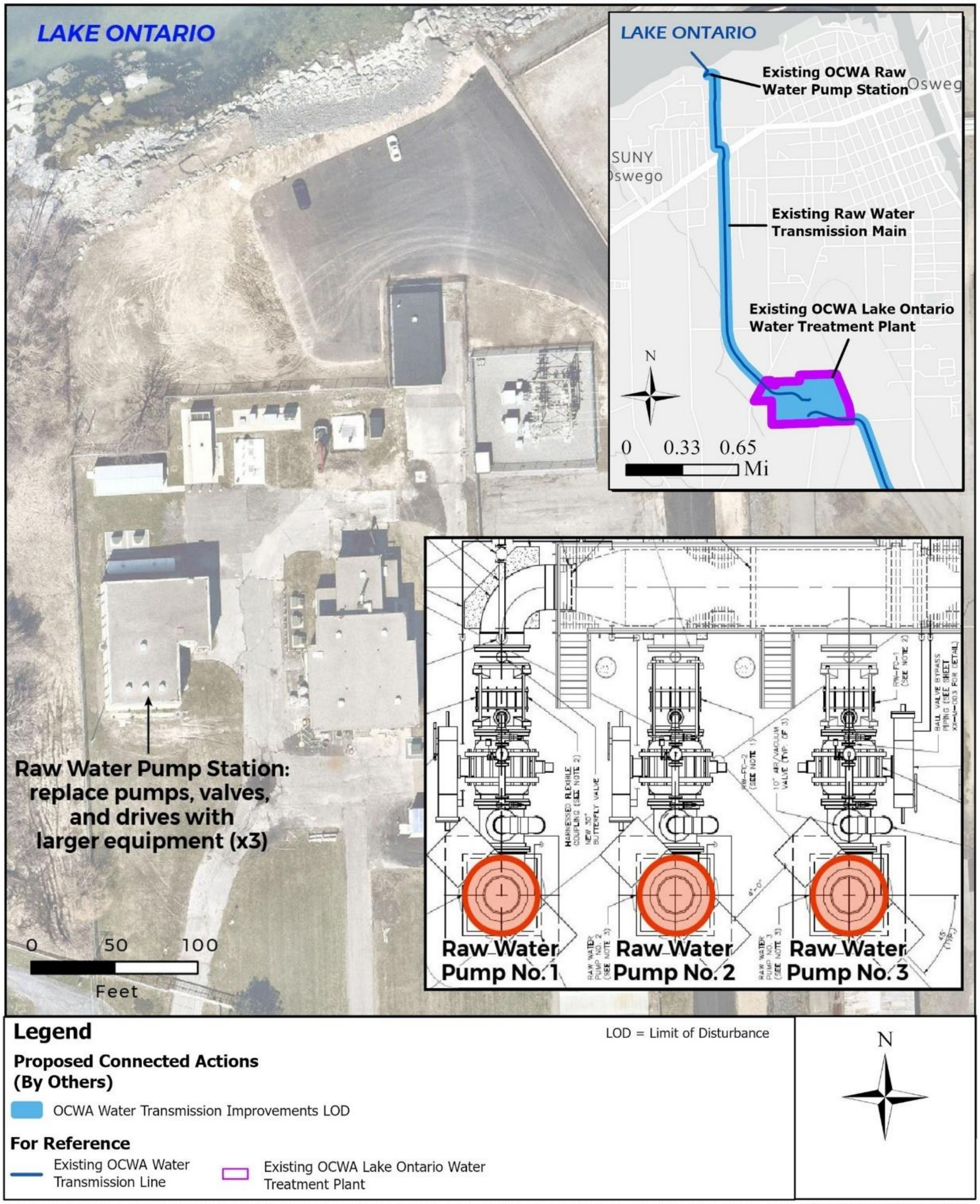
An overview of the water supply infrastructure is depicted in Figure 6. Figure 7, Figure 8, and Figure 9 depict the locations of OCWA's proposed upgrades to the RWPS, LOWTP, and Terminal Campus, respectively.

FIGURE 6. PROPOSED WATER SUPPLY IMPROVEMENTS



Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, (c) OpenStreetMap contributors, and the GIS User Community, Sources: Esri, TomTom, Garmin, (c) OpenStreetMap contributors, and the GI User Community

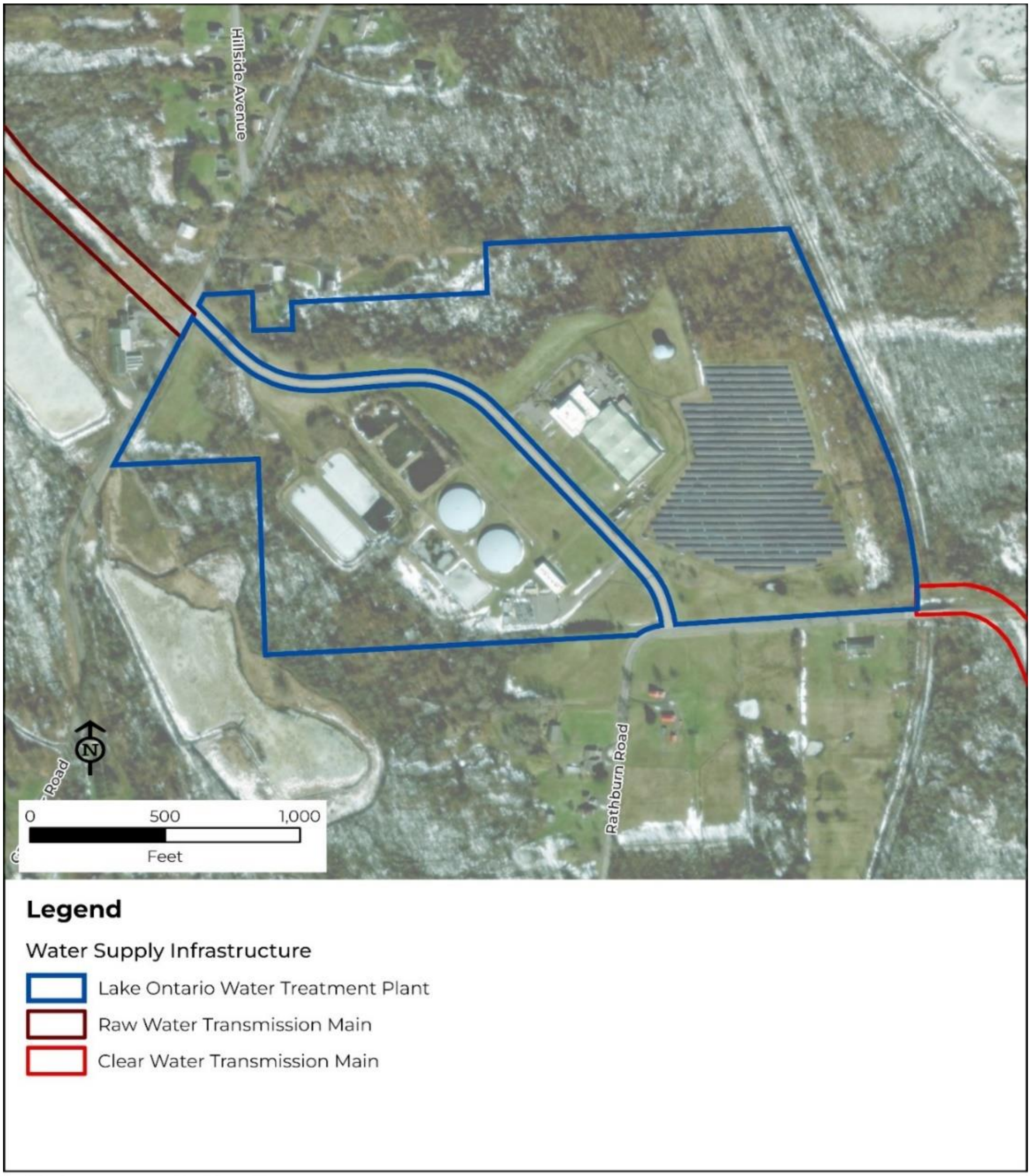
FIGURE 7 EXISTING RAW WATER PUMP SYSTEM UPGRADES



Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, (c) OpenStreetMap contributors, and the GIS User Community, Sources: Esri, TomTom, Garmin, (c) OpenStreetMap contributors, and the GIS User Community

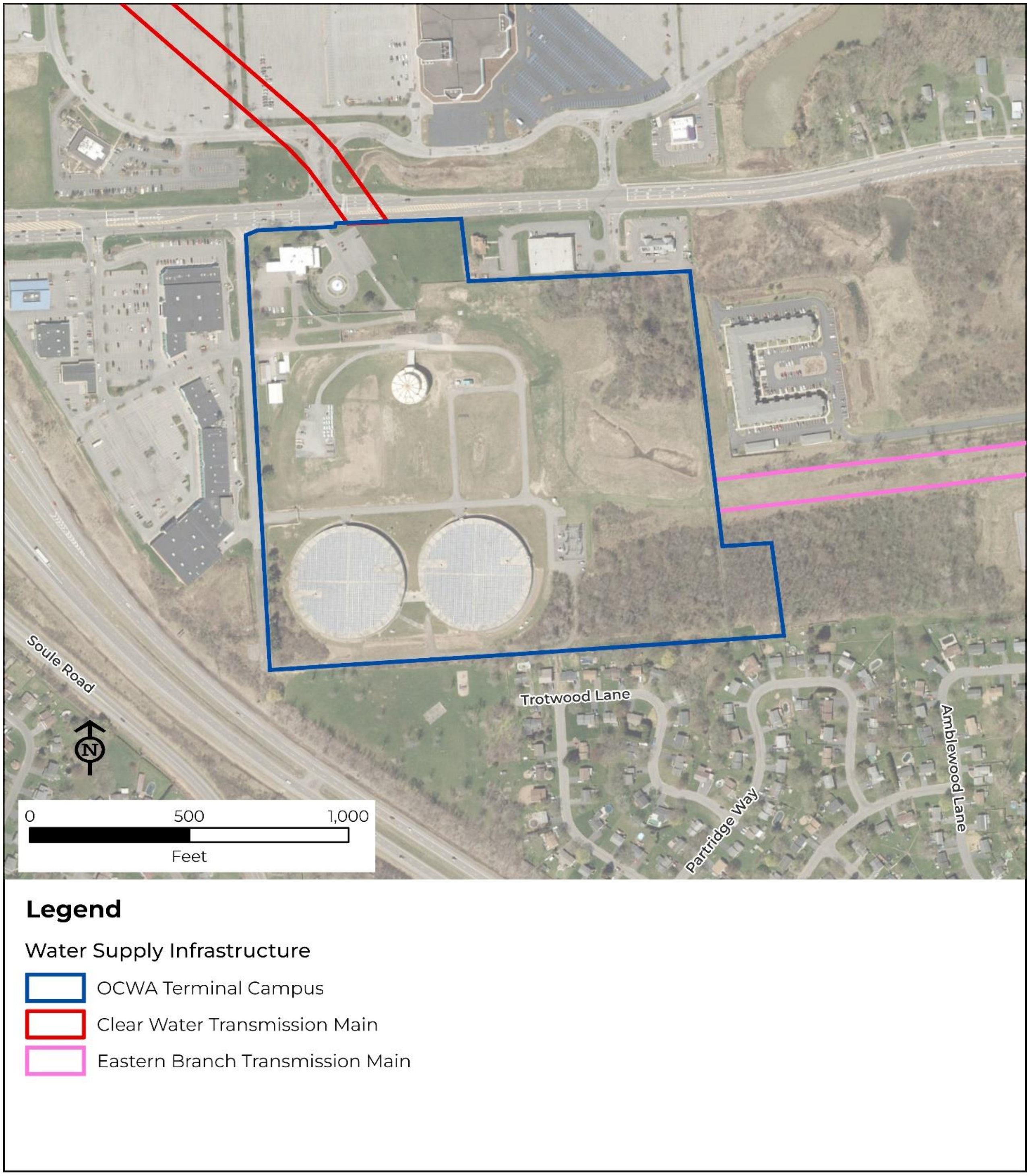
Source: OCWA August 2023

FIGURE 8. OCWA LAKE ONTARIO WATER TREATMENT PLANT PROPERTY LIMITS



World Imagery: New York State, Maxar

FIGURE 9. OCWA TERMINAL CAMPUS PROPERTY LIMITS



World Imagery: New York State, Maxar

1.2.2.4 WASTEWATER

OCDWEP proposes to undertake two stages of wastewater infrastructure and capacity improvements to serve the Micron Campus. Stage 1 would involve interim “bridging” projects at the existing OCDWEP Oak Orchard Wastewater Treatment Plant (OOWWTP) to receive startup industrial wastewater flows and potentially initial manufacturing industrial flows from construction of Phase 1 of the Micron Campus (Fabs 1-2) while OCDWEP constructs a new Industrial Wastewater Treatment Plant (IWWTP) and reclaimed water facilities at its 76-acre Oak Orchard site. Stage 1 would also involve construction of a new conveyance between the Micron Campus and the Oak Orchard site to send pretreated industrial wastewater to the IWWTP and return reclaimed water to the Micron Campus.

Stage 2 would expand and upgrade the IWWTP to serve additional campus industrial wastewater flows from Phase 2 of the Micron Campus build-out (Fabs 3-4) and provide additional reclaimed water back to the Micron Campus.

NEW IWWTP

As part of Stage 1 (to service Fabs 1-2), OCDWEP would oversee the design, construction, operation, and maintenance of a new IWWTP, as well as the reclaimed water facilities, on OCDWEP’s existing 76-acre Oak Orchard site. The new IWWTP processes would include equalization, fine screening, biological treatment and UV disinfection. OCDWEP anticipates starting construction of the IWWTP in 2026, advancing interim operations in 2028, and completing construction in 2029. The IWWTP treated water would connect on the Oak Orchard site to the existing OOWWTP discharge for ultimate combined discharge through the OOWWTP outfall to the Oneida River. Once completed, the IWWTP would work in concert with industrial wastewater pre-treatment facilities constructed on the Micron Campus.

The IWWTP would be sufficient to service Fabs 1-2. As part of Stage 2 (to service Fabs 3-4), OCDWEP would undertake a limited expansion of the IWWTP beginning in 2031, approximately 30 months prior to Micron’s anticipated Q3 2035 ready-for-equipment date for Fab 3. OCDWEP would anticipate completing the Stage 2 expansion of the IWWTP in 2034. Micron would construct biological treatment facilities on the Micron Campus to remove dissolved organic contaminants and nutrients from industrial wastewater from Fabs 3-4 prior to sending the wastewater to the IWWTP. This also would increase Micron’s internal water recovery rate and thereby lower Micron’s total effluent discharge to the IWWTP.

Construction of the IWWTP would necessitate the removal of existing solar panel arrays located on an existing OOWWTP lagoon on the Oak Orchard site. OCDWEP would work with the solar company that is currently leasing the space at Oak Orchard to identify locations for potential relocation of the solar facility at other County properties.

NEW INDUSTRIAL WASTEWATER AND RECLAIMED WATER CONVEYANCE

As part of Stage 1, OCDWEP would oversee the design, construction, operation, and maintenance of a new 2-mile-long industrial wastewater and reclaimed water conveyance between the Oak Orchard site and the Micron Campus.

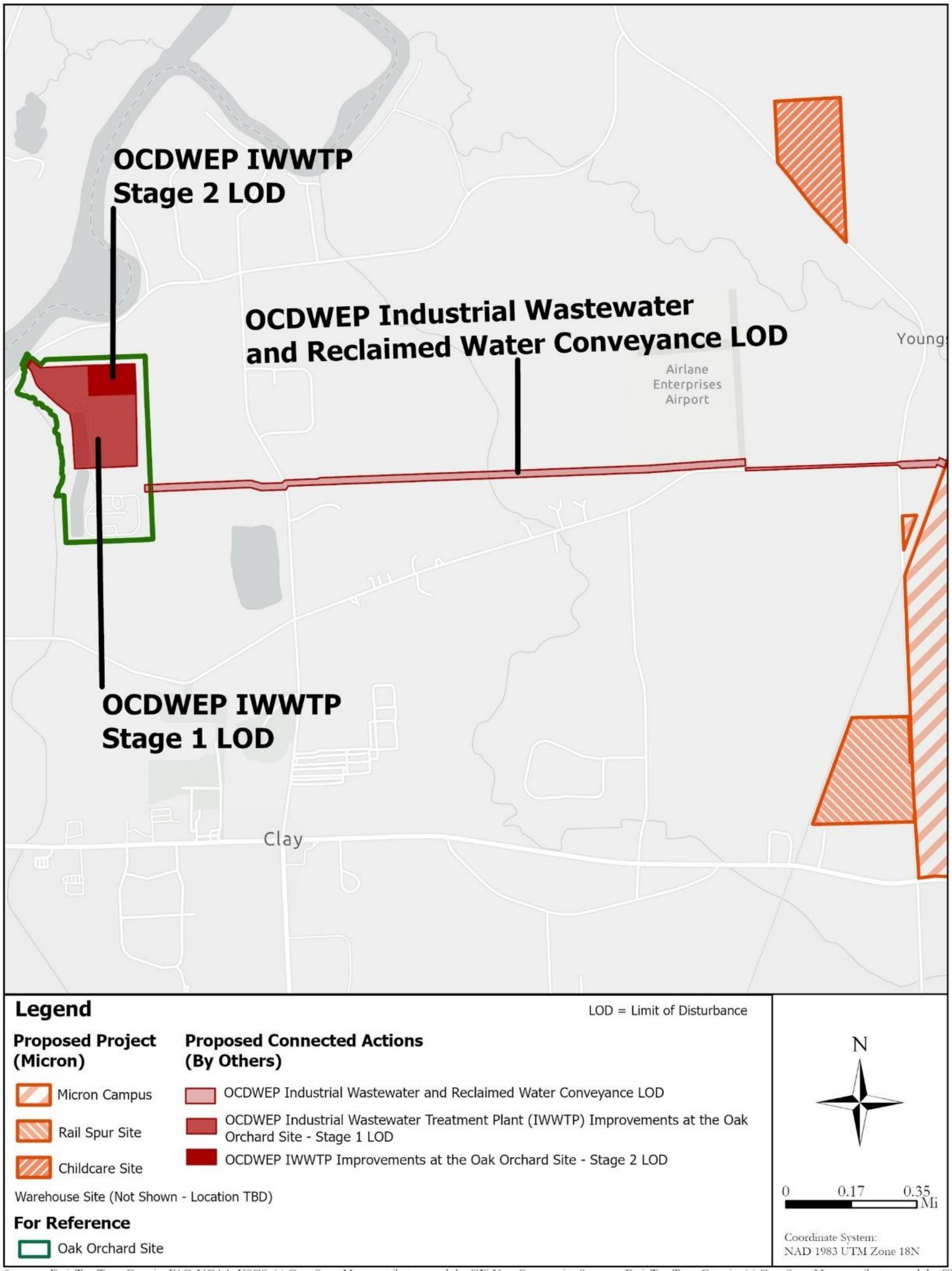
The conveyance would consist of three 30-inch industrial wastewater force mains and four roughly

36-inch reclaimed water force mains. These force mains would be constructed within a 99-foot-wide easement extending east from the Oak Orchard site to Verplank Road at the point where the road curves southwest. From Verplank Road east, the force mains would be constructed beneath or adjacent to Verplank Road to Caughdenoy Road, then beneath Caughdenoy Road and through the undeveloped parcels between Caughdenoy Road and the CSX railroad tracks, and beneath the CSX railroad tracks to where the force mains would terminate within the Micron Campus.

The force mains would be installed underground by conventional cut-and-cover trenching or additional methods depending on site conditions, using horizontal directional drilling or less-intensive ground disturbance methods to the greatest extent practicable to minimize tree removal and other surface disturbances.

See Figure 10 for a depiction of the existing Oak Orchard site boundary, the LOD for the new IWWTP, and the proposed industrial wastewater and reclaimed water conveyance.

FIGURE 10. PROPOSED WASTEWATER IMPROVEMENTS



Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, (c) OpenStreetMap contributors, and the GIS User Community, Sources: Esri, TomTom, Garmin, (c) OpenStreetMap contributors, and the GIS User Community

1.2.2.5 TELECOMMUNICATIONS

To supply telecommunication and broadband internet connectivity to the Micron Campus, Micron would make use of two existing fiber optic lines along Caughdenoy Road and NYS Route 31 accessible via two fiber optic connection entry points within a mile of the WPCP, one at the intersection of Caughdenoy and Verplank Roads, and one at the intersection of Caughdenoy Road and NYS Route 31. The existing fiber optic lines currently serve a cell tower on the southern portion of the WPCP, just north of NYS Route 31.

The purpose of extending the fiber optic lines to the Micron Campus would be to facilitate an underground fiber optic cable network and telecommunication system for the campus designed to provide it with high-speed broadband connectivity, full network coverage, and ample bandwidth capacity for operations and administration. Extending both lines would be necessary to provide the campus with two separate fiber pathways for continuity, operational redundancy, and the capacity for future expansion.

Re-routing the lines would require unburying cable routes at or near the existing connection points or pulling the cables through existing conduits. The cable would be pulled and re-routed along existing road telecommunication ROWs and re-buried at two new connection entry points to connect the fiber optic lines to the Micron Campus, one at the northwestern border of the WPCP via a duct bank shared with electrical lines running under Caughdenoy Road, and one at the cell tower in the WPCP via cable running along NYS Route 31.

Re-routing and extending the fiber optic lines to connect to the Micron Campus would require minimal ground disturbance contained within the existing road ROWs and areas of the WPCP. Installing the fiber optic cable would involve directly burying it 30 inches underground and would not require additional protective conduits or ducts. The need for additional aerial cable routing and splicing would be determined based on final design.

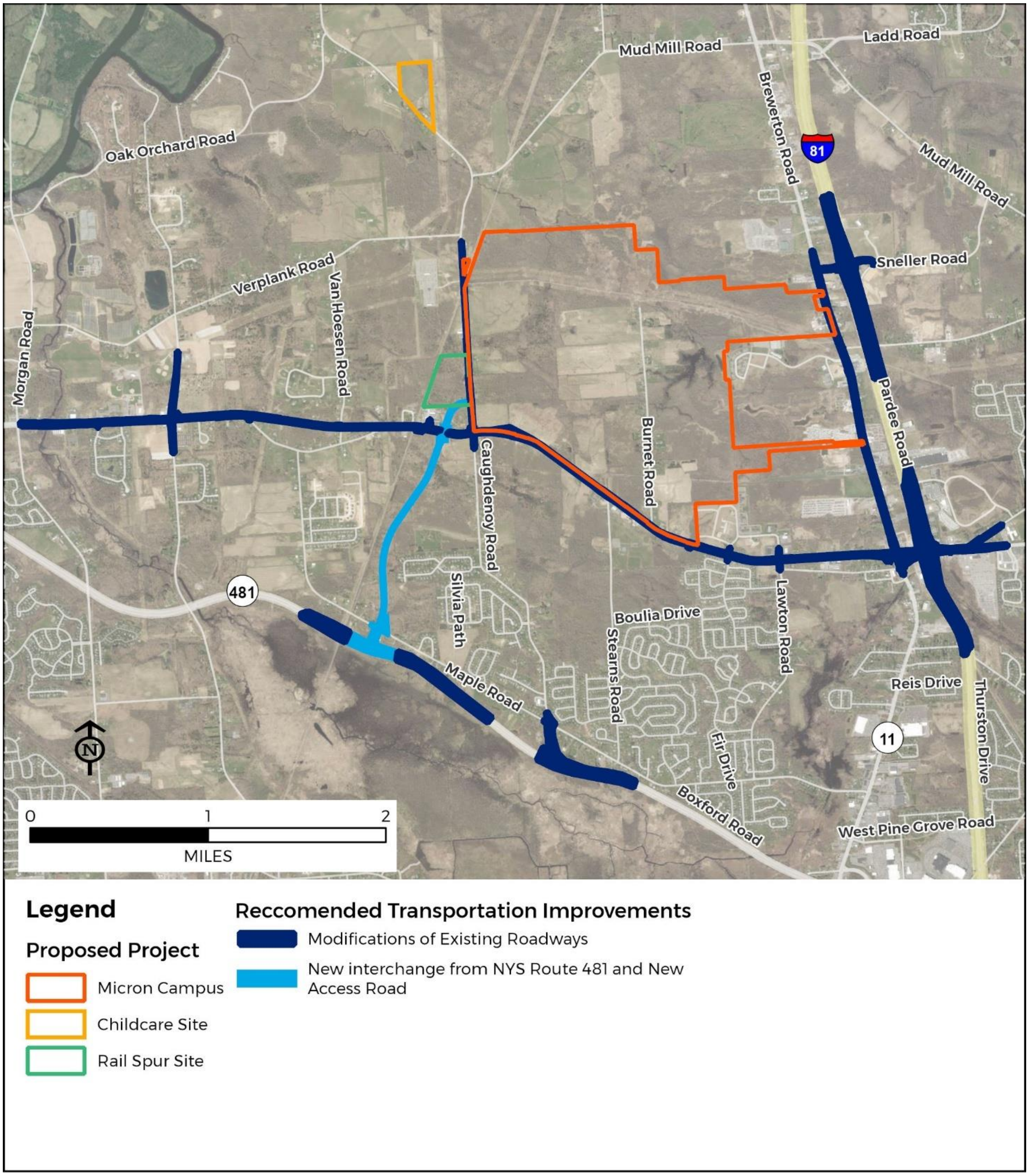
Construction of the proposed telecommunication improvements would start and conclude in 2026 and would not be anticipated to disrupt structures or traffic.

1.2.3 RECOMMENDED TRANSPORTATION MITIGATIONS

CPO, OCIDA, and Micron are evaluating traffic impacts resulting from the construction and operation of the Proposed Project. Concepts to address transportation improvements options that could mitigate traffic impacts are being developed. Since these options may themselves have significant impacts, the Federal Highway Administration (FHWA) is planning to complete a separate NEPA analysis to evaluate all transportation improvements under Title 23 U.S.C Federal Aid-Highways. However, for purposes of ESA section 7 consultation, improvement concepts are being included in this BA as they are currently understood; possible recommended transportation mitigations include a series of potential modifications to I-81, I-481, and NYS Route 31 interchanges and intersections, and potential widening of US Route 11 and NYS Route 31.

An overview of the areas that would be affected by the potential recommended transportation mitigations is shown in Figure 11.

FIGURE 11. RECOMMENDED TRANSPORTATION MITIGATIONS



World Imagery: New York State, Maxar

A construction schedule for the transportation mitigations under consideration to accommodate traffic generated by the Proposed Project has not yet been determined. The detailed design and implementation of the recommended mitigations are subject to the discretion and approval of federal, state, and local transportation agencies. Accordingly, such measures will be subject to further environmental review and approval by NYSDOT, FHWA, and local transportation agencies. Specifically, NYSDOT and FHWA will undertake a separate NEPA/SEQRA environmental review of the recommended mitigations and implement these or other mitigations that the agencies deem appropriate to ensure the best overall operational performance of the transportation network with the Proposed Project.

2. SPECIES CONSIDERED AND ENVIRONMENTAL BASELINE

2.1 INDIANA BAT

2.1.1 BACKGROUND

The Indiana bat is a temperate, insectivorous bat that is federally and New York State-listed as Endangered. Indiana bats emerge from the caves or mines in which they hibernate in early spring. Males then disperse and remain solitary until mating season at the end of the summer. Pregnant females form maternity colonies in which to rear their young. Maternity roosts, roosting sites of post-lactating females, and roosting sites of solitary males are usually under loose bark or in the crevices of trees. Indiana bat roosts have been documented in numerous species of deciduous trees; tree availability, diameter, height, bark characteristics, and sun exposure appear to be more important factors in roost site selection than tree species (USFWS 2007). Roost trees in New York (Britzke et al. 2006) and elsewhere (USFWS 2007) are typically in trees with a diameter at breast height (DBH) greater than 16 inches and a height taller than 52 feet, but roosts in smaller trees are not uncommon (USFWS 2007). Trees are usually dead or nearly dead and decayed (Menzel et al. 2001, Kitchell 2008). Indiana bats often roost near forest gaps or edges where trees receive direct sunlight for much of the day (Callahan et al. 1997, Menzel et al. 2001). A radio-tracking study of Indiana bats in Onondaga County, New York found that bats disproportionately select large-diameter (mean = 44.5 cm [18 in]) trees, maple (*Acer* spp.) snags, American elm snags, and live shagbark hickories relative to their availability (Fishman 2017).

Habitats used by Indiana bats during summer are varied and include riparian, bottomland/floodplain, and upland forests (Humphrey et al. 1977, Britzke et al. 2006, Watrous et al. 2006) often within fragmented agricultural landscapes (Murray and Kurta 2004, Watrous et al. 2006, USFWS 2007) like those in which the Action Area is located. Indiana bats forage in the forest canopy, over open fields, over impounded waterbodies, along riparian corridors, and along forest edges (USFWS 2007).

Maternity colonies are commonly located in areas with abundant natural or artificial freshwater sources (Carter et al. 2002, Kurta et al. 2002, Watrous et al. 2006, and USFWS 2007). At study sites in Onondaga County, New York, foraging areas and roost sites of radio-tracked female and male Indiana bats were found to be closely associated (typically within 200-250 meters [656-820 feet]) with wetlands and surface waters (Fishman 2017). Spring and autumn habitats of Indiana bats have not been well described but appear to be largely similar to their summer habitat (Britzke et al. 2006, USFWS 2007). During autumn, Indiana bats mate and deposit fat stores in preparation for winter hibernation. Hibernacula are typically in caves or abandoned mines in which ambient temperatures remain above freezing (USFWS 2007). Indiana bats can migrate upwards of 100 miles between their summer territory and hibernaculum, although migration distances are typically much shorter (Winhold and Kurta 2006, USFWS 2011).

In the last two decades, the Indiana bat has undergone steep population declines due to an exotic fungal pathogen (*Pseudogymnoascus destructans*) that has caused an outbreak of White-nose Syndrome (WNS)—an infectious disease first documented in New York's Howe's Cave in 2006 (Reeder and Moore 2013, Cheng et al. 2021). Bats infected with WNS suffer structural damage to their wing membranes and exhibit aberrant hibernation behavior and physiology, the consequences of which are usually fatal (Reeder and Moore 2013). Indiana bat populations declined by approximately 10 percent per year in the first few years following the discovery of WNS (Thogmartin et al. 2012) and by now have declined by an estimated 84 percent range-wide (Cheng et al. 2021). In New York State, pre- and post-WNS count data on hibernating Indiana bats showed an average statewide population decline of 72 percent between 2006 and 2011 (Turner et al. 2011). Declines in New York State since the appearance of WNS have been among the most severe of all monitored states and are now approaching 100 percent (Cheng et al. 2021).

2.1.2 POTENTIAL PRESENCE IN THE ACTION AREA

The USFWS IPaC System indicates that the Indiana bat has the potential to occur in the vicinity of the Micron Campus, Childcare Site, Rail Spur Site, Connected Actions, and recommended transportation mitigations.

There is a known Indiana bat hibernaculum approximately 14 miles west of the Micron Campus and it is likely that the individuals that occur at or adjacent to the Micron Campus during the maternity season overwinter in this hibernaculum. Indiana bats captured and radio-tagged upon spring emergence from this hibernaculum were tracked to summer maternity habitat approximately 6 miles northwest of the Micron Campus (Fishman 2017). According to the New York Natural Heritage Program (NYNHP), the Micron Campus is within 1 mile of a previously documented Indiana bat maternity roost, within 3 miles of other known Indiana bat roost trees and capture locations. There are also previous records of the Indiana bat within 1 mile of the Childcare Site and four known Indiana bat roost trees ranging 320 to 3,495 feet from the limits of disturbance of the proposed water supply line.

An acoustic bat survey conducted by AKRF, Inc. in the spring and summer of 2023 on the Micron Campus documented presence of Indiana bats (Attachment 3). They were identified with a significant level of confidence on a total of 22 nights across 6 of the 17 survey locations. Activity levels were high enough to suggest the presence of a maternity colony on or adjacent to the Micron Campus. For the purposes of this BA, Indiana bats are assumed to both roost and forage within the Micron Campus, and the Rail Spur Site west of Caughdenoy Road. The proposed Childcare Site lacks sufficient tree cover to be likely roosting habitat for Indiana bats but contains suitable foraging habitat for any Indiana bats potentially roosting in forest to the east and north, or elsewhere nearby. Suitable roosting and foraging habitat for Indiana bats occurs along some segments of the Connected Action alignments, including the portion of the proposed water supply line that would parallel NYS Route 481 between Fulton and Phoenix. There is potentially suitable roosting and foraging habitat for Indiana bats where a possible new 1.6-mile access road extending north from a new interchange at NYS Route 481, between the CSX rail tracks and Caughdenoy Road, and terminating at the Rail Spur Site. The road alignment would bisect a forest fragment that is south of NYS Route 31, east of the CSX rail tracks, and west of Caughdenoy Road. Despite the IPaC System's return, no suitable roosting or foraging habitat is expected to occur in the vicinity of other components of the recommended transportation mitigations, which would be in highly developed areas and consist of modifications to existing intersections, interchanges, and road segments.

2.2 NORTHERN LONG-EARED BAT

2.2.1 BACKGROUND

The northern long-eared bat hibernates in caves and mines during winter and then emerges in early spring to disperse to summer habitat, usually no more than 60 miles from the hibernaculum (Caceras and Barclay 2000, USFWS 2014). Like Indiana bats, the males remain solitary until mating season at the end of the summer and pregnant females form maternity colonies in which they rear their pups. During summer, northern long-eared bats are most closely associated with contiguous, closed-canopy, upland or riparian forests within heavily forested landscapes (Ford et al. 2005, Henderson et al. 2008). Relative to the Indiana bat, the northern long-eared bat prefers interior forest for roosting and foraging and is sensitive to fragmentation (Foster and Kurta 1999, Broders et al. 2006, Henderson et al. 2008, Segers and Broders 2014). In fragmented, agricultural landscapes, northern long-eared bats avoid open habitats and concentrate where there is greatest forest coverage (White et al. 2017). In addition to interior forest, northern long-eared bats will also use streams, forested wetlands, and other riparian habitats for foraging (Ford et al. 2005, Johnson et al. 2010, Gorman et al. 2022). The deciduous forest and forested wetlands on the Micron Campus' eastern, western, and northern sides represent habitat types with which northern long-eared bats are associated for roosting and foraging.

Unlike many other bats of the Northeast, northern long-eared bats often feed by gleaning prey from leaves and other surfaces rather than strictly hawking flying insects in the air, and are thereby well-adapted to foraging in cluttered, structurally complex, forest interior habitat (Owen et al. 2003, Lacki et al. 2007). Most foraging occurs above the understory and below the canopy (Brack and Whitaker 2001, Harvey et al. 2011, USFWS 2014) in interior areas with a tall and closed canopy (Owen et al. 2003, Patriquin and Barclay 2003, Adams 2013). Northern long-eared bats do not concentrate along riparian corridors or other linear landscape features as much as strictly aerial-foraging species do (Owen et al. 2003, Ford et al. 2005, Harvey et al. 2011, USFWS 2014), and most radiotelemetry and acoustic studies have found that they typically avoid roads and other sharp forest edges (Owen et al. 2003, Patriquin and Barclay 2003, Carter and Feldhamer 2005, Morris et al. 2010, Segers and Broders 2014).

Roost trees are also usually in intact forest, close to the core and away from large clearings, roads, or other sharp edges (Menzel et al. 2002, Owen et al. 2003, Carter and Feldhamer 2005). Roosts are usually in cavities or, less often, under exfoliating bark of large-diameter trees that form a high and dense canopy (Foster and Kurta 1999, Menzel et al. 2002, Carter and Feldhamer 2005; reviewed by Barclay and Kurta 2007), but trees as small as 3 inches DBH can be potential roost sites (USFWS 2023a). Possibly in response to the increased thermoregulatory challenges of roosting alone or in small numbers since the extreme population declines caused by WNS, northern long-eared bats appear to be roosting in small-diameter trees more commonly now than before WNS (Kalen et al. 2022). Males and females will both use many different roost trees throughout the summer, often switching roosts every 1 to 5 days and moving hundreds of feet between successive locations (Menzel et al. 2002, Owen et al. 2002, Johnson et al. 2009).

The northern long-eared bat has experienced the steepest population decline of the six species of bats in the Northeast that are affected by WNS, with numbers at monitored hibernacula in several states dropping by an average of 98 percent between 2006 and 2011 (Turner et al. 2011, Langwig et al. 2012, Reeder and Moore 2013) and then approaching 100 percent in the years since (Cheng et al. 2021). Ninety percent of hibernacula where northern long-eared bats are still found contain fewer than 10 individuals (Cheng et al. 2021). In New York State, pre-and post-WNS count data from 18 northern long-eared bat hibernacula showed local population extinction at all but 4 of the sites as of 2011 and suggested an average statewide population decline of 97 percent (Turner et al. 2011). Surveys at these 18 hibernacula in New York State during the winter of 2012–2013 found only 14 northern long-eared bats where there had previously been more than 1,100 before WNS (Niver 2015). However, in recent years, northern long-eared bats have been increasingly found on Long Island and other coastal islands, which may provide refuge from WNS because their milder winter climate than the mainland shortens the hibernation period and is less favorable to the fungus that causes WNS. Northern long-eared bats in coastal systems also tend to hibernate solitarily rather than colonially, which further reduces disease transmission (Gorman 2023, Hoff 2023).

2.2.2 POTENTIAL PRESENCE IN THE ACTION AREA

The USFWS IPaC System indicates that the northern long-eared bat has the potential to occur in the vicinity of the Micron Campus, Childcare Site, Rail Spur Site, Connected Actions, and recommended transportation mitigations. The northern long-eared bat is also listed by the NYSDEC as documented in the Town of Clay during summer (NYSDEC 2022).

An acoustic bat survey conducted by AKRF, Inc. in the spring and summer of 2023 on the Micron Campus documented presence of northern long-eared bats (Attachment 3). The northern long-eared bat was identified with a significant level of confidence at 5 of the 17 recording locations, across 9 total nights. Activity levels were high enough to suggest the presence of a maternity colony on or adjacent to the Micron Campus, but it has not been determined whether northern long-eared bats roost at the site or use it only as foraging habitat.

Northern long-eared bats are considered to have the potential to both roost and forage on the Micron Campus and the proposed Rail Spur Site west of Caughdenoy Road. The Childcare Site lacks sufficient tree cover to be suitable roosting or foraging habitat for northern long-eared bats, so the species is not expected to occur there. Suitable roosting and foraging habitat for northern long-eared bats occurs along some segments of the Connected Action alignments, including the portion of the proposed water supply line that would parallel NYS Route 481 between Fulton and Phoenix. There is potentially suitable roosting and foraging habitat for northern long-eared bats where a possible new 1.6-mile access road would extend north from a new interchange at NYS Route 481, between the CSX rail tracks and Caughdenoy Road, and terminate at the rail spur site. The road alignment would bisect a forest fragment that is south of NYS Route 31, east of the CSX rail tracks, and west of Caughdenoy Road. Despite the IPaC System's return, no suitable roosting or foraging habitat is expected to occur in the vicinity of other components of the recommended transportation mitigations, which would be in highly developed areas and consist of modifications to existing intersections, interchanges, and road segments.

2.3 TRICOLORED BAT

2.3.1 BACKGROUND

Like the Indiana bat and northern long-eared bat, the tricolored bat is a hibernating species of bat that emerges from its hibernaculum in the spring, with females dispersing to form maternity colonies and males remaining solitary until the end of the summer. The tricolored bat is a forest generalist, inhabiting a variety of forest types across its broad geographic range, which spans most of the continental U.S., southeastern Canada, Mexico, and Central America (USFWS 2022). Tricolored bats roost mostly within leaf clusters on live, dying, or dead hardwood trees, and occasionally in coniferous trees and artificial structures (e.g., barns, porch eves, bridges) (Veilleux et al. 2003, Perry and Thill 2007, Thames 2020, USFWS 2022). Female tricolored bats usually return each year to the same roosting area but switch roost trees frequently (daily to semi-daily; Veilleux and Veilleux 2004, Quinn and Broders 2007, Poissant et al. 2010) over an area of up to a few acres throughout the maternity season (Veilleux and Veilleux 2004).

Tricolored bats forage at or above canopy height, over open water, and along forest edges (Barbour and Davis 1969, Mumford and Whitaker 1982, Hein et al. 2009). Foraging areas are usually within 3 miles of roost sites for females and 7 miles for males (Veilleux et al. 2003, Thames 2020). Wetlands and surface waters are important foraging habitats and sources of drinking water (USFWS 2022).

The tricolored bat has experienced local population declines of 90–100 percent across 59 percent of its geographic range due to WNS (Cheng et al. 2021). The range-wide population is predicted to decline by 89 percent over the next few years, resulting in a 65 percent reduction in spatial distribution (USFWS 2021a, 2022). Mortality caused by wind-energy facilities is the second greatest contributor to tricolored bat population declines (USFWS 2022), with another 19-21 percent decrease expected to result under current wind-energy development scenarios (Wiens et al. 2022, Whitby et al. 2022). In contrast to these stressors, USFWS (2021, 2022) considers the impact of habitat loss on tricolored bat population sizes to currently be low.

Habitat availability is not believed to be currently limiting tricolored bat abundance and is not expected to be a limiting factor in the near future (USFWS 2022). However, while tricolored bat populations are perilously low, they are vulnerable to local extirpations caused by the cumulative effects of habitat loss and other stressors that compound the broader impacts of WNS and wind-energy mortality (USFWS 2022).

2.3.2 POTENTIAL PRESENCE IN THE ACTION AREA

The USFWS IPaC System shows that the tricolored bat has the potential to occur in the vicinity of the Micron Campus, Childcare Site, Rail Spur Site, Connected Actions, and recommended transportation mitigations. An acoustic bat survey conducted by AKRF, Inc. in the spring and summer of 2023 on the Micron Campus documented the presence of tricolored bats, albeit in extremely low abundance relative to the six other species inhabiting the site. Tricolored bats were identified on only two of 478 detector-nights of recording effort during the 7-week survey period, totaling only 12 call sequences. The infrequency and low number of calls detected during the survey suggest there are no resident tricolored bats using the site as summer habitat, and presence of this species at the site is likely limited to the occasional passage of solitary males (Attachment 3). However, it is possible that additional, high-flying tricolored bats were present at times but undetected by the acoustic recorders.

