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WILDLIFE ASSESSMENT REPORT
D121 Transmission Line Structure & Optical Ground Wire Replacement Project
Eversource Energy
Bow, Hooksett and Manchester, New Hampshire

May 2021
File No. 04.0190999.38

PREPARED FOR:
Eversource Energy
Hooksett, New Hampshire

GZA GeoEnvironmental, Inc.
5 Commerce Park North, Suite 201 | Bedford, NH 03110-6984
603-623-3600

Offices Nationwide
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5 Commerce Park North
Suite 201
Bedford, NH 03110
T: 603.623.3600
F: 603.624.9463
www.gza.com

VIA EMAIL

May 18, 2021
File No. 04.0190999.38

Eversource Energy
Attn: Matthew Cardin
13 Legends Drive
Hooksett, New Hampshire 03106

Re: Wildlife Assessment Report
D121 Transmission Line Structure & OPGW Replacement Project
Eversource Energy
Bow, Hooksett and Manchester, New Hampshire

Dear Mr. Cardin:

GZA GeoEnvironmental, Inc. (GZA) is pleased to submit the attached Wildlife Assessment Report in support of an Alteration of Terrain permit for proposed construction along the existing and maintained D121 Transmission Line in Bow and Hooksett, New Hampshire (Site). This report summarizes the results of the field work completed on April 20, 22 and 23, 2021 to document and assess the potential for threatened, endangered, and special concern wildlife species on the Site.

Please contact Tracy Tarr at 603-235-6992 or *tracy.tarr@gza.com* if you have any questions or concerns.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

Logan Young
Scientist I

Deborah M. Zarta Gier, CNRP
Consultant/Reviewer

Tracy L. Tarr, CWS, CESSWI
Associate Principal

LTY/TLT/DMZ: jc
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Attachment: Wildlife Assessment Report

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PART 1: SUMMARY AND FINDINGS

1.1 PROPOSED PROJECT

This report presents the results of the wildlife assessment conducted by GZA GeoEnvironmental, Inc. (GZA) in support of the submittal of an Alteration of Terrain permit to New Hampshire Department of Environmental Services (NHDES) for proposed construction in Bow and Hooksett, New Hampshire (see table below). Eversource Energy is seeking to permit the replacement of 13 existing utility structures and construction of associated access located within the existing and maintained D121 Transmission Line Right-of-Way (ROW) in portions of Bow and Hooksett (Site). Additional structure replacements proposed in other areas of the D121 ROW in Bow, Hooksett, and Manchester (Figure 2 - *Overview of 2020 Wildlife Action Plan Land Cover and Habitat Tiers*) have been excluded from this report as these locations are not subject to the Alteration of Terrain permit (Figure 4 - *Alteration of Terrain Permitting Plans*). Access to the Site will be from Morgan Drive and Dicandra Drive in Bow, New Hampshire and Poore Road in Hooksett, New Hampshire, and is comprised of approximately 143 acres of Appalachian-Oak-Pine, Developed Land, Shrubland, Marsh/Shrub Wetland, Peatland, Stream, Temperate Swamp, and Vernal Pool habitat.

WILDLIFE BIOLOGIST:	Tracy L. Tarr, CWS, CESSWI	NHB FILE:	NHB21-0607 and NHB21-0608
COMPANY:	GZA GeoEnvironmental, Inc.	PROJECT NAME:	D121 Transmission Line & Optical Ground Wire Replacement Project
COMPANY ADDRESS:	5 Commerce Park North Suite 201 Bedford, NH 03110	PROJECT ADDRESS:	Eversource Energy Right-of-Way, Bow & Hooksett, New Hampshire
BIOLOGIST E-MAIL:	tracy.tarr@gza.com	APPLICANT:	Eversource Energy
BIOLOGIST PHONE NUMBER:	603-235-6992	AoT APPLICATION:	TBD

In GZA's opinion, the following selection describes our findings.

PHASE I Threatened and Endangered Wildlife and Habitat Assessment Findings:
Check one

No threatened and endangered wildlife and habitat present, no threatened or endangered wildlife, habitat, or wildlife corridors likely to be impacted by project activities.
Threatened and endangered wildlife and habitat present; HOWEVER, NO threatened or endangered wildlife, habitat, or wildlife corridors likely to be impacted by project activities. No conservation measures are proposed.
Threatened and endangered wildlife and habitat present or wildlife corridors present. Proposed actions have the potential for impacts. Conservation measures incorporated into the proposed project or project design.

1.2 THREATENED AND ENDANGERED WILDLIFE AND HABITAT

- Blanding's turtle (*Emydoidea blandingii*), eastern hognose snake (*Heterodon platirhinos*), northern black racer (*Coluber constrictor constrictor*), peregrine falcon (*Falco peregrinus anatum*), wood turtle (*Glyptemys insculpta*), and spotted turtle (*Clemmys guttata*) are known to occur in the vicinity of the project (see NHB Memo NHB21-0607 and NHB21-0608). The Site contains Appalachian Oak-Pine habitat which may support eastern hognose snake and northern black racer, and Developed habitat which may support peregrine falcon. The Site also contains Marsh/Shrub Wetland habitat which may support Blanding's turtle and spotted turtle, and streams which may support wood turtle.

- Three major upland habitats and five wetland habitats including Appalachian-Oak-Pine, Developed Land, Shrubland, Marsh/Shrub Wetland, Peatland, Stream, Temperate Swamp, and Vernal Pool totaling approximately 143 acres were identified at the Site.

- Based on habitat evaluation, GZA ranked eight endangered, threatened, and special concern species as having potential to occur on or immediately adjacent to the Site, including American eel, bald eagle, Blanding's turtle, eastern hognose snake, northern black racer, smooth green snake, spotted turtle, and wood turtle. Bald eagle and spotted turtle were observed by GZA at the time of assessment. Remaining species have potential to occur based on review of habitat types and rare species records in Bow and Hooksett.

- GZA observed American kestrel, a State Special Concern species, and peregrine falcon, a State Threatened species in the vicinity of the Site at the time of assessment. Both species were observed in open, developed cover not present within the Site. Due to the specific habitat requirements of each species and the cover types where construction is proposed to occur, these species were deemed to have "low" potential to occur at the Site (see Table 1).

- GZA observed eastern towhee at the Site, which is listed as a Species of Greatest Conservation Need. The maintenance of the ROW as predominantly scrub-shrub habitat provides breeding habitat and measures proposed to protect other species on Site also provide conservation benefit to eastern towhee.

1.3 PROPOSED CONSERVATION MEASURES

Based on a review of habitats, GZA offers the following BMP recommendations, consistent with the WAP and as requested by NHFG during a meeting between Eversource, GZA and NHFG on April 27, 2021.

1. Timber matting and erosion controls will be used for all temporary wetland crossings to avoid permanent wetland impacts and sedimentation, as well as to span stream channels in Wetlands BWW12 and BWW13. This serves to preserve wetland habitat and to maintain water quality. Prior to daily construction activity, timber matting will be reviewed for snakes and turtles. Impacts or potential impacts to vernal pools are to be avoided.