The proposed Childcare Site lacks sufficient tree cover to be likely roosting habitat for tricolored bats but contains suitable foraging habitat for any tricolored bats potentially roosting in forest to the east and north, or elsewhere nearby. Suitable roosting and foraging habitat for tricolored bats occurs along some segments of the Connected Action alignments, including the portion of the proposed water supply line that would parallel NYS Route 481 between Fulton and Phoenix. There is potentially suitable roosting and foraging habitat for tricolored bats where a possible new 1.6-mile access road extending north from a new interchange at NYS Route 481, between the CSX rail tracks and Caughdenoy Road, and terminating at the Rail Spur Site. The road alignment would bisect a forest fragment that is south of NYS Route 31, east of the CSX rail tracks, and west of Caughdenoy Road. Roosting and foraging habitat suitability is low in the vicinity of other components of the recommended transportation mitigations, which would be in highly developed areas and consist of modifications to existing intersections, interchanges, and road segments.

2.4 EASTERN MASSASAUGA

2.4.1 BACKGROUND

The eastern massasauga is a declining, range-restricted rattlesnake that occurs in small, highly isolated populations from central New York State and southern Ontario to south-central Illinois and eastern Iowa. Population declines are primarily attributable to wetland drainage, habitat fragmentation, illegal collection for the pet trade, and the advancement of early successional vegetation into later successional stages in the few areas in which remnant populations persist (Gibbs et al. 2007). Only two populations of the eastern massasauga are known to remain within New York State (Gibbs et al. 2007). One is within a few miles of the WPCP (exact location not disclosed due to the species' vulnerability to collecting); the other is in Genesee County (Gibbs et al. 2007).

2.4.2 POTENTIAL PRESENCE IN THE ACTION AREA

At the known site near the WPCP, eastern massasaugas are largely restricted to peatland habitat that was created by a fire in the late 1800s (Johnson and Breisch 1993, Johnson 2000). They have extremely small activity ranges and restricted movements within overlapping territories and have not been found to disperse or emigrate outside of this general area (Johnson 1995, 2000). Moreover, the known site is separated from the WPCP by two interstate highways, several other major roads, and an inhospitable landscape of development that collectively represent significant barriers to the movement of eastern massasaugas away from that known site. Therefore, the species is not likely present at the Micron Campus, Rail Spur Site, Childcare Site, Connected Action areas, or recommended transportation improvement areas.

For each of these reasons, it is concluded the Proposed Project, Connected Actions, and recommended transportation mitigations would have "no effect" on the eastern massasauga and the species is not further analyzed herein.

2.5 BOG BUCK MOTH

2.5.1 BACKGROUND

The bog buck moth is a federally and state-listed endangered species. The bog buck moth occurs exclusively in open, calcareous, low shrub fens containing large amounts of buckbean (*Menyanthes trifoliata*). Buckbean is a shade-intolerant plant species that is the preferred larval food source of the bog buck moth. In addition to needing ample buckbean for larval feeding, suitable bog buck moth habitat also requires plants with sturdy upright stems for oviposition (USFWS 2021b). The eggs hatch between April and June, which aligns with the emergence of buckbean. Bog buck moths do not feed in the adult stage, which occurs over a 9-12-day period between September and October. Before dying off, the adult moth mates in the fall and lays egg clusters on plant foliage to overwinter (NYNHP 2024, USFWS 2023b). As the adult stage is brief, this species seldom leaves its known habitat and is known to typically fly only short distances of 0.5 kilometers (0.3 miles), despite being capable of further travel (USFWS 2023b).

2.5.2 POTENTIAL PRESENCE IN THE ACTION AREA

Known populations of the bog buck moth are restricted to Oswego County in New York State and Ontario, Canada (NYNHP 2024, NYSDEC 2024). In New York State, the six known bog buck moth populations are found within what are considered medium fens, which are those fed by moderately mineralized waters, often as a narrow transition between a stream or lake or between a swamp or upland. Five of the known populations within Oswego County are found in the dunes along the eastern shorelines of Lake Ontario, while the remaining sixth population is located within a wetland in a southwest inland portion of the county (USFWS 2023b).

The bog buck moth is listed by the USFWS IPaC System as occurring in the vicinity of the proposed Connected Actions within Oswego County, which include, leg one of the OCWA transmission line and the Lake Ontario Water Treatment Plant. NYSDEC does not list bog buck moth as present within any of the Connected Action areas in Oswego County, which indicates that these sites do not overlap with the boundaries of the six known populations within New York State. Because the Connected Actions do not overlap with any of the six known populations in Oswego County, this species is not likely present within the Action Area. It is concluded that development of the Proposed Project, Connected Actions, and recommended transportation mitigations would have “no effect” on the bog buck moth and the species is not further analyzed herein.

3. LAND COVER AND BAT HABITAT IN THE ACTION AREA

As discussed above, Indiana, northern long-eared, and tricolored bats roost and forage in a variety of woodland habitat types, including forested wetland, upland deciduous and mixed forest, and riparian forest. Indiana and tricolored bats will roost and forage along forest edges with fields and other open habitats while northern long-eared bats tend to avoid edges and are sensitive to fragmentation. To evaluate the presence and distribution of potential roosting and foraging habitat for these species in the limits of disturbance of the Micron Campus, Childcare Site, Rail Spur Site, Connected Actions, and recommended transportation mitigations, land-cover types in these areas were characterized and quantified using the U.S. Geological Survey's 2021 National Land Cover Database (NLCD). The NLCD consists of remote-sensed (Landsat) data collected in 30 by 30-meter grid cells, and as such, cover-type delineations and acreages derived from them are low-resolution and only intended to generally characterize the existing composition of the Action Area and the extent of disturbances from the Proposed Project, Connected Actions, and recommended transportation mitigations. Acreages provided herein are therefore approximate and rounded to the nearest whole number, and also subject to change to a small degree (± approximately 5 percent) as project designs advance and are refined. Given the scale of the Action Area and infeasibility of field-delineating cover types over such a large area, it was decided during technical assistance from USFWS that the NLCD was the most practical method by which to characterize and quantify land-cover types in the Action Area for this BA.

However, field-collected descriptions of the dominant plant species and ecological communities (as defined for New York State by Edinger et al. 2014) on the Micron Campus, Childcare Site, and Rail Spur Site were made during reconnaissance investigations conducted by AKRF, Inc. from July 31 to August 2, 2023, and are also provided here to supplement the remote-sensed NLCD data for these areas. No field-collected data are available for the Connected Action or recommended transportation improvement areas, and therefore, cover-types in these areas are characterized using the NLCD only. The NLCD land-cover types and their approximate acreages in each portion of the Action Area are shown in Table 2 and Table 3. For the purposes of this BA, all forested NLCD land-cover categories (Deciduous Forest, Evergreen Forest, Mixed Forest, Woody Wetlands) were considered suitable roosting and foraging habitat for Indiana, northern long-eared, and tricolored bats. All undeveloped, open land-cover categories (Shrub/Scrub, Grasslands/Herbaceous, Emergent Herbaceous Wetlands, Cultivated Crops, Pasture/Hay) were considered suitable foraging habitat for the Indiana bat and tricolored bat. It should be noted that the Biological Resources chapter of the Proposed Project's DEIS uses a different approach to characterize land-cover in some of the affected areas and as such, land-cover descriptions and associated acreages may differ between the DEIS and this BA.

TABLE 2.
PRE-AND POST-CONSTRUCTION ACREAGES OF NLCD COVER TYPES ON THE MICRON CAMPUS, CHILDCARE SITE, AND RAIL SPUR SITE

NLCD Cover Type	Micron Campus		Childcare Site		Rail Spur Site	
	Pre-Construction	Post-Construction	Pre-Construction	Post-Construction	Pre-Construction	Post-Construction
Open Water	0	0	0	0	0	0
Developed, Open Space	32	4	2	2	3	2
Developed, Low Intensity	14	3	1	1	0	0
Developed, Medium Intensity	6	4	0	0	0	0

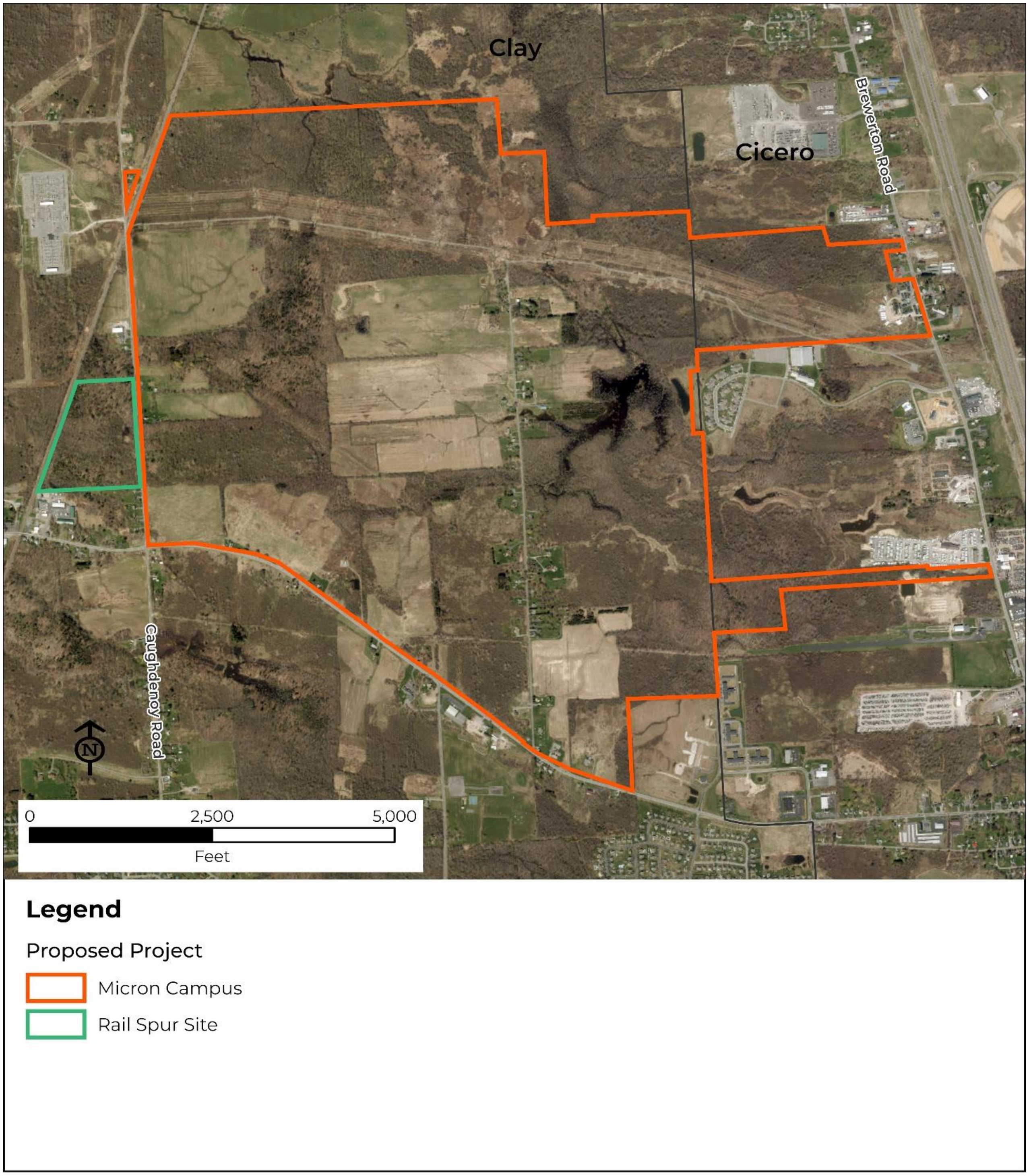
Developed High Intensity	1	0	0	0	0	0
Deciduous Forest	466	120	4	4	30	12
Evergreen Forest	4	0	0	0	0	0
Mixed Forest	7	0	0	0	5	1
Shrub/Scrub	1	0	0	0	0	0
Grassland/Herbaceous	2	0	0	0	0	0
Pasture/Hay	488	48	25	12	1	0
Cultivated Crops	99	36	0	0	0	0
Woody Wetlands	240	152	0	0	0	0
Emergent Herbaceous Wetlands	17	11	0	0	0	0
Total LOD Acreage	**1377**	**380**	**31**	**18**	**38**	**15**

Source: USGS NLCD (2021). **Note:** All acreages have been rounded to the nearest whole acre. Due to rounding, total limit of disturbance acreages are subject to differ from the sum of their NLCD components.

3.1 MICRON CAMPUS

The Micron Campus is in a largely agricultural, but urbanizing, landscape outside of Syracuse, NY (Figure 12). The surrounding landscape composition is a matrix of agricultural land, forest, and urban sprawl, intersected by interstate, state, and local roads. The site has high connectivity to other natural areas to the north and west while it is bordered mostly by roads and dense residential development to the south and east. The closest forested state or federal lands to the site are the NYSDEC Three Rivers Wildlife Management Area and Three Mile Bay Wildlife Management Area, approximately seven miles to the east and approximately four miles to the southwest, respectively.

FIGURE 12. MICRON CAMPUS SITE



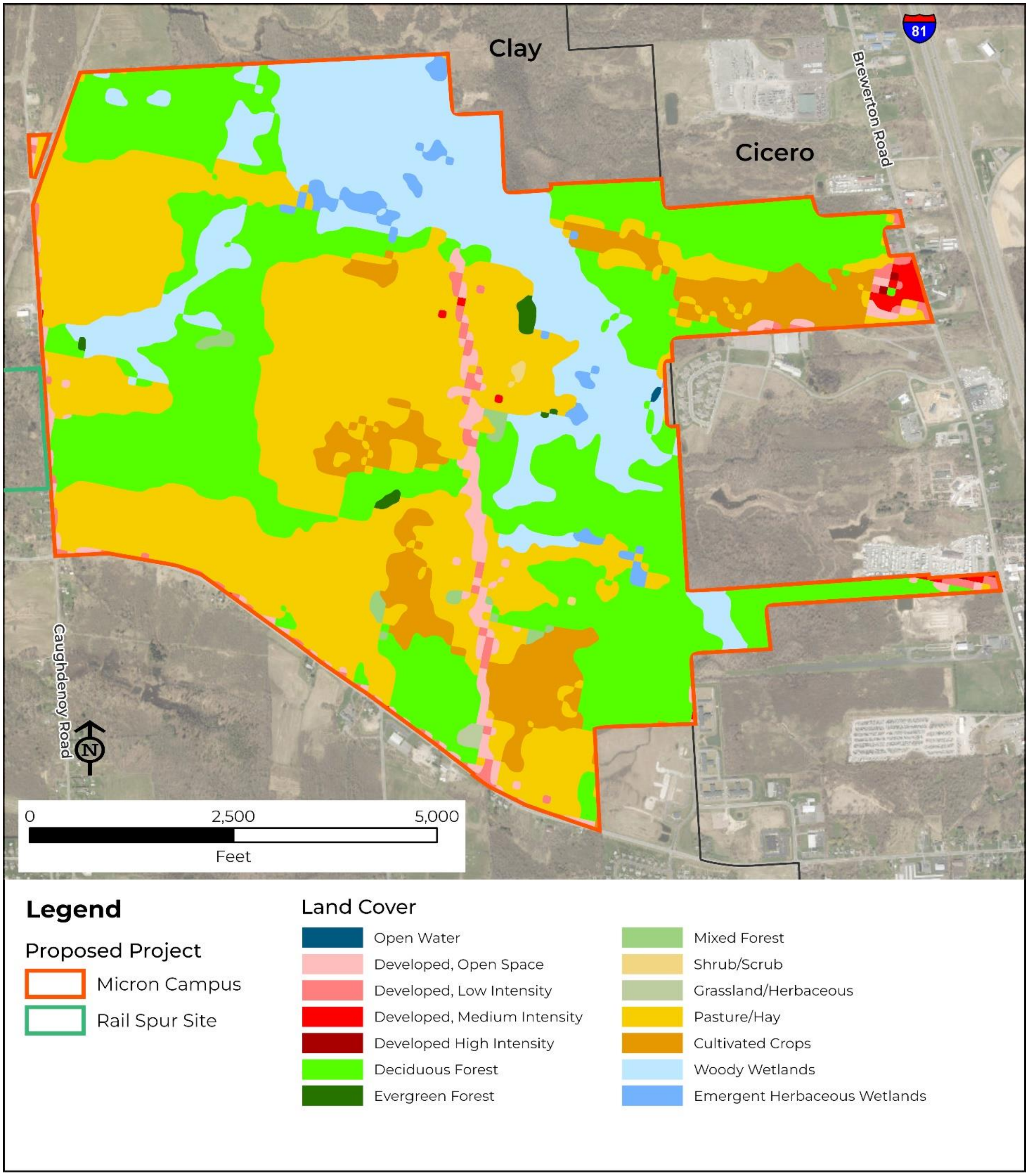
World Imagery: New York State, Maxar

There are 14 NLCD cover types, occupying approximately 1,377 acres, associated with the Micron Campus (Figure 13 and Table 2). The dominant NLCD cover type is Pasture/Hay (488 acres), followed by Deciduous Forest (466 acres) and Woody Wetlands (240 acres) (Table 2). Together, these three cover types account for more than 86 percent of the Micron Campus. However, due to years of inactivity, many of the fields that are mapped as Pasture/Hay and Cultivated Crops by the 2021 NLCD have succeeded into old field or shrubland. Most of the 587 total acres of land mapped by the NLCD as Pasture/Hay or Cultivated Crops is currently better described as successional old field and successional shrubland, while less than approximately 50 acres is still cropland. In total, approximately 717 acres of NLCD woodland cover types are present within the Micron Campus (i.e., Deciduous Forest, Woody Wetlands, Mixed Forest, and Evergreen Forest).

The site reconnaissance investigation conducted by AKRF, Inc. between July 31 and August 2, 2023 characterized the ecological communities and dominant vegetation that occur on the Micron Campus. The Micron Campus contains 16 of the ecological communities of New York State defined by Edinger et al. (2014). Many of the most abundant of these ecological communities are or once were farmland and are in stages of succession typical in the region. These ecological communities are best characterized as cropland/field crops, successional old field, and successional shrubland, and represent different successional stages. Of these ecological communities, cropland/field crop ecological communities are those that have been most recently disturbed through mowing and haying. The cropland/field crop ecological communities on the Micron Campus are dominated by timothy grass (*Phleum pratense*), orchard grass (*Dactylis glomerata*), black knapweed (*Centaurea nigra*), and goldenrod species (*Solidago spp*.). In general, vegetation within these areas is limited to the herbaceous stratum and lacks vegetation in the tree, shrub, and vine strata.

Successional old field ecological communities are in early stages of succession due to disturbance in the recent past associated with prior mowing. These habitats contain a high abundance of invasive species. Trees documented within these habitats were primarily saplings. This community is dominated by eastern cottonwood (*Populus deltoides*), European buckthorn (*Rhamnus cathartica*), gray dogwood (*Cornus racemosa*), assorted goldenrod species, black knapweed, and arrowwood viburnum (*Viburnum dentatum*). Within the southern portion of the Micron Campus, abandoned farmland has reverted into successional shrubland. These habitats contain a greater abundance of vegetation within the shrub stratum than the cropland/field crops and successional old field ecological communities to the north, and the maturity of vegetation suggest that these habitats have not been mowed as recently. These areas are dominated by quaking aspen (*Populus tremuloides*), European buckthorn, multiflora rose (*Rosa multiflora*), gray dogwood, and blackberry (*Rubus allegheniensis*). In addition to cropland/field crops, successional old field, and successional shrubland, some softwood plantations were documented adjacent to farmland. These softwood plantations are best characterized as spruce/fir plantation. The spruce/fir plantation ecological communities are generally monocultures, with the dominant tree species being either Norway spruce (*Picea abies*) or white spruce (*P. glauca*). Vegetation within the understory of these plantations varies from stand to stand, with some plantations containing little to no understory, while others contain green ash (*Fraxinus pennsylvanica*) saplings and goldenrods.

FIGURE 13. EXISTING MICRON CAMPUS NLCD COVER TYPES



World Imagery: New York State, Maxar

A National Grid transmission line ROW traverses the northern portion of the Micron Campus, from Caughdenoy Road to Brewerton Road. The dominant ecological community in the transmission line right-of-way is best characterized as mowed roadside/pathway. Dominant species noted within the mowed roadside/pathway ecological community include green ash, European buckthorn, gray dogwood, goldenrod, and arrowwood viburnum. The green ash noted within the mowed roadside/pathway were primarily saplings. Vehicle and ATV tracks, signs of mowing, and lack of mature trees suggest the mowed roadside/pathway ecological community has been recently disturbed, likely due to maintenance.

Habitat north of the transmission line ROW is primarily forested, with varying species composition based on hydrology. The largest of the ecological communities is best characterized as red maple-hardwood swamp. This area is dominated by red maple (*Acer rubrum*), green ash, shagbark hickory (*Carya ovata*), American elm (*Ulmus americana*), northern spicebush (*Lindera benzoin*), Virginia knotweed (*Persicaria virginiana*), and sensitive fern (*Onoclea sensibilis*). Closer to the floodplains of Youngs Creek, the red maple-hardwood swamp transitions into floodplain forest, with similar dominant vegetation but a denser understory composed of spicebush and green ash saplings. Signs of disturbance noted in these areas were limited to tree mortality from the invasive emerald ash borer (*Agrilus planipennis*). Mature trees were noted within these ecological communities, which suggests a fully mature forest. Within the northwestern corner of the Micron Campus, a portion of the forest is best characterized as successional northern hardwoods. Dominant species within the successional northern hardwoods include eastern cottonwood, black willow (*Salix nigra*), green ash, European buckthorn, sensitive fern, and poison ivy (*Toxicodendron radicans*). Due to the high percentage of first successional species and average size of the trees in the canopy, this area appears to have been recently disturbed.

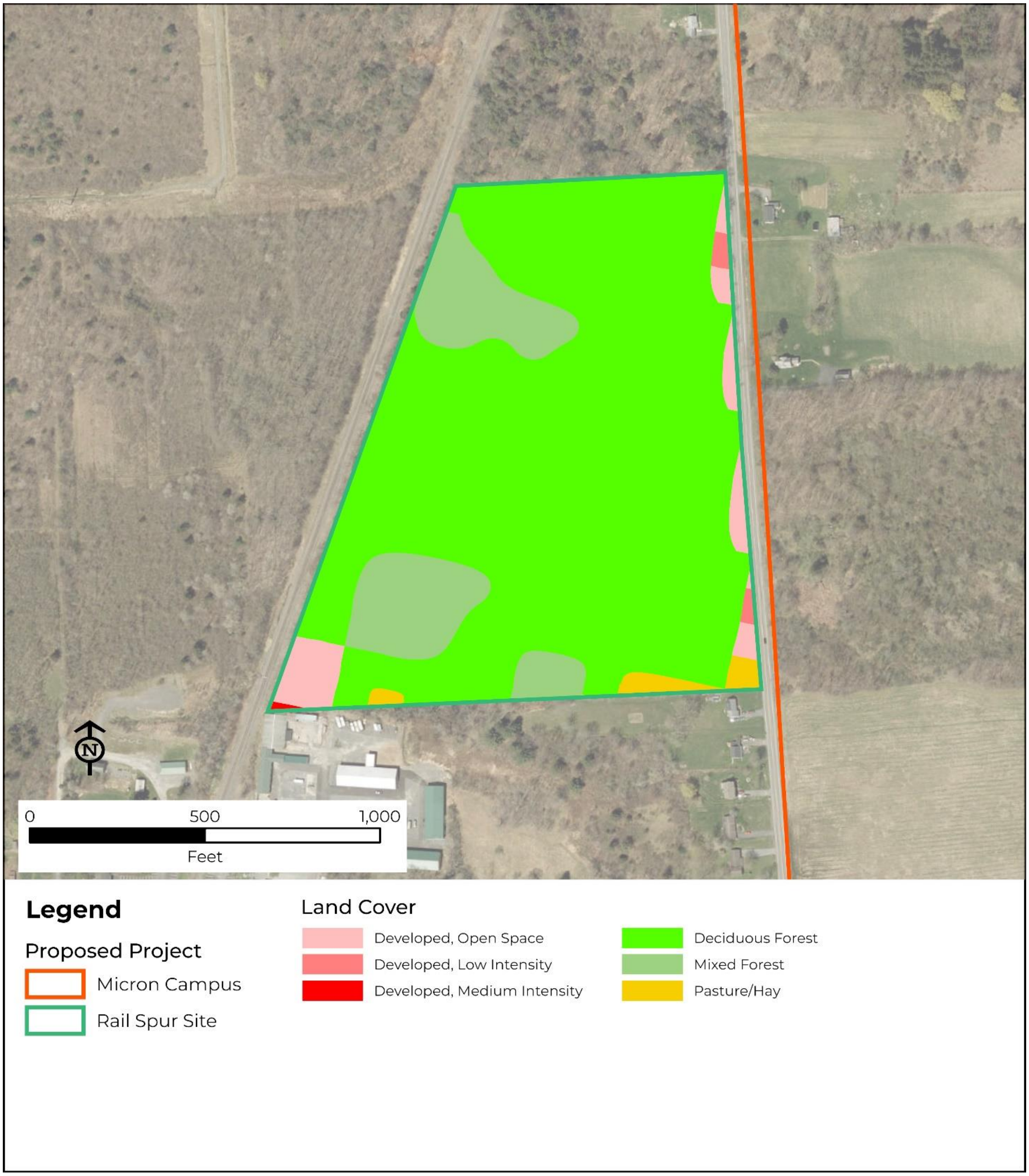
Located between the transmission line ROW and forested ecological communities to the north is shallow emergent marsh and common reed marsh. Dominant vegetation noted within the shallow emergent marsh ecological community included red maple, green ash, narrowleaf cattail (*Typha angustifolia*), common reed (*Phragmites australis*), and goldenrod, as well as invasive purple loosestrife (*Lythrum salicaria*), and reed canary grass (*Phalaris arundinacea*). Within the shallow emergent marsh, monocultures of common reed were noted and classified as the common reed marsh ecological community. Disturbance within shallow emergent marsh and common reed marsh was limited to invasive species and frequent flooding.

The marshland transitions into a forested swamp south of the transmission line ROW and extends offsite to the east. South of the transmission line ROW and west of Burnett Road, red maple-hardwood swamps and floodplain forests transition into different forested ecological communities, generally becoming more fragmented by farmland. The most prevalent of these ecological communities is successional southern hardwoods. Dominant species within the successional southern hardwoods include green ash, black cherry (*Prunus serotina*), shagbark hickory, European buckthorn, and poison ivy. Successional southern hardwoods were disturbed, with the shrub stratum being primarily invasive European buckthorn and few mature trees making up the canopy. In addition, mature green ash trees were noted as declining because of the emerald ash borer.

The area south of the western-most floodplain forest is best classified as beech-maple mesic forest. Dominant species include sugar maple (*Acer saccharum*), American beech (*Fagus grandifolia*), yellow birch (*Betula alleghaniensis*), poison ivy, and Virginia creeper (*Parthenocissus quinquefolia*). Signs of disturbance noted within the beech-maple mesic forest include ATV tracks and a hunting stand within a thin strip of trees utilized as a wind screen between farmlands; however, mature trees in the canopy suggest limited disturbance. In addition to successional southern hardwoods and beech-maple mesic forest, maple-basswood rich mesic forest and successional northern hardwoods were noted west of Burnett Road. The maple-basswood rich mesic forest is dominated by shagbark hickory, pignut hickory (*Carya glabra*), black cherry, European buckthorn, green ash, and goldenrod. Successional northern hardwoods had a similar species composition to successional northern hardwoods found north of the transmission line right-of-way. These ecological communities are small relative to the size of the Micron Campus and occur along the edge of habitats characterized as successional old field. Mature trees were noted within the maple-basswood rich mesic forest canopy, suggesting that this area has not been recently disturbed. The average size of the trees in the canopy of successional northern hardwoods suggest this habitat has been recently disturbed.

South of the transmission line right-of-way and east of Burnett Road, marshland transitions into forested swamps that dominate the eastern portion of the Micron Campus. This forested swamp is best characterized as silver maple-ash swamp. Dominant species include silver maple (*Acer saccharinum*), green ash, and Virginia knotweed. Mature declining trees were noted within the canopy, which can be attributed to frequent flooding and the presence of the emerald ash borer. To the southeast of the silver maple-ash swamp, the forest is better categorized as rich mesophytic forest. Dominant species include shagbark hickory, American beech, American elm, red maple, poison ivy, and Virginia creeper. The mature tree canopy suggests no recent disturbance.

FIGURE 14. EXISTING RAIL SPUR NLCD COVER TYPES



World Imagery: New York State, Maxar

3.2 RAIL SPUR SITE

There are four NLCD cover types existing on the Rail Spur Site (Figure 14 and Table 2). The dominant NLCD cover type is Deciduous Forest (30 acres), followed by Mixed Forest (5 acres) and Developed, Open Space (3 acres), and Pasture/Hay (1 acre) (Table 2). In total, approximately 35 acres of NLCD woodland cover types are present within the Rail Spur Site (i.e., Deciduous Forest and Mixed Forest). Southern portions of the Rail Spur Site that are mapped by the 2021 NLCD as forest were observed to contain high tree mortality from the emerald ash borer and would now be better described as shrubland due to the opening of the canopy.

Following Edinger et al. (2014), the northern and largest portion of the Rail Spur Site is best characterized as a hemlock-northern hardwood forest ecological community. This area is dominated by sugar maple, shagbark hickory, eastern hemlock (*Tsuga canadensis*), green ash, and goldenrod. The average size of the trees in the canopy suggests that this forest is not fully mature. Signs of disturbance are limited in this area. The inundated area located in the eastern/central portion of the Rail Spur Site is best characterized as a common reed marsh ecological community. This area is dominated by common reed. The prevalence of invasive common reed suggests a disturbed community. The southern portion of the Rail Spur Site is best characterized as a successional shrubland ecological community due to recent tree mortality caused by the emerald ash borer and the loss of much of the former canopy. This area is dominated by European buckthorn, gray dogwood, Tartarian honeysuckle (*Lonicera tatarica*), green ash, red maple, and American elm. The species composition (including the prevalence of invasive species), limited canopy cover, and the small size of existing trees suggests recent disturbance and a community in the earlier stages of succession.

3.3 CHILDCARE SITE

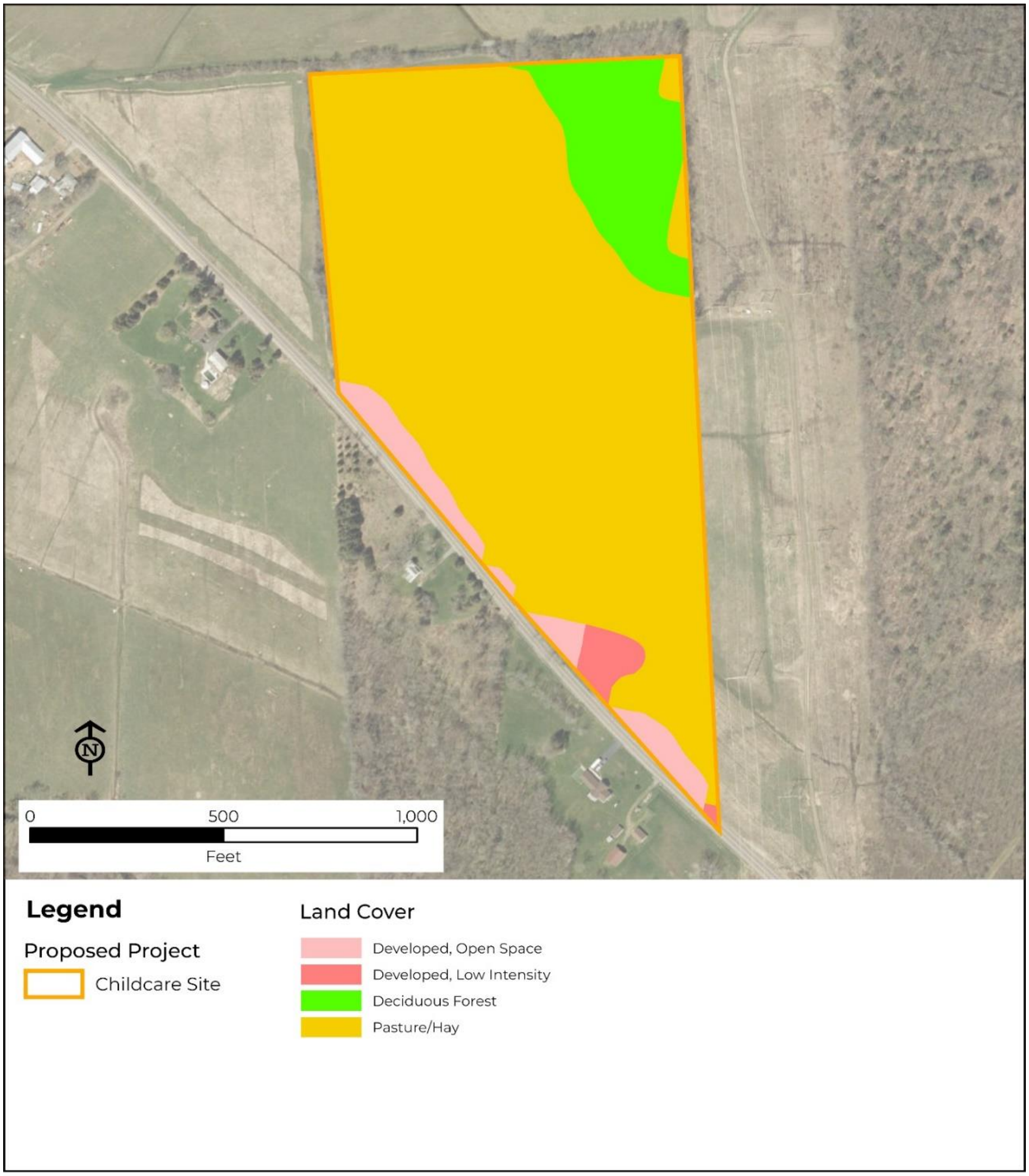
There are four NLCD cover types, occupying approximately 31 acres, on the Childcare Site (Figure 15 and Table 2). These include Pasture/hay (25 acres), followed by Deciduous Forest (4 acres), Developed, Open Space (2 acres), and Developed, Low Intensity (1 acre). As shown in Figure 15, deciduous forest occurs in the northeastern corner of the site along the edge of the fields, and the developed land portion of the site is located around the farmhouse next to Caughdenoy Road on the southeastern edge of the site.

The central and largest portion of the approximately 31-acre Childcare Site is best characterized as a cropland/field crops ecological community, following the classifications of Edinger et al. (2014). This area is dominated by timothy grass, black knapweed, hemp dogbane (*Apocynum cannabinum*), and orchard grass. No trees were documented within this ecological community. Signs of disturbance noted in this area included mowing.

The forested area in the northeastern corner of the Childcare Site is best characterized as a floodplain forest ecological community. This area is dominated by sugar maple, red maple, American elm, Virginia creeper, poison ivy, and sensitive fern. No recent signs of disturbance were noted within this area; however, some farming equipment and debris were observed on the edge of the forested lot. The average size of the trees in the canopy suggests that this area had been previously disturbed.

The area around the residential home (“Developed, Low Intensity” in Figure 15) located in the southern portion of the Childcare Site is best characterized as a mowed lawn with trees. This area is highly disturbed and contains a vacant house and barn, and outdoor areas utilized for farming equipment storage. Limited trees were documented in this area, and the immediate landscape was observed to be maintained.

FIGURE 15. EXISTING NLCD COVER TYPES ON THE CHILDCARE SITE



World Imagery: New York State, Maxar

3.4 CONNECTED ACTIONS

The Connected Actions would have a total construction footprint of approximately 597 acres (Table 3). The OCWA water supply infrastructure accounts for the largest area among the Connected Actions. A total of approximately 229 acres of forest (NLCD categories of Deciduous Forest, Evergreen Forest, Mixed Forest, and Woody Wetlands combined) is present within the limits of disturbance of the Connected Actions. Existing acreages of all NLCD cover types for each Connected Action are shown in Table 3 and illustrated in the figures in Attachment 2.

TABLE 3.
EXISTING ACREAGE OF NLCD COVER TYPES WITHIN CONNECTED ACTION AND OFFSITE RECOMMENDED TRANSPORTATION MITIGATIONS LIMITS OF DISTURBANCE

NLCD Cover Type	OCWA Water Supply Component	OCDWEP IWWTP and Conveyance	NG Natural Gas Line	NG Clay Substation Expansion	Total Connected Actions	Modifications of Existing Roadways	New Interchange from NYS Route 481 and New Access Road	Total Recommended Transportation Mitigations
Open Water	4	2	0	0	6	0	0	0
Developed, Open Space	47	3	3	8	61	31	2	34
Developed, Low Intensity	24	5	3	1	33	88	4	92
Developed, Medium Intensity	20	8	2	1	31	95	3	98
Developed High Intensity	14	1	1	0	16	16	0	16
Barren Land (Rock/Sand/Clay)	0	0	0	0	0	0	0	0
Deciduous Forest	162	17	4	0	183	5	18	23
Evergreen Forest	1	1	0	0	2	0	0	0
Mixed Forest	6	0	0	0	6	0	1	1
Shrub/Scrub	4	1	0	0	5	2	0	2
Grassland/Herbaceous	3	0	0	0	3	0	0	0
Pasture/Hay	104	15	16	16	151	20	4	25
Cultivated Crops	36	1	2	11	50	4	0	4
Woody Wetlands	30	3	4	0	37	5	3	7
Emergent Herbaceous Wetlands	6	1	0	0	7	0	0	0
Total LOD Acreage	**462**	**58**	**35**	**39**	**594**	**266**	**35**	**301**

Note: All acreages have been rounded to the nearest whole acre. Due to rounding, total limit of disturbance acreages are subject to differ from the sum of their NLCD components.

Source: USGS NLCD (2021)

3.4.1 CLAY SUBSTATION EXPANSION

There are 5 NLCD cover types represented in the approximately 39-acre limit of disturbance for the proposed National Grid Clay Substation expansion (Attachment 2, Figure 1B; Table 4). The dominant NLCD cover types for the Clay Substation expansion are Pasture/Hay (16 acres), Cultivated Crops (11 acres), and Developed, Open Space (8 acres) (Table 4). However, based on a review of aerial imagery, no active farmland (Cultivated Crops) exists within the proposed expansion area and the Pasture/Hay NLCD cover type would be better categorized as Developed, Open Space and old field and shrubland with scattered young trees.

TABLE 4.
NLCD COVER TYPES
WITHIN THE CLAY SUBSTATION EXPANSION LIMITS OF DISTURBANCE

NLCD Cover Type	Clay Substation Expansion
Open Water	0
Developed, Open Space	8
Developed, Low Intensity	1
Developed, Medium Intensity	1
Developed High Intensity	0
Barren Land (Rock/Sand/Clay)	0
Deciduous Forest	0
Evergreen Forest	0
Mixed Forest	0
Shrub/Scrub	0
Grassland/Herbaceous	0
Pasture/Hay	16
Cultivated Crops	11
Woody Wetlands	0
Emergent Herbaceous Wetlands	0
Total LOD Acreage	**39**

Source: USGS NLCD 2021. All acreages rounded to the nearest whole number. Total limit of disturbance acreage differs from the sum of its constituent land-cover types due to rounding each cover-type acreage.

3.4.2 NATURAL GAS LINE

There are 8 NLCD cover types occupying approximately 35 total acres within the proposed LOD for the National Grid 3.1-mile natural gas line infrastructure improvements, as shown in Attachment 2, Figure 1C and in Table 5. The width of the anticipated limits of disturbance for the natural gas line is 87 feet in most segments but varies from 27 to 380 feet. The dominant NLCD cover type for natural gas line is Pasture/Hay (16 acres) followed by Woody Wetlands (4 acres), and Deciduous Forest (4 acres)) (Table 5). There is a total of 8 acres of forest along the proposed natural gas line route. Developed areas, which range from uses such as lawns, driveways, residential lots, and local roads (i.e., Developed, Open Space) to paved areas with high uses such as commercial development and highly used roads (i.e., Developed, High Intensity), occupy approximately 9 total acres. Active farmland, covering Pasture/Hay (16 acres) and Cultivated Crops (2 acres), occupies approximately 18 acres.

TABLE 5.
NLCD COVER TYPES WITHIN THE NATURAL GAS LINE LIMITS OF DISTURBANCE

NLCD Cover Type	Natural Gas Line
Open Water	0

Developed, Open Space	3
Developed, Low Intensity	3
Developed, Medium Intensity	2
Developed High Intensity	1
Barren Land (Rock/Sand/Clay)	0
Deciduous Forest	4
Evergreen Forest	0
Mixed Forest	0
Shrub/Scrub	0
Grassland/Herbaceous	0
Pasture/Hay	16
Cultivated Crops	2
Woody Wetlands	4
Emergent Herbaceous Wetlands	0
Total LOD Acreage	**35**

Notes: The natural gas alignment is estimated to be 3.1 miles long and have limits of disturbance that vary in width from 27 to 380 feet. All acreages rounded to the nearest whole number. Due to rounding, totals are subject to differ from the sum of their components.

Source: USGS NLCD 2021

As shown in Attachment 2, Figure 1C, the LOD for the proposed natural gas would extend beneath the west-bound lane of NYS Route 31 from GRS 147A to a point approximately 400 feet east of the west end of Grange Road. At that point, the gas line would extend north and east within a 20-foot-wide easement that runs through several privately owned parcels and wetland areas. The gas line would be co-located within an existing utility ROW containing two 115kV overhead electrical lines, underground electric lines supplying a solar farm, telecommunication lines, and other utility lines. Based on a review of aerial imagery, the easement is largely maintained along its centerline, although vegetation and trees occupy the edges of the centerline within the easement. In some areas, aerial imagery suggests that some of the land designated as a Pasture/Hay cover type is transitioning to successional cover types (e.g., Grassland Herbaceous or Sedge Herbaceous, and Shrub/Scrub communities). There is one area along the natural gas line interconnection that does not have a maintained easement. This area includes an unmaintained portion of easement primarily located northwest of the Rail Spur Site which continues east, overlapping the northern limits of the Rail Spur Site. According to the NLCD, the area along this 0.3-mile stretch consists of mostly intact Deciduous Forest.

3.4.3 WATER SUPPLY INFRASTRUCTURE

There are 15 NLCD cover types, occupying approximately 462 acres, associated with the approximately 30-mile long[3] and up to 100-foot-wide potential construction corridor for the proposed water supply infrastructure (Figure 1D in Attachment 2; Table 6). The dominant NLCD cover type is Deciduous Forest (162 acres) followed by Pasture/hay (104 acres) and Developed, Open Space (47 acres) (Table 6). There is a total of approximately 199 acres of forest (Deciduous Forest, Evergreen Forest, Mixed Forest, Woody Wetlands) along the proposed water supply infrastructure limits of disturbance. Developed areas, which range from uses such as lawns, driveways, residential lots, and local roads (i.e., Developed, Open Space) to paved areas with high uses such as commercial development and highly used roads (i.e., Developed, High Intensity), occupy approximately 105 total acres. Active farmland, including Pasture/Hay (104 acres) and

[3] Mileage associated with the Lake Ontario Water Treatment Plant and OCWA Terminal Campus has been excluded from this measurement.

Cultivated Crops (36 acres), occupies 140 total acres. Open Water (4 acres), Shrub/Scrub (4 acres), Grassland/Herbaceous (3 acres), and Barren Land (< 1 acre) are non-dominant cover types along the proposed water supply infrastructure limits of disturbance.

As shown in Figure 1D in Attachment 2, components of the existing OCWA water supply infrastructure include a right-of-way from the existing LOWTP in Oswego County and existing OCWA Terminal Campus in Onondaga County to the Micron Campus. Proposed modifications to these facilities would be required for the construction of the proposed water supply infrastructure and would be limited to developed NLCD cover types, with limited vegetation. Based on a review of aerial imagery, a narrow (~10 to 20 feet) corridor is clear and maintained along the centerline of the existing 100-foot-wide right-of-way while the remaining ~80 to 90 feet is forested. One area associated with new water supply infrastructure does not have a maintained right-of-way (Figure 1D in Attachment 2). This is the proposed water transmission line (and air release structure) on the southwest corner of the Micron Campus, where the new water supply infrastructure would turn north and run east and parallel to Caughdenoy Road to the Micron Campus. According to the NLCD, this 0.2-mile segment consists largely of Cultivated Crop and Pasture Hay cover types with smaller amounts of Developed, Open Space and Developed, Low Intensity cover types. A review of aerial imagery suggests that the Cultivated Crop and Pasture Hay cover types have transitioned to successional communities (e.g., Grassland/Herbaceous and Shrub/Scrub cover types).

TABLE 6.
NLCD COVER TYPES WITHIN THE WATER SUPPLY INFRASTRUCTURE LIMITS OF DISTURBANCE

NLCD Cover Type	Acreage
Open Water	4
Developed Open Space	47
Developed, Low Intensity	24
Developed, Medium Intensity	20
Developed, High Intensity	15
Barren Land	0
Deciduous Forest	162
Evergreen Forest	1
Mixed Forest	6
Scrub/Shrub	4
Grassland/Herbaceous	3
Pasture/Hay	104
Cultivated Crops	36
Woody Wetlands	30
Emergent Herbaceous Wetlands	6
Total LOD Acreage	**462**

Notes: Proposed water supply infrastructure is estimated to be approximately 32.7 miles long and assumed to require a 100-foot-wide construction corridor, although the actual limits of disturbance would likely be narrower. All acreages rounded to the nearest whole number. Due to rounding, actual totals are subject to differ from the sum of their components.

Source: USGS NLCD (2021)

3.4.4 INDUSTRIAL WASTEWATER

There are 10 NLCD cover types, occupying approximately 22 acres, associated with the approximately 2-mile- long and up to 99-foot-wide proposed industrial wastewater conveyance, as shown in Attachment 2, Figure 1E and in Table 7. The dominant NLCD cover type is Deciduous

Forest (8 acres) followed by Pasture/Hay (6 acres), and Developed, Open Space (2 acres). There is a total of approximately 11 acres of forest (Deciduous Forest, Evergreen Forest, Mixed Forest, Woody Wetlands combined) along the proposed industrial wastewater conveyance. Developed areas occupy approximately 3 acres. Active farmland, including Pasture/Hay (6 acres) and Cultivated Crops (1 acre), occupies approximately 7 acres.

The new IWWTP at Oak Orchard would occur within the existing approximately 76-acre Oak Orchard site, which consists mostly of developed space (i.e., all NLCD development categories combined, totaling approximately 28 acres), Deciduous Forest (approximately 20 acres), and Pasture/Hay (approximately 14 acres). There is a total of approximately 28 acres of forest (Deciduous Forest, Mixed Forest, and Woody Wetlands combined) on the site. Development of the new IWWTP would result in the disturbance of approximately 36 acres, consisting of mostly developed space (approximately 14 total acres), Deciduous Forest (approximately 9 acres), and Pasture/Hay (approximately 9 acres) (Table 7).

**TABLE 7.
NLCD COVER TYPES WITHIN THE IWWTP
AND INDUSTRIAL WASTEWATER
CONVEYANCE LIMITS OF DISTURBANCE**

NLCD Cover Type	IWWTP	Industrial Wastewater Conveyance
Open Water	2	0
Developed, Open Space	1	2
Developed, Low Intensity	4	1
Developed, Medium Intensity	8	0
Developed High Intensity	1	0
Barren Land (Rock/Sand/Clay)	0	0
Deciduous Forest	9	8
Evergreen Forest	0	1
Mixed Forest	0	0
Shrub/Scrub	1	0
Grassland/Herbaceous	0	0
Pasture/Hay	9	6
Cultivated Crops	0	1
Woody Wetlands	1	2
Emergent Herbaceous Wetlands	0	1
Total LOD Acreage	**36**	**22**

Notes: The industrial wastewater conveyance is estimated to be approximately 2 miles long and assumed to require a construction corridor of up to 99 feet wide. All acreages rounded to the nearest whole number. Due to rounding, actual totals are subject to differ from the sum of their components.

Source: USGS NLCD (2021)

3.4.5 TELECOMMUNICATIONS

The specific routing of the telecommunication connections has yet to be designed, so it is not possible to characterize its associated NLCD land cover. However, telecommunications infrastructure for the Proposed Project is likely to involve connections along existing utility poles or underground conduit from terminal points adjacent to the Micron Campus. As such, land cover along the route would likely be limited to paved road, mowed lawn or ruderal vegetation along roadsides, and other disturbed ground in existing rights-of-way. Additional ground disturbance and vegetation removal is expected to be minimal.

3.5 RECOMMENDED TRANSPORTATION MITIGATIONS

There are 9 NLCD cover types, occupying 266 acres, associated with the recommended modifications of existing roadways, as shown on Attachment 2, Figure 2B. These existing roadway rights-of-way are disturbed and mostly developed. The dominant NLCD cover type is Developed, Medium Intensity (95 acres), followed by Developed, Low Intensity (88 acres), and Developed, Open Space (31 acres) (Table 8). Woodland cover types are non-dominant and occupy approximately 9 total acres. Active farmland, covering Pasture/Hay (20 acres) and Cultivated Crops (4 acres), occupies approximately 24 total acres (Table 8).

TABLE 8.
NLCD COVER TYPES WITHIN THE LIMITS OF DISTURBANCE FOR THE RECOMMENDED MODIFICATIONS OF EXISTING ROADWAYS

NLCD Cover Type	Recommended Modifications of Existing Roadways
Open Water	0
Developed, Open Space	31
Developed, Low Intensity	88
Developed, Medium Intensity	95
Developed High Intensity	16
Barren Land (Rock/Sand/Clay)	0
Deciduous Forest	5
Evergreen Forest	0
Mixed Forest	0
Shrub/Scrub	2
Grassland/Herbaceous	0
Pasture/Hay	20
Cultivated Crops	4
Woody Wetlands	5
Emergent Herbaceous Wetlands	0
Total LOD Acreage	**266**

Source: USGS NLCD 2021. All acreages rounded to the nearest whole number. Due to rounding, totals are subject to differ from the sum of their components.

3.5.1 RECOMMENDED NEW INTERCHANGE FROM NYS ROUTE 481 AND NEW ACCESS ROAD

There are 7 NLCD cover types, occupying approximately 35 total acres, within the approximately 1.6-mile-long and up to 200-foot-wide right-of-way for the recommended new access road that would extend from a proposed new interchange at NYS Route 481 to the Rail Spur Site (Attachment 2, Figure 2C). The dominant NLCD cover type is Deciduous Forest (18 acres) followed by Pasture/Hay (4 acres) and Developed, Low Intensity (4 acres) (Table 9). There is a total of approximately 22 acres of forest. Developed areas, which range from uses such as lawns, driveways, residential lots, and local roads (i.e., Developed, Open Space) to moderately used roadways and sparsely vegetated rights-of-way (i.e., Developed, Medium Intensity), occupy approximately 9 acres.

TABLE 9.
NLCD COVER TYPES WITHIN THE LIMITS OF DISTURBANCE FOR THE RECOMMENDED NEW INTERCHANGE FROM NYS ROUTE 481 AND NEW ACCESS ROAD

NLCD Cover Type	Recommended New Interchange from NYS Route 481 and New Access Road
Open Water	0
Developed, Open Space	2
Developed, Low Intensity	4
Developed, Medium Intensity	3
Developed High Intensity	0
Barren Land (Rock/Sand/Clay)	0
Deciduous Forest	18
Evergreen Forest	0
Mixed Forest	1
Shrub/Scrub	0
Grassland/Herbaceous	0
Pasture/Hay	4
Cultivated Crops	0
Woody Wetlands	3
Emergent Herbaceous Wetlands	0
Total LOD Acreage	**35**

Source: USGS NLCD 2021. All acreages rounded to the nearest whole number. Due to rounding, totals are subject to differ from the sum of their components.

4. LAND DISTURBANCE

4.1 MICRON CAMPUS

Upon full buildout, the Micron Campus, including the four fabs and other support buildings, electrical substation and duct bank, staging and laydown areas, stormwater management areas and outfalls, water and wastewater treatment and storage facilities, and entryways and parking areas, would have a total footprint of disturbance of approximately 997 acres. Most of this footprint would be covered by buildings, parking areas and garages, and other impervious surfaces while the remainder would be covered by manicured lawn, landscaped areas of native plantings throughout the campus interior (e.g., between buildings) and along the campus' perimeter, and stormwater bioretention and extended detention ponds. Approximately 380 total acres of the site would remain undeveloped and undisturbed (Table 10).

TABLE 10.
DISTURBANCE AREA (ACRES AND PERCENTAGE OF EXISTING ACREAGE) BY NLCD COVER TYPES ON THE MICRON CAMPUS, CHILDCARE SITE, AND RAIL SPUR SITE

NLCD Cover Type	Micron Campus		Childcare Site		Rail Spur Site		Proposed Project Total	
	Acres Disturbed	% Disturbed	Acres Disturbed	% Disturbed	Acres Disturbed	% Disturbed	Acres Disturbed	% Disturbed
Open Water	0	0.0	0	0.0	0	0.0	0	0.0
Developed, Open Space	28	86.3	0	0.0	1	42.2	29	79.1
Developed, Low Intensity	11	78.4	0	0.0	0	30.7	11	73.8
Developed, Medium Intensity	1	22.5	0	0.0	0	1.4	1	22.3
Developed High Intensity	0	0	0	0.0	0	0.0	0	0
Deciduous Forest	346	74.2	0	0.0	18	60.7	364	72.8
Evergreen Forest	4	100	0	0.0	0	0.0	4	100
Mixed Forest	7	100	0	0.0	4	78.1	11	90.9
Shrub/Scrub	1	100	0	0.0	0	0.0	1	100
Grassland/Herbaceous	2	100	0	0.0	0	0.0	2	100
Pasture/Hay	440	90.2	13	52.5	1	92.3	453	88.4
Cultivated Crops	63	63.7	0	0.0	0	0.0	63	63.7
Woody Wetlands	87	36.5	0	0.0	0	0.0	87	36.5
Emergent Herbaceous Wetlands	6	33.1	0	0.0	0	0.0	6	33.1
Total LOD	**997**	**72.3**	**13**	**42.6**	**24**	**62.0**	**1034**	**71.4**

Notes: All acreages rounded to the nearest whole number. Due to rounding, LOD totals are subject to differ from the sum of their NLCD components.

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Source: USGS NLCD 2021

Based on the 2021 NLCD, the approximately 997-acre Micron Campus footprint would remove approximately 445 total acres of forest (all forest and forested wetland cover types combined), 503 acres of field (Pasture/Hay and Cultivated Crops), 6 acres of non-forested (Emergent Herbaceous) wetlands, 3 acres of grassland and shrubland, and 40 acres of developed space. As noted above, due to years of inactivity, many of the fields that are mapped as Pasture/Hay and Cultivated Crops by the 2021 NLCD have succeeded into an old field or shrubland state. Therefore, most of the 503 acres mapped by NLCD as Pasture/Hay or Cultivated Crops that would be within the development footprint of the Campus would be better described as successional old field and successional shrubland.

Of the approximately 380 acres on the Micron Campus that would be undisturbed and remain in its current state, approximately 272 acres would be forest (all forest types and woody wetlands combined), approximately 84 acres would be agricultural field (Pasture/Hay and Cultivated Crops), approximately 11 acres would be non-forested wetland, and approximately 11 acres would be land that is already developed (due to rounding, these values sum to 378 acres, but the total size of the undeveloped portion of the Campus would be 380 acres).Most of the 84 undisturbed acres mapped by the NLCD as Pasture/Hay and Cultivated Crops has not been recently farmed and is currently best described as a mix of old field and shrubland.

4.2 RAIL SPUR SITE

It is estimated that the approximately 38-acre Rail Spur Site, across Caughdenoy Road from the Micron Campus, would have a total footprint of disturbance of approximately 24 acres (including access to the site from the proposed recommended transportation mitigations) (Table 10). Of this, approximately 22 acres is mapped by the NLCD as Deciduous and Mixed Forest, approximately 1 acre is mapped as Developed Space, and approximately 1 acre is mapped as Pasture/Hay.

4.3 CHILDCARE SITE

Elements of the proposed Childcare Site include a childcare center, healthcare center, recreation center, playground, natural turf soccer field, tennis/pickleball courts, three parking areas, five stormwater management/bioretention areas, sewage leach field, and a native pollinator garden. The proposed site plan would have a total permanent footprint of disturbance of approximately 13 acres on the approximately 31-acre site, leaving approximately 18 acres undisturbed (Table 10). The footprint of disturbance would span existing old field/cropland and no other land-cover types. No tree clearing would occur; thus, the existing shelterbelts on the western and northern property lines and the forest fragment in the northeastern corner of the site would be undisturbed. The limits of disturbance would be set back a minimum of 50 feet from the frontage on Caughdenoy Road and the shelterbelts along the northern and western property boundaries, and at least 100 feet from the wetlands on the eastern side of the property.

4.4 CONNECTED ACTIONS

4.4.1 CLAY SUBSTATION EXPANSION

Land disturbance for the approximately 39-acre expansion of the existing Clay substation would be limited to developed space and small fragments of former Pasture/Hay and Cultivated Crops with scattered young trees. Tree removal would therefore be extremely minimal. As early successional habitat with few, small-diameter trees, suitability of the area as roosting habitat for bats is low, although there is still potential for bats to roost there.

4.4.2 NATURAL GAS LINE

As described above, the approximately 3.1mile-long natural gas line would be installed using a combination of cut-and-cover construction and HDD, with temporary workspace/laydown areas required along the route. A portion of the gas line would be co-located within an existing utility

ROW, which is routinely maintained to limit vegetation growth. Construction of GRS 147A on the existing GRS 147 property would occur within an existing gravel lot. There are approximately 8 total acres of forest present along the natural gas alignment. It is conservatively estimated (i.e., worst case scenario based on 100-foot-wide disturbance corridors) that construction of the natural gas line would require clearing these 8 acres, although actual clearing would likely be less.

4.4.3 WATER SUPPLY INFRASTRUCTURE

It is conservatively estimated (i.e., worst case scenario based on 100-foot-wide disturbance corridors) that construction of the proposed water supply infrastructure would result in approximately 199 total acres of tree removal (i.e., Deciduous Forest, Woody Wetlands, Mixed Forest, and Evergreen Forest combined). This tree clearing would be required to widen the existing ROW associated with the existing water supply infrastructure, which includes the water transmission line from Lake Ontario down to the LOWTP, OCWA’s Clear Water Transmission Main from LOWTP to the OCWA Terminal Campus, modifications of the OCWA’s Eastern Branch Transmission, and the Eastern Branch Transmission Main to the Micron Campus.

4.4.4 INDUSTRIAL WASTEWATER

The force mains for industrial wastewater conveyance would be installed belowground using HDD to the greatest extent practicable to minimize tree removal and other surface disturbances. It is estimated that installation of the 2-mile-long route from the Oak Orchard site to the Micron Campus would require approximately 11 total acres of tree removal consisting of Deciduous Forest, Woody Wetlands, Mixed Forest, and Evergreen Forest according to the 2021 NLCD, mostly within a 50- to 99-foot-wide linear corridor. Reclamation of treated wastewater from the Oak Orchard site would use conveyance lines located within the same route as the industrial wastewater conveyance, and therefore require no additional ground disturbance.

Development of the new IWWTP would have an approximately 36-acre area of disturbance within the Oak Orchard site, most of which is either developed or otherwise unforested. Approximately 10 total acres of tree clearing would be required for the expansion, including approximately 9 acres of Deciduous Forest and approximately 1 acre of Woody Wetlands.

4.4.5 TELECOMMUNICATIONS

The specific routing of the telecommunication connections has yet to be designed, but it is likely to involve connections along existing utility poles or underground conduit from terminal points adjacent to the Micron Campus. As such, ground disturbance is expected to be limited to existing rights-of-way and require minimal to no tree removal.

4.5 RECOMMENDED TRANSPORTATION MITIGATIONS

Aside from the new NYS Route 481 interchange and 1.6-mile-long access road, the recommended transportation mitigations would be limited to disturbed and mostly developed areas along existing roads. Disturbance of currently undisturbed space for the modifications of existing roadways would be limited to approximately 9 total acres of forest and 24 total acres of active farmland (Table 8).

Construction of the recommended new interchange from NYS Route 481 and 1.6-mile-long access road extending from it to the Rail Spur Site would require a maximum of approximately 22 acres of tree removal in addition to approximately 4 acres of agricultural field (Table 9). The new access road would have a 200-foot-wide construction corridor, including the segment that would bisect the approximately 175-acre forest between the CSX railroad tracks to the west and Caughdenoy Road to the east.

5. EFFECTS ANALYSIS

5.1 HABITAT LOSS

As discussed below, the Proposed Project, Connected Actions, and recommended transportation mitigations would result in the removal of a total of approximately 727 acres of potential forested roosting habitat for Indiana, northern long-eared, and tricolored bats, based on the acreage of all 2021 NLCD woodland cover types combined (Table 11). All tree clearing for the Micron Campus, Childcare Site, Rail Spur Site, Connected Actions, and recommended transportation mitigations would occur during the November 1 to March 31 hibernation period of Indiana bats, northern long-eared bats, and tricolored bats to avoid direct disturbance, injury, or mortality that can result from the felling of an active roost tree. Therefore, construction would not have any direct impacts to Indiana bats, northern long-eared bats, or tricolored bats. Potential construction impacts would be limited to indirect effects resulting from habitat loss, and construction noise and lighting disturbances to any bats potentially occurring in adjacent areas of suitable habitat.

Construction would not have any direct or indirect effects on hibernating Indiana bats, northern long-eared bats, tricolored bats, or their hibernacula, because there are no known hibernacula in or near any portions of the Action Area. Similarly, construction would not affect fall swarming bats or fall swarming habitat, which is limited to within only a few miles of a hibernaculum entrance (Ormsbee et al. 2007, Adams 2013, USFWS 2023).

TABLE 11.
PRE- AND POST-CONSTRUCTION ROOSTING HABITAT ACREAGE BY PROJECT COMPONENT

Project Component	Total Acreage	Total Forest/Roosting Habitat Acreage	Total Forest/Roosting Habitat Acreage to be Removed	Total Forest/Roosting Habitat Remaining
Micron Campus	1377	717	445	272
Childcare Site	31	4	0	4
Rail spur	38	35	22	13
Total Proposed Project	**1446**	**756**	**467**	**289**
Connected Actions				
Clay Substation Expansion	39	0	0	0
Natural Gas Line	35	8	8	0
Water Supply Infrastructure	462	199	199	0
Industrial Wastewater Infrastructure	99	39	21	18
Total Connected Actions	**635**	**246**	**229**	**18**
Recommended Transportation Mitigations				
Modification of Existing Roadways	266	9	9	0
New interchange from NYS Route 481 and New Access Road	35	22	22	0
Total Recommended Transportation Mitigations	**301**	**31**	**31**	**0**
Grand Total	**2382**	**1033**	**727**	**307**

Note: Roosting habitat defined as the combined acreage of all 2021 NLCD woodland cover types (Deciduous Forest, Evergreen Forest, Mixed Forest, Woody Wetlands). All acreages rounded to the nearest whole number. Due to rounding, total area sizes are subject to differ from the sum of their NLCD components.

5.1.1 MICRON CAMPUS

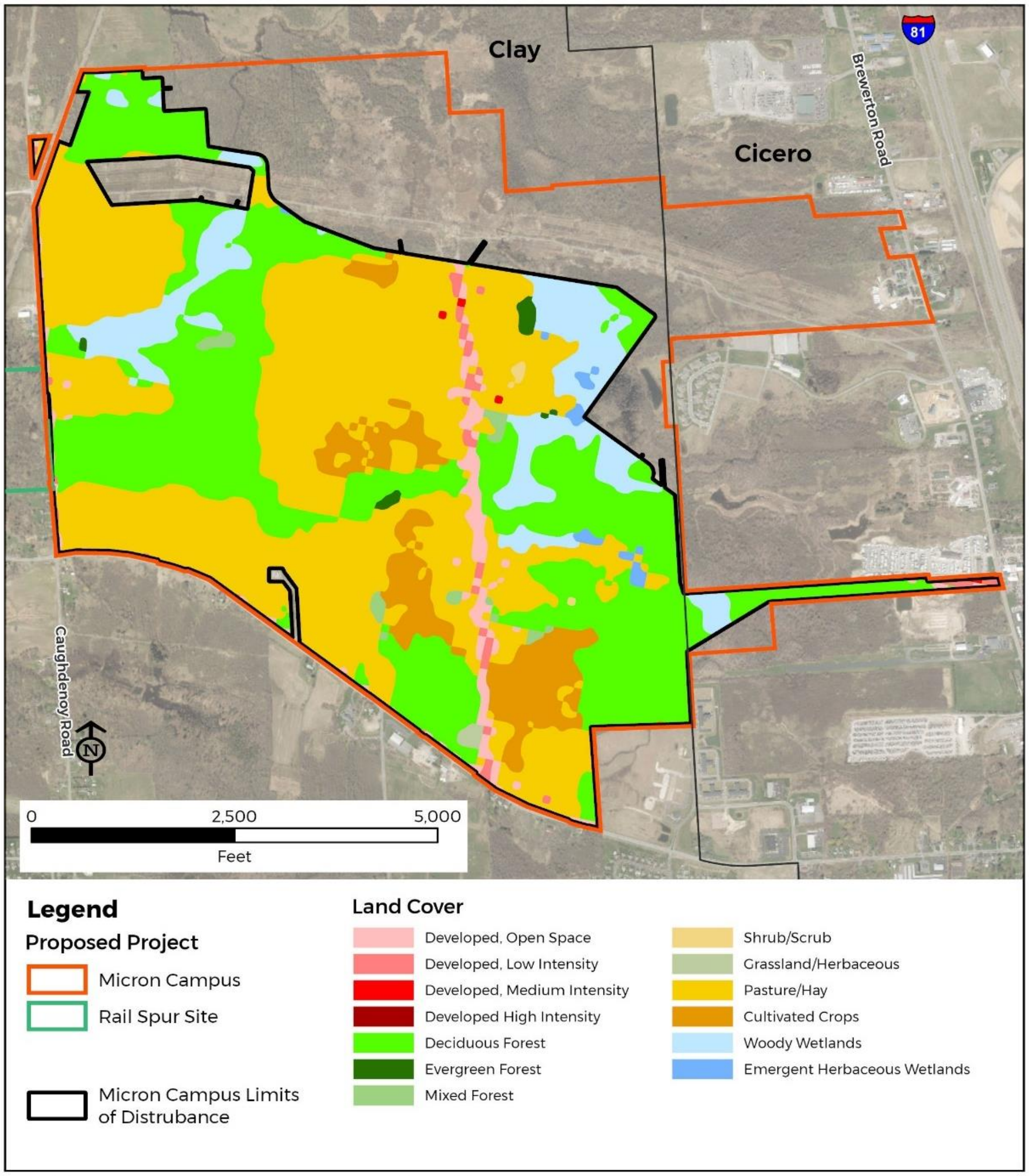
As discussed above, full buildout of the Micron Campus would directly disturb approximately 997 total acres, consisting of approximately 358 total acres of upland forest (all upland forest cover types combined), 87 acres of woody wetlands, 503 acres of agricultural field (Pasture/Hay and Cultivated Crops), 6 acres of herbaceous wetlands, 3 acres of grassland and shrubland, and 40 acres of developed space. Most of the 503 acres mapped by NLCD as Pasture/Hay or Cultivated Crops that would be within the development footprint of the Campus would be better described as successional old field and successional shrubland.

Approximately 445 of the approximately 717 total acres of forest (all forest cover-types and woody wetlands combined) currently on the Micron Campus would eventually be cleared and graded, mostly for construction of Fabs 1 and 4. This includes the mature forest types on the western side of the Micron Campus and forested wetland on its eastern side, locations where Indiana bats, northern long-eared bats, and tricolored bats were detected during the 2023 acoustic bat survey. Approximately 272 total acres of forest would remain outside of the Micron Campus' limits of disturbance, mostly to the north of the National Grid utility corridor, along with approximately 84 acres of Pasture/Hay and Cultivated Crops, and approximately 11 acres of Emergent Herbaceous Wetland (Table 11 and Figure 16). Most of the 84 acres of Pasture/Hay and Cultivated Crops would be better described as old field and shrubland due to farming inactivity in recent years.

Vegetation within the Micron Campus' development footprint following full buildout would be limited to soft-scaped areas near buildings, parking areas, and the construction compound, and around margins of stormwater detention ponds and bioretention areas. Development of the existing old fields and successional shrublands throughout the Micron Campus would eliminate all existing non-forested foraging habitat for Indiana and tricolored bats aside from the shallow emergent marsh and common reed marsh north of the utility corridor. Development in the Youngs Creek wetland complex in the eastern portion of the Campus during Phase 2, and the ephemeral streams and wetlands on the western portion during Phase 1, would reduce current sources of drinking water and aquatic-emergent insect prey for bats on the Micron Campus.

Following full buildout, shallow emergent marsh would remain north of the National Grid utility corridor, and some forested wetland in the Youngs Creek complex would also remain on- and offsite to the east of Fab 4. The stormwater management areas that would be constructed around the Micron Campus' perimeter would also potentially provide foraging habitat and drinking water to Indiana bats and tricolored bats given their proximity to adjacent, undisturbed areas of forest and forested wetland beyond the limits of disturbance. Northern long-eared bats would not be expected to use the Micron Campus' stormwater management areas given the species' tendency to avoid edges and open areas.

FIGURE 16. NLCD COVER TYPES WITHIN THE MICRON CAMPUS LIMITS OF DISTURBANCE



World Imagery: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Upon returning to the Micron Campus site in the first spring following tree removal and other site preparations for Phase 1, Indiana bats and northern long-eared bats would be required to find suitable maternity habitat beyond the construction area in the event their roosts were lost. Because development of the Micron Campus would occur in phases as each of the four fabs is sequentially constructed over an approximately 16-year period, habitat loss would be gradual and suitable roosting and foraging areas would initially remain available to any displaced bats onsite as well as in adjacent areas to the north and east. As development of the Micron Campus proceeded from west to east towards full buildout, the amount of habitat loss would be expected to eventually exceed the tolerance thresholds of Indiana and northern long-eared bats and result in social network and colony dissolvement (Silvis et al. 2014 a,b; Silvis et al. 2015). Any displaced reproductive females, which are pregnant upon spring arrival, would be required to promptly find alternative maternity habitat in which to birth and rear their pup and intensively forage to meet the high energy demands of lactation, likely leading to low birth rates, low juvenile survival, and poor recruitment that year (Brigham and Fenton 1986, Neilson and Fenton 1994, Barclay et al. 2004, Kurta 2004, Borkin et al. 2011, Chaverri and Kunz 2011).

As long-lived species with low reproductive rates, adult survival rate is often a more significant demographic factor regulating bat population size and viability than fecundity, pup survival, and juvenile recruitment (Pryde et al. 2005, Schorcht et al. 2009, Thogmartin et al. 2013, Bailey et al. 2017). This includes the Indiana bat, populations of which Thogmartin et al. (2013) found to be sensitive to adult survival rate but relatively resilient to variation in pup survival and recruitment. Therefore, it is possible that reductions in pup survival and recruitment that could result from displacement from the Micron Campus would not have significant impacts to the size of the local Indiana bat and northern long-eared bat populations, provided there is no effect on adult survival and adults are able to successfully relocate the following summer to habitat of equal or greater suitability.

Following full buildout, nearby tracts of potential roosting and foraging habitat that would potentially be available to Indiana and northern long-eared bats displaced from developed portions of the Micron Campus include a mix of woodland and wetlands extending north from the National Grid utility corridor to Mud Mill Road; woodlands bordering Shaver Creek, Youngs Creek, and the Oneida River to the north of Verplank Road; woodland between Caughdenoy Road and Stearns Road, south of NYS Route 31; and a remnant portion of the Youngs Creek forested wetland complex to the east of Fab 4. It cannot be known whether such areas would meet the resource requirements of displaced Indiana and northern long-eared bats, or if the displacement would affect adult survival. Impacts to population size and viability from the loss of roosting and foraging habitat on the Micron Campus would therefore be possible through potential reductions in fecundity, adult survival, or both.

The areas listed above would also represent the most suitable, nearby habitat available to tricolored bats displaced from the Micron Campus. The results of the acoustic bat survey conducted on the Micron Campus suggest tricolored bats are present there only as rare and transient individuals, for brief periods, and are not using the site as maternity or core foraging habitat, although high-flying tricolored bats could have been undetected by the acoustic recorders. Due to their adaptability to a variety of forest types and conditions, and their high mobility, tricolored bats are considered relatively tolerant of local habitat loss and capable of relocation (USFWS 2022). While reproductive females may have more limited capacity for long-distance relocation (USFWS 2022), the extremely low acoustic activity of tricolored bats detected during the survey indicates the site is not being used as maternity habitat. Moreover, habitat loss is not considered a significant threat currently facing tricolored bat populations (USFWS 2021a, 2022). For these reasons, habitat loss resulting from development of the Micron Campus would not be expected to significantly impact tricolored bats at the individual or population level.

5.1.2 RAIL SPUR SITE

Construction of the Rail Spur Site would clear approximately 24 acres of the approximately 38-acre site, leaving only islands of trees that would likely be too small to be viable roosting or foraging habitat for Indiana, northern long-eared, or tricolored bats. Any bats that potentially use the Rail Spur Site for foraging and/or roosting would likely be displaced and required to relocate upon arrival to the Rail Spur Site in the first spring following the start of construction. In contrast to the Micron Campus, the loss of this small habitat fragment that is located between a road and railroad tracks would not be a significant reduction in habitat availability for these species in the surrounding landscape. This amount of habitat loss is expected to be within the tolerance thresholds of Indiana, northern-long eared, and tricolored bats (*sensu* Silvis et al. 2014 a,b; Silvis et al. 2015; USFWS 2022) and unlikely to cause significant adverse impacts to the species at the individual or population level. Cumulatively, the approximately 22 acres of woodland cleared on the Rail Spur Site would represent a minor addition to the approximately 445 acres of roosting habitat and approximately 512 acres of non-forested foraging habitat (i.e., Shrub/Scrub, Grassland/Herbaceous, Pasture/Hay, Cultivated Crops, Emergent Herbaceous Wetlands) cleared for the main portion of the Micron Campus. As such, the Rail Spur Site on its own would not be expected to significantly impact Indiana, northern long-eared, or tricolored bats, or meaningfully add to the potential impacts to these species from the Micron Campus.

5.1.3 CHILDCARE SITE

No trees would be cleared to construct the Childcare Site. The limits of disturbance for the Childcare Site would fit within an existing agricultural field while the existing shelterbelts of trees along the western and northern property lines, and the small forest fragment in the northeastern corner of the site would be undisturbed. Therefore, no loss of potential roosting habitat for bats would occur. The lack of sizable forest on the Childcare Site, and therefore lack of forest edge with the agricultural field, makes the Childcare Site unlikely to be used as foraging habitat by Indiana or tricolored bats, and even less so by northern long-eared bats. As such, development of the approximately 13-acre Childcare Site would not be expected to impact foraging habitat for these species, and an abundance of similar agricultural fields would remain available in the surrounding landscape.

5.1.4 CONNECTED ACTIONS

5.1.4.1 CLAY SUBSTATION EXPANSION

Land disturbance for the 39-acre expansion of the existing Clay substation would be limited to developed space and small fragments of former Pasture/Hay and Cultivated Crops with scattered young trees. As early successional habitat with few, small-diameter trees, suitability of the area as roosting habitat for bats is low, although there is still potential for bats to roost and forage there. Given the presence of more suitable foraging and roosting habitat in adjacent areas to the north, east, and west, loss of this small patch of early successional habitat and small number of young trees would not be expected to impact Indiana, northern long-eared, or tricolored bats.

5.1.4.2 NATURAL GAS LINE

As described above, the approximately 3.1-mile-long natural gas line would be installed using a combination of cut-and-cover construction and HDD, with temporary workspace/laydown areas required along the route. A portion of the gas line would be installed in the existing Eastern Branch Transmission Main right-of-way, which is routinely maintained to limit vegetation growth. Construction of GRS 147A on the existing GRS 147 property would occur within an existing gravel lot.

It is conservatively estimated (i.e., worst case scenario) that construction of the natural gas line would require clearing approximately 8 total acres of trees in an approximately 100-foot-wide corridor of disturbance needed for open trench installation and construction vehicle access and staging, although actual clearing would likely be limited to a narrower corridor. Some of this forest clearing would be only a temporary loss of potential bat habitat, as some of the up to 100-foot-wide corridor would be allowed to revert back to forest in the long term following installation. Only an approximately 70-foot-wide corridor would need to be maintained as non-forested post-construction. While the remainder of the corridor is reverting back to forest and the approximately 70-foot-wide corridor is maintained in an herbaceous to shrubland state, the net loss in tree cover would represent a small reduction in roosting habitat availability and potentially improve foraging and commuting conditions for Indiana bats and tricolored bats. The up to 100-foot-wide temporary corridor created by installation of the gas line and the approximately 70-foot-wide permanent maintenance corridor afterwards would be narrow enough and vegetated enough to likely avoid fragmentation effects on northern long-eared bats. Indiana, tricolored, and northern long-eared bats have been documented using utility corridors as commuting and/or foraging habitat (reviewed by Campbell et al. 2024).

5.1.4.3 WATER SUPPLY INFRASTRUCTURE

As discussed above, it is estimated that the various components of the proposed water supply infrastructure improvements would result in approximately 199 total acres of tree removal. This is mostly attributable to the tree clearing associated with components of the existing water supply infrastructure, consisting of the water transmission line from Lake Ontario down to the LOWTP, OCWA’s Clear Water Transmission Main from LOWTP to the OCWA Terminal Campus, modifications of the OCWA’s Eastern Branch Transmission, and a 50-foot ROW from the Eastern Branch Transmission Main to the Micron Campus. Modifications to the Lake Ontario Water Treatment Plant and OCWA Terminal Campus would require no or negligible tree removal, as the proposed work would occur in currently paved or mowed areas.

The approximately 199 acres of tree clearing required for the proposed water supply infrastructure would result from a conservatively estimated 100-foot-wide corridor of disturbance needed for open trench installation, construction vehicle access and staging in the forested portion of the alignment. The actual limits of disturbance would likely be narrower. One segment of the alignment would parallel NYS Route 481 near its interchange with NYS Route 264 in the Town of Phoenix, where a forested area around Sixmile Creek is known to contain three Indiana bat roost trees that were discovered by a radiotelemetry study in 2006. The closest of these known roost trees is approximately 320 feet from the alignment’s limits of disturbance, and therefore, no removal of known roost trees would result from the tree clearing.

Much of the forest clearing for the 2.5-mile transmission main would be a temporary loss of potential bat habitat since most of the 100-foot-wide construction corridor would be allowed to revert back to forest following installation. It is expected that OCWA would need to maintain an approximately 70-foot-wide corridor as non-forested following construction. While the remainder of the corridor is reverting back to forest over time and the remaining 70-foot-wide corridor is maintained in an herbaceous to early successional state, the net loss in tree cover would represent a small reduction in roosting habitat availability in the area and potentially improve foraging and commuting conditions for Indiana bats and tricolored bats. As an example, the maintained OCWA waterline corridor, currently running east-west through the southern end of the Micron Campus, is where the highest levels of Indiana bat activity were recorded during the acoustic bat survey conducted in the summer of 2023, which shows this species' preference for forest corridors as foraging habitat. The100-foot-wide temporary corridor created by construction of the new waterline and the 70-foot-wide permanent corridor that would be maintained in the future would likely be narrow and vegetated enough to avoid fragmentation and the creation of sharp forest edges that could reduce habitat suitability for northern long-eared bats. All three of these bat species have been documented using utility corridors as commuting and/or foraging habitat (Campbell et al. 2024).

5.1.4.4 INDUSTRIAL WASTEWATER

The force mains associated with the industrial wastewater conveyance would be installed belowground using HDD to the greatest extent practicable and located in existing rights-of-way to minimize tree removal and other surface disturbances. It is estimated that installation of the approximately 2-mile industrial wastewater conveyance from the Oak Orchard site to the Micron Campus would require approximately 11 total acres of tree removal, mostly within a 50-99-foot-wide linear corridor. Reclamation of treated wastewater from the Oak Orchard site would use conveyance lines located within the same route as the industrial wastewater conveyance, and therefore require no additional ground disturbance. Development of the new IWWTP would require approximately 10 total acres of tree removal.

As with the natural gas line and water supply infrastructure, forest clearing for the industrial wastewater conveyance would represent mostly a temporary loss of potential bat habitat, since a portion of the alignment corridor's forested sections would be allowed to revert to forest following installation. It is expected that an approximately 70-foot-wide corridor would need to be maintained as non-forested post-construction. While the remainder of the corridor is reverting back to forest in the long term and when the remaining 70-foot-wide corridor is maintained in an herbaceous to early successional state, the net loss in tree cover would represent a minor reduction in roosting habitat availability in the area and potentially improve foraging and commuting conditions for Indiana bats and tricolored bats. The 50-99-foot-wide temporary corridor created by installation of the industrial wastewater conveyance and the 70-foot-wide permanent corridor that would be maintained in the future would both be narrow enough and vegetated enough to create soft edges and likely avoid fragmentation effects on northern long-eared bats. Indiana, northern long-eared, and tricolored bats have all been documented using utility corridors as commuting and/or foraging habitat (reviewed by Campbell et al. 2024). Overall, construction of the industrial wastewater infrastructure would not result in habitat loss that would be expected to impact the Indiana, northern long-eared, or tricolored bat.

5.1.4.5 TELECOMMUNICATIONS

The specific routing of the telecommunication connections has yet to be designed, but it is likely to involve connections along existing utility poles or underground conduit from terminal points adjacent to the Micron Campus. As such, ground disturbance is expected to be limited to existing rights-of-way and require minimal to no tree removal. This would constitute a negligible loss of potential roosting or foraging habitat for Indiana, northern long-eared, and tricolored bats and have no effect on these species at an individual or population level.

5.1.5 RECOMMENDED TRANSPORTATION MITIGATIONS

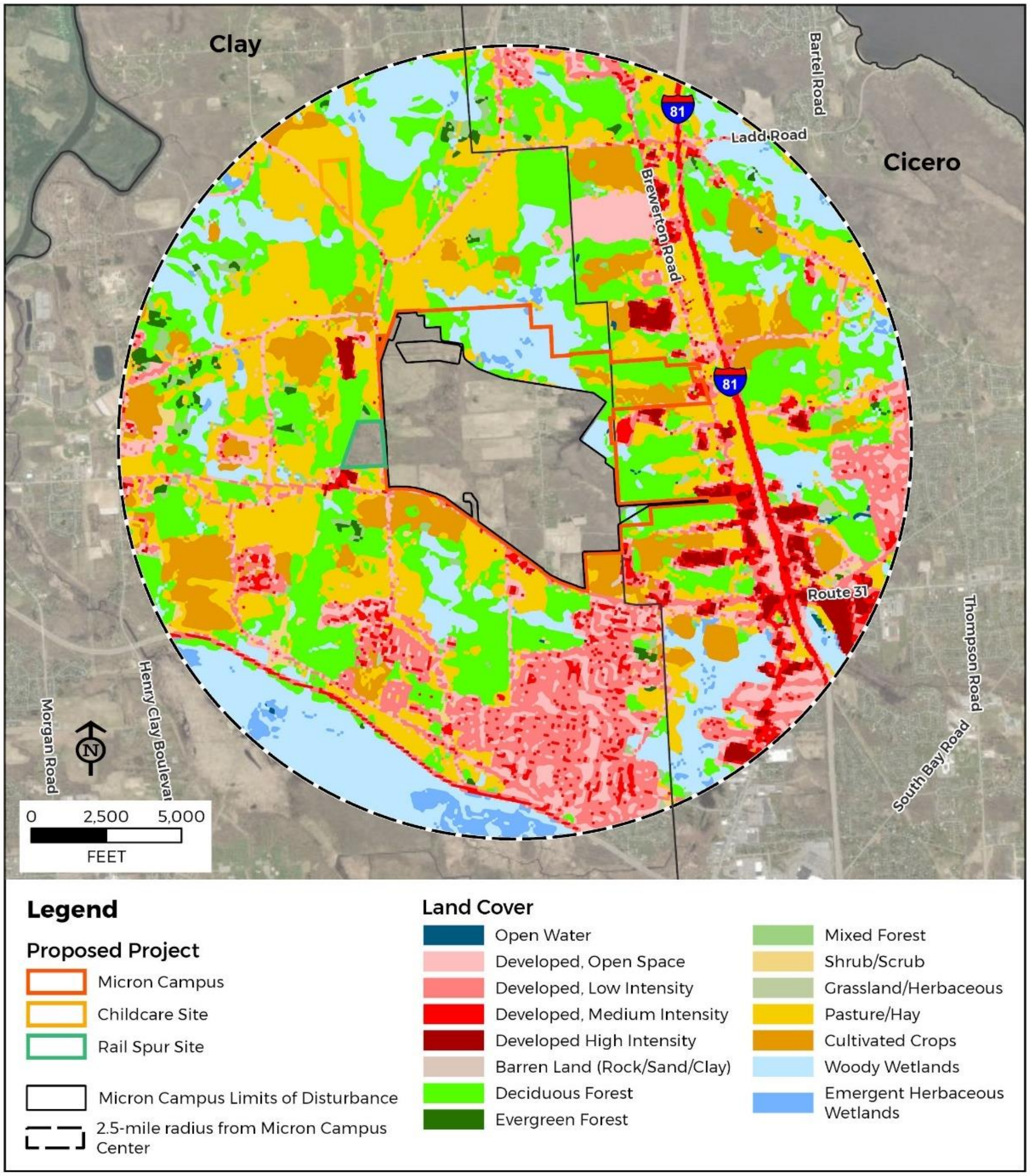
The recommended transportation mitigations have not been designed in detail, but the recommended modifications of existing roadways would be expected to require minimal removal of roadside trees (approximately 9 total acres) occurring on the edges of intersections, interchanges, and road segments where modifications would occur. Roadside trees are of low suitability as roosting habitat for Indiana, northern long-eared, and tricolored bats, and the trees occurring in the vicinity of the recommended transportation mitigations would be unlikely to be used as roost sites by these species over the various forested lands available in the same landscape. Removal of roadside trees would not meaningfully reduce roosting habitat availability to local bat populations or otherwise impact Indiana, northern long-eared, and tricolored bats.