2. Install temporary barriers (e.g., silt fence) at Structure 95 construction area where spotted turtle was observed to occur to exclude turtles and snakes from active construction areas. Avoid use of plastic or netted fencing. Fencing should be maintained bi-weekly and after major storm events.

3. Utilize "wildlife friendly" matting consisting of coco or jute, and lacking plastic mesh, if matting is utilized for final stabilization. Welded plastic or "biodegradable plastic" netting or thread (e.g., polypropylene) should not be used, per NHFG feedback on similar projects. This BMP is already included in project plans.

4. Bald eagle was observed in the Site vicinity, however NHB reports no nesting bald eagles have been recorded in the immediate vicinity of the Site. If nesting eagles are observed within 660 feet of construction, NHFG should be notified for further coordination.

5. Add Blanding's turtle, eastern hognose snake, northern black racer, smooth green snake, spotted turtle, and wood turtle identification information to construction plans, per request by NHFG. Guidance protocols for species identification by contractors will be included in daily tailboard information and additional reptile "sweeps" will be completed during erosion control monitoring. If observed on or near the site during construction, contact NHFG immediately upon observation, and safely relocate amphibians and reptiles out of construction areas if observed. Observations of threatened and endangered species should be reported to NHFG by email at *RAARP@wildlife.nh.gov* and *Melissa.Doperalski@wildlife.nh.gov*, with photographs (if available).

6. Blanding's turtles, spotted turtles, or wood turtles observed laying eggs in project areas should be reported to Melissa Doperalski (603-479-1129), or Josh Megyesy (978-578-0802) at NHFG immediately for further guidance.

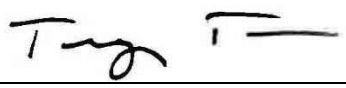
7. All observations of northern black racer snakes encountered from the end of September through the month of April will be immediately reported to the NHFG Department (Brendan Clifford 603-944-0885).

8. All observations of eastern hognose snake seen at any time must be immediately reported to the NHFG Department (Melissa Doperalski or Josh Megyesy) for further instructions.

In GZA's opinion, if the BMPs identified above are followed, the project design "will not jeopardize the continued existence of state or federally threatened and endangered species."

Printed name, date and signature of Individual that conducted the Phase I Threatened and Endangered Wildlife and Habitat Assessment.

Tracy L. Tarr, CWS, CESSWI	May 18, 2021
Name – printed	Date



Signature

Check Applicable Requested Action

Request for NHFG Concurrence with Findings in compliance with Env. Wq. 1503.19(h)(1)a

Request for NHFG Concurrence with Findings and Proposed Conservation Measures in compliance with Env. Wq. 1503.19(h)(1)b*

Requests further coordination with NHFG to discuss proposed conservation measures and/or potential focused survey needs (Phase II)*

Other

PART 2: NHB DATACHECK RESULTS LETTER AND FIGURES

See Appendix B in Part 4: Appendices for NHB Datacheck Results Letter (i.e., Memo). The following Figures, consistent with NHDES AoT requirements have been included in the Figures section at the end of this document:

FIGURE 1	LOCUS PLAN
FIGURE 2	OVERVIEW OF 2020 WILDLIFE ACTION PLAN LAND COVER AND HABITAT TIERS
FIGURE 3	LAND COVER TYPE OVERLAY
FIGURE 4	'ALTERATION OF TERRAIN PERMITTING PLANS' – PREPARED BY GZA GEOENVIRONMENTAL, INC.

PART 3: DETAILED EVALUATION

3.1 INTRODUCTION

This report presents the results of the wildlife assessment conducted by GZA GeoEnvironmental, Inc. (GZA) in support of the submittal of an Alteration of Terrain permit to NHDES for proposed construction at the Eversource Energy D121 Transmission Line Right-of-Way (ROW) in Bow and Hooksett, New Hampshire. This report was prepared to address the requirements of Env-Wq 1503.19 and RSA 212-A:9, III, which requires a report to document that a project "will not appreciably jeopardize the continued existence of state or federally threatened and endangered species." The Site totals approximately 143 acres Appalachian-Oak-Pine, Developed Land, Shrubland, Marsh/Shrub Wetland, Peatland, Stream, Temperate Swamp, and Vernal Pool habitat. (i.e., Site, see Figure 1 - *Locus Plan*; Figure 2 - *Overview Of 2020 Wildlife Action Plan Land Cover and Habitat Tiers*; and Figure 3 – *Land Cover Type Overlay*). Eversource Energy is proposing to replace certain structures and optical ground wire at the existing ROW (see Figure 4 – *D121 Transmission Line OPGW and Str Replacement Project*).

GZA was retained by Public Service Company of New Hampshire dba Eversource Energy (Eversource) to prepare a wildlife assessment per Env-Wq 1503.19, and as required by RSA 212-A:9, III, wherein the applicant must demonstrate that the project will not "appreciably jeopardize the continued existence of state or federally threatened and/or endangered species" for a permit to be issued. This assessment included the following components:

- Review existing georeferenced wildlife habitat data available through the New Hampshire Wildlife Action Plan (WAP) to characterize the regional significance and landscape connectivity of the Site;
- Describe wildlife habitat types and observed wildlife species;
- Utilize the Natural Heritage Bureau (NHB) memos provided by Eversource to identify known records of rare species near the project Site;
- Assess the potential for currently listed New Hampshire or federally threatened, endangered wildlife species, or special concern species to occur on the Site (see "Rare Plants, Rare Animals, and Exemplary Communities in New Hampshire Towns," published by the New Hampshire Natural Heritage Bureau [NH NHB], dated July 2020);
- Recommend conservation measures (i.e., best management practices [BMPs]) to protect threatened, endangered, and special concern species, consistent with the WAP, if in GZA's opinion there is potential for threatened and endangered wildlife to occur on Site;
- Coordinate a review with the New Hampshire Fish and Game Department (NHFG), after review with Eversource to finalize recommendations for best management practices for rare species protection; and
- Prepare a report summarizing methods, observations, and findings of the field assessment, consistent with reporting requirements outlined in "Phase I Threatened and Endangered Wildlife and Habitat Assessment Outline and Template, Version 1, dated September 25, 2020, published by NHFG.

GZA completed wildlife assessment field work on April 20, 22 & 23, 2021. It is our understanding that documentation from this effort will be used by Eversource in their submittal of an Alteration of Terrain permit to NHDES. This report is subject to the Limitations in Appendix A.

3.2 PROJECT DESCRIPTION

3.2.1 SCOPE OF WORK

Professional services provided by GZA within the work area described below included:

- *Review of existing georeferenced statewide data to assess landscape context of the Site.* GZA reviewed WAP habitat mapping and habitat ranking. In addition, GZA reviewed the NH NHB query's (NHB21-0607 and NHB21-0608) for locations of rare species to assess whether rare species are known to occur on the Site. GZA also reviewed the NH NHB document titled "Rare Plants, Rare Animals, and Exemplary Communities in New Hampshire Towns" (NH NHB 2020) to assess the potential for rare vertebrates at the Site.