The new 1.6-mile access road extending north from a new interchange at NYS Route 481, between the CSX rail tracks and Caughdenoy Road, and terminating at the Rail Spur Site would involve forest disturbance. This road alignment would bisect an approximately 175-acre forest fragment that is south of NYS Route 31, east of the CSX rail tracks, and west of Caughdenoy Road, where potentially suitable roosting and foraging habitat exists for Indiana, northern long-eared, and tricolored bats. The bisection of this forest by the 200-foot-wide road would remove approximately 22 acres of suitable roosting and foraging habitat and potentially make all or much of the remaining forest unsuitable for these species as a result of fragmentation and edge effects in addition to the disturbances subsequently generated by safety lighting and motor vehicles once it was operational (Zurcher et al. 2010, Bennett and Zurcher 2013, Bennett et al. 2013) (operations impacts discussed below).

5.1.6 REMNANT FOREST COVER

According to the USGS NLCD, forest (i.e., combined categories of Deciduous Forest, Evergreen Forest, Woody Wetlands, and Mixed Forest) currently covers approximately 42.0 percent of the land within 2.5 miles of the center point of the Micron Campus (Figure 17). Following full buildout of the Proposed Project (Micron Campus, Childcare Site, Rail Spur Site), that percentage would decrease to approximately 38.4 percent but remain above the USFWS goal of maintaining a minimum of 35 percent forest-cover surrounding Indiana bat colonies (USFWS 2012).

FIGURE 17. NLCD COVER TYPES WITHIN A 2.5-MILE RADIUS OF THE MICRON CAMPUS LIMITS OF DISTURBANCE



World Imagery: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

5.2 EFFECTS FROM NOISE AND HUMAN ACTIVITY

5.2.1 BACKGROUND ON NOISE SENSITIVITY IN BATS

Anthropogenic noise is thought to mainly affect bats by masking the echolocation signals of aerial-foraging species and interfering with passive listening by gleaning species, with the latter group generally showing higher sensitivity. For this reason, bats appear to be more sensitive to noise while foraging than while roosting. Some studies have shown foraging behavior to be affected by various forms of anthropogenic noise such as motor vehicle traffic (Finch et al. 2020), train passage (Jarem and Mathews 2021), natural gas extraction (Bunkley et al. 2015), and outdoor music concerts (Shirley et al. 2001, Hooker et al. 2023). Road noise can reduce the foraging activity and efficiency of bats (Schaub et al. 2008, Murphy et al. 2009, Siemers and Schaub 2011, Bennett et al. 2013) even though its maximum frequencies are at the lower end of the hearing ranges of most bat species (Bonsen et al. 2015, California Department of Transportation 2016).

Therefore, noise can sometimes be a negative stimulus that causes avoidance by foraging bats even when there is little signal interference (Luo et al. 2015). Usually, however, the effect of anthropogenic noise on bats depends on the degree to which the frequency of the noise overlaps with their echolocation and/or hearing ranges. High-frequency, aerial-foraging species, such as many species in the genus *Myotis*, tend to be unaffected because most anthropogenic noise sources are well below their echolocation ranges, while the opposite is true of lower-frequency species (Bunkley et al. 2015, California Department of Transportation 2016, Hooker et al. 2023). For example, Bunkley et al. (2015) found noise from natural gas compression stations in the U.S. to be associated with significantly lower foraging activity of low-frequency, aerial-foraging bat species (< 35 kHz) while having no effect on the foraging activity of high-frequency, aerial-foraging species (> 35 kHz), including the little brown bat, a close relative of the Indiana and northern long-eared bat. Gleaners typically show greater sensitivity than aerial foragers, likely because of a greater masking effect of anthropogenic noise on passive listening than echolocation (Schaub et al. 2008, Siemers and Schaub 2011).

In sum, the most consistent patterns found in studies of noise impacts to bats are: (1) bats are less sensitive to noise while roosting than foraging, (2) high-frequency species are less affected than low-frequency species, and (3) aerial foragers are less affected than passive-listening gleaners. The Indiana bat, northern long-eared bat, and tricolored bat are all high-frequency species (Fenton and Bell 1981, Miller and Treat 1993, MacDonald et al. 1994); the Indiana bat and tricolored bat are aerial foragers while the northern long-eared bat is a gleaner (USFWS 2007, Lacki et al. 2007, Hein et al. 2009).

Tolerance of low-frequency anthropogenic noise by high-frequency bats is consistent with observations of these species occurring in areas with extensive noise pollution. Indiana bats, for example, have been observed roosting near airports and under bridges (Sparks et al. 1998, Keeley and Tutle 1999), demonstrating that they can be tolerant of chronic noise and surface vibrations from very loud (to the human ear) forms of human activity while roosting. Both roosting and foraging behaviors of Indiana bats on military bases were found to be unaffected by artillery fire and helicopter activity (Martin et al. 2004, Shapiro and Hohmann 2005), which also suggests Indiana bats are not always disturbed by exceptionally loud noises and strong reverberations. Similarly, Indiana bats have been found to continue roosting adjacent to active construction sites, which indicates a tolerance of construction noises while day-roosting (Niver 2009).

There do not appear to be any direct studies of the sensitivity of northern long-eared bats or tricolored bats to construction noise or other forms of anthropogenic noise while roosting or foraging. However, northern long-eared bats and tricolored bats (as well as Indiana bats) are known to roost and forage in a well-studied area near the Indianapolis International Airport (Sparks et al. 1998, Helms 2010, Divoll and O'Keefe 2018), which demonstrates they sometimes tolerate what are loud noises to humans despite gleaning species that are adapted to foraging in cluttered airspace, like the northern long-eared bat, being considered more vulnerable to signal masking than aerial hawking species (Schaub et al. 2008, Siemers and Schaub 2011, California Department of Transportation 2016). This is likely because jet engine noise is low-frequency (< 6.4 kHz; Konopka et al. 2014).

The hearing ranges of the Indiana bat, northern long-eared bat, and tricolored bat have not been described but are likely similar to that of another high-frequency species, the little brown bat (*M. lucifugus*). Little brown bats have a threshold sound level sensitivity of 15 dB and a hearing range of 10 to 130 kHz (Moss and Schnitzler 1995), with peak sensitivity between 35 and 40 kHz (Grinnell 1963). Echolocation calls of Indiana, northern long-eared, and tricolored bats range from 41-75 kHz, 49-117 kHz, and 19-70 kHz respectively (Fenton and Bell 1981, Miller and Treat 1993, MacDonald et al. 1994). Noises from construction equipment (e.g., graders, dozers, and loaders) typically fall well below these frequency ranges and are therefore unlikely to be audible to high-frequency bats or interfere with their ability to hear and echolocate prey (California Department of Transportation 2016). However, higher frequency noises that might be generated during construction, such as those that are comparable to passing cars and light trucks (up to approximately 15 kHz; California Department of Transportation 2016), may overlap with the hearing and echolocation ranges of high-frequency bats and affect their foraging behavior, particularly for gleaners (Schaub et al. 2008, Siemers and Schaub 2011).

5.2.2 MICRON CAMPUS AND RAIL SPUR

5.2.2.1 CONSTRUCTION NOISE EFFECTS

Construction of Fab 1 on the Micron Campus could begin while the Rail Spur Site is also being constructed or while the Rail Spur Site is already operational. If Fab 1 were being constructed while the Rail Spur were also still under construction, the overlapping construction periods would be expected to be only about four months in duration and likely limited to winter when bats would not be present. However, the noise of Fab 1 construction combined with either Rail Spur Site construction noise or Rail Spur Site operation noise were both modeled as potential scenarios and considered here for their potential to affect listed bat species. The highest noise frequency that could be modeled for the analyses in this BA is 8 kHz, which is slightly below the expected low end of the hearing range of the Indiana bat, northern long-eared bat, and tricolored bat (10 kHz; Fenton and Bell 1981, Miller and Treat 1993, MacDonald et al. 1994, Moss and Schnitzler 1995) and therefore conservative. Construction of Fab 1 along with operation of the Rail Spur Site would generate maximum high-frequency (8 kHz) noise levels of approximately 52 to 62 dB at the closest receptors modeled near the western and southern edges of the Campus. Construction of Fab 1 while the Rail Spur Site was still under construction would generate maximum high-frequency (8 kHz) noise levels of approximately 28 to 41 dB at these same receptors. By comparison, existing 8 kHz noise levels in these locations range from approximately 8 to 32 dB during peak morning and evening traffic periods. The greatest difference between the two construction scenarios is the greater truck activity that would be required if Fab 1 were constructed before rather than after the Rail Spur Site were operational, and the resulting noise exposure along I-81, NYS Route 11, and NYS Route 31 from the additional trucks traveling to and from the site to deliver aggregate. Construction of Fab 4 near the end of Phase 2 of the Proposed Project would generate maximum high-frequency (8 kHz) noise levels of approximately 50 to 72 dB at the closest receptors modeled along the eastern and southern edges of the Campus, where existing 8 kHz noise levels range approximately 0 (R2) to 24 (R5) dB during peak traffic conditions.

Campus construction would occur and generate these noises 7 days per week, beginning around 5:30 am and ending no later than 10 pm. Construction of the Rail Spur Site would occur from approximately 6 am to 10 pm, 7 days per week, and take approximately 7 to 8 months to complete. Construction of both the Micron Campus and Rail Spur Site would begin with mechanized tree clearing and then involve standard site-civil construction equipment such as excavators, graders, bulldozers, loaders, dump trucks, and generators (**Appendix A**). Noises generated by these types of construction equipment usually reach levels of approximately 85 to 102 dB at close distance and range in frequency from approximately 40 to 10,000 Hz (0.04 to 10 kHz), with the vast majority at the low end of that spectrum (Delaney and Grubb 2004, Vardhan et al. 2006, USDOT 2016).

High-frequency bats like the Indiana, northern long-eared, and tricolored bat are expected to have a hearing range of approximately 10 to 130 kHz, with peak sensitivity between 35 and 40 kHz (Grinnell 1963, Moss and Schnitzler 1995). The minimum sound pressure level (SPL) they can detect is likely between approximately 15 and 23 dB based on the threshold hearing sensitivity of the little brown bat (Griffin et al. 1960, Dalland 1965, Moss and Schnitzler 1995). Sound contours for the highest frequency that could be modeled (8 kHz) show that construction noises at this frequency would decay to 0 dB at a maximum distance of 380 meters (1247 feet) from the limits of disturbance during construction of Fab 1 and simultaneous operation of the Rail Spur Site (Figure 18; Table 12), and 410 meters (1345 feet) from the limits of disturbance during simultaneous construction of Fab 1 and the Rail Spur Site (Figure 19; Table 12). At a very low and likely inaudible noise level of 10 dB, 8 kHz construction noise would reach 277 meters (909 feet) beyond the construction area during construction of Fab 1 and simultaneous operation of the Rail Spur Site, and a distance of 213 meters (699 feet) during simultaneous construction of Fab 1 and the Rail Spur Site (Table 12). At the minimum assumed threshold SPL for detection by Indiana, northern long-eared, and tricolored bats (15 dB), 8 kHz construction noise would reach 237 meters (778 feet) beyond the construction area while Fab 1 was under construction and the Rail Spur Site were operational, and 157 meters (515 feet) if Fab 1 and the rail spur were constructed simultaneously (Figure 18 and Figure 19; Table 12).

Because the distance that sound travels decreases with increasing frequency, sound contours for any construction noises potentially higher than 8 kHz (i.e., more audible to high-frequency bat species) would be smaller than those modeled for 8 kHz. Any potential noises that extended into the expected hearing range of the bats (i.e., ≥ 10 kHz at ≥ 15 dB) would therefore reach shorter distances than those above and shown in Table 12.

TABLE 12.
8 KHZ SOUND CONTOUR DISTANCES FROM ACTIVE CONSTRUCTION AREAS

Sound Pressure Level (dB)	Max. Distance (m) During Rail Spur Operation with Fab 1 Construction	Max. Distance (m) During Rail Spur Construction with Fab 1 Construction	Max. Distance (m) During Fab 4 Construction With Rail Spur Operation
35	104	37	15
30	135	59	30
25	168	86	51
20	202	117	80
15	237	157	111
10	277	213	144
5	321	294	181
0	380	410	230

Note: Shaded rows represent the range of minimum sound pressure levels expected to be audible to Indiana, northern long-eared, and tricolored bats at 10 kHz or lower (Griffin et al. 1960, Dalland 1965, Moss and Schnitzler 1995).

FIGURE 18. NOISE CONTOURS FOR MICRON CAMPUS PHASE 1 CONSTRUCTION ALONG WITH RAIL SPUR OPERATION

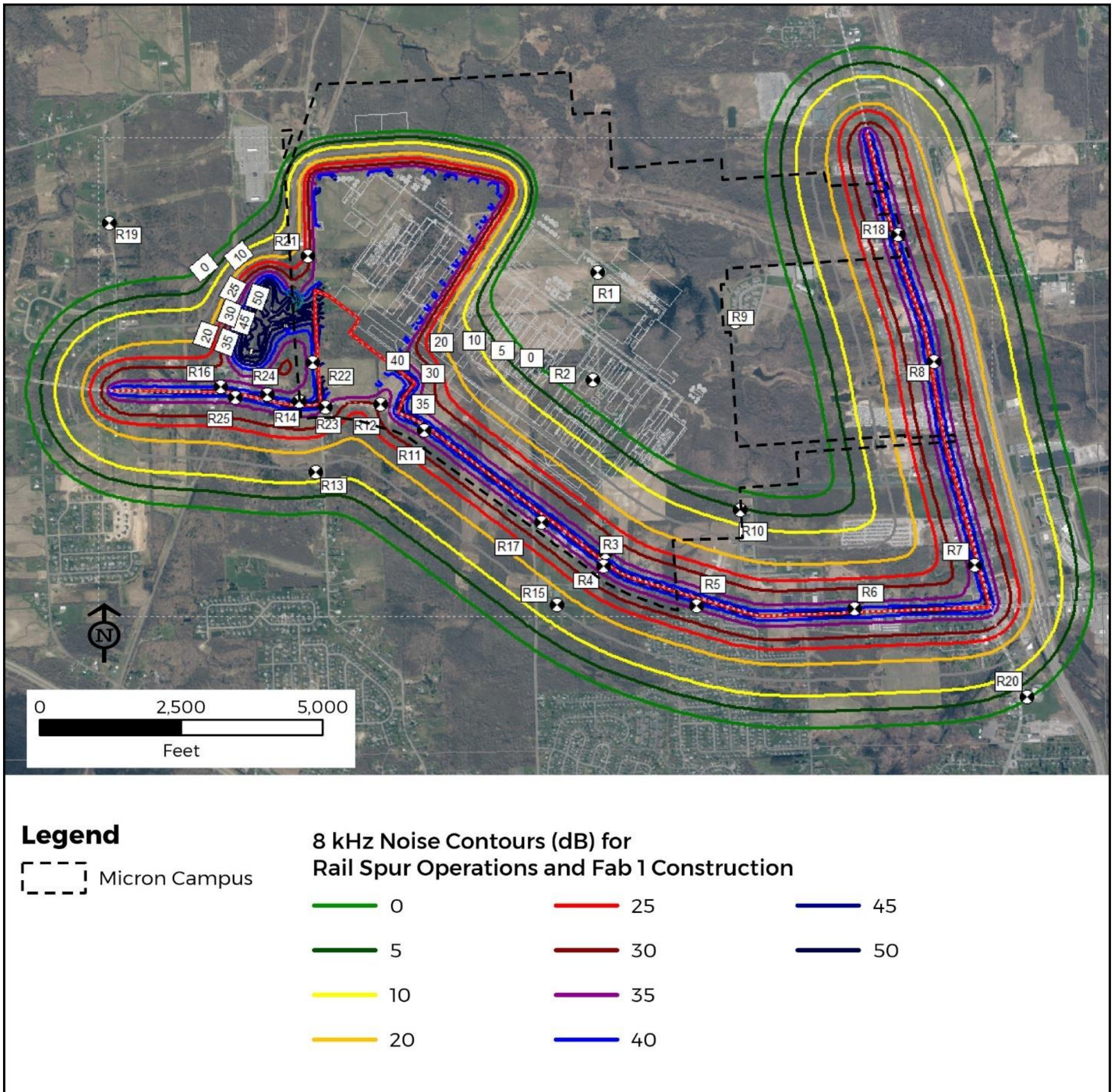


FIGURE 19. NOISE CONTOURS FOR MICRON CAMPUS PHASE 1 CONSTRUCTION ALONG WITH RAIL SPUR CONSTRUCTION

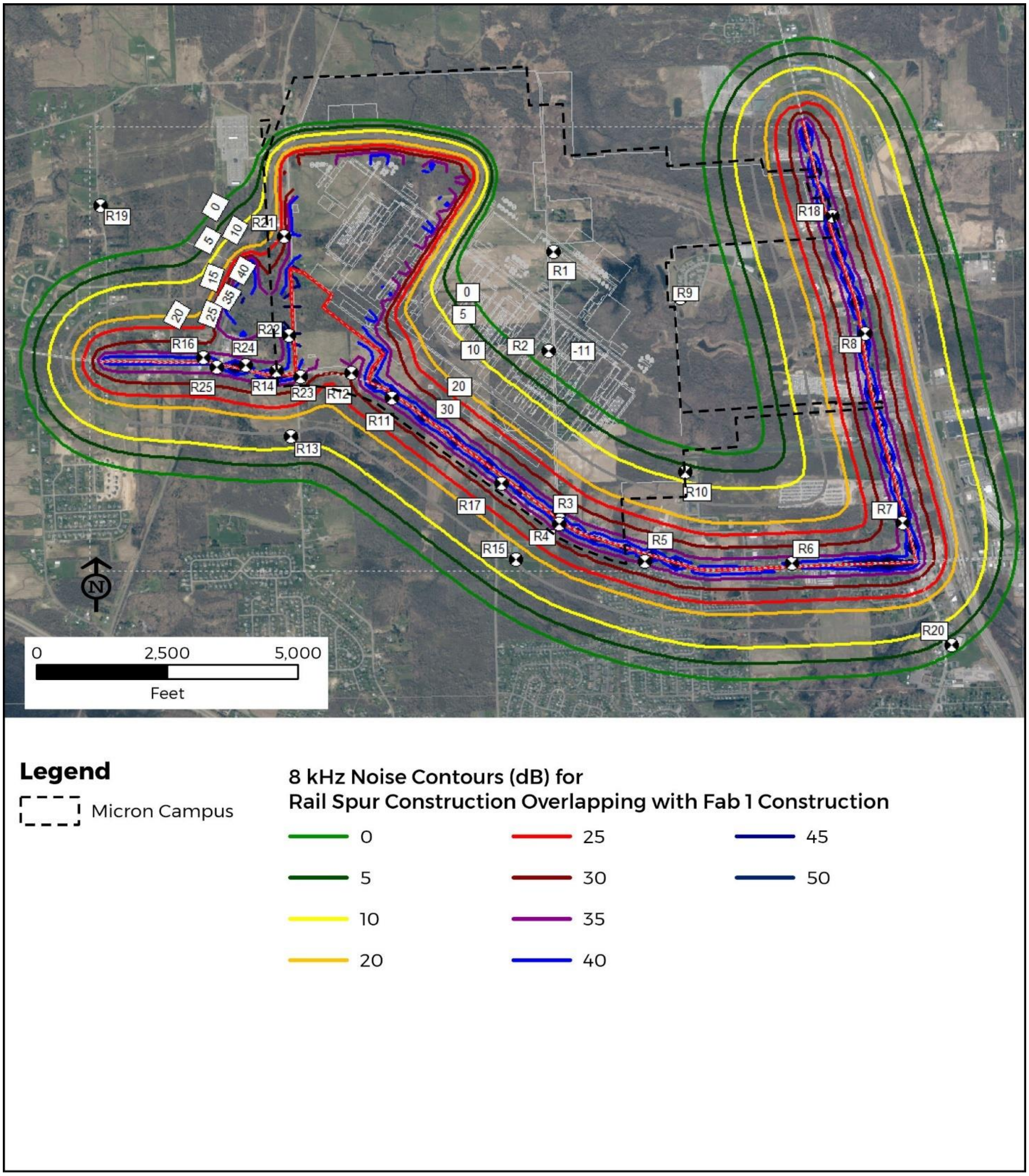
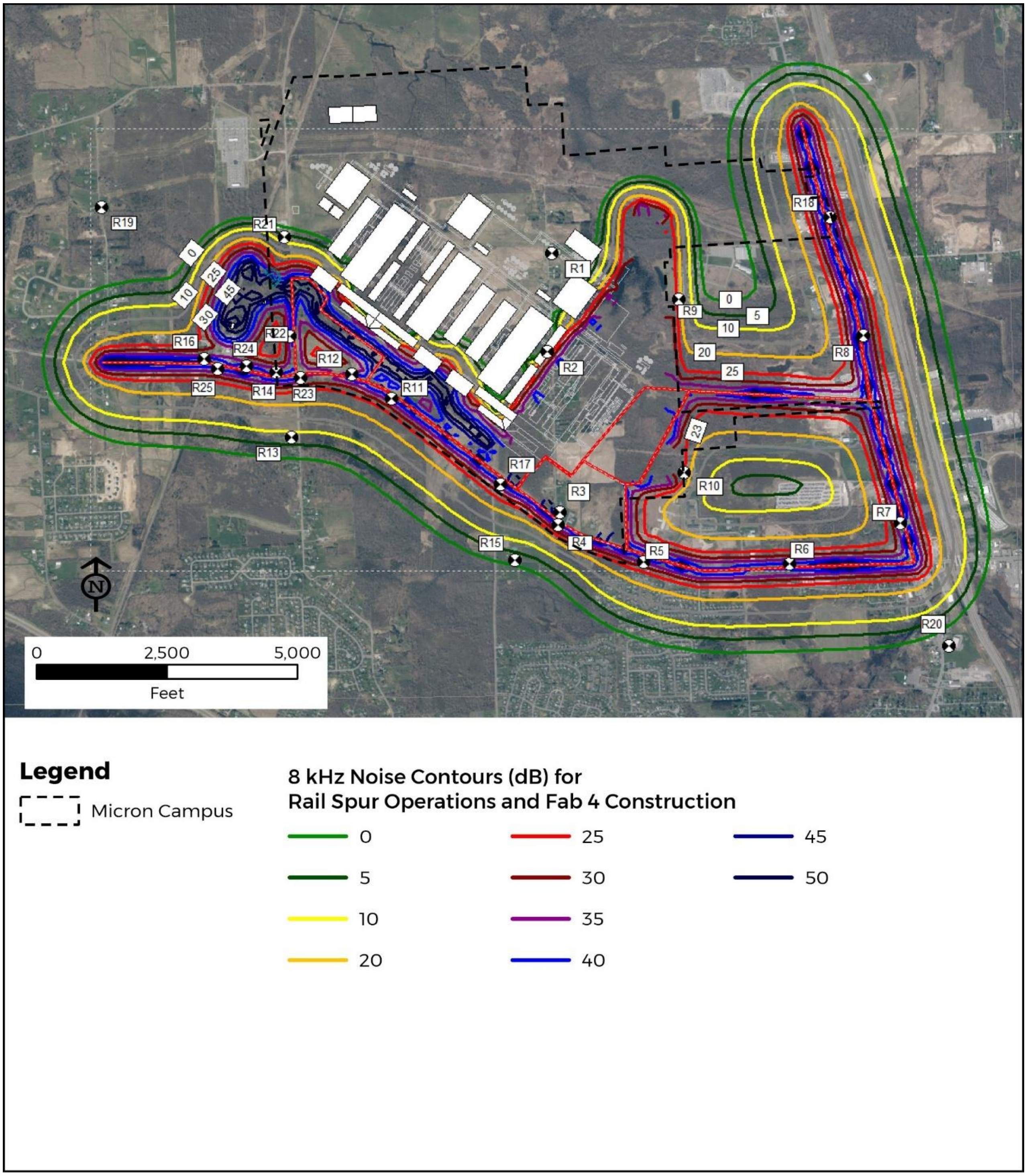


FIGURE 20. NOISE CONTOURS FOR MICRON CAMPUS PHASE 2 CONSTRUCTION



As discussed above, construction of the Micron Campus and Rail Spur Site would be expected to produce noises ranging in frequency from approximately 40 to 10,000 Hz (0.04 to 10 kHz), with the vast majority at the low end of that spectrum. High-frequency bats like the Indiana, northern long-eared, and tricolored bat are expected to have a hearing range of approximately 10 to 130 kHz, with peak sensitivity between 35 and 40 kHz (Grinnell 1963, Moss and Schnitzler 1995), so most construction noises would likely be inaudible or barely audible to bats and well below their range of peak hearing sensitivity.

Sound contours for the highest frequency that could be modeled (8 kHz) show that at the minimum assumed threshold SPL for detection by Indiana, northern long-eared, and tricolored bats (15 dB), 8 kHz construction noise would reach 237 meters (778 feet) beyond the construction area under the loudest potential scenario (Rail Spur Site operation along with Fab 1 construction) and 111 meters (364 feet) during the least noisy construction phase (Fab 4 construction plus Rail Spur operation) (Table 12). Therefore, adjacent areas of suitable bat habitat, such as the undeveloped portions of the Micron Campus to the north of the National Grid utility corridor, the forest and forested wetlands east of the Fab 4 limits of disturbance, and the forest west of the Rail Spur Site would be degraded by the masking effects of construction noise over the first 111 to 237meters (364-778 feet) in from the edges (Figure 18, Figure 19, and Figure 20; Table 12). These distances are likely overestimates of the true distances sound capable of disturbing bats would likely travel because 15 dB is the absolute quietest decibel level these bats are expected to be capable of hearing, and 8 kHz is below the minimum frequency they can likely hear (10 kHz) and well below their peak hearing range (approximately 35 to 40 kHz; Grinnell 1963, Moss and Schnitzler 1995). These distances are also conservatively based on sound-travel through open space whereas the attenuation effect of forest vegetation would cause the noise to decay below hearable levels at shorter distances. For example, Kerth and Melber (2009) and Bonsen et al. (2015) found high-frequency (approximately 10 kHz) road noise and its displacement effect on foraging bats to only extend approximately 50 meters (164 feet) from the road into adjacent forest. Nevertheless, impacts to bat habitat beyond the Proposed Project's physical limits of disturbance would be likely to result from noises generated by Micron Campus construction and Rail Spur Site construction and operation.

Construction trucks traveling to and from the Micron Campus and Rail Spur Site would significantly increase the exposure of areas along I-81, NYS Route 11, and NYS Route 31 to noises of 8 kHz (and higher frequencies) relative to existing peak traffic conditions, particularly along NYS Route 31. High-frequency truck noise at SPL's likely to be audible to Indiana, northern long-eared, and tricolored bats ($\geq$ 15 dB at $\geq$ 8 kHz) would extend far into some areas of roadside forest (Figure 18, Figure 19, Figure 20), likely degrading foraging conditions there for bats. These roadside fragments are already exposed to noise from trucks and other motor vehicles, particularly along I-81, but areas adjacent to the quieter corridors of NYS Routes 11 and 31 would likely be further degraded by the substantial increase in truck noise during construction of the Micron Campus. Under the scenario in which Fab 1 was being constructed at the same time the Rail Spur Site was being constructed, areas along the NYS Route 11 and I-81 corridor would experience an approximately 80 to 256 percent increase in 8 kHz noise above existing peak traffic conditions while areas along the NYS Route 31 corridor would experience an approximately 15 to 204 percent increase in 8 kHz noise above existing peak traffic conditions.

Because daily construction activity on the Micron Campus would extend no later than approximately 10 pm, noise effects on foraging bats from construction equipment and trucks would overlap with only the first 1 to 3 hours of the nighttime foraging period. The first few hours after sundown are when foraging activity is highest, however, so bats occurring in habitat adjacent to active construction areas and truck routes would potentially choose to forage in more interior, distant portions of adjacent habitats or commute farther offsite prior to 10 pm. From 10 pm until sunrise, foraging conditions for bats on and near the Campus and along truck routes would be unaffected by construction noise.

During the daytime, potential effects of construction noise on Indiana bats, northern long-eared bats, and tricolored bats would be limited to disturbance while roosting. Because all tree removal for the Micron Campus would be conducted during the winter hibernation period and no roosting habitat would be available to Indiana bats, northern long-eared bats, or tricolored bats within active construction areas when they return in the spring, construction noises could only affect bats potentially roosting outside of the limits of disturbance. Suitable roosting habitat would remain in undeveloped portions of the Micron Campus to the north of the National Grid utility corridor and offsite, to the east of the Fab 4 limits of disturbance. Otherwise, there would be no suitable roosting habitat for these species that would be adjacent to the Micron Campus limits of disturbance and directly exposed to construction noise. All non-adjacent areas of potential roosting habitat would be separated from the Micron Campus by roads (Caughdenoy Road, NYS Route 31, US Route 11, I-81), the CSX rail corridor, and other forms of development, which generate high levels of anthropogenic noise under current conditions. Construction of the Micron Campus would not be expected to increase audible noises above baseline conditions in these non-adjacent areas to an extent that would further reduce habitat quality for Indiana bats, northern long-eared bats, or tricolored bats.

The Indiana bat, northern long-eared bat, and tricolored bat roosting habitat that would exist north of the National Grid utility corridor and in the remaining area of the Youngs Creek forested wetland east of Fab 4 would be immediately adjacent to the Micron Campus' limits of disturbance and thus exposed to construction noise (Figure 18, Figure 19, and Figure 20). The acoustic bat survey conducted in 2023 detected Indiana bats and northern long-eared bats at a recording location along the National Grid utility corridor's edge with the woodland to the north and in the Youngs Creek complex, demonstrating that they possibly roost nearby. Because of the low vegetation height within the utility corridor, there would be minor attenuation of construction noise from the northern portion of the limits of disturbance to the northern side of the corridor. Similarly, the westernmost portion of the forested wetland that would remain in the Youngs Creek complex east of the Fab 4 limits of disturbance and north of the campus entryway from U.S. Route 11 would be exposed to noise from the construction of Fab 4 and the entryway (Figure 20). However, as discussed above, nearly all construction noise would likely be well below the hearing ranges of these bats and, at 8 kHz, reach distances of 111 to 237 meters (364-778 feet) into offsite habitat (Figure 18, Figure 19, and Figure 20; Table 12), leaving some habitat unexposed.

Because Indiana, northern long-eared, and tricolored bats have been observed roosting near active construction sites and/or comparably noisy areas (e.g., Sparks et al. 1998, Feldhamer et al. 2003, Shapiro and Hohmann 2005, Niver 2009), it is likely that any individuals in these areas would continue to roost there, unaffected. Also, because construction would already be ongoing at the time of spring emergence each year, no bats would have the potential to be displaced from roosts by a sudden start of construction in the midst of the maternity season. Any bats intolerant of the ongoing construction noise upon arrival to that area in the spring would have the opportunity to select other roosting habitat in the surrounding landscape prior to beginning the maternity season. For each of these reasons, it is not expected that construction noise from the Micron Campus would disturb or displace any Indiana, northern long-eared, or tricolored bats potentially day-roosting in adjacent habitat.

The majority of the Rail Spur Site would be constructed during the winter hibernation period of bats, potentially beginning with tree clearing in the fall of a given year and nearing completion by the end of the following April or May (estimated construction duration is 7 to 8 months). Little if any construction activity would likely be ongoing by the time most bats typically return to the area around mid-May. In the event there is still some construction activity upon the bats' return, potential impacts of the construction noise would be limited to the disturbance of day-roosting and foraging bats offsite since there would be no suitable roosting or foraging habitat for bats on the site. Suitable roosting and foraging habitat would be available to bats to the east of the Rail Spur Site (unless its construction overlaps with Fab 1 construction) and to the west of the CSX railroad tracks. Both areas are currently exposed to anthropogenic noise from motor vehicle activity on Caughdenoy Road and train passage on the railroad tracks.

Most construction noises would be expected to be below 10 kHz (Delaney and Grubb 2004, Vardhan et al. 2006) and therefore inaudible or nearly inaudible to high-frequency bats (Grinnell 1963, Moss and Schnitzler 1995). At the minimum assumed SPL threshold for detection by Indiana, northern long-eared, and tricolored bats (15 dB), it is predicted that 8 kHz construction noise would travel 157 meters (515 feet) from the Rail Spur Site under the scenario of Rail Spur construction overlapping with Fab 1 construction (Figure 19; Table 12). Because the distance that sound travels decreases with increasing frequency, sound contours for any construction noises potentially higher than 8 kHz and closer to the bats' hearing range would be smaller than those modeled for 8 kHz. This distance is also likely an overestimate of the true distance sound capable of disturbing bats would likely travel because 15 dB is the absolute quietest decibel level these bats are expected to be capable of hearing, and 8 kHZ is below the minimum frequency they can likely hear (10 kHz) and well below their peak hearing range (approximately 35 to 40 kHz; Grinnell 1963, Moss and Schnitzler 1995). Audible high-frequency noises would attenuate over a shorter distance.

As discussed above, Indiana, northern long-eared, and tricolored bats have been observed roosting near construction sites and/or other loud environments, and therefore do not appear to be sensitive to anthropogenic noises while roosting. Foraging bats would have the potential to be displaced by the construction noise up to approximately 157 meters (515 feet) away, which would affect foraging conditions in the CSX rail corridor and the forest to the west. Any displacement of foraging bats from this area would be limited to only the first few hours of the nighttime foraging period since daily construction would end by 10 pm and would not be expected to represent a significant reduction in foraging habitat availability to bats in the surrounding area.

5.2.2.2 OPERATIONS NOISE EFFECTS

Although the facilities have yet to be designed in detail, operation of the Micron Campus would generate noise from sources such as pumps, exhaust fans, cooling towers, air handling units, chillers, exhaust fans, makeup air units, rooftop units, and transformers on the fabs and CUBs. Sound from these types of equipment is mostly concentrated at frequencies below 0.5 kHz, but some outer band noises can reach 8 kHz or higher at low energy. The Micron Campus would employ noise mitigation measures (e.g., sound attenuators, acoustical louvers, sound walls) to reduce the noises associated with this equipment.

The Micron Campus would be in operation continuously, with rotating shifts of personnel. First-shift teams would be on-site, working Monday-Friday, 8 am – 5 pm, along with shift operations teams that would be on-site working one of four, 12-hour shifts. These four, 12-hour shifts would be on-site, supporting operation 24 hours per day/7 days per week/365 days per year. Trucks are expected to deliver goods to the site between 8 am and 5 pm on weekdays. On peak days (Monday through Friday), the foresaid conditions are expected to generate the following trips into and out of the Micron Campus (assuming 1 employee per trip): between 7 – 8 am: 5,808 trips into the site; between 8-9am: 2,296 trips into the site and 450 trips out of the site; 9 – 10 am: 450 trips out of the site; between 11 am – 12 pm: 162 trips into the site and 162 trips out of the site; between 12pm-1pm: 162 trips into the site and 162 trips out of the site; between 5 – 6 pm: 5,043 trips out of the site; between 6–7 pm: 2,161 trips out of the site; between 7 – 8 pm: 450 trips into the site and 450 trips out of the site; between 8 – 9 pm: 450 trips into the site and 450 trips out of the site; between 11 pm – 12 am: 18 trips into the site and 18 trips out of the site; between 12 am – 1 am: 18 trips into the site and 18 trips out of the site. Additionally, 8 trucks would be coming in and out of the site at every hour between 8 am – 5 pm. Noises from cars and trucks moving at low speeds generally range up to 5 kHz in frequency, with most sounds well below 1 kHz (Jenkens 1975, Roberts 2010).

Primary anthropogenic noise sources to which the Micron Campus is currently exposed include motor vehicle traffic on Caughdenoy Road, Burnett Road, and State Routes 11 and 31; train activity on the CSX railroad tracks across Caughdenoy Road; periodic farm equipment activity (e.g., haying); periodic vegetation maintenance, maintenance vehicle activity, and ATV activity in the National Grid utility corridor; and residential and commercial activities at homes and businesses adjacent to the site. Operation of the Micron Campus would increase noise levels above these existing conditions. Outdoor equipment such as pumps, exhaust fans, cooling towers, air handling units, chillers, exhaust fans, makeup air units, rooftop units, and transformers on the fabs and CUBs would generate sounds mostly below 0.5 kHz in frequency, but some outer band noises could reach 8 kHz or higher at a low SPL. The Micron Campus would employ noise mitigation measures (e.g., sound attenuators, acoustical louvers, sound walls) to reduce the noises associated with this equipment.

Suitable habitat for Indiana or northern long-eared bats remaining within or adjacent to the Micron Campus during operation that would be exposed to noise would be limited to the utility corridor and woodlands and wetlands to the north of the campus, and the portion of the Youngs Creek wetland complex that would remain beyond the eastern boundary of Fab 4. These areas would be exposed to high-frequency noises during the daytime and nighttime from the sources listed above as well as motor vehicles entering and exiting the campus. Indiana, northern long-eared, and tricolored bats appear to be tolerant of anthropogenic noises while roosting but are likely to avoid foraging in areas where high-frequency anthropogenic noise can interfere with echolocation or passive listening. As such, operations noise from the campus would not be expected to displace Indiana, northern long-eared, or tricolored bats from roosting in areas of suitable roosting habitat nearby, but would likely degrade the edges of those areas as potential foraging habitat. Because high-frequency noises decay to inaudible levels over short distances and typically affect bats no more than 50 meters (164 feet) in from a forest edge (e.g., Bonsen et al. 2015, Kerth and Melber 2009) the spatial extent of any disturbance to foraging bats would likely be minimal and represent a small loss of potential foraging habitat availability.

Although traffic noise can impact foraging bats (Schaub et al. 2008, Siemers and Schaub 2011, Finch et al. 2020) and there would be thousands of vehicles entering and exiting the Micron Campus each day, nearly all of this vehicle activity would occur during daytime hours. After 9 pm, there would likely be only approximately 36 trips in and 36 trips out of the Micron Campus, with no activity expected after 1 am. Therefore, the potential effects of traffic noise along the entryway from U.S. Route 11 and into the interior roads and parking areas of the Micron Campus would be minor in terms of both vehicle volume and duration. Additionally, at the low speeds at which vehicles would be coming in and out of the Campus, vehicle sounds typically have frequencies that are below 5 kHz (Jenkens 1975, Roberts et al. 2010) and therefore likely inaudible to Indiana, northern long-eared, and tricolored bats.

During operation of the Rail Spur Site, it is estimated that 60 railcars carrying approximately 113 tons (81 cubic yards) of aggregate materials would be processed each day, for approximately 12 months. The operation would consist of receiving 60 rail cars delivered by CSX each morning, which would then be moved to an offload station where the material would be moved to a stockpile. The operation would involve an average of 8 to 10 workers on the site for approximately 18 hours per day, 7 days per week. Noises generated by locomotives and rail cars, railcar vibrators, the unloader system, the conveyance system, and dump trucks during operation would be expected to reach levels of approximately 70 to 115 dB at close distance and range in frequency from approximately 30 to 8,000 Hz (0.03 to 8 kHz), with the vast majority at the low end of this frequency spectrum (Brown 2004, USDOT 2016, Tiwari 2017, Azman et al. 2022). Sound contours for the highest frequency that could be modeled (8 kHz) show that the highest-frequency noises from operation of the Rail Spur Site coincident with the construction of Fab 1 would decay to 0 dB and 10 dB at respective distances of 380 and 277 meters (1247 and 909 feet) beyond the Rail Spur Site. At the minimum assumed SPL threshold for detection by Indiana, northern long-eared, and tricolored bats (15 dB), 8 kHz noise would travel 237 meters (778 feet) during Rail Spur operation along with Fab 1 construction (Table 12, Figure 18). This would cover most of the potential bat habitat between the CSX railroad tracks and the utility right-of-way to the west. However, the affected area would likely be smaller because of the rapid decay of high-frequency sound through forest and the fact that noises higher than 8 kHz (i.e., more audible to bats) would travel shorter distances.

As discussed in section 5.2.1., Indiana, northern long-eared, and tricolored bats appear to be tolerant of anthropogenic noises while roosting but are likely to avoid foraging in areas where high-frequency anthropogenic noise can interfere with echolocation or passive listening. Any high-frequency noises potentially emitted from the Rail Spur Site during operation would not be expected to displace Indiana, northern long-eared, or tricolored bats from roosting in the forest to the west but would likely degrade a large area as potential foraging habitat. However, daily operation of the Rail Spur Site would end by approximately 10 pm and therefore potentially overlap with only the first 1 to 3 hours of the nighttime foraging period of bats.