- *Assessment and classification of habitat types.* GZA mapped habitat types to assess habitat rarity and predict wildlife usage on the Site. The habitat assessment was completed by Wildlife Biologist Logan Young on April 20, 22 & 23, 2021, under the direction of Wildlife Biologist Tracy Tarr. Mr. Young has a B.S. in Ecology and Spatial Analysis and Ms. Tarr has a B.S. in Wildlife Management and an M.S. in Wildlife Ecology: Natural Resources.

- *Documentation of wildlife (observed and potential).* As part of documentation, GZA completed visual observations for wildlife and wildlife sign (i.e., tracks, scat, feathers) along random traverse routes across the Site on April 20, 22 & 23, 2021. Wildlife tracking surveys, habitat survey, and visual and acoustic species survey were completed by Mr. Young, under the direction of Tracy Tarr.

- *Coordination with NHFG.* On April 27, 2021, GZA and Eversource met with NHFG and NHB to discuss the proposed project and BMPs for rare species reported in the Site vicinity, which are incorporated in this report.

3.2.2 DESCRIPTION OF WORK AREA AND SURROUNDING LAND USES

Based on materials prepared by GZA GeoEnvironmental and field review of current conditions, the Site is a transmission utility corridor maintained predominantly as scrub-shrub habitat. The Site also contains forested and developed cover, in addition to peatlands and forested and emergent wetlands. Based on a review of historic aerial imagery available from Google Earth, Nationwide Environmental Title Research, LLC, and information provided by Eversource, the Site has been maintained as a utility corridor since 1957. The Site is surrounded primarily by wooded land with nearby residential and commercial uses. The Merrimack River, and important corridor where rare species are known to occur, runs parallel to the Site and is located less than one mile from the majority of project areas. A portion of the Site in Bow also crosses through a portion of conservation land known as Bow Town Forest. A portion of the Site in Hooksett is also located northeast adjacent to the Manchester Cedar Swamp, a 642-acre nature preserve. The Site contains "Highest Ranked Habitat in Biological Region" and "Supporting Landscapes" throughout according to the NH WAP (see *Figure 2 – Overview Of 2020 Wildlife Action Plan Land Cover and Habitat Tiers*). These landscape positions are considered in the following narrative.

3.3 METHODOLOGY

3.3.1 WILDLIFE HABITAT MAPPING

GZA assessed habitat conditions on April 20, 22 & 23, 2021 by conducting vegetation assessments along random traverse routes and in random plant plot locations throughout the property. At the time of assessment, weather

conditions were partly cloudy with temperatures ranging between 40 to 60 degrees Fahrenheit. GZA identified dominant plant species along random traverse routes and plots to describe the vegetation composition of individual areas. Habitat boundaries were determined by assessing major changes in vegetation through aerial photograph interpretation and field reconnaissance. Upland habitat classifications were based on habitats recognized in the New Hampshire WAP and further refined in DeGraaf and Yamasaki 2001. Upland habitats consist of Appalachian-Oak-Pine, Shrubland, and Developed cover, and wetland habitats include Marsh/Shrub Wetland, Peatland, Temperate Swamp, and Vernal Pool cover (see Figure 3 – *Land Cover Type Overlay*). Wetlands were delineated by Normandeau Associates, Inc. in 2016 and confirmed by GZA in March 2021. A vernal pool evaluation was conducted by GZA in March 2021.

GZA utilized the WAP and Wildlife Habitat Assessment Field Data Form, developed with guidance from the NHFG, New Hampshire Audubon, and the University of New Hampshire (UNH) Cooperative Extension, to develop a datasheet for wildlife assessment required under New Hampshire Administrative Rule Env-Wq 1503.19 and RSA 212-A:9, III. The form specifically documents the presence of major wildlife habitat types, which are known to provide potential habitat to rare species based on the New Hampshire WAP (see Appendix C). In addition, GZA utilized the New Hampshire NHB memo for the project to determine if any rare species or exemplary natural communities are known to occur on the project Site (NHB21-0607 and NHB21-0608 see Section 2). Additionally, the town based WAP maps Developed by the NHFG were reviewed to determine the presence of any regionally significant habitat areas (e.g., highest ranked habitats or supporting landscapes).

To assess the potential impacts of the proposed project on habitats for rare species, GZA created an overlay map of the property of existing wetland and upland habitats. Approximate habitat areas were mapped and calculated in a Geographic Information System (GIS) database.

3.3.2 DOCUMENTATION OF WILDLIFE

The presence of wildlife species on the Site was assessed by identifying species through song, track, nest, and scat identification, as well as direct observations. Birds were assessed along random traverse route using binoculars and by call survey (identifying songs). Mammals were assessed by visual observation and track survey. Amphibians were assessed by call identification and visual identification. Because wildlife species can be cryptic and seasonally active, and in consideration of the timeframe of the assessment (spring), GZA utilized known habitat preferences (see DeGraaf and Yamasaki 2001) to predict potential habitat utilization by rare wildlife species on the Site to supplement information gained from direct observations.

GZA assessed potential for presence by reviewing individual habitat requirements of each species including minimum home range size and breeding habitat requirements, as well as prior documentation in the Towns of Bow and Hooksett, and the City of Manchester. Species considered to have limited to near zero potential to be present on Site based on habitat requirements and previous town records are ranked by GZA as "not likely" to be present. Species with some potential to be present (i.e., if they have general habitat requirements or preferred habitats are found on-site but are not recorded in Bow or Hooksett as of July 2020, or habitats present are suboptimal), are ranked by GZA as "low" potential. Species that are known to occur near the Site, and where the Site contains or directly borders preferred habitat or have very general habitat requirements and high tolerance of development are ranked as "possible." GZA has identified potential BMPs to reduce/eliminate impacts to "possible" species, based on guidance provided in the NH WAP and feedback received by the NHFG during project correspondence, as well as for similar projects.

3.4 HABITAT MAPPING AND WILDLIFE DOCUMENTATION RESULTS

3.4.1 UPLAND WILDLIFE HABITATS

The area of the Site in total is approximately 143 acres. The Site contains approximately 47% Shrubland, 42% Appalachian-Oak-Pine habitat, and 3.8% Developed cover (see Figure 3 – *Land Cover Type Overlay*). The majority of the Site is maintained as a utility corridor with portions of adjoining forested land and some areas of residential development. Cyclical vegetation maintenance supports predominantly early successional and scrub-shrub habitat throughout ROW areas.