5.2.3 CHILDCARE SITE

5.2.3.1 CONSTRUCTION NOISE EFFECTS

Construction of the childcare center on the Childcare Site is scheduled to commence in Q3 2026 and take approximately two years to complete. It is planned to be completed before Fab 1 opens for operation in Q1 2029. During that period, outdoor construction would occur from approximately 6 am to 6 pm (with indoor/interior construction ending by 10 pm), 7 days per week. Each day, approximately 15 to 40 worker vehicles would enter and exit the site and approximately 10 to 15 pieces of mobile construction equipment would be active. Construction would involve standard site-civil construction equipment such as excavators, graders, bulldozers, loaders, dump trucks, and generators to prepare the site and construct the facilities (Appendix A). Noise generated by these types of construction equipment usually reaches levels of approximately 85 to 102 dB at close distance and ranges in frequency from approximately 40 to 10,000 Hz (0.04 to 10 kHz), with the vast majority at the low end of this frequency spectrum (Delaney and Grubb 2004, Vardhan et al. 2006, USDOT 2016).

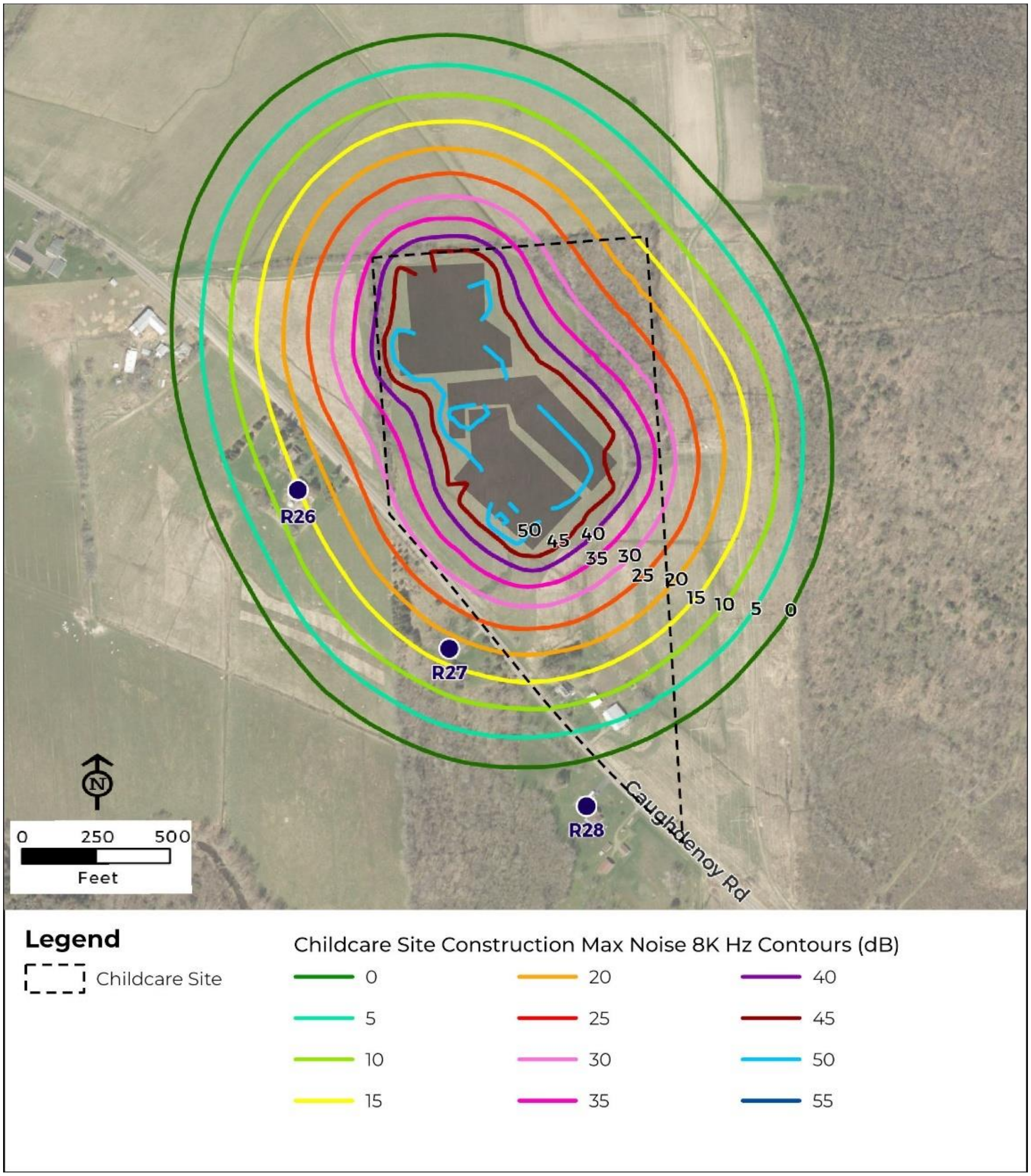
Sound contours for the highest frequency that could be modeled (8 kHz) show that the highest-frequency construction noises (i.e., those closest to the low end of the 10 to 130 kHz suspected hearing range of Indiana, northern long-eared, and tricolored bats) would decay to 10 dB at a maximum distance of 200 meters (656 feet) from the construction activity and 0 dB at a maximum distance of 264 meters (866 feet) (Table 13, Figure 21). At the minimum assumed SPL threshold for detection by Indiana, northern long-eared, and tricolored bats (15 dB), 8 kHz construction noise would travel only 165 meters (541 feet). Because the distance that sound travels decreases with increasing frequency, sound contours for any construction noises potentially higher than 8 kHz would be smaller than those modeled for 8 kHz. Any potential noises that approached the expected hearing range of the bats (i.e., ≥ 10 kHz at ≥ 15 dB) would therefore be capable of only minimally extending beyond the site.

TABLE 13.
8 KHZ SOUND CONTOUR DISTANCES FOR CHILDCARE SITE CONSTRUCTION NOISE

Sound Pressure Level (dB)	Distance from Limits of Disturbance (m)
40	33
35	53
30	78
25	105
20	134
15	165
10	200
5	230
0	264

Note: Shaded rows represent the range of minimum sound pressure levels expected to be audible to Indiana, northern long-eared, and tricolored bats at 10 kHz or lower (Griffin et al. 1960, Dalland 1965, Moss and Schnitzler 1995).

FIGURE 21. CHILDCARE SITE CONSTRUCTION NOISE CONTOURS



Because Indiana, northern long-eared, and tricolored bats are not expected to roost on the Childcare Site and construction would be limited to the daytime, potential effects of construction noise would be limited to the disturbance of bats potentially roosting offsite, in the woodland to the east of the site, beyond the utility corridor. There are known Indiana bat roost trees in this woodland and it is also suitable roosting habitat for northern long-eared and tricolored bats. The closest limits of disturbance for the Childcare Site would be distanced from the western edge of the forest by more than 600 feet. This buffer between the limits of disturbance and the roosting habitat to the east would include the narrow forest fragment on the eastern and northern sides of the site, which would further attenuate the construction noise. As discussed above, most if not all construction noises would likely be outside of the bats' hearing ranges. Sound contours for the highest frequency that could be modeled (8 kHz) show that construction noise at the minimum SPL to likely be audible by Indiana, northern long-eared, and tricolored bats (15 dB) would travel only as far as the western edge of the utility corridor separating the Childcare Site from the roosting area to the east (Figure 21). Therefore, high-frequency sounds that could be audible to bats would not reach the forested area to the east and potentially disrupt day-roosting behavior. For these reasons, construction noise from the Childcare Site would not be expected to impact Indiana, northern long-eared, or tricolored bats.

5.2.3.2 OPERATIONS NOISE EFFECTS

The childcare center on the Childcare Site would be expected to open for operations before Fab 1 opens for operation in Q1 2029, and is estimated to be used daily by approximately 125 children and 40 staff members. Operation would involve the use of indoor space as well as outdoor play areas. Attendance and staff size would potentially increase by 2037. Construction of the healthcare center and recreation center are scheduled to commence in Q2 2030 and be completed by Q2 2031, with an anticipated opening in Q2 2031. The healthcare center would have approximately 20 staff members and up to 40 daily appointments. The recreation center would be used for team events, team meetings, and after-hour events for Micron employees' families. The outdoor sports facilities would also open at this time to provide Micron employees with a place to take a break from work and find wellness before/after shifts or during their lunch breaks.

The Childcare Site facilities have not yet been designed in detail, but during operation, would likely generate noise from rooftop exhaust fans, air handlers, and similar equipment. Sound from these types of equipment is mostly concentrated at frequencies below 0.5 kHz, but some outer band noises can reach 8 kHz or higher at low energy. The childcare center would employ noise mitigation measures to reduce noises generated by this equipment.

Primary anthropogenic noise sources to which the Childcare Site is currently exposed include motor vehicle traffic on Caughdenoy Road, periodic farm equipment activity (e.g., haying) on the site and adjacent fields, and periodic vegetation maintenance in the overhead powerline corridor to the east. Although no details are available on the noises that operation of the Childcare Site would produce, there would be an increase in existing daytime noise levels due to increased vehicle traffic on Caughdenoy Road to and from the site, increased human activity (e.g., on the outdoor recreational facilities), and the operation of rooftop air handling units and other external building maintenance equipment. Because the Childcare Site, including the outdoor recreational facilities, would not operate past approximately 9 pm, nighttime noises would mostly be limited to external maintenance equipment on the buildings.

Operations noises that would be generated from air handlers, exhaust fans, and similar equipment would likely be concentrated at frequencies below 0.5 kHz, with some outer band noises that could reach 8 kHz or higher at a low SPL. As with construction noises described above, any high-frequency noises at the minimum assumed SPL threshold for detection by Indiana, northern long-eared, and tricolored bats (15 dB) would not be expected to travel more than approximately 200 meters (656 feet) from the buildings. This assumes no noise mitigation, which is highly conservative because the

Childcare Site would employ noise mitigation measures on rooftop equipment and other noise sources. Noises potentially audible to bats would likely be highly constrained to the proximity of the Childcare Site's buildings and would not be expected to reach the woodland more than 600 feet to the east, where Indiana, northern long-eared, and tricolored bats may roost and/or forage.

At highway speeds, cars and trucks generate noise frequencies up to approximately 15 kHz that can disturb foraging bats (e.g., Bonsen et al. 2015), but at the lower speeds at which vehicles would be coming in and out of the Childcare Site, vehicle sounds typically have frequencies below 5 kHz, with most sounds well below 1 kHz (Jenkens 1975, Roberts et al. 2010). As such, vehicle noise associated with operation of the Childcare Site would not be expected to disturb roosting or foraging bats and would not extend past approximately 9 pm.

5.2.4 CONNECTED ACTIONS

5.2.4.1 CONSTRUCTION NOISE EFFECTS

The construction schedule and methods for the Connected Actions have yet to be developed in detail. However, it is anticipated that most construction would begin with mechanized tree clearing wherever necessary and then involve the use of backhoes, excavators, gas-powered trenchers, cranes, bulldozers, dump trucks and other standard site-civil construction equipment. For the underground utility alignments (e.g., water supply infrastructure), backhoes, excavators, and gas-powered trenchers would be used to dig the trench and then cranes would be used to lower pipe segments into the trench. Bulldozers would then cover the trenches following installation. Noises generated by these types of construction equipment usually reach levels of approximately 85 to 102 dB at close distance and range in frequency from approximately 40 to 10,000 Hz (0.04 to 10 kHz) (Delaney and Grubb 2004, Vardhan et al. 2006, USDOT 2016).

Since all tree removal for the Connected Actions would occur during the winter hibernation period, tree clearing noise would not have the potential to disturb Indiana bats, northern long-eared bats, or tricolored bats along the alignments. Construction activity later in the season, when bats are out of hibernation, would be mostly, if not entirely, limited to the daytime and would not be expected to generate noise and human disturbance to an extent that would disturb roosting or foraging bats given that the majority of the alignments would be located alongside roads and in other rights-of-way in mostly developed areas that are noisy and lack quality habitat for these species. Moreover, HDD would be used when alignments cross wetlands that may contain suitable roosting habitat for bats. One exception would be the cut-and-cover installation of a segment of the OCWA water supply line parallel to NYS Route 481 in the Town of Phoenix, where a forest to the east contains known roost trees of Indiana bats. Construction of this segment of the alignment would not be expected to disturb any bats associated with these roosts because the closest roost is approximately 320 feet from the limits of disturbance. A 320-foot forested buffer would separate the roost tree from the closest point of construction activity, providing a sound buffer that would make it unlikely that bats associated with this roost would be disturbed. Additionally, as discussed above for the Micron Campus, most construction noises would likely fall outside of the hearing range of the Indiana bat, and Indiana bats are known to sometimes roost in noisy environments (e.g., under bridges).

In the unlikely event any bats from this roost were displaced by the disturbance, they would be expected to further distance themselves by switching roosts. Indiana bats naturally switch roost trees about every 1 to 4 days (Kurta 2004, Silvis et al. 2014a) and would therefore be capable of moving to alternate roosts if necessary. There are at least three other roost trees in this area, likely used by the same colony, each of which is 2,100 feet or more from the limits of disturbance. Overall, construction noise from the Connected Actions would not be expected to impact roosting or foraging Indiana, northern long-eared, or tricolored bats.

5.2.4.2 OPERATIONS NOISE EFFECTS

Operation of the Connected Actions would not generate noise above existing conditions and would not have the potential to disturb bats.

5.2.5 RECOMMENDED TRANSPORTATION MITIGATIONS

5.2.5.1 CONSTRUCTION NOISE EFFECTS

The construction schedule for the recommended transportation mitigations has not yet been determined. It is anticipated the transportation mitigations would begin with construction of the new interchange at I-81 and Sneller Road in Cicero sometime in 2026 and ending sometime in 2027. Otherwise, all other construction timelines are currently anticipated to be included in the NYSDOT-FHWA NEPA Record of Decision, which is anticipated to start with a Notice of Intent around August of 2025 and finish around October of 2027. Construction would likely last from 2027 through 2030.

The recommended transportation mitigations would be constructed using standard site-civil construction equipment such as excavators, graders, bulldozers, loaders, pavers, and dump trucks. Noises generated by road construction equipment usually reach levels of approximately 85 to 102 dB at close distance and range in frequency from approximately 40 to 10,000 Hz (0.04 to 10 kHz) (Delaney and Grubb 2004, Vardhan et al. 2006, USDOT 2016).

All tree removal for the transportation mitigations would occur during the winter hibernation period such that tree clearing noise would not have the potential to disturb Indiana bats, northern long-eared bats, or tricolored bats. Construction during the bats’ active season would not be expected to disturb roosting bats given that most of the proposed improvements involve modifications to existing roads, intersections, and interchanges, where existing levels of disturbance are currently high and habitat suitability is low. One exception is the proposed development of a new 1.6-mile access road extending north from NYS Route 481 to the Rail Spur Site. This road would intersect an approximately 175-acre forested area between Caughdenoy Road to the east and CSX railroad tracks to the west, where there is potentially suitable roosting habitat for Indiana, northern long-eared, and tricolored bats. This forest is currently exposed to high-frequency road noise on its eastern side and occasional train noise on its western side. Construction of the proposed road would increase noise levels above existing conditions, particularly in the interior portion where noise from Caughdenoy Road and the railroad tracks is unlikely to currently reach. However, all or nearly all noises from road construction are low-frequency (Delaney and Grubb 2004) and outside of the hearing ranges of these species. Additionally, all three species have demonstrated a tolerance for roosting in loud environments.

If construction noise causes avoidance by roosting bats, the effect would be temporary and extend a short distance due to the rapid decay of high-frequency sound through forest. The width of the forest ranges from approximately 1,000 to 2,500 feet, so not all areas would be exposed to construction noise or existing noise from Caughdenoy Road and the railroad tracks. Additionally, because construction would begin before spring emergence, there would be no potential for sudden disturbance to bats already roosting nearby, and any arriving bats that are intolerant of the construction activity would have the opportunity to distance themselves from the noise.

As discussed above for the Micron Campus, bats tend to be more sensitive to noise disturbance while foraging than roosting. If nighttime road construction generated some high-frequency noises, it would likely cause foraging bats to distance themselves from the construction area to avoid signal masking. It is estimated that any such effects from high-frequency noises would extend approximately 50 meters (164 feet) into the adjacent forest (Kerth and Melber 2009, Bonsen et al. 2015). Most, if not all, of the road construction would likely occur during the daytime, thus minimizing potential disturbance to nocturnally foraging bats. Any avoidance by foraging or roosting bats of the portion of forest potentially exposed to audible sources of construction noise in favor of nearby quieter areas would likely be energetically insignificant (Kurta 2004) and represent a small and temporary reduction in foraging and roosting habitat availability within their home range. Independent from potential noise effects, however, fragmentation of the forest by the road may reduce the likelihood of this forest being used for roosting or foraging by Indiana, northern long-eared, and tricolored bats (as discussed below, under Operations Noise Effects).

5.2.5.2 OPERATIONS NOISE EFFECTS

The recommended transportation mitigations to existing roads, intersections, and interchanges would not be expected to increase existing traffic noise to an extent that would degrade foraging habitat quality beyond current conditions. These areas are already exposed to chronic, high-speed traffic noise and are therefore unlikely to be used by foraging Indiana, northern long-eared, or tricolored bats. In contrast, operation of a new access road extending north from a new interchange at State Route 481 to the Rail Spur Site would introduce new high-frequency noise disturbance to an area of forest that is considered suitable roosting and foraging habitat for Indiana, northern long-eared, and tricolored bats. Foraging Indiana bats have been found to avoid roads, often reversing course when a road is encountered, and this appears to be due more to vehicle noise than the physical presence of the road (Zurcher et al. 2010, Bennett and Zurcher 2013). Zurcher et al. (2010) found that Indiana bats reversed course 32 percent of the time when they approached a road and no vehicles were present, whereas they reversed course 60 percent of the time when there was a passing vehicle. A similar study also found that gaps in commuting routes caused by roads alone (i.e., with no vehicles) often caused multiple species of bats, including the Indiana bat and northern long-eared bat, to turn away from the road upon approach, but the likelihood of a bat turning away from the road was significantly greater when vehicles were present (Bennett and Zurcher 2013; also see Bennett et al. 2013). This is likely due to the interference effects of high-frequency traffic noise on the echolocation and passive listening of Indiana bats and northern long-eared bats, respectively (Schaub et al. 2008, Siemers and Schaub 2011, California Department of Transportation 2016).

Vehicle noise disturbance from operation of the new access road would likely extend approximately 50 meters (164 feet) perpendicularly from the road into the forest to the east and west (Kerth and Melber 2009, Bonsen et al. 2015). An affected area of this size would likely represent an insignificant reduction in foraging habitat availability in a bat's home range and be unlikely to have significant impacts. Day-roosting of Indiana and tricolored bats in remnant areas of the forest bordering the road would not be likely to be affected by daytime operation of the road given that these species are known to sometimes roost near roads and under bridges. Given their aversion to fragmentation and sharp edges (Foster and Kurta 1999, Broders et al. 2006, Henderson et al. 2008, Segers and Broders 2014), northern long-eared bats would not be expected to roost in the fragmented forest remaining to the east and west of the road following construction and would therefore be unlikely to have the potential to be impacted by the road's operation.

5.3 EFFECTS FROM LIGHTING

5.3.1 BACKGROUND ON LIGHT SENSITIVITY IN BATS

Some bat species avoid artificial light at night (ALAN) while others are attracted to it by associated concentrations of insect prey (Stone et al. 2015, Rowse et al. 2016). This attraction-repulsion dynamic created by ALAN can influence bat community composition at local to landscape scales (Azam et al. 2016, Schoeman 2016, Seewagen and Adams 2021). Although light sensitivities of Indiana bats and northern long-eared bats have not been studied, strong aversion to ALAN is a consistent pattern found among bats in the genus *Myotis* (Stone et al. 2009, Rowse et al. 2016), to which the Indiana and northern long-eared bat belong. This includes the light-averse little brown bat (McGuire and Fenton 2010, Alsheimer 2011, Cravens and Boyles 2019, Seewagen and Adams 2021, Seewagen et al. 2023), which is sympatric with Indiana and northern long-eared bats throughout much of their geographic ranges and also present on the Micron Campus.

Widespread light avoidance among *Myotis* species is thought to be due to their relatively slow flight speeds, which may increase their perception of predation risk in lit environments more so than faster-flying, light-tolerant species (Jones and Rydell 1994, Stone et al. 2015). Tricolored bats are also slow flyers (Harvey et al. 2011) and therefore likely to be light-averse. Displacement effects of ALAN can extend well beyond a light source and its primary area of illuminance. For example, ALAN was found to reduce the foraging activity of little brown bats as far as 75 meters (246 feet) from a light source even though the illuminance at that distance had attenuated to less than 1 lux (Seewagen et al. 2023). Similarly, ALAN has been found to influence the foraging behavior of *Myotis* species in Europe at distances of 15-50 meters (49-164 feet), where corresponding light levels were also below 1 lux (Kuijper et al. 2008, Azam et al. 2018, Barre et al. 2021). In light-polluted landscapes, light-averse bats will therefore seek dark refugia where habitat is sufficiently buffered from the nearest light sources. This has been observed in Indiana bats, which can occur in areas with abundant ALAN, such as suburban residential neighborhoods (Bellwood et al. 2002), near interstate highways (USFWS 2008), and at major international airports (Sparks et al. 1998, 2005), but may concentrate in the darkest spaces remaining within those areas while foraging (Sparks et al. 2005).

5.3.2 MICRON CAMPUS

5.3.2.1 CONSTRUCTION LIGHTING EFFECTS

All lighting used during construction and operation of the Micron Campus would strive to meet the criteria of the U.S. Green Building Council's Leadership in Energy and Environmental Design

(LEED) light pollution reduction credit (SS6) for LZ1 land-use zones, including the design of all exterior lighting so that "all site and building-mounted luminaires do not exceed the Backlight, Up-light and Glare (BUG) ratings as defined by the Illuminating Engineering Society." All exterior lighting for the Micron Campus would also be consistent with the Town of Clay's lighting code (§140).

As construction of the Micron Campus would be phased and progress across the site from west to east (i.e., Fabs 1 through 4), only active construction areas would have outdoor lighting. Construction would end by 10 pm; therefore, outdoor construction lighting would be required only for a portion of the nighttime. When needed, the outdoor construction lighting would be provided by portable, diesel or gas-powered light towers with multiple, adjustable fixture heads on a single pole that would be extended approximately 20 to 30 feet high. Portable light towers vary in specifications depending on manufacturer and model but typically feature cool white LED fixtures, with a total horizontal illuminance of approximately 90-100 lux that attenuates to about 5 lux over a distance of approximately 175 feet (e.g., Generac model MLT6SMDS; Shandong Storike Engineering model 4TN4000). The lights would be aimed towards the interior of active construction areas whenever possible, although some spill beyond these areas during construction would likely occur.

Assuming the Indiana bat, northern long-eared bat, and tricolored bat are light-averse, outdoor lighting used during construction of the Micron Campus would be expected to cause them to avoid foraging in any areas exposed to artificial light levels greater than approximately 0.1 to 1 lux (Kuijper et al. 2008, Azam et al. 2018, Barre et al. 2021, Seewagen et al. 2023). Construction lighting would be limited to active work areas (where any habitat suitable for these bats would previously have been cleared) and directed towards the interior to minimize trespass into adjacent areas. As discussed above, lighting used for construction of all components of the Micron Campus would strive to meet the criteria of the U.S. Green Building Council's LEED light pollution reduction credit (SS8) for LZ1 land-use zones and would be consistent with the Town of Clay's lighting code (§ 140). As such, spill beyond the active construction areas would be expected to be minimal and the spatial extent of any displacement effects on bats in areas of remnant habitat would be minor. Nighttime construction would occur only as late as 10 pm rather than the entire night, thereby overlapping with only a portion of the foraging period and limiting the temporal extent to which construction lighting could affect foraging bats. With these measures in place, construction lighting on the Micron Campus would not be expected to displace Indiana, northern long-eared, or tricolored bats from foraging habitat well beyond active construction areas.

5.3.2.2 OPERATIONS LIGHTING EFFECTS

Outdoor lighting during operation of the Micron Campus would be expected to be provided by warm white LED lights mounted on poles and building exteriors at a height of approximately 26 feet. Parking areas would be expected to have warm white LED lights on shorter poles of approximately 13–16 feet tall. The outdoor lighting would be concentrated in the campus interior, along entryways, and limited around the periphery to minimize light trespass offsite and into areas of the Micron Campus that may provide foraging habitat for bats, including stormwater management ponds and undisturbed areas outside the development footprint (e.g., north of the National Grid utility corridor and east of Fab 4).

Indiana and northern long-eared bats are expected to be light-averse and potentially avoid habitat exposed to artificial light levels as low as 1 lux or less, based on similar species (Kuijper et al. 2008, Azam et al. 2018, Barre et al. 2021, Seewagen et al. 2023). Adverse effects from lighting during operation of the Micron Campus could therefore result if that lighting trespassed into remnant bat habitat adjacent to the illuminated areas. Following construction, suitable habitat that would remain for Indiana, northern long-eared, and tricolored bats adjacent to developed portions of the Micron Campus would include undisturbed wetland, shrubland, forest, and forest edge in and north of the National Grid utility corridor to the north of the Campus and a fragment of forested wetland remaining in the eastern portion of the Youngs Creek complex, to the east of Fab 4/north of the southern entryway from US Route 11.

To avoid impacts to Indiana and northern long-eared bats potentially occurring in these areas, all nighttime exterior lighting used during operation of the Micron Campus would be designed to minimize trespass beyond intended areas of illumination. In accordance with the LEED light pollution credit, the lighting design would include luminaires that do not exceed the defined BUG Ratings based on mounting height and distance from the LEED lighting boundary. The operations lighting would be designed to be as close to zero as possible for all three ratings (backlight, uplight, glare), with a priority of zero uplighting. In addition, the operations lighting on the Micron Campus would be warm white LED as opposed to cool white, to minimize effects on bats (Stone 2013), along with cut-off optics to reduce uplight and spill. The lighting would be concentrated in the Campus interior and limited at the periphery to further minimize light trespass into areas of the site that may provide foraging habitat for bats, including the stormwater management areas and undisturbed areas of potential bat habitat (e.g., north of the National Grid utility corridor and east of Fab 4). Luminaires with a BUG Rating of B1-U0-G1 would be used along the northern and eastern boundaries of the development footprint and would be expected to emit light that would attenuate to 0 lux over an approximate distance of only 10 feet offsite. As such, adjacent areas of bat habitat north of the National Grid utility corridor and in the Youngs Creek wetland complex east of Fab 4 would be exposed to zero illuminance.

One potential exception is the entryway from US Route 11, which would be expected to have double-sided, warm white LED lights on 26-foot-tall poles mounted in the median, which would potentially emit light that trespasses into the southern edge of the remnant forest (Youngs Creek complex) to the north. However, the lighting would not be expected to reach more than approximately 36 feet from the edge of the entryway into adjacent forest, and therefore, the zone of forest edge habitat that could be affected would be narrow. To further minimize light spilling into the adjacent forest, alternate lights with quality optic control on shorter poles will be considered as the design advances. For these reasons, the spatial extent of any foraging habitat degradation caused by lighting on the Micron Campus would be unlikely to significantly limit foraging opportunities for bats in the surrounding area.

5.3.3 RAIL SPUR SITE

5.3.3.1 CONSTRUCTION LIGHTING EFFECTS

Construction of the Rail Spur Site would occur between approximately 6 am to 10 pm, and therefore require some lighting that would overlap with a portion of the foraging period of bats. As with the Micron Campus, construction lighting for the Rail Spur Site would be provided by portable, diesel-or gas-powered tower lights featuring four tiltable lights on a pole that would be extended approximately 20 to 30 feet high. Portable tower lights vary in specifications depending on manufacturer and model but typically feature cool white LED fixtures, with a horizontal illuminance of approximately 90-100 lux that attenuates to about 5 lux over a distance of approximately 175 feet (e.g., Generac model MLT6SMDS; Shandong Storike Engineering model 4TN4000). It is unknown what the illuminance levels would be at and beyond the Rail Spur Site boundaries throughout the construction process, but it is likely that the nearby area of forested foraging habitat west of the CSX rail tracks and the rail corridor itself (a possible foraging and/or commuting route of bats) would be exposed to levels of light that would cause avoidance by Indiana, northern long-eared, and tricolored bats. However, because construction would occur no later than 10 pm, the temporary exclusion of bats from this area would not be expected to significantly reduce foraging opportunities for bats in the surrounding area.

5.3.3.2 OPERATIONS LIGHTING EFFECTS

Design of the operations lighting for the Rail Spur Site has not been finalized, but preliminarily, would include 28 total lights on the approximately 38-acre property. Roughly half of these lights would be warm amber (2,700 Kelvin) LED while the other half would be cool white (5,000 Kelvin) LED. All fixtures would be dark-sky compliant. The amber lights would be used for entrances and parking areas and would be mounted on 25-foot-tall poles while cool white lights would be used for the rail yard and other areas of operation and mounted on 60-80-foot-tall poles. Wall-mounted fixtures would be located at building entrances. Ground-level illuminance levels on the site would be expected to range from approximately 0 to 229 lux, and average approximately 28 lux. Nearly the entire site would be exposed to ground-level illuminance levels of at least 10 lux. The lights would be concentrated towards the western half of the site with the exception of a few lights that would be oriented near the conveyor system extending from the center of the site to Caughdenoy Road to the east. Ground-level illuminance levels on the western edge of the site, along the CSX railroad tracks and forest tract to the west, would be expected to range approximately 30-60 lux in most places and have a maximum of approximately 160 lux, to meet American Railway Engineering and Maintenance-of-Way Association standards for rail yards. The Rail Spur’s site plan condenses onsite rails to limit wetland impacts, which does not allow for light to be located between the rails. This requires poles to instead be located on the periphery of the rail yard and of sufficient height (60 and 80 feet) to reach areas where the lighting is needed. The height of the stockpile (approximately 50 feet) also necessitates tall light poles.

Indiana, northern long-eared, and tricolored bats are likely averse to artificial lighting at levels any greater than 0.1 to 1 lux based on studies of similar species (Kuijper et al. 2008, Azam et al. 2018, Barre et al. 2021, Seewagen et al. 2023) and therefore would not forage on the Rail Spur Site or in immediately adjacent areas of habitat while the lights were on. Suitable habitat for these species occurs to the west of the site, beyond the CSX railroad tracks, and would likely be affected by the trespass of light from the site’s western boundary, where ground-level illuminance levels would be extremely bright (approximately 30-60 lux in most places) and originate from 60-80-foot-tall poles that are higher than the adjacent forest canopy. At this height and brightness, the light would extend well into the adjacent forest and likely prohibit Indiana, northern long-eared, and tricolored bats from foraging there.

5.3.4 CHILDCARE SITE

5.3.4.1 CONSTRUCTION LIGHTING EFFECTS

Outdoor construction work on the Childcare Site would be limited to the daytime (ending by 6pm), and therefore no outdoor lighting would be used during construction except minor safety and security lighting in limited areas. This lighting would not be expected to trespass beyond the site and affect foraging conditions for Indiana, northern long-eared, or tricolored bats in adjacent areas.

5.3.4.2 OPERATIONS LIGHTING EFFECTS

Outdoor lighting during operation of the Childcare Site would include two primary types: 26-foot-tall, downward directional, LED lights along internal roads, in the parking areas, and around the buildings, and 80-foot-tall stadium-style LED lights bordering the soccer field and tennis courts. The 26-foot-tall fixtures would have 156- or 312-watt, warm-white (2700 Kelvin) LED lights that would generate maximum horizontal illuminance levels of approximately 82 lux in the daycare center parking area, approximately 45 lux in the soccer field parking area, and approximately 26 lux elsewhere on the site. The 80-foot-tall fixtures around the soccer field and tennis courts would have 1000-watt, cool white (5000 Kelvin) LED lights that would have maximum illuminance levels of approximately 635 lux on the soccer field and approximately 700 lux on the tennis courts.

Both lighting types would be downward-directional (0-8 degrees with respect to horizontal) and concentrated in interior portions of the site such that spill beyond the intended areas of illumination would be minor. Lighting of the soccer field and tennis courts would be limited to spring, summer, and fall, and in the evening, not likely past approximately 9 pm. All lights on the Childcare Site would be set back a minimum of 50 feet from the frontage on Caughdenoy Road and the shelterbelts along the northern and western property boundaries, and at least 100 feet from the wetlands on the eastern side of the property. Illuminance levels reaching the property boundaries and edge of the forest fragment in the northeastern corner of the site would have a maximum of approximately 1 lux and average only 0.2 lux overall.

Because the lighting on the Childcare Site would be directional and concentrated in the interior, spill beyond intended areas of illumination would be negligible. While illuminance would be high near the soccer field and tennis courts, these lights would be directional to limit trespass and would not be in use past approximately 9 pm. Light levels reaching the property boundaries would have a maximum of approximately 1 lux and average only 0.2 lux overall. As such, lighting from operation of the proposed Childcare Site would not trespass into potential bat habitat offsite to an extent that would affect the likelihood of Indiana or northern long-eared bats foraging in adjacent areas.

5.3.5 CONNECTED ACTIONS

5.3.5.1 CONSTRUCTION LIGHTING EFFECTS

It is anticipated that construction of the Connected Actions would be limited to the daytime (7 am to 6 pm), but there would potentially be a need for nighttime construction on occasion. No lighting plans have been developed at this time. However, because most of the Connected Actions would occur along existing roads and other developed areas that are already exposed to light at night, any occasional need for construction lighting would not introduce major sources of new light to these areas. Overall, any lighting needed in the unanticipated event of nighttime construction of the Connected Actions would not have impacts to Indiana, northern long-eared, or tricolored bats.

5.3.5.2 OPERATIONS LIGHTING EFFECTS

Operation of the Connected Actions would not require any nighttime lighting aside from minor building-mounted safety lights at the pump stations, treatment plant, and substation. Therefore, there would be no lighting impacts to Indiana, northern long-eared, or tricolored bats from operation of the Connected Actions.

5.3.6 RECOMMENDED OPTIONS FOR RECOMMENDED TRANSPORTATION MITIGATIONS

5.3.6.1 CONSTRUCTION LIGHTING EFFECTS

Construction lighting information is not available for the recommended transportation mitigations because they have not been designed in detail. However, construction would most likely be limited to the daytime and therefore not require lighting. In the event nighttime construction and lighting were required, nearly all of the work would occur in existing intersections, interchanges, and road segments, that are already developed with transportation infrastructure and exposed to some light from existing streetlights and/or vehicles. Indiana, northern long-eared, and tricolored bats are not expected to forage in these roadside environments given the high levels of disturbance and degraded habitat conditions. Any nighttime construction in these areas would be expected to require only minor additional lighting that would not be likely to further limit foraging opportunities for bats.

One sub-component of the transportation mitigations where construction lighting could affect protected bats is the new 1.6-mile access road that would extend north from a new interchange NYS Route 481 between the CSX rail tracks and Caughdenoy Road to the east and terminate at the Rail Spur Site. This road alignment would bisect an approximately 175-acre forest fragment that is south of NYS Route 31, east of the CSX rail tracks, and west of Caughdenoy Road, where there is currently no light exposure in the interior. Temporary construction lighting would be required in this area for any nighttime construction of the road.

Although no detailed lighting plan is available at this time, it is likely that lighting of this road during construction, combined with the forest fragmentation, would cause Indiana, northern long-eared, and tricolored bats to avoid this area in favor of darker habitat away from the road. Any such displacement effect of the lighting would likely extend no more than 50 meters (164 feet) from the road, given the rapid attenuation of light through forest. The width of the forest ranges from approximately 1,000 to 2,500 feet, so only a small portion would potentially be affected. This would be a negligible reduction in foraging habitat availability in this forest and elsewhere in the home range of any bats present. Independent of potential lighting effects, however, fragmentation of the forest by the road may reduce the likelihood of this forest being used for roosting or foraging by Indiana, northern long-eared, and tricolored bats.

5.3.6.2 OPERATIONS LIGHTING EFFECTS

Operations lighting information is not available for the recommended transportation mitigations because they have not been designed in detail, but additional streetlights would likely be required in some improvement areas. Because nearly all of the improvements would involve modification of areas that are already developed with transportation infrastructure, the areas are already exposed to some light from existing streetlights and/or vehicles. Indiana, northern long-eared, and tricolored bats are not expected to forage in these roadside environments given the high levels of disturbance and degraded habitat conditions. Recommended transportation mitigations in these areas would be expected to require only minor additional lighting that would not be likely to further limit foraging opportunities for bats.

However, the new 1.6-mile access road that would extend north from NYS Route 481 to the Rail Spur Site would bisect an approximately 175-acre forest fragment where there is currently no light exposure in the interior. Streetlights would possibly be required for this road and passing vehicles at night would be an additional light source. Although no detailed lighting plan is available at this time, it is likely that lighting of the road would cause Indiana, northern long-eared, and tricolored bats to avoid this area in favor of darker habitat away from the road. The width of the forest ranges from approximately 1,000 to 2,500 feet, so only a minor portion would potentially be degraded as foraging habitat by the trespass of streetlight. This would likely represent a small reduction in foraging habitat available to bats in this forest or elsewhere in their home range.

6. CUMULATIVE EFFECTS

The Proposed Project is expected to indirectly influence residential, commercial, industrial, and infrastructure development trends in the surrounding region by increasing the local workforce population and accelerating economic development. These increases in development, combined with past, present, and reasonably foreseeable future development unassociated with the Proposed Project, could reduce habitat availability for Indiana, northern long-eared, and tricolored bats, and thereby result in cumulative impacts from the Proposed Project. Although it cannot be known to what extent future Micron-induced development would occur where there is suitable versus unsuitable habitat for these species, habitat loss can be reasonably estimated or extrapolated based on patterns in land-cover change in the recent past. To estimate potential losses in bat roosting habitat in relation to Micron-induced growth projections, land-cover change over the past two decades was analyzed and used to predict future changes in forest cover in a five-county area surrounding the Proposed Project.[4] The five-county Central New York study area for the analysis, which includes Onondaga, Oswego, Madison, Cortland, and Cayuga Counties, is the area in which the vast majority (approximately 90 percent) of Micron-induced residential growth and job growth are projected to occur.[5]

The analysis used historic growth patterns to examine land-cover change in this five-county study area at five-year intervals between 2001 and 2021 using the NLCD. Roosting habitat for Indiana, northern long-eared, and tricolored bats was quantified as all NLCD woodland cover types combined (Deciduous Forest, Evergreen Forest, Mixed Forest, Woody Wetlands). The amount of roosting habitat cover that changed to developed land (i.e., NLCD categories of Low, Medium, and High Intensity Development) in the five-county study area between 2001 and 2021 was then related to household growth during this period using U.S. Census Bureau American Community Survey (ACS) data.[6] Ratios of roosting habitat loss per new household were calculated by dividing the area of roosting habitat loss due to development of all types by the number of households built during the two-decade analysis period. The ratios were calculated for each of the five counties in the study area and then applied to projections of Micron-induced household growth in those counties to estimate changes in NLCD land-cover that would occur under the expected growth scenarios.

Residential development was used as an index of overall development partly due to data availability. Information on historic residential development is available from the Syracuse Metropolitan Transportation Council (SMTC) and household growth projections have been made for 2041 within the five-county study area for the Micron EIS. SMTC has also made available cumulative job growth projections for the SMTC region; however, some proportion of those jobs would be absorbed within existing businesses while others would be associated with new businesses that could generate additional land disturbance.[7] Importantly, the ratios of historic land cover change per new household

[4] Section 3.16 Induced Growth in the DEIS describes the methodology used to estimate Micron-induced growth.

[5] Regional Economic Models, Inc. (REMI), *Economic and Fiscal Impact of Establishing a Semiconductor Manufacturing Facility in Onondaga County, New York*, September 29, 2022. The 2022 REMI Study projects that approximately 85 percent of induced job growth and 90 percent of induced residential growth projected for New York State would occur within the five-County Central New York Region.

[6] New households built between 2000 and 2022 were used to compare to bat habitat losses between 2001 and 2021.

[7] In contrast, household growth does not have this "absorption factor" as new household demand will require additional housing units (conservatively assuming existing supply constraints).

capture non-residential development (i.e., the land cover changes identified in the ratios are created by all development, not only residential development). Therefore, assuming a positive correlation between household growth and non-residential growth, it is reasonable to use household growth in the recent past as a predictor of potential future land-use change, including both residential and non-residential development.

Future residential growth is not expected to require the same amount of undeveloped land as in the past because modern “smart growth” principles and more recent development patterns suggest that future residential development will be more multifamily, vertical and concentrated around already developed transit nodes (i.e., higher density and less “dispersed”). Past development has predominantly been single-family detached homes, which have a much larger development footprint (i.e., lower density) on a per-household basis. In this respect the method used is highly conservative and likely to overestimate forest loss in relation to future residential growth. The analysis also conservatively assumes that all projected residential growth will require new housing units, while in reality, some new households will occupy existing vacant or vacating properties.

Separate from roosting habitat (forest cover) loss resulting from development, between 2001 and 2021, roosting habitat increased slightly from 1.212 to 1.217 million acres in the five-county area, due in large part to agricultural abandonment and the subsequent succession of former farmland into forest (Table 14). This positive influence on roosting habitat is not associated with residential or commercial development, and therefore was excluded from the calculated ratios of roosting habitat loss per new household. Calculated ratios of roosting habitat loss per new household ranged from 0.011 acres in Cayuga County to 0.109 acres in Oswego County (Table 15). Within Onondaga County, the towns of DeWitt and Onondaga experienced the highest ratio of roosting habitat loss per new household.

In addition to Micron-induced growth, this cumulative assessment accounts for the potential loss of habitat from the Proposed Project, Connected Actions, associated recommended transportation mitigations, and known, planned projects within the five-county study area. For known, planned projects, roosting habitat loss was estimated using those projects’ estimated areas of disturbance and the 2021 NCLD.

Overall, projected losses in roosting habitat as a result of cumulative growth were low, ranging from approximately 19 acres (0.01 percent) in Cortland County to approximately 3,776 acres (1.8 percent) in Onondaga County by 2041 (Table 15). Although Onondaga County likely supports the greatest abundance of the listed bat species among the five counties examined, projected losses there would only reduce roosting habitat from 39.9 percent of the county’s current total land cover to 39.2 percent of the total land cover in 2041. This loss would not be expected to reduce the county’s capacity to support bats or its bat population sizes. Across the entire five-county study area, cumulative growth is predicted to result in a loss of approximately 4,667 acres (0.38 percent) of existing roosting habitat by 2041. This may be explained by the abundance of farmland in the region and the ongoing decline of agriculture, with abandoned farmland rather than forestland absorbing a large proportion of recent and future development. Under cumulative projections to 2041, roosting habitat is expected to occupy 29.7 to 58.0 percent of the total land cover in each of the five counties analyzed (Table 15). The projected reductions in roosting habitat do not account for potential roosting habitat increases due to future agricultural abandonment and the subsequent succession of former farmland into forest; to the extent historic trends continue into the future, the succession of former farmland into forest would offset some forest losses caused by Micron-induced development, resulting in a lower net loss of forest.