3.4.1.1 Appalachian-Oak-Pine

Approximately 61 acres of the Site is Appalachian-Oak-Pine habitat. A portion of the ROW width throughout the Site is unmaintained as a utility corridor and contains this cover type along the edges of the existing maintained ROW. The canopy layer is dominated by eastern white pine (*Pinus strobus*), red oak (*Quercus rubra*), eastern hemlock (*Tsuga canadensis*), red maple (*Acer rubrum*), white oak (*Quercus alba*), black cherry (*Prunus serotina*), and grey birch (*Betula populifolia*). The sapling / shrub layer contains eastern hemlock, white oak, and striped maple (*Acer pensylvanicum*). The herbaceous layer contains princess pine (*Dendrolycopodium obscurum*), club moss (*Lycopodiopsida sp.*), lowbush blueberry (*Vaccinium angustifolium*), creeping juniper (*Juniperus horizontalis*), sheep laurel (*Kalmia angustiflia*), and wintergreen (*Gaultheria procumbens*).

GZA observed common resident bird species including downy woodpecker (*Picoides pubescens*), pileated woodpecker (*Drycopus pileatus*), American robin (*Turdus migratorius*), chipping sparrow (*Spizella passerina*), American crow (*Corvus brachyrhynchos*), black-capped chickadee (*Poecile atricapillus*), blue jay (*Cyanocitta cristata*), ruby-crowned kinglet (*Regulus calendula*), turkey vulture (*Cathartes aura*), white-throated sparrow (*Zonotrichia albicollis*), and red breasted nuthatch (*Sitta canadensis*). GZA also observed evidence of eastern chipmunk (*Tamias striatus*). Bald eagle (*Haliaeetus leucocephalus*), a federally protected and State Special Concern species was observed flying overhead in this habitat type in the vicinity of Structure 27.

Photo 1. View of Appalachian-Oak-Pine habitat.

Photo 2. Bald eagle observed overhead in this cover type.

3.4.1.2 Shrubland

Approximately 66 acres of the Site is Shrubland habitat (maintained utility corridor). The sapling / shrub layer consists of eastern white pine, grey birch, red oak, quaking aspen (*Populus tremuloides*), staghorn sumac (*Rhus typhina*), meadowsweet (*Filipendula ulmaria*), autumn olive (*Elaeagnus umbellata*), sweet fern (*Comptonia peregrina*), blackberry (*Rubus fruticosus*), and highbush blueberry (*Vaccinium corymbosum*). The herbaceous layer contains eastern white pine, grey birch, lowbush blueberry, club moss, dewberry, princess pine, sheep laurel, creeping juniper, goldenrod (*Solidago canadensis*), New England aster (*Symphyotrichum novae-angliae*), steeplebush (*Spiraea tomentosa*), violet (*Viola sp.*), club moss, and grasses (*Poaceae spp.)*.

GZA observed common resident bird species including red tailed hawk (*Buteo jamaicensis*), black-capped chickadee, dark-eyed junco (*Junco hyemalis*), chipping sparrow, field sparrow (*Spizella pusilla*), song sparrow (*Melospiza melodia*), American robin, mourning dove (*Zenaida macroura*), eastern phoebe (*Sayornis phoebe*), wild turkey (*Meleagris gallopavo*), and broad-winged hawk (*Buteo platypterus*). Carpenter bee (*Xylocopa virginica*) and evidence of eastern chipmunk, coyote (*Canis latrans*), domestic dog (*Canis lupus*), groundhog (*Marmota monax*), red fox (*Vulpes vulpes*), and white-tailed deer (*Odocoileus virginianus*) were also observed. GZA did not observe any threatened or endangered wildlife.

Photo 3. View of Shrubland habitat

Photo 4. View of Shrubland habitat after recent vegetation maintenance cycle.

3.4.1.3 Developed (Impervious or Barren)

Approximately 5.4 acres of the Site is Developed habitat. The canopy layer contains eastern white pine, quaking aspen, red maple, red oak, red cedar (*Thuja plicata*) and silver maple (*Acer saccharinum*). The sapling / shrub layer consists of eastern white pine, white oak, red oak, blackberry, autumn olive, multiflora rose (*Rosa multiflora*), bittersweet (*Celastrus scandens*), forsythia (*Forsythia sp.*), arborvitae (*Thuja occidentalis*), honeysuckle (*Lonicera japonica*), common lilac (*Syringa vulgaris*), and birdsfoot trefoil (*Lotus corniculatus*). The herbaceous layer contains grey birch, grasses, bittersweet, aster, and milkweed (*Asclepias syriaca*).

GZA observed common resident bird species including ruby crowned kinglet, mourning dove, song sparrow, white-throated sparrow, mockingbird (*Mimus polyglottos*), brown-headed cowbird (*Molothrus ater*), tufted titmouse (*Baeolophus bicolor*), and northern flicker (*Colaptes auratus*). Evidence of coyote, domestic dog, and white-tailed deer was also observed. GZA observed American kestrel (*Falco sparverius*), a State Special Concern species, in this

cover type west of Structure 4, and peregrine falcon (*Falco peregrinus*), a State Threatened species in this cover type north of Structure 1. These structures and their vicinity are not subject to the Alteration of Terrain permit. Due to the specific habitat requirements of each species and the cover types where construction is proposed to occur, these species were deemed to have "low" potential to occur at the Site

Photo 5. View of Developed habitat.

3.4.2 WETLAND HABITATS

The Site contains approximately 0.3% Peatland, 0.1% Streams, 6.3% Emergent/Marsh Wetland, 0.2% Temperate Swamp and 0.3% Vernal Pool habitat (see Figure 3 – *Land Cover Type Overlay*). The Site contains approximately 37 wetland areas throughout the Site in Bow and Hooksett.

3.4.2.1 Peatland

Approximately 0.5 acres of the Site is Peatland habitat. No canopy layer was observed within this cover type. The shrub layer is dominated by leatherleaf (*Chamaedaphne calyculata*), highbush blueberry, speckled alder (*Alnus incana*), and maleberry (*Lyonia ligustrina*). The herbaceous layer is dominated by sphagnum moss, leatherleaf, and highbush blueberry, in association with eastern white pine, wintergreen, grasses, and cotton sedge (*Eriophorum angustifolium*). GZA observed common resident bird species black-capped chickadee.

GZA also observed eastern towhee (*Pipilo erythrophthalmus*), which are listed as a Species of Greatest Conservation Need by the NH WAP, in this cover type near Structure 32. This species occurs in open shrubland, forest edges, peatlands, and utility ROWs (NHFG 2015). Eastern towhees occur most commonly in brushy, shrub-dominated areas where they forage for insects and seeds on the ground under dense cover. These cover types may be viewed as "undesirable" habitats and are often allowed to revert to mature forest or converted by development. As a result, this species is becoming less common throughout much of its range and has experienced an annual decline in New Hampshire of 9.83% annually since 1966 (NHFG 2015). Permanent maintenance of much of the ROW as scrub-shrub serves to promote habitat of this species.

Photo 6. View of Peatland habitat.

Photo 7. Eastern towhee observed in Peatland habitat.