It is difficult to determine how the projected losses in forest cover would impact Indiana, northern long-eared, and tricolored bats without knowing the specific locations, extent, and nature of future development projects in relation to areas that are most suitable for, or occupied by, these species. The assessment conservatively considers any wooded areas represented in the NLCD as a forested cover type to be potential roosting habitat when in reality, many areas are likely too young, small, fragmented, degraded, or otherwise of low suitability as roosting habitat. Nevertheless, the overall predicted loss in forest cover across the five-county study area as a result of Micron-induced growth is unlikely to limit roosting habitat availability and affect the size or viability of Indiana bat, northern long-eared bat, or tricolored bat populations. Moreover, all future development proposals, whether induced by Micron or not, would be fully independent of the Proposed Project, subject to their own environmental, regulatory, and planning reviews, and at the discretion of regulatory and planning agencies to approve, modify, or mitigate.

TABLE 14.
LOSSES IN ROOSTING HABITAT COVERAGE FROM 2001–2021 AND FUTURE LOSSES EXPECTED TO RESULT FROM THE PROPOSED PROJECT, CONNECTED ACTIONS, RECOMMENDED TRANSPORTATION MITIGATIONS, AND UNRELATED PLANNED PROJECTS

	2001		2021				
Geographic Area	Roosting Habitat Acreage	Roosting Habitat as Percentage of Total Land Cover	Roosting Habitat Acreage	Roosting Habitat as Percentage of Total Land Cover	Roosting Habitat Loss from Known Planned Projects (ac)	Roosting Habitat Loss from Proposed Project (ac)	Roosting Habitat Loss from Connected Actions and Recommended Transportation Mitigations (ac)
Cayuga County	160,798	29.1	164,193	29.7	0	0	0
Oswego County	437,491	52.1	438,976	52.3	8	0	168
Madison County	220,931	52.2	221,936	52.4	0	0	0
Cortland County	185,632	57.8	186,286	58.0	0	0	0
Onondaga County	207,201	40.2	205,836	39.9	529	467	92
Total Central New York Region	1,212,053	45.7	1,217,227	45.9	537	467	260

TABLE 15.
PROJECTED CHANGE IN ROOSTING HABITAT FROM CUMULATIVE GROWTH BY 2041

	Induced Growth Projections				Cumulative Growth Projections		Predicted Results for Cumulative Growth	
Geographic Area	ACS Estimates: Occupied Households Built from 2000 to 2022	Habitat Change Ratio: Roosting Habitat Loss Per Household Built from 2000 to 2022 (ac)	Projected Number of Micron-Induced Households by 2041	Roosting Habitat Loss from Projected Induced Growth (ac)	Roosting Habitat Loss from Cumulative Growth (ac)	Roosting Habitat Loss as Percentage of 2021 Habitat Acreage	Projected Acreage of Remaining Roosting Habitat by 2041	Projected Remaining Roosting Habitat by 2041 as Percentage of Total Land Cover
Cayuga County	3,185	0.011	2,881	33	33	0.0	164,160	29.70
Oswego County	2,492	0.109	5,548	605	777	0.2	438,199	52.18
Madison County	3,250	0.022	2,757	62	62	0.0	221,875	52.24
Cortland County	1,290	0.012	1,655	19	19	0.0	186,267	58.03
Onondaga County	20,530	0.084	28,713	2,408	3,776	1.8	202,060	39.19
Total Central New York Region	30,747	0.102	41,554	3,127	4,667	0.4	1,212,560	45.72

7. SUMMARY AND EFFECT DETERMINATIONS

Upon full buildout, the Micron Campus would have a total permanent footprint of disturbance of approximately 997 acres, including the loss of approximately 445 acres of forested roosting habitat and approximately 512 acres of non-forested foraging habitat (e.g., old field, shrubland, herbaceous wetland) for Indiana, northern long-eared, and tricolored bats. The Rail Spur Site would require approximately 22 additional acres of roosting habitat removal on the 38-acre site. The Childcare Site would be located on a recently abandoned agricultural field and thus would not require any tree removal. Among the Connected Actions, the utility alignments would mostly follow existing roads and other disturbed ROWs, but some segments would intersect forest and have up to 100-foot-wide construction corridors, requiring a total of approximately 232 linear acres of roosting habitat removal. However, some of this forest loss would only be temporary, as only 70-foot-wide corridors would be permanently maintained in a non-forested state following construction. Recommended transportation mitigations would involve minor roadside tree removal to modify existing roads, intersections, and interchanges, except for a new 1.6-mile-long, 200-foot-wide access road that would bisect and require approximately 22 linear acres of tree removal in an approximately 175-acre forest.

All tree clearing for the Proposed Project, Connected Actions, and recommended transportation mitigations would occur during the November 1 to March 31 hibernation period to avoid any potential for direct effects on bats. Upon returning to the Micron Campus in the first spring following tree removal and other site preparations for Phase 1, Indiana bats and northern long-eared bats would need to find alternative maternity habitat beyond the construction area in the event multiple roosts were lost. Because development of the Micron Campus would occur in phases as each of the four fabs are sequentially constructed over an approximately 16-year period, habitat loss would be gradual and suitable roosting and foraging areas would remain available to any displaced bats onsite and in adjacent areas to the north and east.

As development of the Micron Campus proceeded from west to east towards full buildout, the amount of habitat loss would be expected to eventually exceed the tolerance thresholds of Indiana and northern long-eared bats and possibly result in social network and colony dissolvement. Any displaced reproductive females would be required to promptly find alternative maternity habitat in which to birth and rear pups and intensively forage to meet the high energy demands of lactation, potentially leading to low birth rates, juvenile survival, and recruitment that year. Impacts to Indiana and northern long-eared bat population size and viability from the loss of habitat on the Micron Campus would be possible through reductions in fecundity, adult survival, or both. Habitat loss on the Micron Campus would likely have lesser impacts to tricolored bats because they appear to be present there only as rare transients, they are considered by the USFWS to be relatively tolerant of habitat loss, and habitat loss is not considered by the USFWS to be a significant threat currently facing tricolored bat populations.

Forest loss from the Connected Actions and recommended transportation mitigations would mostly be temporary and distributed linearly, and thus unlikely to compromise the suitability of remnant adjacent forest as habitat for Indiana, northern long-eared, or tricolored bats. The approximately 70-foot-wide, post-construction corridors that would be maintained in wooded areas for some segments of the utility alignments would potentially benefit Indiana and tricolored bats by providing preferred forest-corridor habitat for foraging and commuting.

Micron would strive to meet the criteria of the U.S. Green Building Council's LEED light pollution reduction credit and would therefore design construction and operations lighting for the Proposed Project to limit trespass into adjacent areas. Some avoidance of foraging near the Micron Campus and Childcare Site boundaries due to operations lighting would still be likely but would be limited to the closest edges of habitat that would remain on- and off-site. Lighting used during operation of the Rail Spur Site would extend well into a forested area west of the railroad tracks and likely displace Indiana, northern long-eared, and tricolored bats from potentially foraging there. The Connected Actions and recommended transportation mitigations would have limited and mostly temporary effects on bat habitat from lighting.

Most noises generated by construction and operation of the Proposed Project, Connected Actions, and recommended transportation mitigations would have frequencies well below the expected hearing range of Indiana, northern long-eared, and tricolored bats. Modeled sound contours show that any high-frequency noises at a sound pressure level that could be audible to bats would travel a maximum of approximately 237 meters (778 feet) from the source. Some acoustic degradation of foraging conditions for Indiana, northern long-eared, and tricolored bats would occur in nearby areas of habitat.

In sum, the BA finds that the Proposed Project, Connected Actions, and recommended transportation mitigations would result in the loss of approximately 727 total acres of forested roosting habitat and more than 500 acres of non-forested foraging habitat, along with indirect impacts to additional areas of habitat from fragmentation and noise and light pollution. Based on these findings, CPO has made preliminary ESA effect determinations of "*may affect, likely to adversely affect*" for the Indiana bat and the northern long-eared bat. CPO has made a preliminary ESA effect determination of "*not likely to jeopardize; may affect, likely to adversely affect*" for the tricolored bat.[8] CPO has made a preliminary ESA effect determination of "*not likely to jeopardize*" for the monarch butterfly. The eastern massasauga and bog buck moth are highly restricted to specific sites in Onondaga or Oswego County that would not be affected by the Proposed Project, Connected Actions, or recommended transportation mitigations; therefore, it is concluded there would be "*no effect*" on these species.

[8] CPO notes that if the tricolored bat is listed in the future, based on the BA's analysis of the tricolored bat, CPO would anticipate making a preliminary ESA effect determination for the species of "*may affect, likely to adversely affect*".

8. PROJECT COMMITMENTS AND MITIGATION MEASURES

The Proposed Project, Connected Actions, and recommended transportation mitigations would implement several measures to avoid and minimize the above-described potential impacts to Indiana, northern long-eared, and tricolored bats. These would include:

- **Wintertime tree clearing:** All tree removal for the Proposed Project, Connected Actions, and recommended transportation mitigations would occur during the November 1 to March 31 winter hibernation period, when bats would not be present. This would avoid any potential for direct disturbance, injury, or mortality that can result from the felling of an active roost tree.

- **Tree marking:** all areas of tree clearing will be clearly marked to distinguish them from areas where forest will remain.

- **Retention of onsite roosting and foraging habitat:** The site plan for the Micron Campus has been designed to economize space and reduce its footprint of disturbance. The proposed site plan would leave approximately 380 total acres on the site undisturbed, including approximately 272 nearly contiguous acres of forested roosting habitat and approximately 84 acres of former cropland (mostly old field and shrubland) and approximately 11 acres of non-forested wetland as foraging habitat. This would reduce the scale of habitat lost to the Proposed Project and allow some suitable roosting and foraging habitat for Indiana, northern long-eared, and tricolored bats to remain available on the site and connected to adjacent areas of additional habitat offsite. The approximately 272 acres of forest outside of the Campus limits of disturbance will be permanently protected for bats via conservation easement.

- **Tree retention on the Childcare Site:** The site plan for the Childcare Site has been centered on a recently abandoned agricultural field to avoid any tree clearing. The existing shelterbelts on the western and northern property lines and the forest fragment in the northeastern corner of the site would be left undisturbed and would buffer adjacent areas from noise and lighting from the facilities. The limits of disturbance would be set back a minimum of 50 feet from the frontage on Caughdenoy Road and the shelterbelts along the northern and western property boundaries, and at least 100 feet from the wetlands on the eastern side of the property. This site plan would distance and buffer human activity, noise, and lighting from adjacent areas of potential bat habitat.

- **Limited nighttime construction:** Construction of the Micron Campus would not occur past 10 pm, to minimize overlap with the nighttime foraging period of bats and limit the potential for disturbance from construction noise or lighting. Rail Spur Site and Childcare Site construction would not occur at night, and the Connected Actions would be expected to require little if any nighttime construction.

- **Best management practices for outdoor lighting:** Outdoor lighting used during construction and operation of the Campus would strive to meet the criteria of the U.S. Green Building Council's LEED light pollution reduction credit (SS8) and therefore be designed to minimize spill into unintended areas. This would greatly reduce the potential for disturbance of light-averse bats in adjacent areas of habitat.

- **Operations noise reduction:** Operation of the Micron Campus and Childcare Site would employ noise mitigation measures (e.g., sound attenuators, acoustical louvers, sound walls) to reduce noises generated by outdoor equipment such as rooftop air handlers and cooling fans. Operation of the Rail Spur conveyor would include equipment upgrades to reduce noise, including upgraded pulleys and return idlers, and 1-inch rubber flashing on the hoppers. These measures would reduce the potential for disturbance of bats in adjacent areas of habitat.

- **Water quality protection:** Use of dyes, pesticides, and fertilizers will be avoided near surface waters over which bats may forage (e.g., Youngs Creek complex to the east of Fab 4).

- **Implementation monitoring:** A biological monitor will be used to ensure all of the above measures are implemented.

Despite these project commitments, impacts to Indiana, northern long-eared, and tricolored bats would still have the potential to result from the Proposed Project, Connected Actions, and recommended transportation mitigations. Therefore, Micron is committed to several mitigation actions to compensate for unavoidable impacts, including the purchase and permanent protection of twice the amount of roosting habitat lost, and the support of research and monitoring efforts that would benefit science-based management and conservation of these species in New York. Specifically, the mitigation actions that would be implemented to offset unavoidable impacts would include:

- **Offsite Habitat Protection:** Micron is committed to offsetting roosting habitat loss by purchasing and permanently protecting (via conservation easement) two acres of suitable roosting habitat for every one acre of forest lost to construct the Micron Campus, Connected Actions, and recommended transportation mitigations. This 2 to 1 ratio amounts to a minimum of approximately 1,182 acres of protected roosting habitat offsite in addition to the approximately 272 undisturbed acres of roosting habitat that will be protected via conservation easement on the Micron Campus following full buildout, resulting in a total of at least 1,454 permanently protected acres of roosting habitat for Indiana, northern long-eared, and tricolored bats. In consultation with USFWS and NYSDEC, sites with or near previous records of these species have been selected for protection, with priority given to sites that have or are within 2.5 miles of a known roost tree. In exceedance of the 1,182 offsite acres needed to achieve a ratio of two protected acres for every one acre lost, 1,367 total acres of forested roosting habitat across 9 parcels has been reviewed by USFWS and NYSDEC and acquired for permanent protection via conservation easement by the Wetland Trust Inc. (Attachment 4). This includes a nearby hibernaculum and its approximately 300 surrounding acres of forested fall swarming and suitable roosting habitat. A management plan will be developed for each site, and trespassing, ATV use, timber harvesting, and other such impactful uses will be prohibited.

- **Artificial Roost Sites:** To further offset the loss of roosting habitat on the Micron Campus, Micron will fund the purchase and installation of 10 roost boxes of appropriate styles and designs selected by USFWS and NYSDEC for Indiana, northern long-eared, and tricolored bats in undisturbed portions of the Micron Campus. The boxes will be installed prior to the completion of Fab 1. Occupancy of the boxes will be monitored once per maternity season for the first five years following their installation, along with annual cleaning and maintenance procedures that follow manufacturer recommendations and best management practices (e.g., Holroyd et al. 2023).

- **Research and Monitoring:** Micron will sponsor research and monitoring projects recommended by and designed in consultation with USFWS and the NYSDEC, to help improve science-based management and conservation of the Indiana, northern long-eared, and tricolored bat in New York. They include studies of the movement, summer ranges, and distribution of bats on the Syracuse-area landscape, the sensitivity of bats to noise and light, and the response of bats to the Micron Campus' development over time. A request for proposals (RFP) for each project will be disseminated to universities, conservation organizations, and environmental consultants, and advertised online. All details regarding study design, site selection, timing, and other methods to be described in the RFP's will be determined in coordination with USFWS and NYSDEC. Conceptually, these projects are as follows:

  - **Project 1: Current roost tree locations and post-construction fate of bats on the Micron Campus**

    Learning how bats respond to construction of the Micron Campus over time will help USFWS, NYSDEC, and natural resources agencies elsewhere in the geographic range of the Indiana bat, northern long-eared bat, and tricolored bat better understand potential impacts to these species from other large-scale development projects in the future. To do this, baseline (pre-construction) information on the current roost-tree locations of bats will be identified in the spring/summer of 2025 via radiotelemetry. Micron will fund efforts to capture, radio-tag and track up to ten Indiana bats, northern long-eared bats, tricolored bats, or combination thereof, depending on capture outcomes, on the Micron Campus to identify their roosting locations prior to the start of construction in the fall of 2025. Up to ten nights of mist-netting effort will be applied and any tagged bats will be radio-tracked for a minimum of seven days each. Concomitantly, acoustic recorders will be deployed at select locations to identify areas in which to focus capture efforts.

    The second phase of this project will be to investigate potential changes in roosting locations or abandonment of the Micron Campus in response to construction. In the first spring following tree clearing for Fab 1, acoustic surveys will be conducted in undisturbed portions of the Micron Campus to evaluate whether Indiana, northern long-eared, or tricolored bats are still present. If so, an attempt will be made to capture and radio-track bats to their roost trees (up to ten nights of capture effort, up to ten total bats tagged, and at least seven days of tracking per tagged bat). Emergence surveys will also be conducted at any previously identified roosts that have not been cleared, to assess continued use. This acoustic monitoring and radio-tracking approach will be repeated for two maternity seasons following any winter in which there is additional tree clearing, with the intent to determine how bat roosting locations and site usage are affected by the gradual development of the Micron Campus from west to east. In the event acoustic surveys conclude probable absence of these species following the first winter of tree clearing on the Micron Campus, an equivalent amount of funding will be dedicated to an alternative project selected in consultation with USFWS and NYSDEC.

- **Project 2: Dispersal of bats from the Jamesville hibernaculum**

In 2006, USFWS and NYSDEC radio-tagged Indiana bats while they were hibernating in the Jamesville Mine and then followed them upon emergence to identify their summer habitat areas. Now that these data are nearly 20 years old and much has changed since 2006 in terms of land-use and bat population sizes, repeating this study would yield valuable, current information about where bats still occur on the local landscape. As such, Micron will fund the radio-tagging and tracking of Indiana, northern long-eared, and/or tricolored bats that hibernate in the Jamesville Mine during the spring of 2026. Up to 10 bats of each species will be sought for tagging prior to or upon spring emergence, and then tracked via ground-based methods (motor vehicle; on foot) for up to two weeks.

Because these species currently hibernate in the Jamesville Mine in very low numbers and are difficult to access, an equivalent amount of funding would be allocated towards a similar study at a different New York hibernaculum, selected in consultation with USFWS and NYSDEC, if these agencies determine that tracking bats from the Jamesville Mine would not be practical.

- **Project 3: Effects of construction noise on the foraging behavior of Myotis bats**

Construction noise is a primary source of potential impact that is evaluated during environmental reviews concerning the Indiana bat and northern long-eared bat. However, very few empirical studies have investigated how bats are affected by construction noise, so impact assessments must rely on what is known from studies of other anthropogenic noises (e.g., traffic) and other bat species.

The effects of noise on bats largely depend on the degree to which the noise’s frequency range overlaps with the echolocation frequency range of the bats, meaning different sources of anthropogenic noise can have very different effects on bats. As such, Micron will fund a field experiment to assess the sensitivity of Indiana, northern long-eared, and tricolored bats to phantom construction noise playbacks (e.g., Finch et al. 2020), either directly or by using the little brown bat as a model. The study will be designed to isolate the effects of construction noise from other variables by comparing acoustic activity of bats at a known foraging habitat during natural, quiet periods and periods when recordings of various types of construction equipment are broadcast through speakers (specific study sites will be proposed by RFP responders).

Such a design will hold all other factors that can influence bat foraging activity constant. Because of the logistical challenges associated with finding a study site in which Indiana, northern long-eared, or tricolored bats can be reliably found foraging on a nightly or semi-nightly basis for several weeks of the summer to provide adequate sample sizes, proposals that would use the little brown bat as a surrogate for the other high-frequency bats will also be considered. All three species have similar echolocation frequency ranges as the little brown bat and are therefore expected to have similar sensitivity to masking effects from anthropogenic noises.

- **Project 4: Effects of artificial light at night on the foraging behavior of Myotis bats**

  Like noise, artificial light at night is a primary source of potential impact addressed in environmental reviews involving the Indiana bat or northern long-eared bat, but little is known about how these species are affected by light. Micron will fund a field experiment to assess the sensitivity of Indiana, northern long-eared, or tricolored bats to white LED lighting (the most common contemporary lighting type). The study will be designed to isolate the effects of the light from other variables by comparing acoustic activity of bats at a known foraging habitat during natural, dark conditions and conditions in which the foraging area is exposed to white LED (e.g., Seewagen and Adams 2021). Specific study sites will be proposed by RFP responders.

- **Micron-Funded Grant Program:** To further support the conservation and management of the Indiana bat, northern long-eared bat, and tricolored bat, and help compensate for future cumulative impacts that could result from Micron-induced economic growth in the region, Micron will establish a fund from which grants will be awarded for projects that benefit these species. Research, education/outreach, surveys, and habitat protection and enhancement projects will be eligible, with those in New York State being most competitive for funding. Up to $100,000 in grants will be made available and disbursed each year for the first 10 years of the Micron Campus's construction. Any unused funds in a given year will be carried over to the following year until a total of $1,000,000 has been awarded over the life of the program. Micron will partner with a non-governmental conservation organization or university to administer the program, and input from USFWS and NYSDEC will be sought during yearly review of received proposals and the selection of awardees.

- **Hibernaculum Gating:** Micron will contribute up to $50,000 towards the fabrication and installation of gates to prevent people from entering and disturbing the Glen Park bat hibernaculum or another hibernaculum of USFWS' and NYSDEC's choosing.

In coordination with the USFWS and NYSDEC, Micron will develop a mitigation masterplan that details all final, agreed-to mitigation actions by the time formal Section 7 consultation with USFWS is completed. As required by USFWS, and apart from the mitigation, Micron will also conduct acoustic bat monitoring on the Micron Campus during each year of its construction and for the first two years after full buildout, following USFWS survey guidelines and approved study plans.

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APPENDIX A: Preliminary Construction Phases, Duration, and Equipment

APPENDIX A, TABLE 1
EQUIPMENT BY CONSRUCTION PHASE FOR FAB 1

PHASE	GENERAL ACTIVITY	DURATION IN MONTHS	MOBILE EQUIPMENT (MAX VEHICLES/ DAY)	ON SITE UTILIZED EQUIPMENT
1	Site Establishment / Mass Excavation	6	550 - (Assumes ~1.2M Cu Yds)	Dump Trucks (40) Bulldozers / Loaders (8) Motor Graders (3) Scrapers (3) Trenchers (1) Excavators (6) Crusher/Screener (1)
2	Underground Utilities start of foundation work	6	550	Dump Trucks (20) Bulldozers / Loaders (8) Trenchers (1) Drilling Rigs for caisson (13) Excavators (6) Gas powered generators (10) Welders (8) Gas powered compressors (10) Conveyer system (1) Crusher/Screener (1) Mobile lifts (10)
2	Foundations	8	250	Concrete Batch Plant (1) Concrete Trucks (10) Excavators (6) Dump Trucks (15) Drilling Rigs for caisson (13) Welders (8) Gas powered generators (10) Gas powered compressors (10) Bulldozers / Loaders (8) Conveyer system (1) Tower Cranes (6) Mobile lifts (10)

PHASE	GENERAL ACTIVITY	DURATION IN MONTHS	MOBILE EQUIPMENT (MAX VEHICLES/ DAY)	ON SITE UTILIZED EQUIPMENT
3	Building Erection	18	200	Concrete Batch Plant (1) Concrete Trucks (15) Excavators (4) Dump Trucks (10) Mobile Crawler Cranes (10) Generators (10) Compressors (10) Tower Cranes (6) Welders (8) Conveyer system (1) Mobile lifts (10)
4	Final Site Work	5	100	Concrete Batch Plant (1) Concrete Trucks (4) Loaders (2) Dump Trucks (5) Paver Machines (2) Asphalt Rollers (2) Conveyer system (1)

APPENDIX A, TABLE 2
EQUIPMENT BY CONSRUCTION PHASE FOR FAB 2

Phase	General Activity	Duration in Months	Mobile Equipment (Max Vehicles/Day)	Utilized Equipment
1	Site Establishment / Mass Excavation	4	200	Dump Trucks (40) Bulldozers / Loaders (8) Motor Graders (3) Scrapers (3) Trenchers (1) Excavators (6) Conveyer system (1) Crusher/Screener (1)
2	Underground Utilities	3	200	Dump Trucks (20) Bulldozers / Loaders (8) Trenchers (1) Drilling Rigs for caisson (13) Excavators (6) Gas powered generators (10) Welders (8) Gas powered compressors (10) Conveyer system (1) Mobile lifts (10) Crusher/Screener (1)
2	Foundations	8	200	Concrete Batch Plant (1) Concrete Trucks (10) Excavators (6) Dump Trucks (15) Drilling Rigs for caisson (13) Welders (8) Gas powered generators (10) Gas powered compressors (10) Bulldozers / Loaders (8) Conveyer system (1) Tower Cranes (6) Mobile lifts (10)

Phase	General Activity	Duration in Months	Mobile Equipment (Max Vehicles/Day)	Utilized Equipment
3	Building Erection	18	200	Concrete Batch Plant (1) Concrete Trucks (15) Excavators (4) Dump Trucks (10) Mobile Crawler Cranes (10) Generators (10) Compressors (10) Tower Cranes (6) Welders (8) Conveyer system (1) Mobile lifts (10)
4	Final Site Work	5	100	Concrete Batch Plant (1) Concrete Trucks (4) Loaders (2) Dump Trucks (5) Paver Machines (2) Asphalt Rollers (2) Conveyer system (1)

APPENDIX A, TABLE 3
EQUIPMENT BY CONSRUCTION PHASE FOR FAB 3

Phase	General Activity	Duration in Months	Mobile Equipment (Max Vehicles/Day)	Utilized Equipment
1	Site Establishment / Mass Excavation	5	200	Dump Trucks (40) Bulldozers / Loaders (8) Motor Graders (3) Scrapers (3) Trenchers (1) Excavators (6) Conveyer system (1) Crusher/Screener (1)
2	Underground Utilities	3	200	Dump Trucks (20) Bulldozers / Loaders (8) Trenchers (1) Drilling Rigs for caisson (13) Excavators (6) Gas powered generators (10) Welders (8) Gas powered compressors (10) Conveyer system (1) Mobile lifts (10) Crusher/Screener (1)
2	Foundations	8	200	Concrete Batch Plant (1) Concrete Trucks (10) Excavators (6) Dump Trucks (15) Drilling Rigs for caisson (13) Welders (8) Gas powered generators (10) Gas powered compressors (10) Bulldozers / Loaders (8) Conveyer system (1) Tower Cranes (6) Mobile lifts (10)

Phase	General Activity	Duration in Months	Mobile Equipment (Max Vehicles/Day)	Utilized Equipment
3	Building Erection	18	200	Concrete Batch Plant (1) Concrete Trucks (15) Excavators (4) Dump Trucks (10) Mobile Crawler Cranes (10) Generators (10) Compressors (10) Tower Cranes (6) Welders (8) Conveyer system (1) Mobile lifts (10)
4	Final Site Work	5	100	Concrete Batch Plant (1) Concrete Trucks (4) Loaders (2) Dump Trucks (5) Paver Machines (2) Asphalt Rollers (2) Conveyer system (1)

APPENDIX A, TABLE 4
EQUIPMENT BY CONSRUCTION PHASE FOR FAB 4

Phase	General Activity	Duration in Months	Mobile Equipment (Max Vehicles/Day)	Dump Trucks (40)
1	Site Establishment / Mass Excavation	5	200	Dump Trucks (40) Bulldozers / Loaders (8) Motor Graders (3) Scrapers (3) Trenchers (1) Excavators (6) Conveyer system (1) Crusher/Screener (1)
2	Underground Utilities	3	200	Dump Trucks (20) Bulldozers / Loaders (8) Trenchers (1) Drilling Rigs for caisson (13) Excavators (6) Gas powered generators (10) Welders (8) Gas powered compressors (10) Conveyer system (1) Mobile lifts (10) Crusher/Screener (1)
2	Foundations	8	200	Concrete Batch Plant (1) Concrete Trucks (10) Excavators (6) Dump Trucks (15) Drilling Rigs for caisson (13) Welders (8) Gas powered generators (10) Gas powered compressors (10) Bulldozers / Loaders (8) Conveyer system (1) Tower Cranes (6) Mobile lifts (10)

Phase	General Activity	Duration in Months	Mobile Equipment (Max Vehicles/Day)	Dump Trucks (40)
3	Building Erection	18	200	Concrete Batch Plant (1) Concrete Trucks (15) Excavators (4) Dump Trucks (10) Mobile Crawler Cranes (10) Generators (10) Compressors (10) Tower Cranes (6) Welders (8) Conveyer system (1) Mobile lifts (10)
4	Final Site Work	5	100	Concrete Batch Plant (1) Concrete Trucks (4) Loaders (2) Dump Trucks (5) Paver Machines (2) Asphalt Rollers (2) Conveyer system (1)

APPENDIX A, TABLE 5
RAIL SPUR PRELIMINARY CONSTRUCTION PHASES, DURATION, AND EQUIPMENT

Project Component	Duration in Months	Calendar Time Period	Utilized Equipment
Mobilization / Clearing, Grubbing, Grading, UG Utility Installations	3	11/2025-2/26	Dump Trucks (4) Bulldozers / Loaders (2) Motor Graders (1) Scrapers (1) Trenchers (1) Excavators (2) Tamping Machines / Vibrating Rollers (1)
Rail Installations	4.5	1/26-6/26	Telehandlers (2) Skidsteers (2) Excavators (2) Railroad Grapple Truck (1)
Foundation Installations / Grading	2	2/26-4/26	Concrete Pump (1) Concrete Trucks (2) Excavators (1) Drilling Rig (1) Dump Trucks (2) Mobile Crawler Cranes (1) Compressors (2) Generators (2) Welders (2)
Utility and Equipment Installations	2.5	4/26-6/26	Telehandlers (2) Skidsteers (2) Mobile Crawler Cranes (1) Stationary Cranes (1) Loaders (1) Compressors (2) Generators (2) Welders (2)
Paving / Final Site Work	2	4/26-6/26	Concrete Trucks (2) Loaders (2) Dump Trucks (2) Paver Machines (2) Asphalt Rollers (2)

APPENDIX A, TABLE 6
CHILDCARE SITE PRELIMINARY CONSTRUCTION PHASES, DURATION, AND EQUIPMENT

Project Component	Duration in Months	Calendar Time Period	Utilized Equipment
Site Prep / Mobilization	3	7/26–10/26	Dump Trucks (2) Bulldozers / Loaders (2) Motor Graders (1) Scrapers (1) Trenchers (1) Excavators (2)
Child Care Center (25,000 gsf)	10	10/26–8/27	Concrete Pump (1) Dump Trucks (2) Concrete Trucks (2) Mobile Crawler Cranes (1) Excavators (1) Compressors (2) Drilling Rig (1) Generators (2) Welders (2)
Sewage Disposal System, Wet Pond / Bioretention SWMA	8	8/27–4/28	Concrete Pump (1) Dump Trucks (2) Concrete Trucks (2) Mobile Crawler Cranes (1) Excavators (1) Compressors (2) Drilling Rig (1) Generators (2) Welders (2)
Playground, Tennis/Pickball Courts, Soccer Field	8	8/27–4/28	Concrete Pump (1) Dump Trucks (2) Concrete Trucks (2) Mobile Crawler Cranes (1) Excavators (1) Compressors (2) Drilling Rig (1) Generators (2) Welders (2)
Parking Area / Final Site Work	3	3/28–6/28	Concrete Trucks (2) Dump Trucks (2) Loaders (2) Paver Machines (2)

			Asphalt Rollers (2)
Health Care Center (10,000 gsf)	12	4/30–4/31	Concrete Pump (1) Dump Trucks (2) Concrete Trucks (2) Excavators (1) Drilling Rig (1) Mobile Crawler Cranes (1) Compressors (2) Generators (2) Welders (2)
Rec Center (5,000 gsf)	12	4/30–4/31	Concrete Pump (1) Dump Trucks (2) Concrete Trucks (2) Mobile Crawler Cranes (1) Excavators (1) Compressors (2) Drilling Rig (1) Generators (2) Welders (2)

Appendix G-5
Grassland Breeding Bird Survey

GRASSLAND BREEDING BIRD SURVEY REPORT
MICRON PROJECT
CLAY, NY

September 2023

Prepared for:
Micron New York Semiconductor Manufacturing LLC

Prepared by:
AKRF, Inc.
34 South Broadway
White Plains, NY 10601

Submitted to:
New York State Department of
Environmental Conservation
1285 Fisher Avenue
Cortland, NY 13045

EXECUTIVE SUMMARY

AKRF, Inc. (AKRF) conducted a grassland breeding bird survey from May 15 – July 12, 2023 to evaluate the presence of state-listed grassland bird species on an approximately 1400-acre proposed development site in the town of Clay, NY ("Project Study Area"). The Project Study Area contains former agricultural fields, which have succeeded into old fields that may support breeding grassland birds. The survey followed the New York State Department of Environmental Conservation's *Survey Protocol for State-listed Breeding Grassland Bird Species*, including duration and effort, survey site selection, habitat characterization methods, and bird point-count methods. Over an 8-week period and across 16 point-count locations, the survey recorded 3,253 total observations of 49 species of birds. The bird community mostly included a mix of habitat generalists, shrubland and young-forest birds, and grassland specialists. Habitat generalists were dominant in most locations, with red-winged blackbird, song sparrow, common yellowthroat, and American goldfinch representing 67% of all observations. However, one grassland-obligate, the bobolink, was the second-most abundant species, after red-winged blackbird. Other grassland specialists observed included American kestrel, eastern meadowlark, savannah sparrow, and vesper sparrow. No sedge wrens were observed. The limited abundance of grassland-obligate species in the Project Study Area's fields relative to generalists may be partly due to vegetation conditions, which are transitioning from old field to early successional, woody habitat at many survey points. State-listed species documented during the survey included northern harrier (threatened), osprey (special concern), sharp-shinned hawk (special concern), vesper sparrow (special concern), and golden-winged warbler (special concern). Other than ospreys nesting on top of a cell tower at the south end of the Project Study Area, there was no confirmation or clear indication of listed species breeding within the Project Study Area during the survey period. Most records of state-listed species were limited to one or two observations and were in the spring, when the observed individuals may have been migrants only briefly stopping over. However, a report of a northern harrier egg in the Project Study Area in late April, prior to the start of the survey, indicates some usage of the site as breeding habitat by this species. Overall, the survey documented that the open habitats in the Project Study Area support a diverse assemblage of breeding birds that is dominated by generalists but also includes declining grassland specialists and other species of conservation concern. Loss of these habitats and resulting impacts to the bird communities they support would be mitigated by the protection and long-term management of equivalent offsite habitat that is three times the size of the area of impact and that would otherwise be vulnerable to future development. The long-term result of this mitigation would be a net conservation benefit to listed species of grassland birds and other birds that utilize grassland habitats in northern New York State.

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A. PROJECT DESCRIPTION

Micron New York Semiconductor Manufacturing LLC, a Delaware limited liability company and wholly owned subsidiary of Micron Technology, Inc. (Micron), is proposing to construct a semiconductor manufacturing campus in the Town of Clay, New York (Onondaga County), at the White Pine Commerce Park, an approximately 1,400-acre industrial park controlled by the Onondaga County Industrial Development Agency (OCIDA) (the "Project Study Area"). Micron's proposed semiconductor manufacturing facility campus will be built-out over an approximate 20-year period, encompassing the construction of four (4) Memory Fabrication facilities (Fabs) (the "Proposed Project"). Micron expects that the Fabs will be built in sequence, with construction of each Fab starting as the preceding Fab is being fit-out and operations begun. This process will result in continuous construction activities on the site over the approximate 20-year period, with a significant portion of that construction occurring inside the previously constructed Fab buildings. Each Fab is expected to occupy approximately 1.2 million square feet (sf) (approximately 27.6 acres) of land. The proposed campus will also have ancillary on-site electrical substations, water and wastewater pre-treatment and storage, and industrial gas storage.

Micron is seeking federal funding under the Creating Helpful Incentives to Produce Semiconductors and Science Act of 2022 (the "CHIPS Act") and will require certain federal permits and approvals, including, but not limited to, federal wetlands permits pursuant to Section 404 of the Clean Water Act. Micron, as the Project Sponsor, will comply with the requirements of the National Environmental Policy Act (NEPA) of 1969 (42 United States Code (U.S.C.) § 4321 et seq.) and Council on Environmental Quality's (CEQ) NEPA-implementing regulations (40 Code of Federal Regulations (CFR) §§ 1500-1508), as well as the requirements of the New York State Environmental Quality Review Act (SEQRA) (6 NYCRR Part 617).

The Project Study Area (**Figure 1**) contains former agricultural fields, which have succeeded into old field and shrubland habitats with which some state-listed species of grassland birds in New York are associated. There are historical and recent records of the sedge wren (Threatened) and other state-listed grassland birds breeding in the vicinity of the Project Study Area and in other nearby areas of Onondaga County. Additionally, the short-eared owl (Endangered) and northern harrier (Threatened) have been documented by NYSDEC overwintering in the Project Study Area, but it is unknown if these species may breed there as well. For these reasons, AKRF conducted a survey in accordance with the New York State Department of Environmental Conservation's (NYSDEC) *Survey Protocol for State-listed Breeding Grassland Bird Species*, to help determine presence or probable absence of state-listed grassland bird species breeding within the Project Study Area.

B. PROJECT STUDY AREA

The approximately 1,400-acre Project Study Area is in a largely agricultural, but urbanizing, landscape north of Syracuse, NY (**Figure 1**). The Project Study Area contains a matrix of old field, shrubland, upland forest, and forested wetland. A utility corridor that passes through the northern end of the Project Study Area also contains wetland and shrubland. According to the National Land Cover Database (2019), the Project Study Area comprises approximately 575 acres of pasture/hayfields (now fallow), 440 acres of deciduous forest, 300 acres of forested wetland, 60 acres of cultivated cropland, and 5 acres of mixed forest (**Figure 2**). Of this, approximately 435 acres of pasture/hayfield, 310 acres of deciduous forest, 80 acres of forested wetland, 35 acres of cropland, and 5 acres of mixed forest are within the Proposed Project's limits of disturbance (LOD) and proposed for development (**Figure 2**).

C. SURVEY LOCATIONS AND METHODS

Birds were surveyed in the Project Study Area by conducting fixed-radius point-counts in appropriate habitats (open areas dominated by grasses and forbs) of sufficient size to meet the area requirements of breeding sedge wrens and other area-sensitive, state-listed grassland birds (conservatively > 10 acres; Herkert 1994, Jones and Vickery 1997, Dechant et al. 2002) (**Table 1, Figure 2**). In a study plan submitted to NYSDEC on April 27, 2023, locations for sixteen survey points were proposed based on a desktop analysis of the Project Study Area, with the objective of having at least 100 meters between points and forest edges, hedgerows, roads, and similar obstructions, having full visibility of open habitat for a minimum distance of 100 meters in each direction at each point; and having a minimum distance of 250 meters between points. Because sedge wrens have been shown to avoid forest edges for at least 220 meters (Tack et al. 2017) and respond negatively to the amount of forest cover surrounding open habitats (Thompson et al. 2014, Panci et al. 2017), we prioritized distance from forest edge over other criteria when selecting locations. Following on-site inspections, some of these locations were adjusted to account for obstructions such as trees that were not visible in aerial imagery during the desktop analysis. Ultimately, the layout of fields and corresponding distribution of wooded hedgerows prevented all points from meeting all criteria. Specifically, five points were less than 100 meters from forest edges and eight points were 200–250 meters from their nearest neighbor, with a further two points 180 meters apart (**Table 1**). The final density of points, however, was one point per 27.2 acres of former pasture/hayfield within the Proposed Project's limits of disturbance (one point per 35.9 acres of former pasture/hayfield total), which exceeded the NYSDEC protocol's target of one point per 25 acres.

Counts were conducted at survey points between May 15 and July 12, 2023, with the goal of surveying each point twice per week (morning and evening) over eight weeks. Each week, surveys took place over three consecutive days, with half of the points surveyed on the evening of day one and the morning of day two, and the second half surveyed on the evening of day two and the morning of day three. Surveys in different weeks were spaced seven days apart except for the week of June 26, when rain delayed the surveys to the end of the week, and the week of June 12, when rain limited the time available for surveys to a single day. This latter constraint resulted in a failure to survey two points in both the morning (points 6 and 14) and evening (points 4 and 5) windows. The resulting dates of surveys were May 15–18, May 22–24, June 5–7, June 13, June 19–21, June 28–30, July 3–5, and July 10–12. Morning surveys were conducted between sunrise and 10:30 AM, and evening surveys were conducted between two hours prior to and one hour after sunset. Upon arriving at each survey location, the observer allowed a minimum of two minutes of silence to elapse before recording all birds seen and/or heard at the point for five minutes. For each individual bird identified, the observer recorded the species, sex (if known), behavior, and whether the individual occurred within 100 meters of the point. In between survey points, the observer conducted meander surveys averaging a distance of 350 meters, during which they recorded observations of target species (including sex, and behavior) and non-target species when engaged in breeding behavior.

In parallel with the point-count surveys, the observer measured vegetation height at each survey point each week with a Robel pole and recorded the lowest visible point on the Robel pole from the four cardinal directions at an eye level of 1 meter above ground. At the start and end of the survey period (weeks 1 and 8), the observer also characterized within 25 meters of each point-count location the dominant grass and forb species, and the percent cover of grasses, forbs, and woody vegetation.

Table 1
Bird Point-Count Locations

Point #	Latitude	Longitude	Closest Neighbor (Point #)	Distance to Closest Neighbor (m)	Distance to Forest Edge (m)
1	43.18673	-76.16449	2	277	112
2	43.18674	-76.16108	1	277	97
3	43.18597	-76.15778	2	281	87
4	43.18525	-76.15303	5	180	75
5	43.18364	-76.15287	4	180	103
6	43.18098	-76.14424	5	761	164
7	43.19072	-76.16371	1	448	52
8	43.18913	-76.15346	9	201	82
9	43.18919	-76.15099	8	201	103
10	43.19129	-76.15454	11	218	126
11	43.19135	-76.15186	10	218	116
12	43.19318	-76.14999	13	236	131
13	43.19384	-76.15276	12	236	136
14	43.19182	-76.14488	12	442	109
15	43.19536	-76.16516	16	234	220
16	43.19564	-76.16231	15	234	167

D. SURVEYOR QUALIFICATIONS

The survey was conducted by Dr. Wales Carter, an avid birder and ornithologist with expertise in migratory songbird ecology and physiology. Dr. Carter has conducted extensive field work on Northeastern birds, including point-counts, and is a USGS banding permit sub-permittee. His research on birds has been published in several peer-reviewed journals, such as Ecology and Evolution, Diversity, and the Journal of Experimental Biology. He earned a B.A. in Ecology from Dartmouth College in 2013 and a Ph.D. in Biological and Environmental Science from the University of Rhode Island in 2019, followed by post-doctoral research fellowships at the University of Rhode Island and Great Hollow Nature Preserve and Ecological Research Center.