3.4.2.2 Stream

Approximately 0.2 acres of the Site is Stream habitat. The canopy layer contains red maple, eastern white pine, eastern hemlock, white oak, red oak, red maple, black birch (*Betula lenta*), and yellow birch (*Betula alleghaniensis*). The sapling / shrub layer contains eastern white pine, eastern hemlock, speckled alder, maleberry and highbush blueberry. The herbaceous layer consists of various grasses, steeplebush, sensitive fern, dewberry, sphagnum moss, club moss, wintergreen, cinnamon fern (*Osmundastrum cinnamomeum*), lowbush blueberry, and skunk cabbage (*Symplocarpus foetidus*).

GZA observed common resident bird species including dark-eyed junco and downy woodpecker. Evidence of eastern chipmunk and meadow vole (*Microtus pennsylvanicus*) was also observed. GZA did not observe any threatened or endangered wildlife.

Photo 8. View of Stream habitat in forested cover outside of proposed construction area.

3.4.2.3 Marsh/Shrub Wetland

Approximately nine acres of the Site is Marsh/Shrub Wetland habitat. The canopy layer contains red maple and willow (*Salix sp.*). The sapling / shrub layer contains grey birch, eastern white pine, red oak, speckled alder, willow, cattail, sweet fern, meadowsweet, maleberry, highbush blueberry, and leatherleaf. The herbaceous layer consists of eastern white pine, blackberry, dewberry, sphagnum moss, skunk cabbage, goldenrod, grasses, meadowsweet, steeplebush, sensitive fern, sheep laurel, wintergreen, purple loosestrife, tussock sedge (*Carex stricta*), raspberry (*Rubus idaeus*), and hay-scented fern (*Dennstaedtia punctilobula*).

GZA observed common resident bird species including red-winged black bird (*Agelaius phoeniceus*), song sparrow, chipping sparrow, field sparrow, blue jay, black-capped chickadee, red-tailed hawk, American crow, common grackle (*Quiscalus quiscula*), and yellow-rumped warbler (*Setophaga coronata*). Evidence of eastern chipmunk, beaver (*Castor canadensis*), muskrat (*Ondatra zibethicus*), and white-footed mouse (*Peromyscus leucopus*) was also observed. GZA did not observe any threatened or endangered wildlife.

Photo 9. View of emergent-dominant wetland.

Photo 10. View of shrub-dominant wetland with associated stream intersecting.

3.4.2.4 Temperate Swamp

Approximately 0.4 acres of the Site is Temperate Swamp habitat. This habitat type was observed in areas associated with forested streams. The canopy layer contains yellow birch, red maple, eastern white pine, eastern hemlock, and white oak. The sapling / shrub layer contains eastern white pine, eastern hemlock, red maple, yellow birch, and highbush blueberry. The herbaceous layer consists of eastern white pine, grasses, cinnamon fern, skunk cabbage, sphagnum moss, and wintergreen.

GZA observed resident bird species black-capped chickadee and evidence of eastern chipmunk. GZA did not observe any threatened or endangered wildlife.

Photo 11. View of Temperate Swamp habitat outside of proposed construction area.

3.4.2.5 Vernal Pool

Approximately 0.5 acres of the Site is Vernal Pool habitat. Two vernal pools were observed associated with Marsh/Shrub Wetland habitat near proposed access from Morgan Drive, Bow and the vicinity of Structures 94 and 95. GZA confirmed vernal pools by the presence of amphibian egg masses, a primary vernal pool indicator per Env-Wt 101.75. Sedimentation and rutting as a result of recreational vehicle activity was observed in the Bow vernal pool.

No canopy layer was observed within this cover type. The sapling / shrub layer contains eastern white pine, meadowsweet, highbush blueberry, steeplebush, maleberry, and leatherleaf. The herbaceous layer consists of grasses, sheep laurel, steeplebush, sphagnum moss, maleberry.

GZA observed foraging American goldfinch (*Spinus tristis*) and carpenter bee, as well as spotted salamander (*Ambystoma maculatum*) and wood frog (*Lithobates sylvaticus*) egg masses. GZA also observed spotted turtle (*Clemmys guttata*), a State Threatened species, in the vicinity of Structures 94 and 95 at the time of assessment.

Photo 12. View of Vernal Pool habitat in PSS1,3F/PEM1G wetland.

Photo 13. Spotted salamander egg mass observed in Vernal Pool habitat.

3.4.3 THREATENED, ENDANGERED, AND SPECIAL CONCERN WILDLIFE SPECIES

According to NHB21-0607 and NHB21-0608, Blanding's turtle (*Emydoidea blandingii*), eastern hognose snake (*Heterodon platirhinos*), northern black racer (*Coluber constrictor constrictor*), peregrine falcon (*Falco peregrinus anatum*), wood turtle (*Glyptemys insculpta*), and spotted turtle (*Clemmys guttata*) have been reported to occur within the vicinity of the Site parcels. The Site contains eight general habitat types within the parcel (Appalachian-Oak-Pine, Developed Land, Shrubland, Marsh/Shrub Wetland, Peatland, Stream, Temperate Swamp, and Vernal Pool habitat) that are considered to have some potential to support federally and state listed wildlife species. Pursuant to Env-Wq 1503.19, the following assessment focuses on state and federal threatened and endangered species. In addition, per NHFG guidance for AoT wildlife assessments, the assessment considers special concern species that are either listed on the NHB report and/or are known to occur in the Towns of Bow and Hooksett. Per NHFG guidance, GZA also provides information on Species of Greatest Conservation Need that were observed on Site or believed to be present based on available information.

As documented in the NH WAP, 63 endangered, threatened, and special concern species have potential to utilize Appalachian-Oak-Pine, Developed Land, Shrubland, Marsh/Shrub Wetland, Peatland, Stream, Temperate Swamp, and Vernal Pool habitat cover types. The specific habitat requirements of each of these species and likelihood for potential presence on the Site is discussed below to give context to the potential for these species to occur on the Site (see Table 1).

In GZA's opinion, of the 63 threatened and endangered species known to use Appalachian-Oak-Pine, Developed Land, Shrubland, Marsh/Shrub Wetland, Peatland, Stream, Temperate Swamp, and Vernal Pool habitats, eight species have potential to occur on Site. Of these American eel, bald eagle, Blanding's turtle, eastern hognose snake, northern black racer, smooth green snake, spotted turtle, and wood turtle are ranked as "possible."

3.4.3.1 American Eel

The American eel is listed as Special Concern. It occupies a diversity of habitats during its life cycle, including marine, estuarine, and freshwater habitats. The species may be found in any freshwater habitat that can be accessed from the ocean. The Site is located approximately one mile from the Merrimack River, a watercourse

where this species is known to occur that empties to the Atlantic Ocean. The Site also contains two intermittent riverine channels with unconsolidated bottoms (R4UB) which drain to the Merrimack River. Proposed construction includes the use of timber matting to temporarily cross wetlands and bridge all stream channels within Wetlands BWW12 and BWW13 and is not anticipated to obstruct passage in areas of flow. In addition, erosion control measures will be installed at wetland crossings to prevent sedimentation and maintain water quality. There are no proposed permanent impacts in streams.