E. WEATHER CONDITIONS

As per the NYSDEC *Survey Protocol for State-listed Breeding Grassland Bird Species*, surveys were not conducted in either rainy conditions or with winds exceeding 12 mph. Outside the aforementioned rain delays, the only surveys with any potential impact of precipitation were 1) evening surveys on May 16, which were postponed until later in the evening, 2) the first five surveys on the morning of May 24, which occurred under light sprinkles, and 3) evening surveys on June 28 and July 10, which both took place approximately one hour after a thunderstorm had passed. Winds approached the upper suitable limit during the first week of surveys (morning and evening of May 16 and morning of May 17) but were well within acceptable speeds for the remainder of the surveys. For morning surveys, minimum temperatures ranged from 38°F on May 17 to 69°F on July 4, whereas maximum temperatures ranged from 40°F on May 17 to 75°F on July 4. For evening surveys, minimum temperatures ranged from 52°F on May 16 to 76°F on July 4 and July 11, whereas maximum temperatures ranged from 62°F on June 28 to 84°F on June 20. Surveys during the week of June 5 and June 26 occurred during times of extremely poor air quality due to wildfires in adjacent Canadian provinces and reached peak $PM_{2.5}$ air quality index (AQI) values of 246 on June 7 and 170 on June 29.

F. VEGETATION CHARACTERISTICS

Vegetation grew consistently over the study period (**Table 2, Appendix A**) from an average height of 25.4 cm in the week of May 15 to an average of 75.1 cm in the week of July 10. There was considerable variation among survey points in vegetation height, with average heights over the full study period ranging from 35.8 cm to 87.2 cm. The highest vegetation recorded was a height of 141.6 cm at point 2 during the week of July 10. At the start of the survey period, eleven out of sixteen survey points were primarily covered with forbs (**Table 3**). Goldenrod (*Solidago* spp.) was the most common cover species, predominating at nine survey points. The remaining five survey points were primarily covered by grasses, of which the most common species was reed canary grass. In addition, four survey points (4, 5, 15, and 16) contained at least 25% coverage by woody vegetation (**Table 3**). Point 6 was unique among survey points in its relatively low vegetation height and the preponderance of clover among vegetation within 25 meters. The prominence of these species was relatively consistent throughout the survey period with the exception of point 7, which became dominated by an unknown sedge following mowing, point eleven, which was increasingly dominated by dogbane over the survey period, and points 9, 10, and 16, all of which contained roughly equal coverage of goldenrod and knapweed at the end of the survey period. All areas containing survey points were historically either hayfields, pastures, or cultivated land, although the precise management history of the study area was unknown. The one exception to this was survey point 7, which was unexpectedly mowed for hay between the weeks of June 12 and June 19, approximately halfway through the survey period, as communicated to Thomas Bell of NYSDEC on June 15. Following this disturbance, evening grassland bird surveys were skipped for this point during the weeks of June 26 and July 3, until the vegetation regrew.

Table 2

Dominant Plant Species and Weekly Height Measurements (cm) at Each Point

Point	Dominant plant species	Mean	May 15	May 22	June 5	June 12	June 19	June 26	July 3	July 10
1	Timothy	53.0	27.9	30.5	41.9	53.3	57.8	72.4	67.3	73.0
2	Goldenrod	87.2	27.9	45.1	62.2	81.3	107.9	111.8	119.4	141.6
3	Goldenrod	58.4	21.6	34.3	31.8	48.3	64.8	77.5	87	102.2
4	Goldenrod/ arrowwood	52.6	20.3	37.5	43.2	52.7	63.5	66.0	71.1	66.0
5	Goldenrod	62.0	25.4	33.0	45.1	52.7	70.5	84.5	89.5	95.3
6	Red clover	40.6	17.8	16.5	33.0	35.6	50.2	52.7	58.4	61.0
7	Reed canary grass, sedge spp.	15.8	13.3	–	21.6	39.4	5.1	7.0	10.2	14.0
8	Goldenrod	42.1	20.3	31.8	32.4	39.4	38.7	51.4	56.5	66.0
9	Goldenrod, knapweed	45.9	18.4	30.5	34.3	41.9	50.2	59.1	69.9	63.5
10	Goldenrod, knapweed	48.2	24.1	25.4	33.0	43.2	50.8	64.8	73.0	71.1
11	Goldenrod, dogbane	79.4	38.7	46.4	57.2	77.5	87.6	104.1	111.1	112.4
12	Unidentified grass	68.7	44.5	48.3	57.2	73.7	74.3	83.2	85.1	83.2
13	Reed canary grass	35.8	26.0	26.7	34.3	36.8	31.8	39.4	43.2	48.3
14	Reed canary grass	59.4	30.5	33.0	48.3	51.4	64.1	81.3	81.9	84.5
15	Goldenrod	52.2	31.8	43.2	44.5	43.2	52.7	69.2	67.9	64.8
16	Goldenrod, knapweed	36.8	17.2	27.9	21.6	34.9	39.4	43.2	55.9	54.0
Mean		**52.5**	**25.4**	**34.0**	**40.1**	**50.3**	**56.9**	**66.7**	**71.7**	**75.1**

Table 3
Estimated Percentage of Grass, Forb, Bare, and Woody Ground Cover Within 25 Meters of Each Point at the Beginning (Week 1) and End (Week 8) of the Bird Survey Period

	Week 1				Week 8			
Point	% Grass	% Forb	% Bare	% Woody	% Grass	% Forb	% Bare	% Woody
1	70	20	0	5	50	35	0	15
2	10	85	0	5	0	95	0	5
3	5	80	5	10	0	95	0	5
4	20	30	0	50	10	60	0	30
5	5	55	0	40	5	70	0	25
6	40	55	5	0	30	70	0	0
7	70	30	0	0	55	40	5	0
8	50	50	0	0	30	65	0	5
9	40	55	0	5	30	65	0	5
10	40	60	0	0	30	70	0	0
11	15	85	0	0	10	90	0	0
12	70	30	0	0	65	35	0	0
13	70	25	5	0	60	40	0	0
14	85	15	0	0	70	30	0	0
15	30	40	5	25	5	65	0	30
16	30	55	5	10	5	70	0	25

G. BIRD OBSERVATIONS

All survey data were uploaded to eBird within a week of the end of the survey period. In total, 3,253 observations of all birds within survey points and grassland species along meander survey routes were recorded. These observations were spread among 49 species ranging from waterfowl to songbirds (**Table 4**). The most common bird encountered during the surveys was the red-winged blackbird, with 845 observations and presence at all survey points and in all survey weeks. Common yellowthroat (504 observations), song sparrow (598 observations), and American goldfinch (237 observations) were also observed at every survey point and in every survey week. The second most frequently observed bird, the bobolink (601 observations), was observed in every survey week, but was not observed at survey point 3 or survey point 14. The only other species with more than 100 observations was the barn swallow, which was observed flying over all survey points except 5, 7, and 8, and was observed in all survey weeks. Of the remaining species, eight were observed between 10 and 100 times and thirty-four were observed fewer than 10 times (**Table 4**).

Table 4

Locations and Weeks of Birds Species Observations During Point-Counts and Meanders

Species	Total Observations	Point(s)	Survey Week(s)
Alder flycatcher	16	2, 3, 4, 5, 8, 11, 15	2, 3, 4, 5, 6, 7, 8
American goldfinch	237	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	1, 2, 3, 4, 5, 6, 7, 8
American kestrel	18	1, 6, 11, 12, 13	2, 3, 4, 5, 6, 8
American robin	1	6	3
American woodcock	4	2, 16	1, 4
Baltimore oriole	1	13	4
Barn swallow	111	1, 2, 3, 4, 6, 9, 10, 11, 12, 13, 14, 15, 16	1, 2, 3, 4, 5, 6, 7, 8
Blue jay	4	7	2, 8
Blue-winged warbler	1	7	2
Bobolink	601	1, 2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15, 16	1, 2, 3, 4, 5, 6, 7, 8
Brown-headed cowbird	1	6	8
Canada goose	2	14	1
Cedar waxwing	15	3, 4, 5, 13	5, 6, 7, 8
Chimney swift	15	1, 2, 15	3, 5, 8
Cliff swallow	1	8	4
Common raven	3	3, 10	1
Common yellowthroat	504	1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16	1, 2, 3, 4, 5, 6, 7, 8
Eastern kingbird	3	1, 2, 6	1, 2, 3
Eastern meadowlark	1	12	2
Eastern phoebe	1	7	2
Eastern towhee	1	16	8
European starling	9	6, 14	5, 8
Field sparrow	4	7	2, 3, 4
Golden-winged warbler	2	4	1
Gray catbird	4	4, 6, 8, 9	3, 6, 7
Great Blue Heron	5	2, 3, 4, 14	1, 2, 3, 6
Great-crested flycatcher	1	6	2
Great-horned owl	1	7	1
Green heron	2	4	7
Indigo bunting	7	3, 7	2, 3, 4, 5, 7, 8
Killdeer	2	4, 14	4, 7
Least flycatcher	1	15	8
Mallard	5	9, 12	1
Mourning dove	2	12	6
Northern harrier	2	2	1
Osprey	1	3	1
Red-bellied woodpecker	1	1	4

Table 4, cont'd

Locations and Weeks of Birds Species Observations During Point-Counts and Meanders

Species	Total Observations	Point(s)	Survey Week(s)
Red-tailed hawk	3	6, 7, 9	1, 2, 7
Red-winged Blackbird	845	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	1, 2, 3, 4, 5, 6, 7, 8
Rose-breasted grossbeak	1	5	1
Savannah sparrow	24	4, 6	1, 2, 3, 4, 5, 6, 7, 8
Sharp-shinned Hawk	1	14	3
Song sparrow	598	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	1, 2, 3, 4, 5, 6, 7, 8
Swamp sparrow	80	1, 2, 3, 5, 8, 9, 10, 11, 12, 14, 15, 16	1, 2, 3, 4, 5, 6, 7, 8
Tree swallow	53	1, 3, 8, 10, 11, 12, 13, 14, 15, 16	1, 3, 4, 5, 6, 7, 8
Vesper sparrow	3	6, 13	6, 7
Wild turkey	7	15	6
Willow flycatcher	8	3, 4, 5, 8	2, 3, 4, 5
Yellow warbler	39	1, 2, 3, 4, 5, 6, 8, 9	1, 2, 3, 4, 5, 6

The most species observed at a single point over the course of the survey period was 17, which occurred at point 6 (**Table 4**; American goldfinch, American kestrel, American robin, barn swallow, brown-headed cowbird, bobolink, common yellowthroat, eastern kingbird, European starling, great-crested flycatcher, gray catbird, red-tailed hawk, red-winged blackbird, savannah sparrow, song sparrow, vesper sparrow, yellow warbler), whereas the lowest number of species observed at a single point was nine at point 10 (American goldfinch, barn swallow, bobolink, common raven, common yellowthroat, red-winged blackbird, song sparrow, swamp sparrow, and tree swallow). The most observations recorded at a single point over the course of the full survey period was 293 observations at point 12, while the most observations at a single survey point in a single survey week was 63 at point 11 in the week of July 12. Point 7 had both the lowest total observations and the fewest observations in a given week; this was likely due to its small size and mowing in the middle of June, which resulted in some skipped surveys. The fewest birds observed at a point with a full complement of surveys was 148 observations at point 6, while the fewest observed at a single survey point in a single week was four observations at point 15 in the week of May 15. The Shannon-Weiner diversity index across all points was 2.1, while values for individual points ranged from 1.5 at point 14 to 2.2 at point 6 (**Table 5**).

For grassland specialists, the bobolink was observed at survey points 9, 10, 11, 12, 13, 15, and 16 in every week of the survey period, and also observed at point 1 in seven out of eight weeks and at point 8 in six out of eight weeks. American kestrels were observed most consistently at points 12 and 13, which were adjacent and where a pair was consistently seen foraging, ultimately being observed in six out of the eight weeks between those two points. The only other kestrel observed was a female which was seen at point 6 in three of the eight survey weeks. At least one, and up to three male savannah sparrows were observed singing at point 6 in each week of the study period while there was only one other observation of this species at any other point-count location (point 4).

The most common behavior observed was singing by territorial males (2037 observations), although there was considerable overlap with the individuals that were visually identified (1819 observations). Relatively few birds were identified only by song (195 observations) or only in flight over survey points (365 observations). Several breeding behaviors were observed, primarily during meander surveys, including: 1) agitated behavior of red-winged blackbirds, bobolinks, common yellowthroats, and song sparrows, 2) nests of red-winged blackbirds (two nests each with four eggs), 3) carrying of food by adult red-winged blackbirds, bobolinks, common yellowthroats, and song sparrows, and 4) presence of fledgling red-winged blackbirds, common yellowthroats, and song sparrows. All of these behaviors are consistent with nesting by these species in the Project Study Area. Additionally, whereas the early observations of American kestrels at survey points 12 and 13 included both a male and female, later observations were exclusively of the male, suggesting that the female was occupied with incubation and brooding during the later survey period.

Table 5
Bird Species Richness, Diversity (Shannon-Weiner Diversity Index), and Total Abundance at Each Point-Count Location

Point #	Species Richness	Diversity Index	Total Obser-vations	Number of birds observed by week							
				May 15	May 22	June 5	June 12	June 19	June 26	July 3	July 10
1	13	1.8	191	17	11	21	10	39	32	25	36
2	14	1.8	203	18	20	30	16	31	32	26	30
3	15	1.9	200	18	15	21	16	40	33	22	35
4	16	2.1	186	14	13	23	15	30	34	33	24
5	12	1.9	165	14	11	16	12	30	21	34	27
6	17	2.2	148	7	15	8	10	20	24	30	34
7	11	2.1	31	3	9	4	7	2	1	2	3
8	12	1.9	223	16	18	26	25	41	34	27	36
9	11	1.8	237	23	17	29	28	40	26	28	46
10	9	1.7	266	19	23	29	32	37	47	36	43
11	10	1.8	268	11	26	27	36	39	32	34	63
12	12	1.9	293	17	22	27	31	45	56	47	48
13	11	1.7	244	6	19	21	22	25	40	54	57
14	12	1.5	185	21	21	19	11	29	28	32	24
15	12	1.8	190	4	25	19	24	22	29	33	34
16	11	1.7	223	6	20	34	36	31	25	40	31
Total	**49**	**2.1**	**3253**	**214**	**285**	**354**	**331**	**501**	**494**	**503**	**571**

H. ENDANGERED, THREATENED, AND SPECIAL CONCERN SPECIES

No federally listed threatened or endangered bird species were observed during the survey, while one New York state-listed threatened species, four state-listed species of special concern, and two high priority species of greatest conservation need were recorded. The state-listed threatened species was the northern harrier, two of which were observed flying during a meander survey between points 2 and 3 on the morning of May 16. It is assumed one of these harriers was the individual reported by NYSDEC to have overwintered in the Project Study Area and observed by Ramboll throughout the geotechnical investigation work in April. Prior to the start of the bird survey, Ramboll staff also observed a harrier egg on the ground, which was not in a nest and appeared to be unviable and abandoned. No other signs of harriers or harrier breeding activity were observed during the survey. Also in the week of May 16, two golden-winged warblers (species of special concern) were heard singing, but not seen, along the northern and eastern margins of the field containing point 4 on the evening of May 15. These were likely spring migrants on stopover, as no golden-winged warblers were observed at this point or the others for the remainder of the survey. The second species of special concern observed at the study area was a single sharp-shinned hawk, which was seen flying south over the field containing point 14 on June 6. There were no other observations of sharp-shinned hawks for the remainder of the 8-week survey. The third species of special concern observed was the vesper sparrow. A vesper sparrow was heard singing south of point 6 on both the morning of June 29 and the evening of July 4, and another vesper sparrow was heard singing north of point 13 on the morning of July 5. There was no visual confirmation of these aural identifications of vesper sparrow, however. Throughout the survey, a pair of ospreys (species of special concern) occupied a nest on a cell tower visible from points 2, 3, 4, 5, and 8, and were regularly seen flying in the area and carrying food towards the nest. During the final two weeks of the survey, two nestlings were visible within the nest (these observations were not included in point counts or meander surveys due to their ubiquity). The species of greatest conservation need were the bobolink and eastern meadowlark. As described above, the bobolink was one of the most widely distributed and frequently seen species at the Project Study Area, being observed at 14 of 16 survey points and in all survey weeks, as well as exhibiting behavior consistent with active breeding. A single eastern meadowlark was flushed and observed flying N/NE during a morning meander survey at survey point 12 on May 24.

I. CONCLUSION

The grassland bird survey documented dense populations of breeding birds and a relatively wide range of bird species in the old field and shrubland portions of the Project Study Area. Diversity indices were relatively high compared to those typically found in grassland bird habitats in the northern hemisphere, which are often well below 2 (e.g., Boyce et al. 2021, Han et al. 2021, Brüggeshemke et al. 2022). However, the majority of birds observed during the survey were not grassland-obligate species and were instead generalists that can use a variety of other habitat types for breeding. For example, red-winged blackbird, song sparrow, common yellowthroat, and American goldfinch, which are habitat generalists, collectively represented 67% of the observations. One notable exception is the bobolink, which requires large tracts of grassland or grassland-surrogate habitat like old fields and was observed nesting in abundance in the Project Study Area. Other grassland specialists observed during the survey included American kestrel, eastern meadowlark, savannah sparrow, and vesper sparrow.

The abundance of generalists relative to grassland specialists in most of the Project Study Area's fields may be partly explained by vegetation conditions, which are transitioning from old field to woody, early successional habitat at some survey points. Most of the survey points were dominated by goldenrod, and several contained enough woody vegetation to potentially displace some grassland specialists. Although these conditions may have supported a broader mix of bird species overall (e.g., survey point 4), they may be less suitable for grassland-obligate species. In contrast, point 6, where we observed the greatest species richness and recorded observations of several less common, grassland species, including vesper sparrow, savannah sparrow, and American kestrel, was uniquely dominated by red clover and other low, herbaceous vegetation. Without management to prevent succession into dense shrubland and young forest, the fields in the Project Study Area would not be expected to support grassland-obligate birds much longer.

State-listed species of special concern (vesper sparrow, osprey, sharp-shinned hawk, golden-winged warbler) and one state-listed threatened species (northern harrier) were observed, but aside from the osprey, there was no confirmation of these species breeding in the Project Study Area during the survey period. Except for the single osprey pair, observations of listed species were limited to only one or two weeks, and in some cases, single flyovers. Observations of golden-winged warbler and eastern meadowlark were limited to the first two weeks of the survey period (mid- to late-May), suggesting these may have been migrating birds using the Project Study Area as stopover habitat, but not for breeding. Conversely, observations of vesper sparrows occurred in the sixth and seventh weeks of the survey period, which could have been due to the movement of post-breeding birds or failed breeders (e.g. floaters) into the Project

Study Area late in the breeding season. The timing of the sharp-shinned hawk observation is more suggestive of a resident individual, but with only a single observation of non-breeding behavior, it is difficult to infer any reproductive behavior.

The Proposed Project would result in the loss of the majority of the Project Study Area's current habitat for grassland birds. Without mitigation, the Proposed Project would likely contribute to regional declines in grassland bird species, including the American kestrel, bobolink, eastern meadowlark, northern harrier, short-eared owl, and vesper sparrow, by removing a sizable area of relatively disturbance-free breeding and/or overwintering habitat. However, the Proposed Project would mitigate this impact by protecting three times the equivalent area of suitable habitat elsewhere, which would otherwise be vulnerable to development. The mitigation site(s) would be actively managed for grassland birds under a long-term operational agreement with NYSDEC whereas the Project Study Area will soon reach more advanced successional stages that are unsuitable for grassland birds. As such, by protecting and managing three acres of grassland bird habitat for every one acre impacted, the Proposed Project will result in a net conservation benefit for the northern harrier, short-eared owl, and many other wildlife species associated with grassland habitats in New York State.

J. REFERENCES

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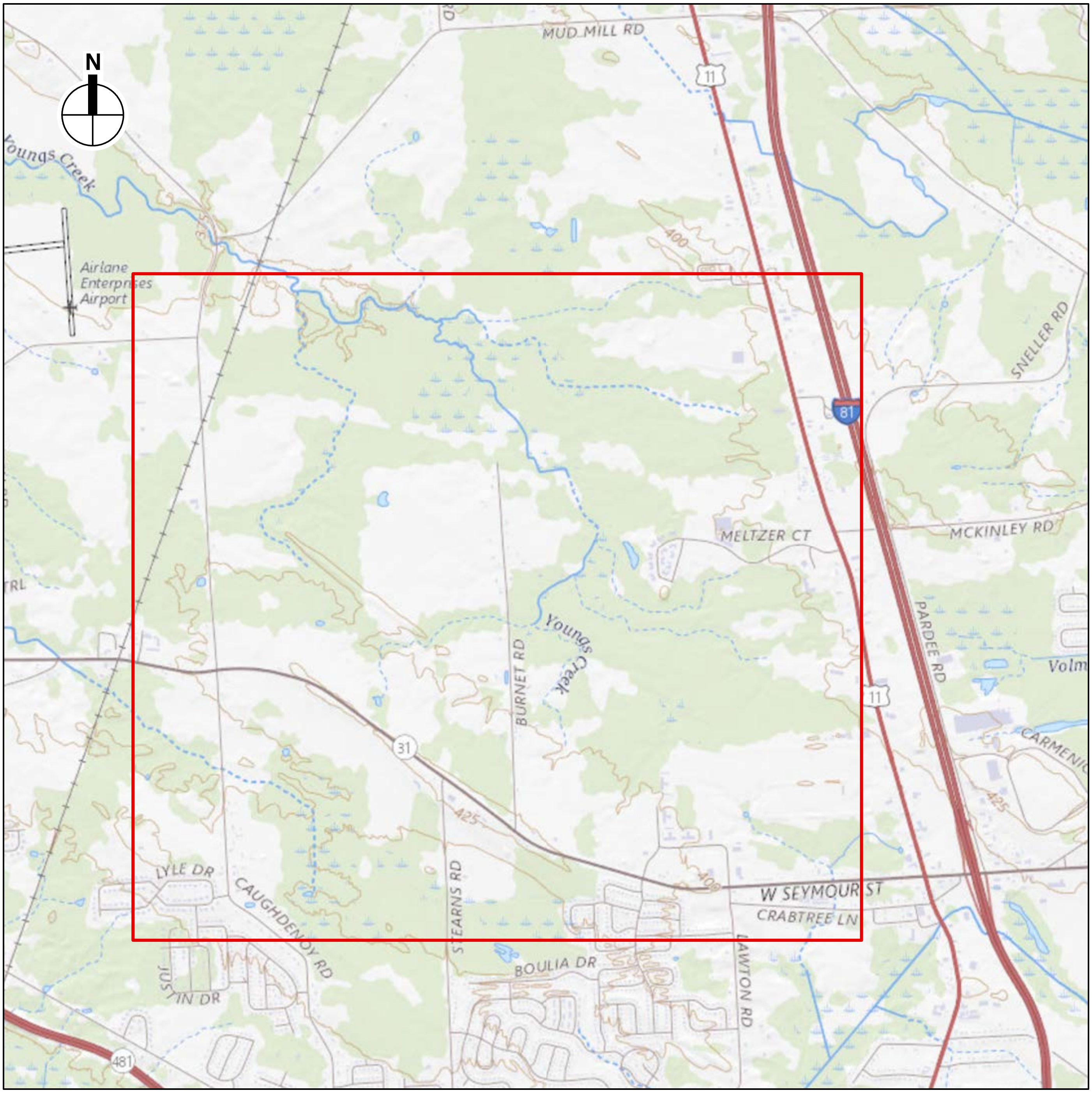
FIGURES

3.13.23

Data source: USGS The National Map, https://basemap.nationalmap.gov/arcgis/rest/services/USGSTopo/MapServer



0 2.8 MILES

Approximate Project Area

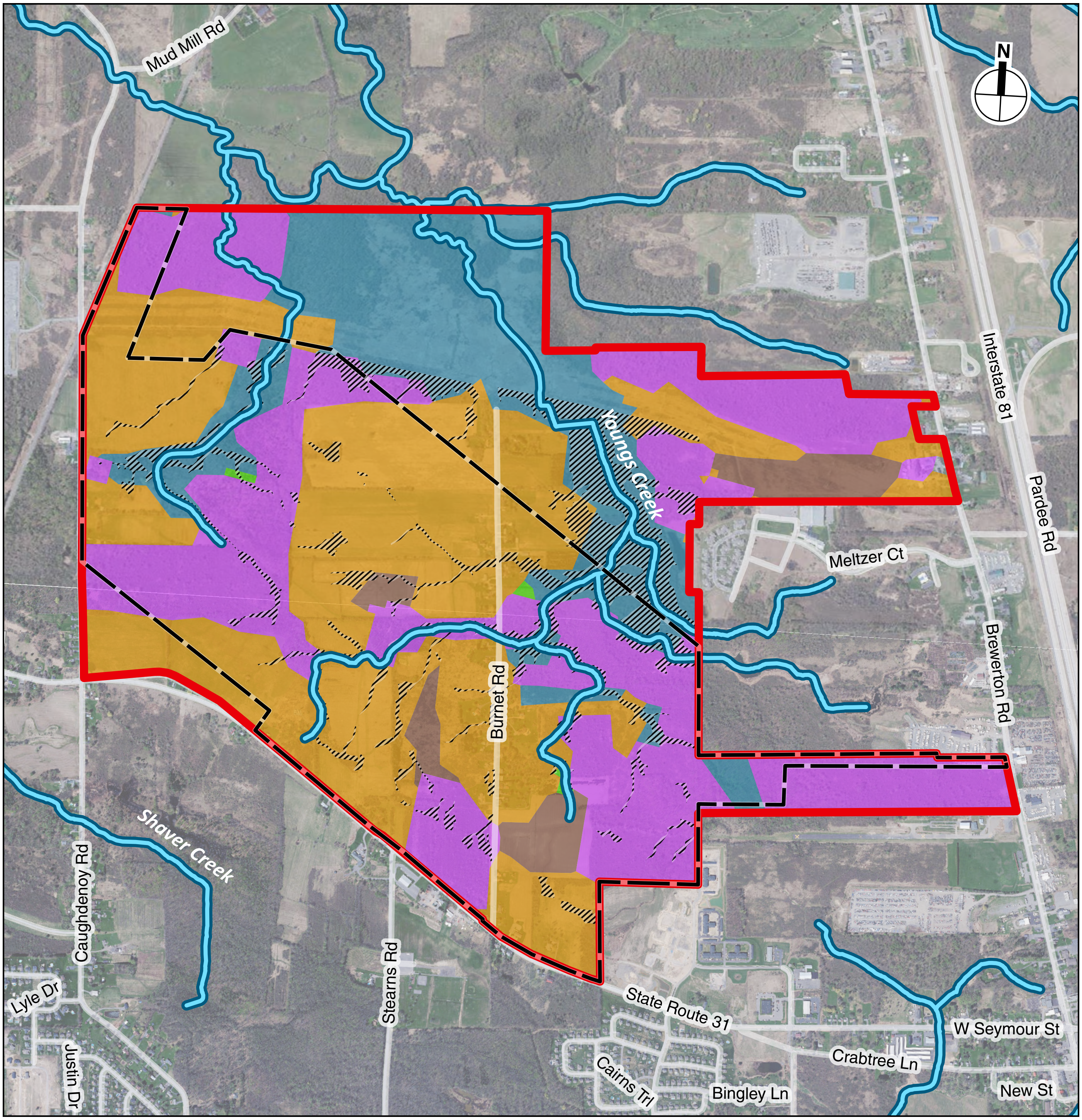
Approximate coordinates of Project Site:
76°8'40"W 43°11'29"N

USGS Topographic Map – Brewerton and Cicero Quadrangles

MICRON - NATURAL RESOURCES

Figure 1

3.14.23



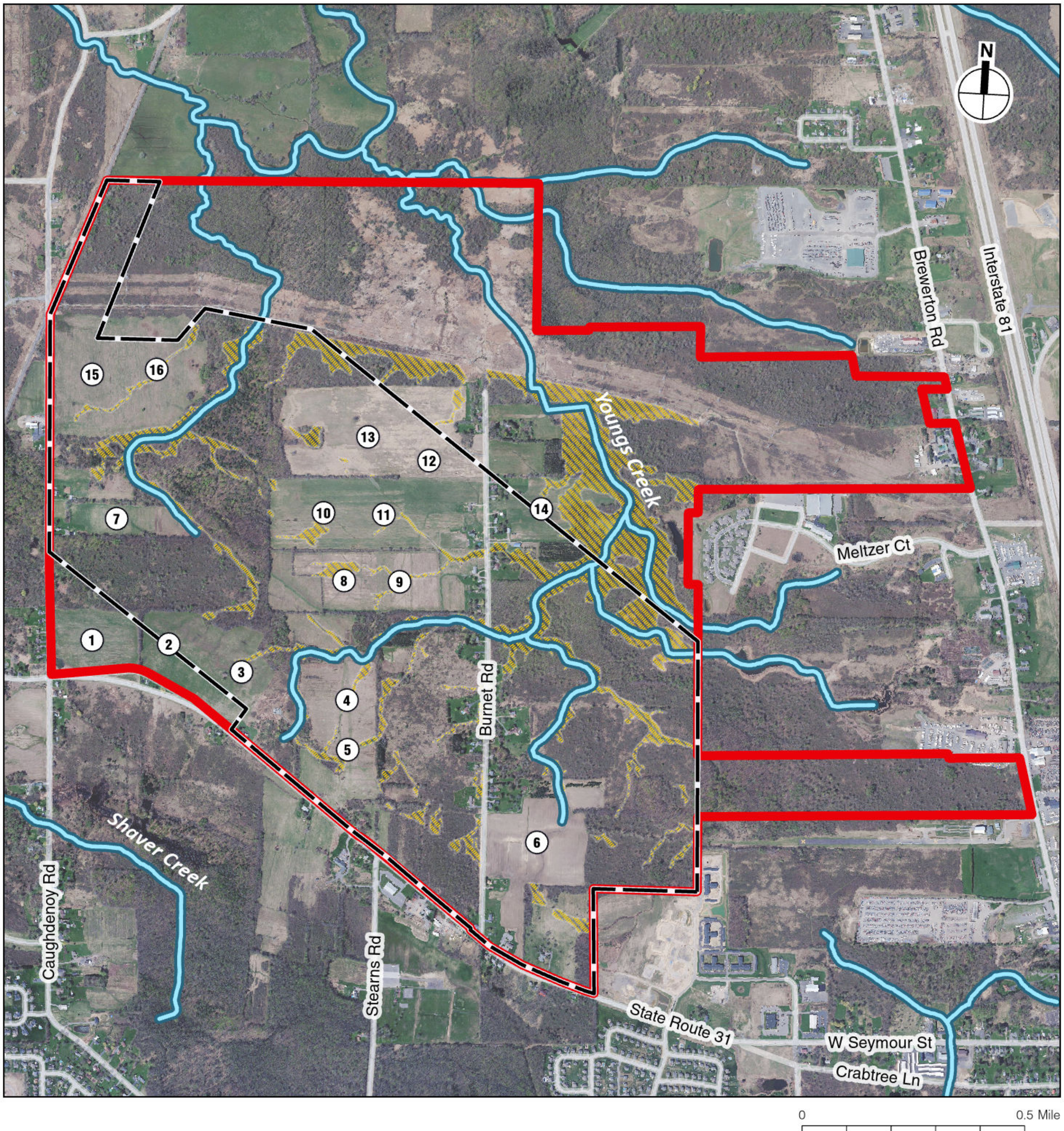
0 0.5 Mile

Study Area
Stream/Creek (USGS National Hydrography Dataset)
Limits of Disturbance
Delineated Wetlands

NLCD 2019 Land Cover (Limits of Disturbance Acres/ Study Area Acres)
Deciduous Forest (310 ac/ 480 ac)
Mixed Forest (5 ac/ 5 ac)
Pasture/Hay (435 ac/ 575 ac)
Cultivated Crop (35 ac/ 60 ac)
Woody Wetlands (80 ac/ 300 ac)

Land Cover

Figure 2



Study Area

Limits of Disturbance

Stream/Creek (USGS National Hydrography Dataset)

Delineated Wetlands

Bird Point-Count Location

Bird Point-Count Locations

MICRON - NATURAL RESOURCES

Figure 3

APPENDICES

APPENDIX A: PHOTOGRAPHS OF HABITAT AT SURVEY POINTS

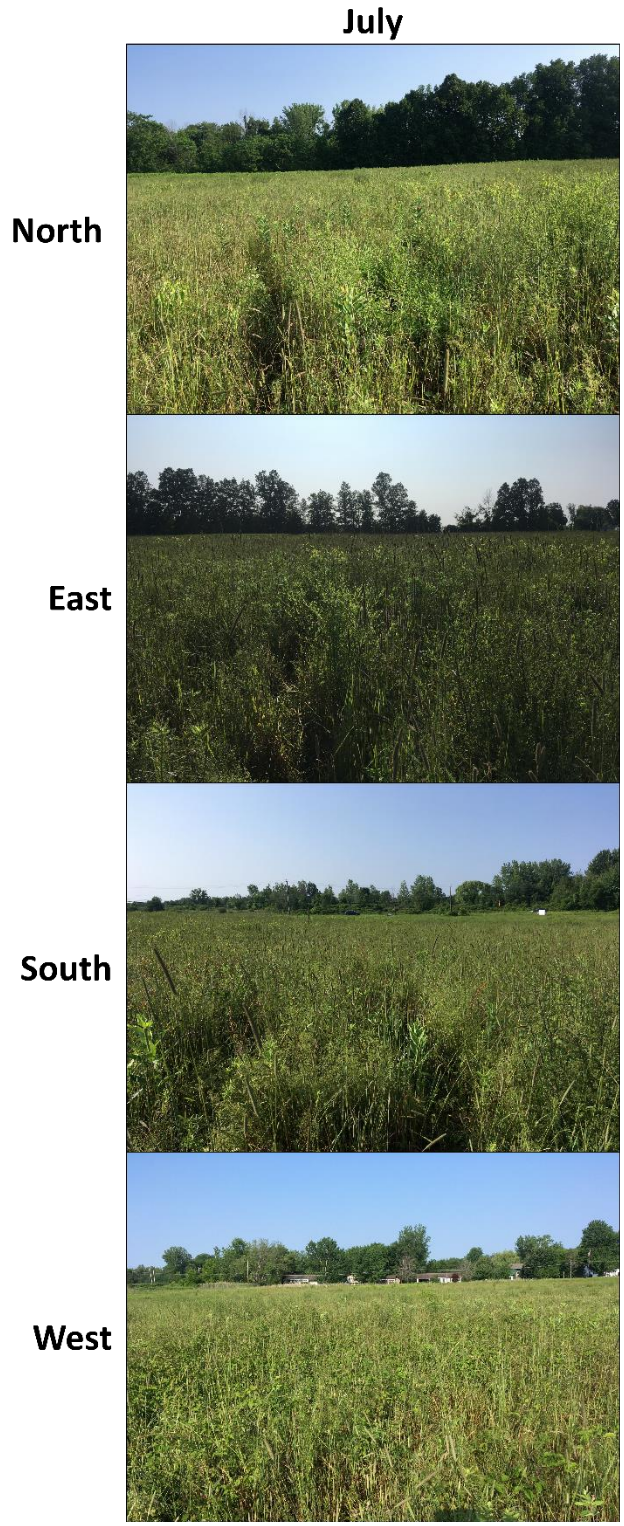


Figure A1. Habitat at survey point 1.

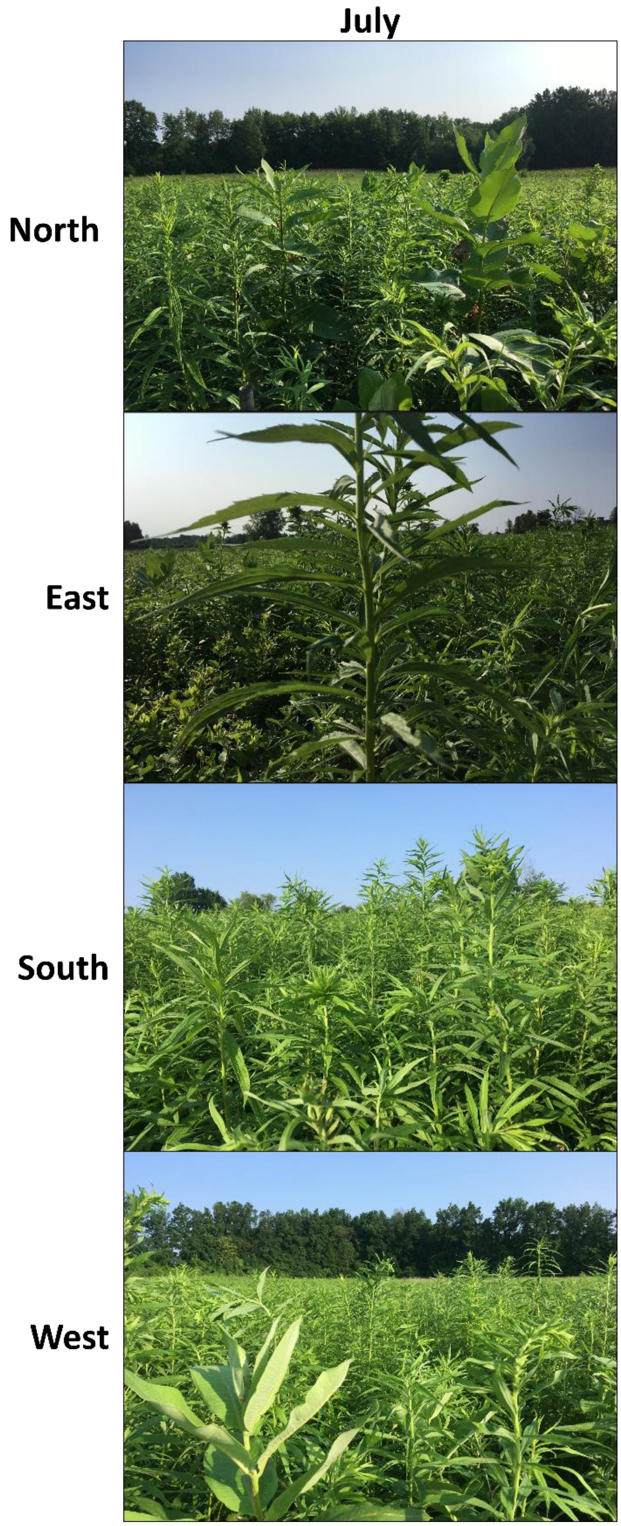


Figure A2. Habitat at survey point 2.

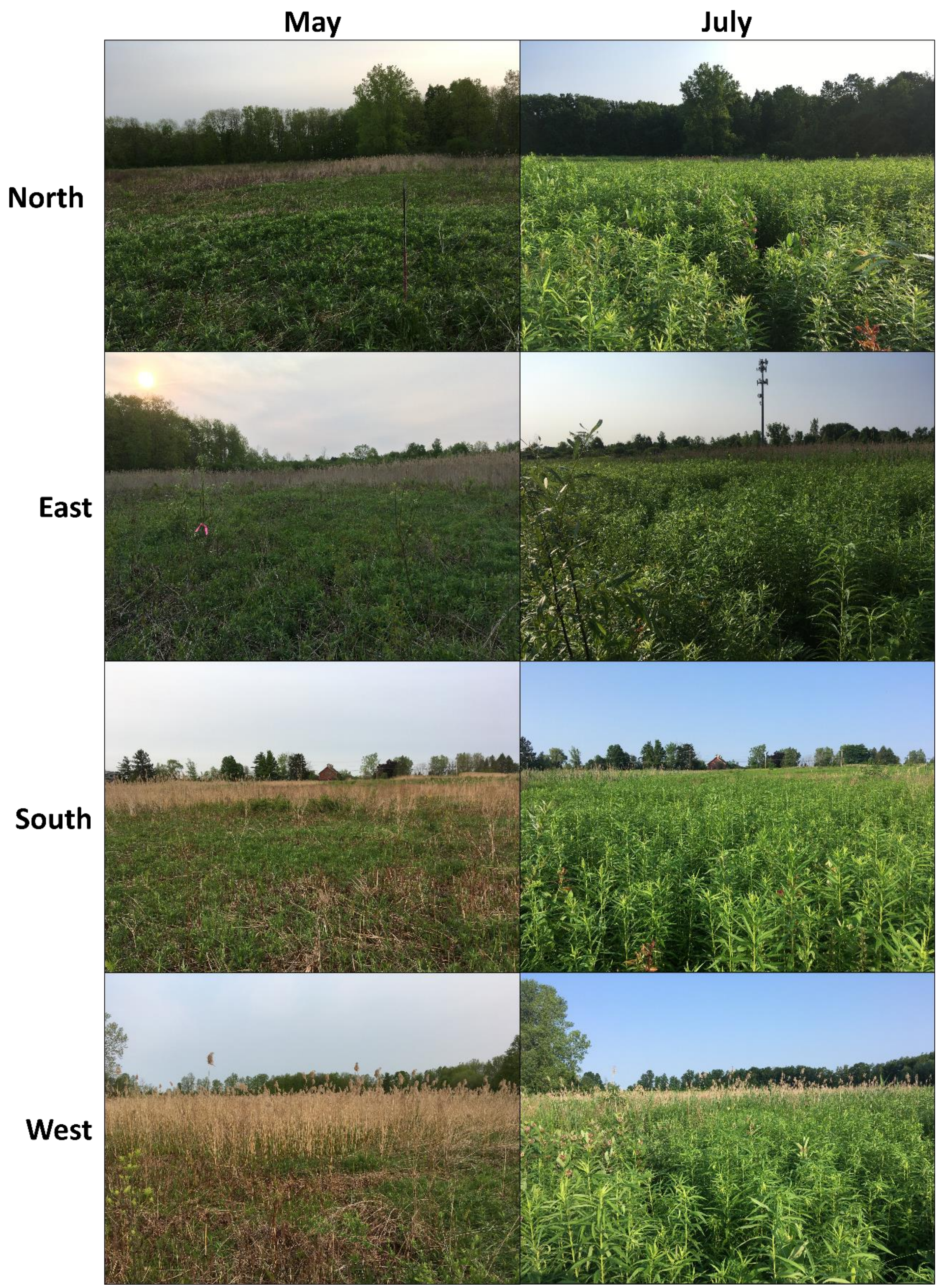


Figure A3. Habitat at survey point 3.