3.4.3.2 Bald Eagle

The bald eagle is listed as Special Concern. It occupies habitats associated with open waters such as lakes, rivers, and coastal estuaries. GZA observed this species flying through the Site vicinity at the time of assessment. The Site is located approximately one mile west of the Merrimack River where this species is known to occur. During the breeding season, eagles have high site fidelity and nest primarily in very tall, mature trees at the edges of wooded areas within 1.5 miles from a water source. During nonbreeding months, bald eagles may forage further from water sources and share roost trees with multiple eagles (NHFG 2015). Large, mature trees likely to be suitable for nest sites, such as white pine, were observed at the Site, and adjacent forests provide potential roosting habitat, however no active nests are reported in the Site vicinity. GZA did not observe evidence of nests during the assessment. Per the Northeast United States Fish and Wildlife Bald Eagle Management Guidelines, if proposed construction is expected to occur within a 660-foot radius of a known bald eagle nest, tree clearing should be avoided within that radius and construction should be scheduled outside of the breeding season from February to August (USFWS 2007). If nesting eagles are observed on or near the Site, NHFG should be notified for further coordination. No nests are currently known within 660-feet of the Site based on NHB Memos NHB21-0607 and NHB21-0608.

3.4.3.3 Blanding's Turtle

The Blanding's turtle is listed as State Endangered. This species utilizes a variety of wetlands throughout the year including vernal pools, beaver flowages, marshes, scrub-shrub, and forested wetlands with standing water. Blanding's turtles are known to make routine seasonal movements to vernal pools for foraging and other activities in the spring, as well as for summer rest periods known as aestivation. In addition, Blanding's turtles make large overland movements to nest in anthropogenic habitats such as maintained hay fields. Exposed soils that may be present at the Site, or during construction, may also be utilized for spring/summer nesting habitat, however this has not been observed. The Site contains large emergent scrub-shrub wetlands typically utilized by Blanding's turtle and this species is reported to occur in the vicinity. However, the project is maintained as an existing utility corridor and no permanent wetland impacts or conversion of habitats utilized by Blanding's turtle is proposed. Providing pre-made NHFG flyers for species identification, to be added to construction plans by the project contractor, is a recommended construction BMP, and has been incorporated into the project plans. In addition, reptile sweeps will be completed by Eversource's consultant during erosion control monitoring. If Blanding's turtles are observed, turtles should be safely relocated out of the way of construction activities and immediately reported to the NHFG.

3.4.3.4 Eastern Hognose Snake

The eastern hognose snake is listed as State Endangered. This species is known to utilizes beaches, fields, and dry open pine or deciduous woodlands with a preference for very dry, sandy soils, such as former sand and gravel quarries. Hognose snakes feed predominantly on amphibians and may prefer habitats containing vernal pools or similar wetland types (NHFG 2015). The Site contains areas of dry woodlands adjacent to emergent, shrub, and

vernal pool wetlands and this species is reported to occur in the vicinity. Providing pre-made NHFG flyers for species identification, to be added to construction plans by the project contractor, is a recommended construction BMP. In addition, reptile sweeps will be completed by Eversource's consultant during erosion control monitoring. If eastern hognose snakes are observed, snakes should be safely relocated out of the way of construction activities and immediately reported to the NHFG. If matting is required for slope stabilization, use of "wildlife friendly" matting (e.g., coco or jute matting) to limit and prevent mortality to snakes is already included as part of the project plan.

3.4.3.5 Northern Black Racer

The northern black racer snake (i.e., racer) is listed as State Threatened. This species is known to utilize large tracts of land consisting of mixed forest and a variety of early successional habitats including old fields, meadows, and forest/swamp/marsh edges (Kjoss and Litvaitis 2001). Racers typically occur in terrestrial sites (Ernst and Ernst 2003 in Mays and Todd 2007) but may utilize moist areas including marshes and swamps. During late fall through winter, racers hibernate in a variety of places including mammal burrows, rock crevices/caves, stone walls, cisterns/wells, and rotting logs (Ernst and Barbour 1989). The Site contains woodland and shrubland habitat typically utilized by racers and this species is reported to occur in the vicinity. Providing pre-made NHFG flyers for species identification, to be added to construction plans by the project contractor, is a recommended construction BMP. If northern black racers are observed, snakes should be safely relocated out of the way of construction activities and immediately reported to the NHFG. If matting is required for slope stabilization, use of "wildlife friendly" matting (e.g., coco or jute matting) to limit and prevent mortality to snakes is already included as part of the project plan.

3.4.3.6 Smooth Green Snake

The smooth green snake is listed as Special Concern. This species is typically found in open habitats, typically with dense herbaceous vegetation, including grassy fields, wet meadows, marsh edges, abandoned agricultural land, shrublands, utility rights-of-way, and lightly wooded areas. Smooth green snakes are known to occur in Hooksett and the Site contains shrubland and wetland habitats that may support this species. Providing pre-made NHFG flyers for species identification, to be added to construction plans by the project contractor, is a recommended construction BMP. If smooth green snakes are observed, snakes should be safely relocated out of the way of construction activities and immediately reported to the NHFG. If matting is required for slope stabilization, use of "wildlife friendly" matting (e.g., coco or jute matting) to limit and prevent mortality to snakes is already included as part of the project plan.

3.4.3.7 Spotted Turtle

The spotted turtle is listed as State Threatened. This species utilizes a variety of wetlands throughout the year including vernal pools, marshes, woodland streams, and scrub-shrub and forested wetlands with standing water. Spotted turtles are known to make routine seasonal movements to vernal pools for foraging and other activities in the spring. The Site contains areas of shrub-dominated wetlands, vernal pools, and woodland streams that may support this species. Exposed soils that may be present at the Site, or during construction, may also be utilized for spring/summer nesting habitat, however this has not been observed. GZA observed this species in shrub cover within Vernal Pool habitat in the Hooksett portion of the Site at the time of assessment. The project is maintained as an existing utility corridor and no temporary or permanent wetland impacts, or conversion of habitats utilized by spotted turtle, is proposed. Providing pre-made NHFG flyers for species identification, to be added to

construction plans by the project contractor, is a recommended construction BMP. If spotted turtles are observed, turtles should be safely relocated out of the way of construction activities and immediately reported to the NHFG.

3.4.3.8 Wood Turtle

The wood turtle is listed as Special Concern. This species utilizes slow-moving streams and rivers, as well as upland habitats bordering riparian zones, often within approximately 600 feet of riparian habitats. Wood turtles forage in uplands in riparian zones, and nest in open sandy and well-drained areas such as meadows, fields, and banks. The Site contains wooded streams, emergent and shrub-dominated wetlands, and shrubland habitats that may be utilized by this species. Exposed soils that may be present at the Site, or during construction, may also be utilized for spring/summer nesting habitat, however this has not been observed. However, the project is maintained as an existing utility corridor and no permanent wetland impacts or conversion of habitats utilized by wood turtle is proposed. This species is known to occur in the vicinity. Providing pre-made NHFG flyers for species identification, to be added to construction plans by the project contractor, is a recommended construction BMP. If wood turtles are observed, turtles should be safely relocated out of the way of construction activities and immediately reported to the NHFG.

Table 1. Summary of NH Threatened, Endangered, and Special Concern Wildlife Associated with On-site Habitat Types.

Species (common name)	Broad Habitat Association	Federal Listing	State Listing	Minimum/Special habitat requirements	Likelihood of Presence on Site Based on Minimum/Special Habitat Requirements
American brook lamprey	Rivers and streams	Not federally listed	State Endangered	Utilizes freshwater streams and small rivers. Spawns at the head of riffle areas over coarse sand and gravel with stones. In NH, only recorded in Oyster River watershed. Not reported to occur in the Site vicinity as of July 2020.	Not Likely
American bumble bee	Developed/ Shrubland	Not federally listed	Special Concern	Ground-nesting bumble bee that occurs in meadows, crop fields, orchards, and gardens. Nectar plants include thistle, bunch berry, purple coneflower, Joe-Pye-weed, sunflower, St. John's wort, goldenrods, and clovers. The Site area contains habitat that may support this species, however areas containing extensive flowering plant cover required by this species were not observed.	Low
American eel	Rivers & Streams, Lakes & Ponds, Marine and Estuarine	Not federally listed	Special Concern	Relatively common in coastal rivers in New Hampshire. Spawns in the Sargasso Sea and migrates into estuaries and freshwater rivers where they mature. May be found in any freshwater wetland with access to the ocean. After approximately 3-25 years, the yellow eel stage metamorphoses into silver eels, and then migrate back	Possible

Species (common name)	Broad Habitat Association	Federal Listing	State Listing	Minimum/Special habitat requirements	Likelihood of Presence on Site Based on Minimum/Special Habitat Requirements
				to the Sargasso Sea to spawn and die. Known to occur in the Site vicinity.	
American kestrel	Developed, Grassland, Shrubland	Not federally listed	Special Concern	Occupies a diversity of habitats including forested edges, grasslands, pastures, utility ROWs, marshes, beaver complexes, and suburban areas. Requires nest cavities in trees (minimum 12-inch diameter at breast height) and elevated perches for hunting. Observed to occur in the Site vicinity at the time of assessment. The Site may provide supporting habitat; however, project areas lack large open areas (e.g. grassland) typically preferred by this species.	Low
Appalachian tiger beetle	Rivers and streams	Not federally listed	Special Concern	Prefers cool, rocky rivers and streams. NH populations isolated to northern counties of the state. Not reported to occur in the Site vicinity as of July 2020.	Not Likely
Bald eagle	Appalachian Oak-Pine, Spruce-Fir, Northern Hardwood-Conifer, Hemlock-Hardwood-Conifer, Floodplain Forest, Marsh-Shrub Wetland, Rivers and streams, Pond and Lake	Protected by the Bald & Golden Eagle Protection Act	Special Concern	Found in association with aquatic habitats such as large lakes, rivers, and coastal estuaries. Nests often in forested areas adjacent to water bodies and avoids human disturbance. Known to occur in the Site vicinity and observed at the time of assessment.	Possible
Banded sunfish	Rivers and streams, Pond	Not federally listed	Special Concern	Prefer vegetated areas of ponds, lakes, and backwaters of lowland streams. May be found in low gradient headwater streams with beaver activity. Not reported to occur within the Site vicinity as of July 2020.	Not Likely
Bank swallow	Rivers and streams, Pond, Grassland, Marsh/Shrub Wetland	Not federally listed	Special Concern	Inhabits grasslands, fields, or open areas adjacent to water. Requires exposed, vertical banks along rivers, lakes, and oceans where regular erosion occurs. The Site lacks critical habitat features required by this species.	Not Likely

Species (common name)	Broad Habitat Association	Federal Listing	State Listing	Minimum/Special habitat requirements	Likelihood of Presence on Site Based on Minimum/Special Habitat Requirements
Blanding's turtle	Temperate Swamp, Marsh/scrub-shrub, Vernal Pool	Not federally listed	State Endangered	Utilizes a diversity of wetland types, as well as exposed, sandy anthropogenic soils for nesting. Beaver flowages, marshes, permanently flooded scrub-shrub/forested wetlands, and vernal pools are preferred summer and overwintering habitat. Females make large overland movements and may travel 1 km to reach nesting locations. Known to occur in the Site vicinity. Identification information should be added to Site plans. Contact NHFG immediately upon observation, and safely relocate reptiles outside of construction areas if observed.	Possible
Blue-spotted/Jefferson salamander complex	Appalachian Oak-Pine, Northern Hardwood-Conifer, Hemlock-Hardwood Conifer, Floodplain Forest, Northern Swamp, Temperate Swamp, Peatland, Marsh/Shrub Wetland, Vernal Pool	Not federally listed	Special Concern	Known to form hybrid populations in New Hampshire. Requires vernal pools for breeding in association with large areas of undisturbed upland forest connected by suitable dispersal corridors. This species complex is not reported in the Site vicinity but is present in surrounding towns and may be underreported.	Low
Brook floater	Rivers and streams	Not federally listed	State Threatened	Prefer well-oxygenated streams and rivers with high to moderate flows. Often found in gravel and sand among cobble in nutrient-poor streams. Known to occur within scattered areas of the Merrimack River. Aquatic habitats within the project areas are unlikely to provide critical habitat features required by this species.	Not Likely
Burbot	Rivers and streams, Pond	Not federally listed	Special Concern	A native cold-water fish found in medium and large lakes with deep water in NH. Also found in cold water rivers and streams in the Connecticut, upper Merrimack Saco, and Androscoggin River drainages. Reported to occur in the Site vicinity,	Not Likely