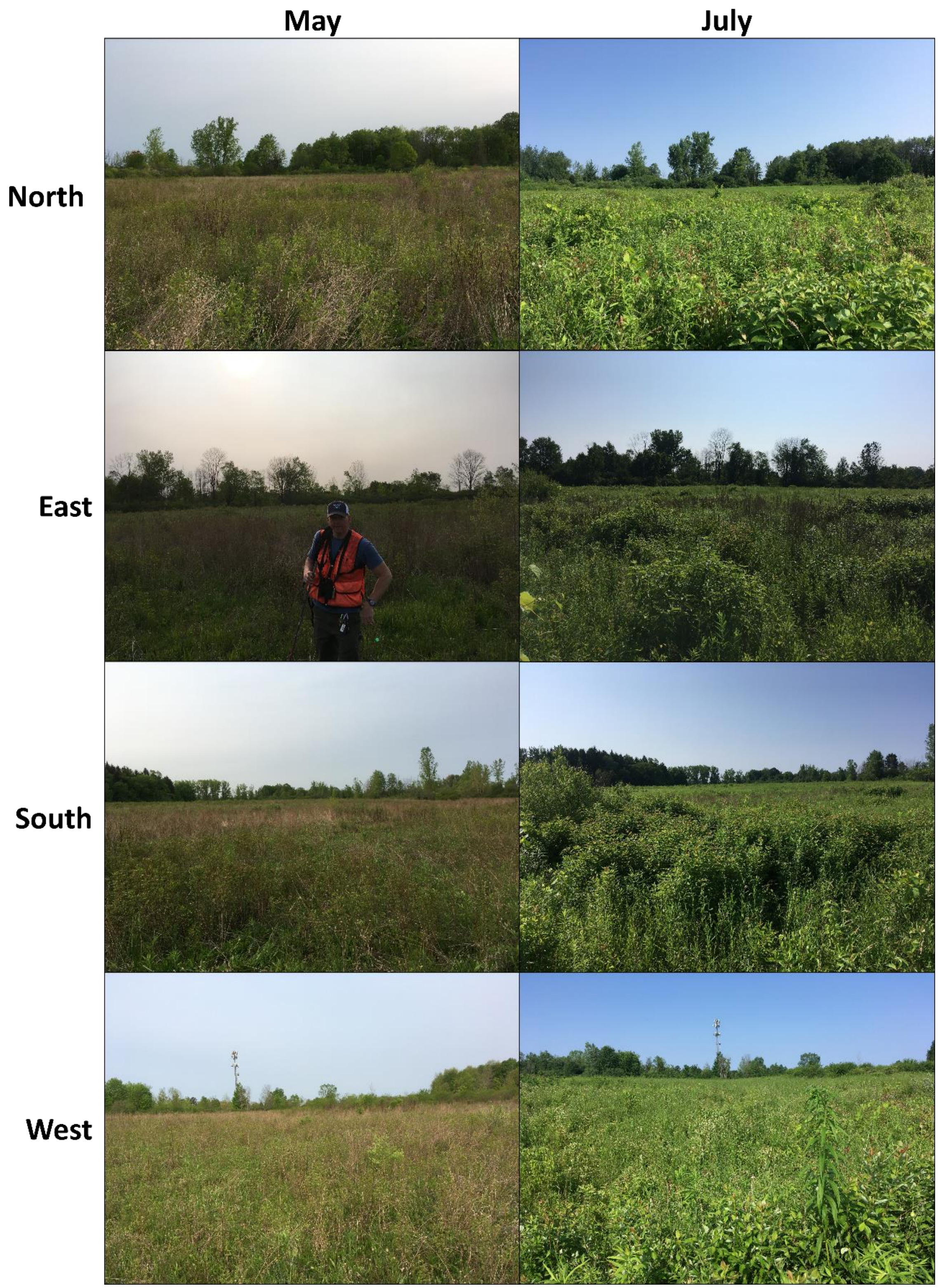


Figure A4. Habitat at survey point 4.

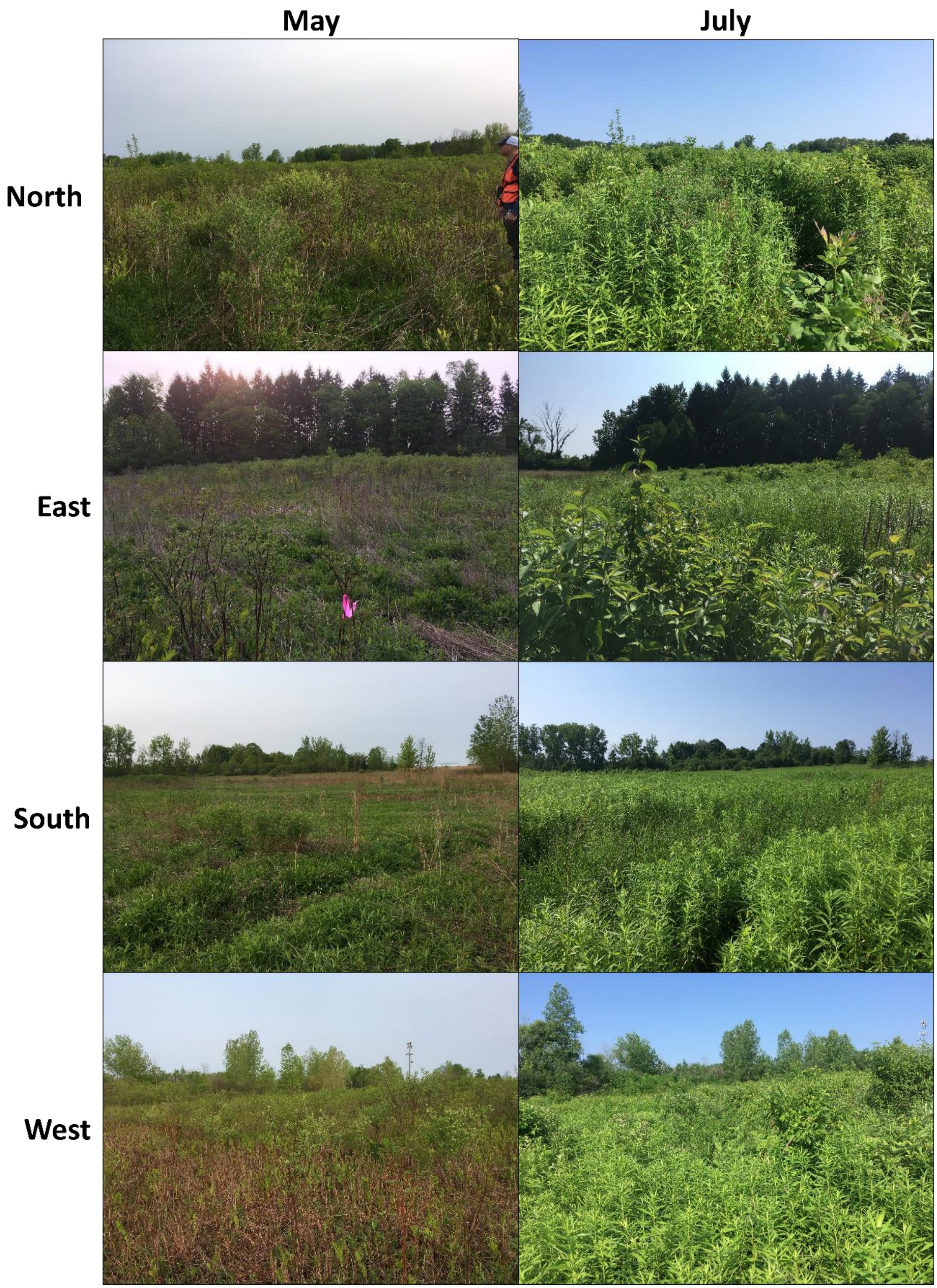


Figure A5. Habitat at survey point 5.

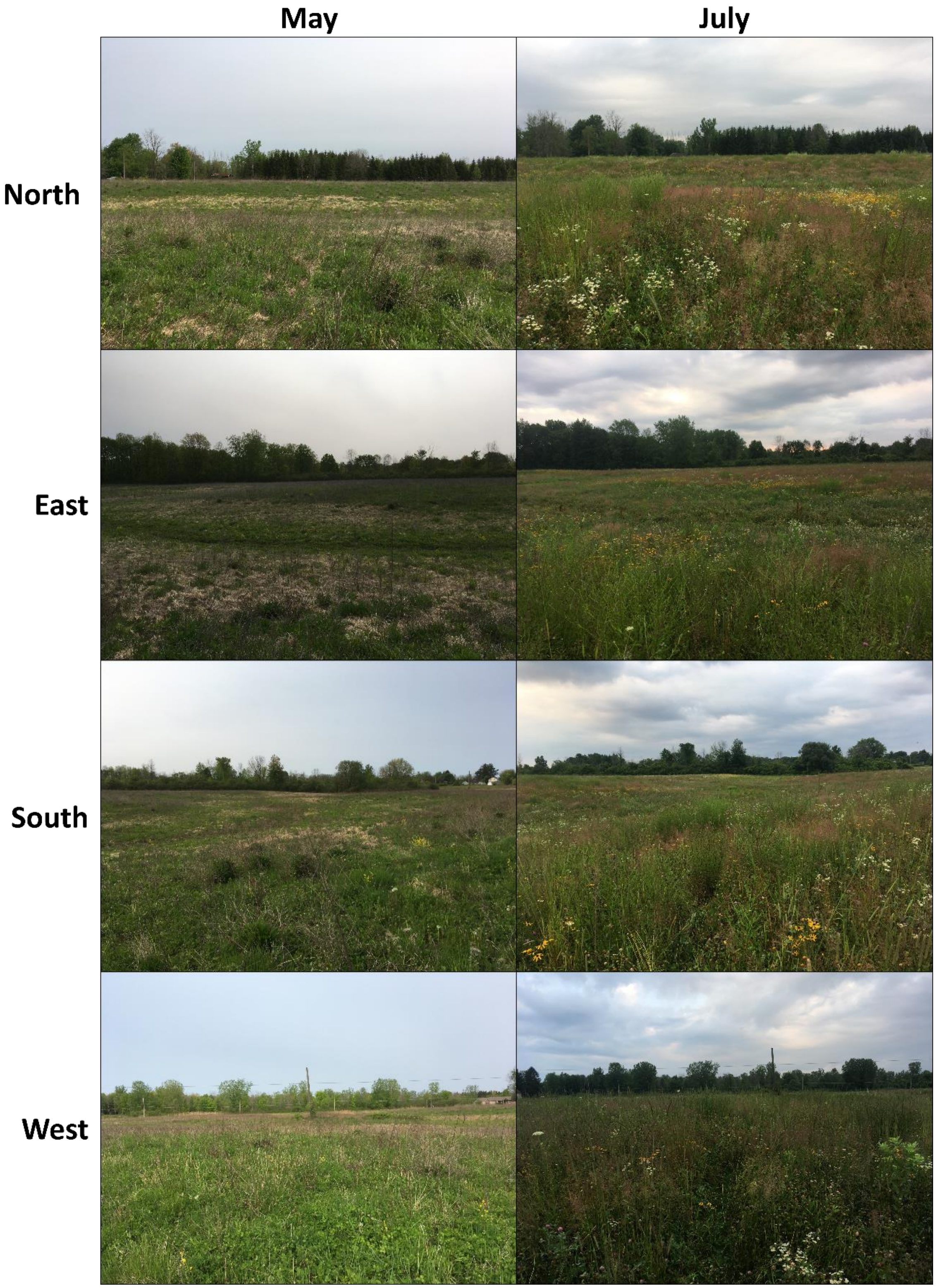


Figure A6. Habitat at survey point 6.

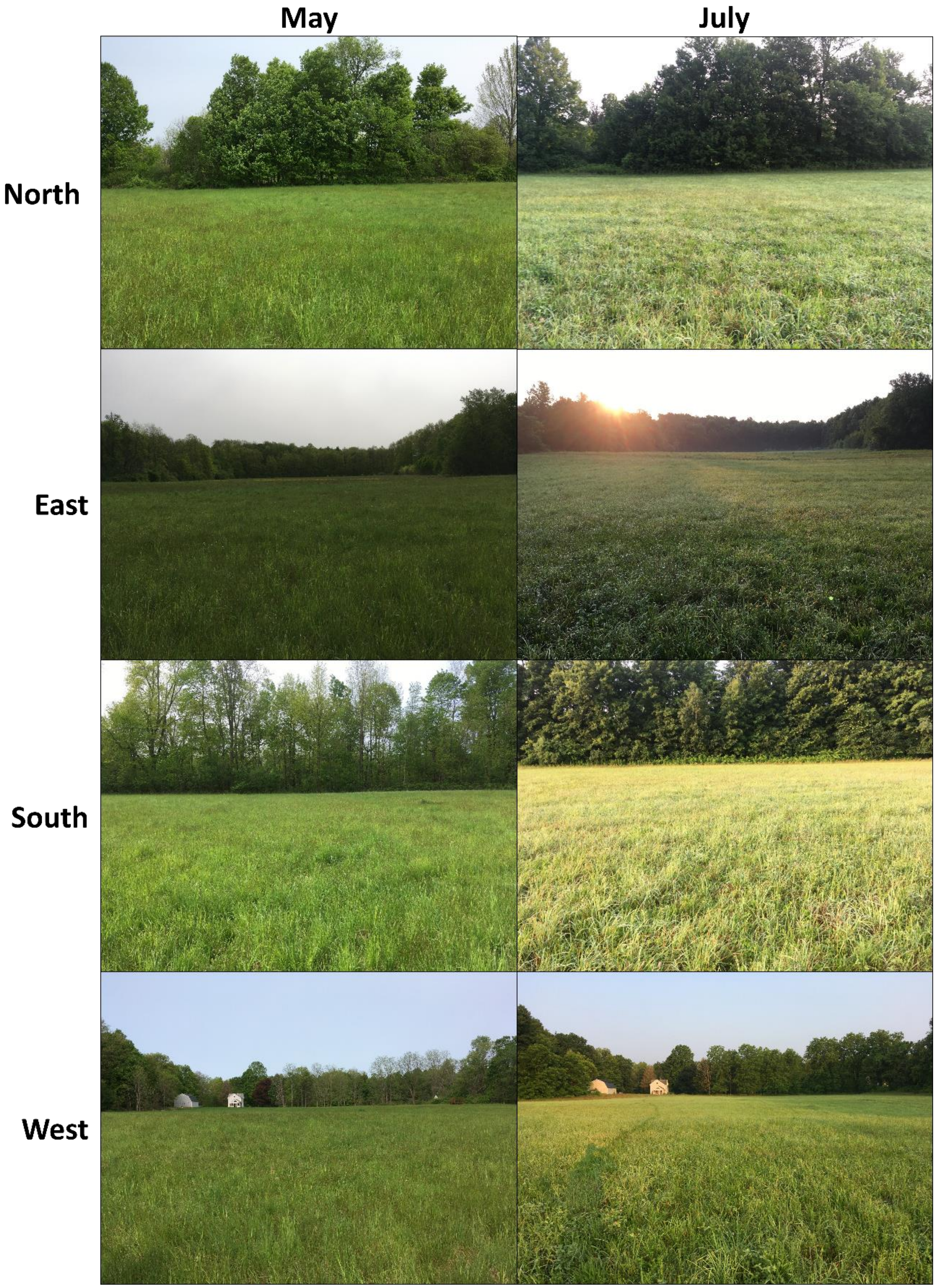


Figure A7. Habitat at survey point 7.

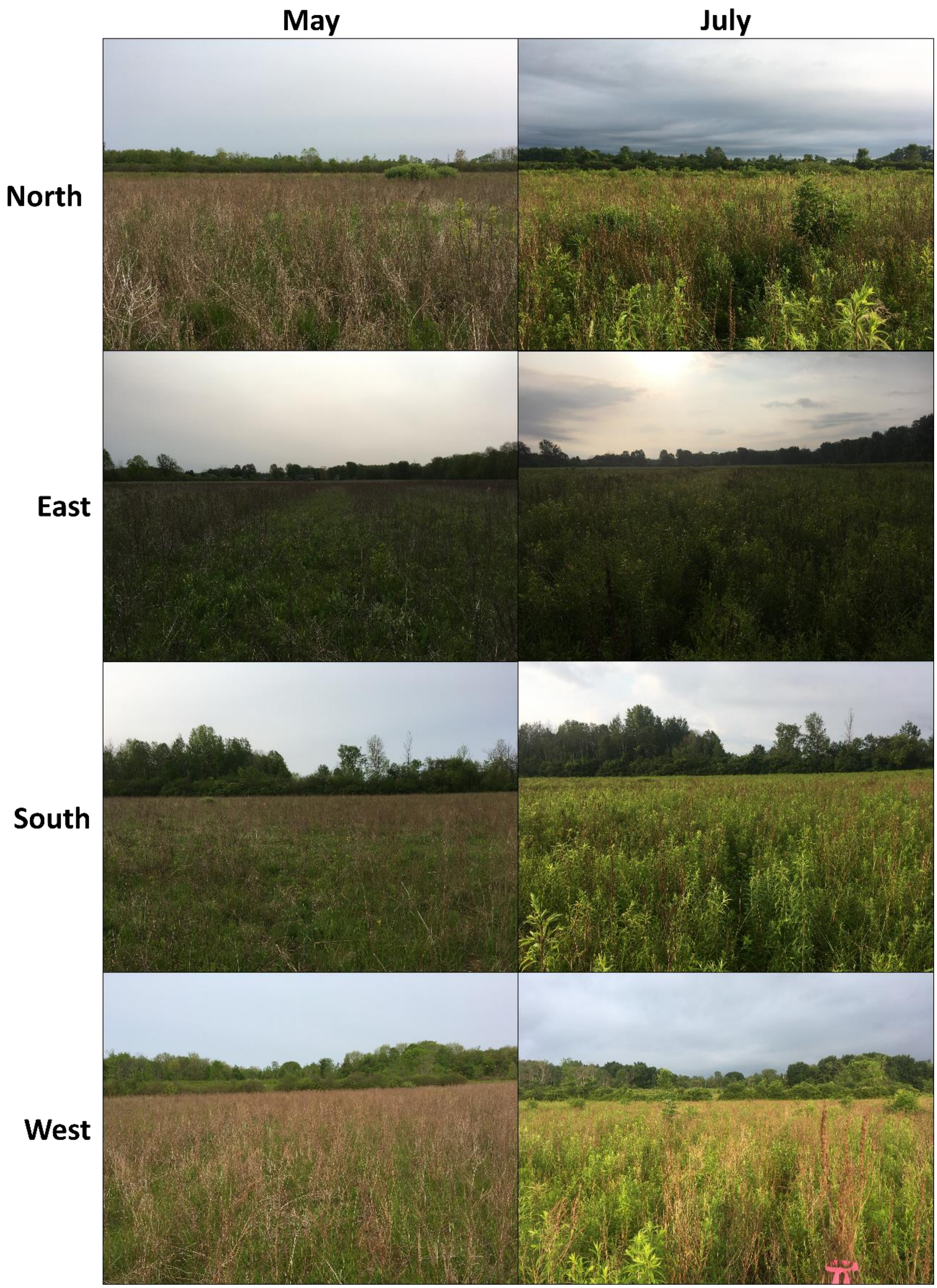


Figure A8. Habitat at survey point 8.

Figure A9. Habitat at survey point 9.

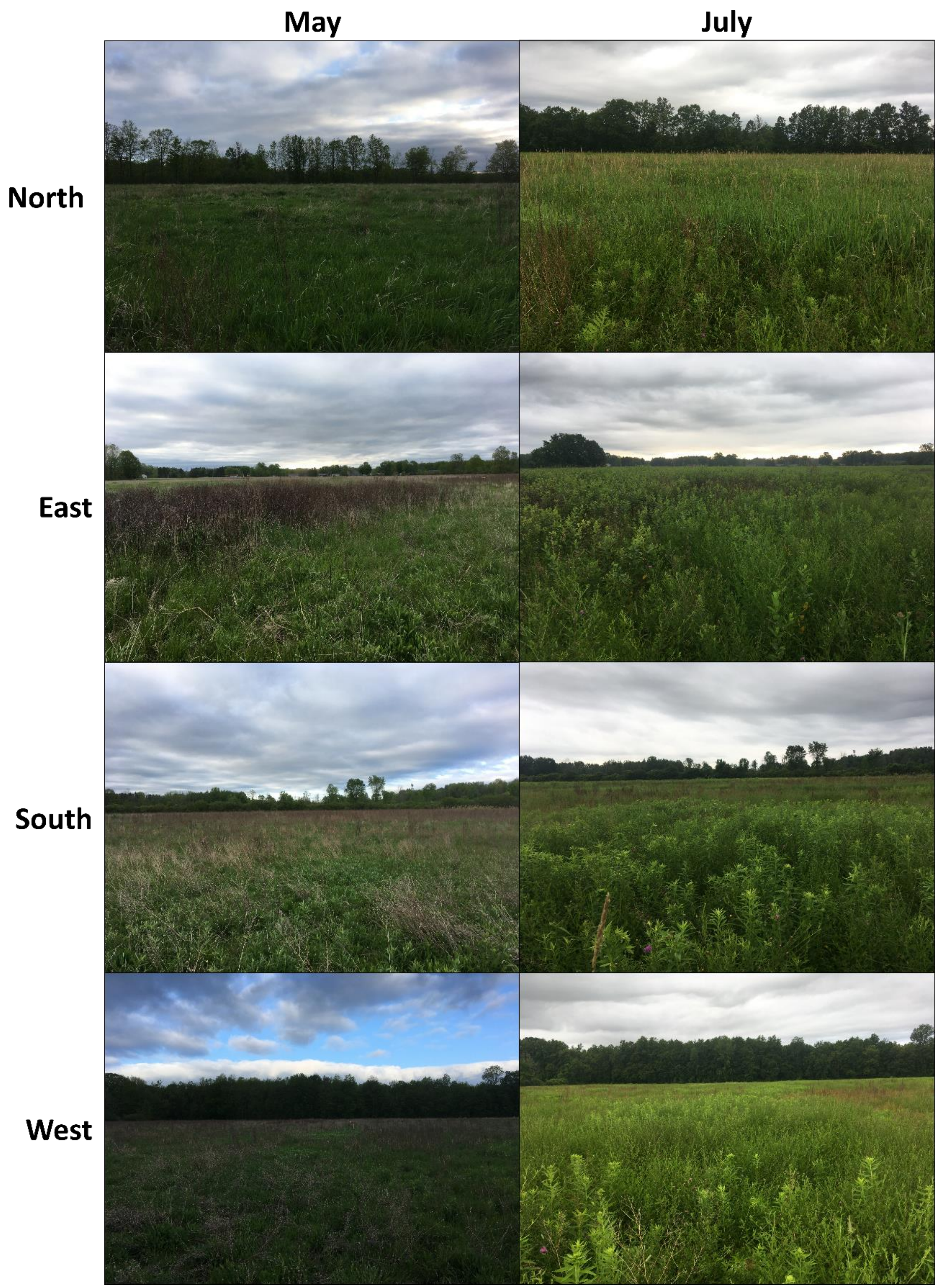


Figure A10. Habitat at survey point 10.

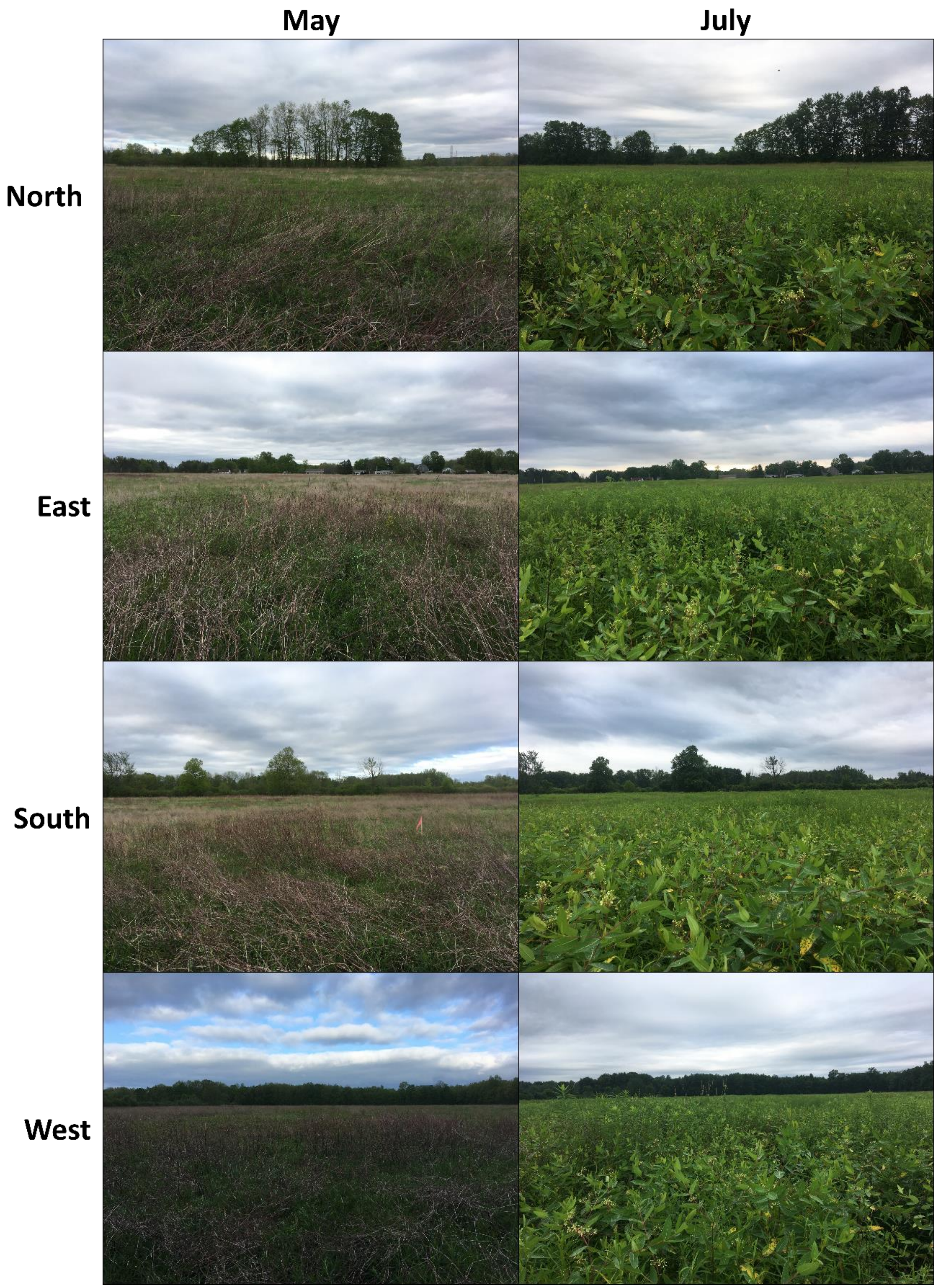


Figure A11. Habitat at survey point 11.

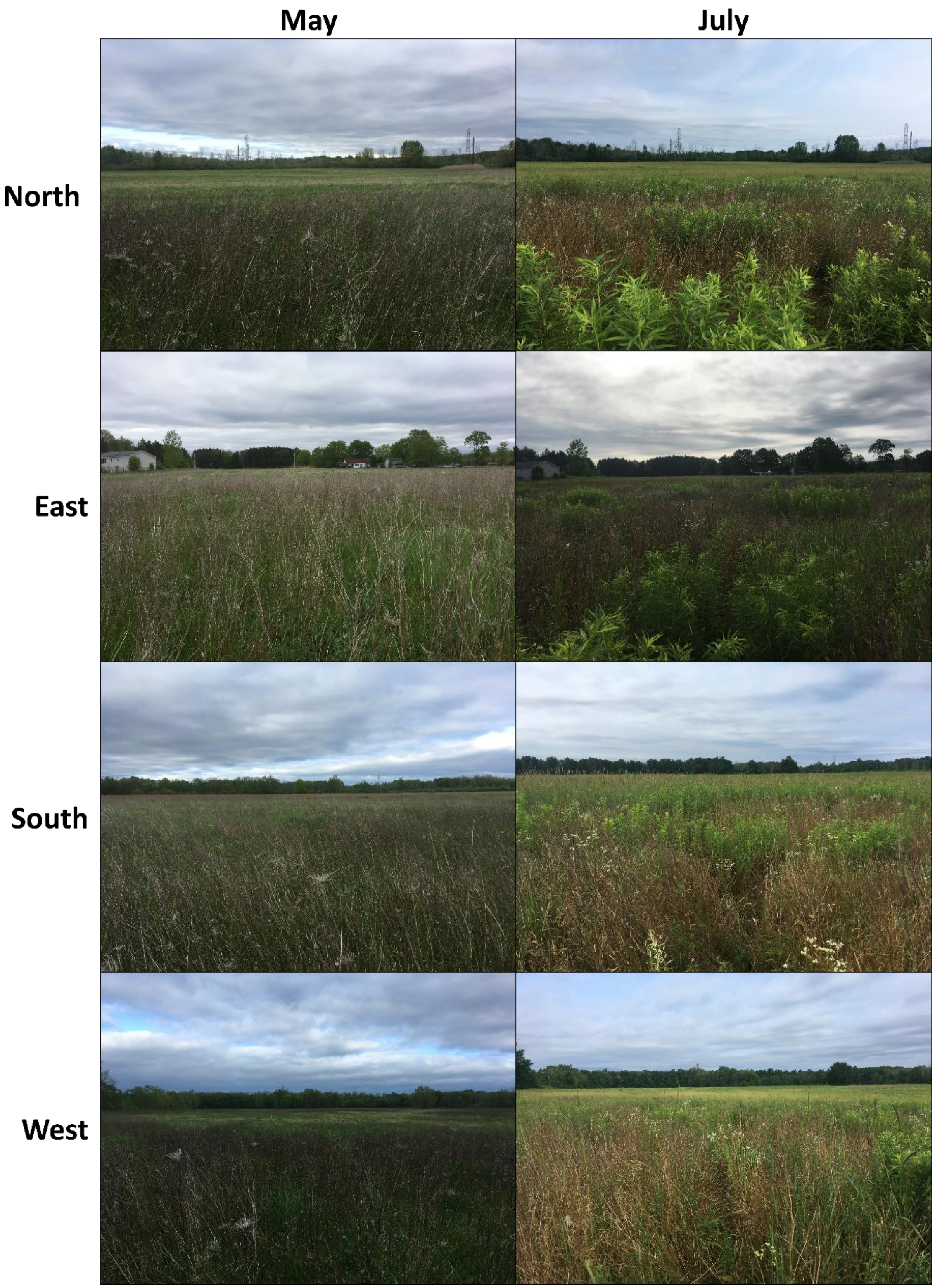


Figure A12. Habitat at survey point 12.

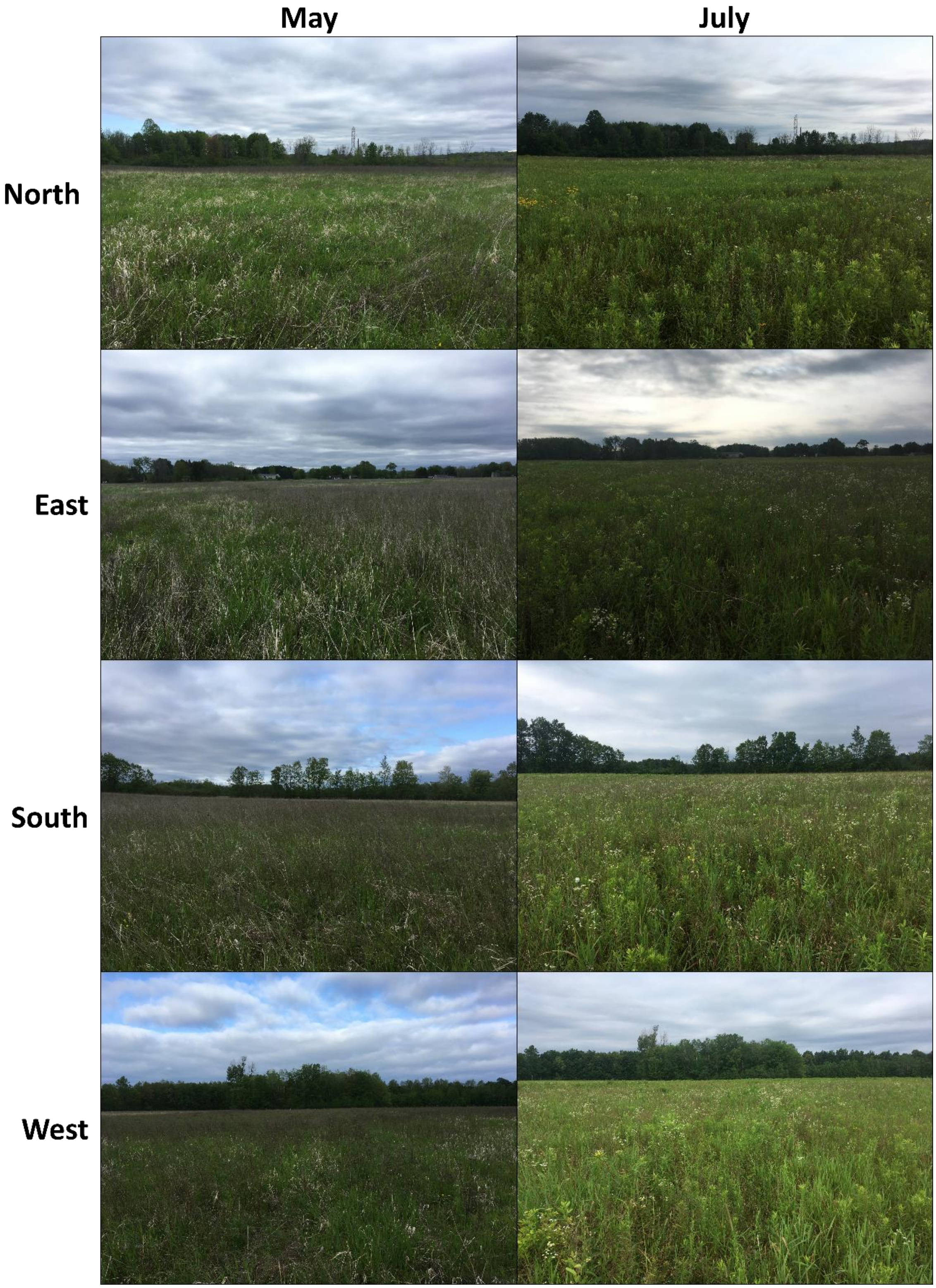


Figure A13. Habitat at survey point 13.

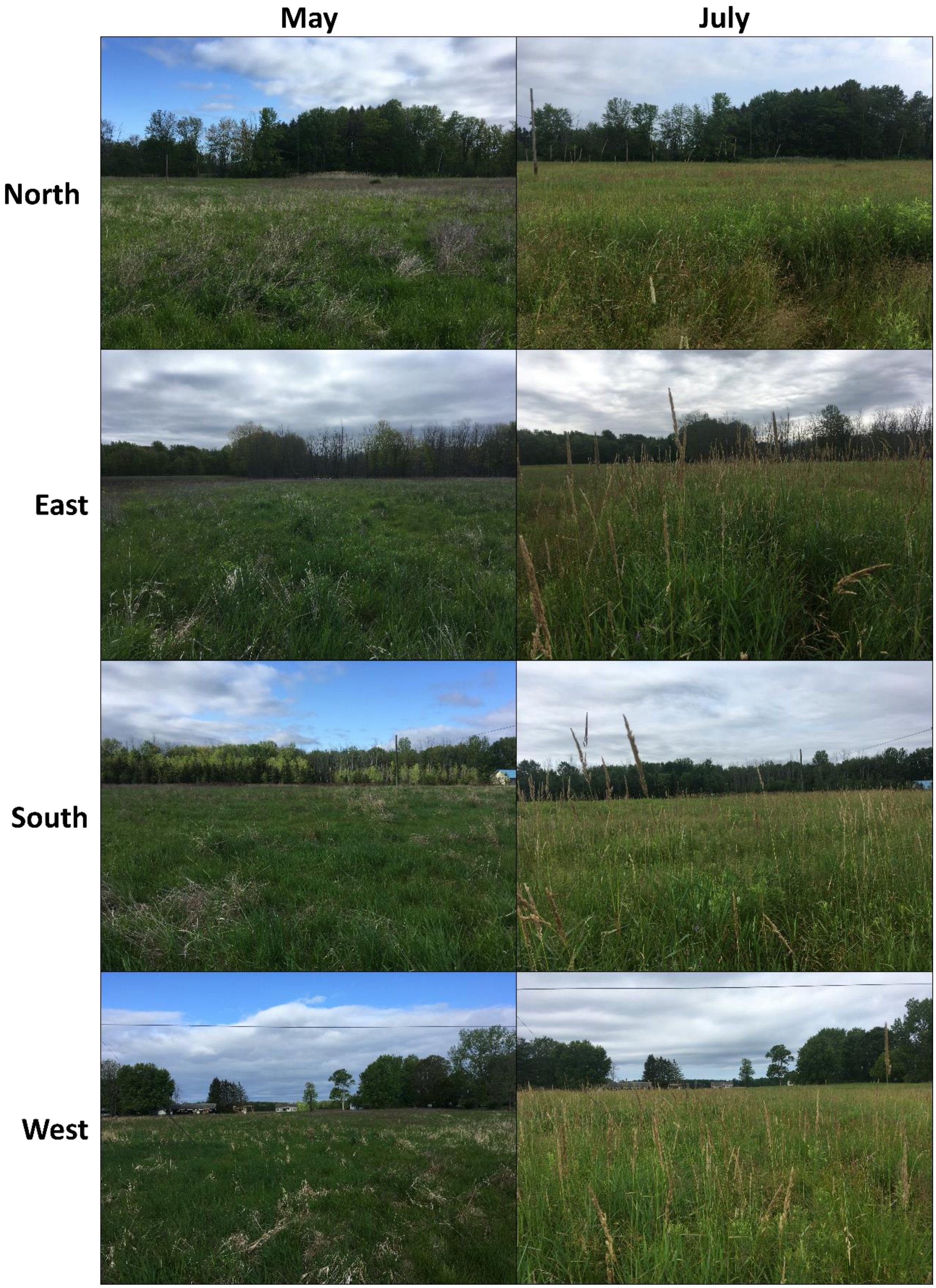


Figure A14. Habitat at survey point 14.

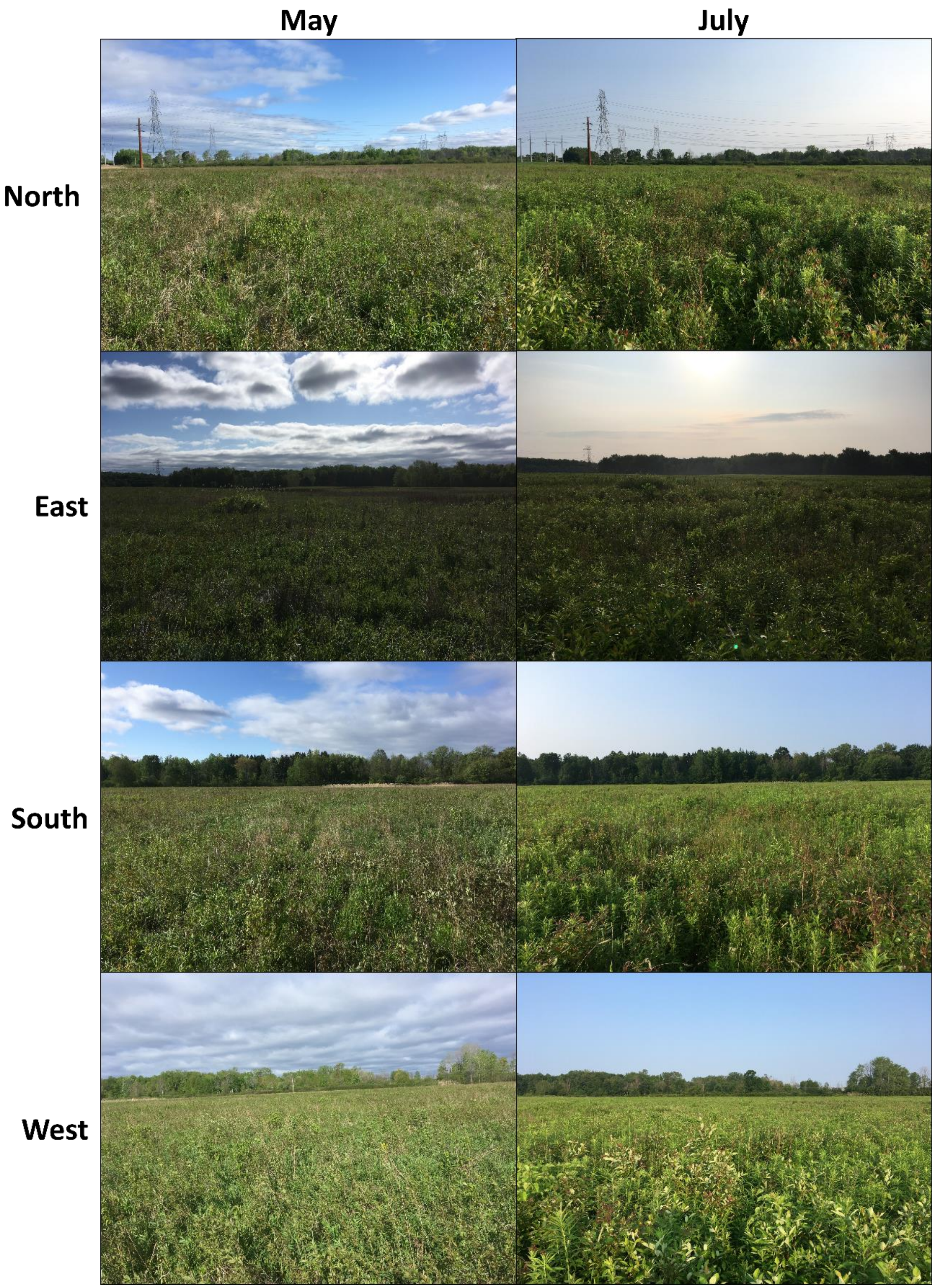


Figure A15. Habitat at survey point 15.

May | July

North

East

South

West

Figure A16. Habitat at survey point 16.