Species (common name)	Broad Habitat Association	Federal Listing	State Listing	Minimum/Special habitat requirements	Likelihood of Presence on Site Based on Minimum/Special Habitat Requirements
				however project areas lack cold water rivers or lakes required by this species.	
Cerulean warbler	Appalachian Oak-Pine, Floodplain forest	Not federally listed	Special Concern	Requires extensive (>250 ha) mature deciduous forests. The Site vicinity and areas within proposed project boundaries lack critical habitat features required by this species.	Not Likely
Cliff swallow	Developed	Not federally listed	State Threatened	Requires vertical substrates with overhangs for nesting, a mud supply for nest construction, a water source, and open areas near nest sites. Primarily found in Coos County and the Lakes Region with some scattered colonies near the Seacoast. Not reported to occur in the Site vicinity as of July 2020.	Not Likely
Cobblestone tiger beetle	Rivers and streams	Not federally listed	State Endangered	Inhabits sandy cobble beaches on the upstream ends of island and along the banks of rivers. Five populations known in NH, all within the Connecticut River watershed. Not reported to occur in the Site vicinity as of July 2020.	Not Likely
Common gallinule	Marsh/Shrub Wetland	Not federally listed	Special Concern	Breeds in freshwater wetlands containing dense mixes of emergent and floating vegetation. Only recorded at three sites in northern and coastal NH since 1990 and believed to be extirpated from the state (NHFG 2015). Not reported to occur in the Site vicinity as of July 2020.	Not Likely
Common loon	Pond and Lake, Rivers, and streams	Not federally listed	State Threatened	Widely distributed to freshwater lakes and large rivers, preferring open water >2 acres. Prefers nesting areas in marshes, islands, and shorelines. Reported to occur in the Site vicinity, however project areas lack open water habitat required by this species.	Not Likely
Common nighthawk	Appalachian Oak-Pine, Hemlock-Hardwood-Conifer, Developed, Pine Barren, Rocky Ridge/Cliff/Talus	Not federally listed	State Endangered	Prefers open areas including grasslands, cultivated fields, woodland clearings, beaches, railroad rights-of-way, and flat gravel roofs. Reported to occur in the Site vicinity, however proposed project areas are utility corridors maintained as predominantly scrub-shrub habitat and lack critical habitat features required by this species.	Not Likely
Coppery Emerald	Appalachian Oak-Pine, Temperate Swamp	Not federally listed	Special Concern	Only NH population reported to occur in Kingston. Usually occurs in forested peatlands, such as cedar swamps, not present in the project areas. Not	Not Likely

Species (common name)	Broad Habitat Association	Federal Listing	State Listing	Minimum/Special habitat requirements	Likelihood of Presence on Site Based on Minimum/Special Habitat Requirements
				recorded in the Site vicinity as of July 2020.	
Dwarf wedgemussel	Rivers and streams	Federally Endangered	Federally Endangered	Inhabits small streams and large rivers with moderate flow. Prefer hydrologically stable areas with a variety of substrates. NH populations are limited to the Connecticut River watershed. Not reported to occur in the Site vicinity as of July 2020.	Not Likely
Eastern box turtle	Appalachian Oak-Pine, Hemlock-Hardwood-Conifer, Temperate Swamp, Marsh/Shrub Wetland, Grassland, Shrubland	Not federally listed	State Endangered	Utilizes open woodlands but is generally close to water such as marshes, bogs, ponds, and stream banks. Prefers old fields and clearings with sandy soils for nesting. Like all NH turtles, requires well-drained soil for nesting. The Site contains scrub-shrub, shrub/emergent wetlands, and developed clearings, in association with adjacent woodlands that may support this species. Not recorded in the Site vicinity or proposed project areas but is present in surrounding towns and may be underreported.	Low
Eastern hognose snake	Appalachian Oak-Pine, Hemlock-Hardwood-Conifer, Marsh/Shrub Wetland, Vernal Pool, Pine Barren, Shrubland	Not federally listed	State Endangered	Utilizes beaches, fields, and dry open pine or deciduous woodlands. Prefers sandy soils upland of wetlands where is feeds on amphibians. Reported to occur in the Site vicinity.	Possible
Eastern red bat	Appalachian Oak-Pine, Spruce-Fir, Hemlock-Hardwood-Conifer, Northern Hardwood-Conifer, Floodplain Forest, Northern Swamp, Temperate Swamp	Not federally listed	Special Concern	Uses a variety of hardwood and softwood habitats, especially with still water, along roads/trails, and in regenerating and older forest age classes. Most active over water in early evening. Summer roosts in dense foliage and tree crowns. Similar to other bats, decimated by white-nose syndrome. Not formally reported to occur in the Site vicinity as of July 2020.	Not Likely
Eastern small-footed bat	Appalachian Oak-Pine,	Not federally listed	State Endangered	Females form small maternity colonies, often in rocky crevices of cliffs and	Not Likely

Species (common name)	Broad Habitat Association	Federal Listing	State Listing	Minimum/Special habitat requirements	Likelihood of Presence on Site Based on Minimum/Special Habitat Requirements
	Hemlock-Hardwood-Conifer, Northern Hardwood-Conifer, Caves and Mines, Rocky Ridge/Cliff/Talus			sometimes in crevices in buildings. Favors drafty, cool, and dry hibernacula such as entrances of mines and caves. Only two hibernacula are currently reported in the NH with summer populations most frequently observed in rocky, mountainous areas. Not reported to occur in the Site vicinity as of July 2020.	
Eastern whip-poor-will	Hemlock-Hardwood-Pine, Appalachian Oak-Pine, Pine Barren, Shrubland	Not federally listed	Special Concern	Prefers dry open woodlands, especially pine and oak, within 30m of early or secondary successional forests, large clearings, or fields and uncommon in mature forest (USFWS 2001). Known to occur in the Site vicinity, however the project areas consist of relatively narrow corridors of early successional vegetation within large blocks of mature forest or development. Project areas may provide supporting habitat but lack critical habitat features required by this species.	Low
Finescale dace	Rivers and streams, Pond	Not federally threatened	Special Concern	Prefers lower gradient, cool headwater streams and small ponds with cover and aquatic vegetation. NH populations limited to areas of Coos and Sullivan counties. Not reported to occur in the Site vicinity as of July 2020.	Not Likely
Fowler's toad	Appalachian Oak-Pine, Marsh/Shrub Wetland, Vernal Pool, Rivers and streams, Pond, Shrubland, Pine Barren, Dune	Not federally listed	State Threatened	Utilizes sandy alluvial soils and requires shallow water not dominated by *Sphagnum* spp. for breeding. Found along roadsides, near homes and gardens, and in fields and pastures (Wright and Wright 1949). This species is not reported in the Site vicinity but is present in surrounding towns and may be underreported, however project areas lack critical habitat features required by this species.	Not Likely

Species (common name)	Broad Habitat Association	Federal Listing	State Listing	Minimum/Special habitat requirements	Likelihood of Presence on Site Based on Minimum/Special Habitat Requirements
Golden eagle	Appalachian Oak-Pine, Spruce-Fir, Northern Hardwood-Conifer, Hemlock-Hardwood-Conifer, Rocky Ridge/Cliff/Talus	Protected by the Bald & Golden Eagle Protection Act	State Endangered	Utilizes a variety of open habitats, especially in mountainous terrain. Typically nests on mountain cliffs associated with coniferous forest. Hunts over open areas and prefers remote locations with low human disturbance. May be seen during migration in New Hampshire. Not reported to occur in the Site vicinity as of July 2020.	Not Likely
Hoary Bat	Appalachian Oak-Pine, Spruce-Fir, Hemlock-Hardwood-Conifer, Northern Hardwood-Conifer, Floodplain Forest, Northern Swamp, Temperate Swamp	Not federally listed	Special Concern	Prefers coniferous forests but also utilizes deciduous forests. Roosts in foliage, hollow trees, and woodpecker cavities in the summer. Uncommon and not formally reported to occur in the Site vicinity as of July 2020.	Not Likely
Kennedy's emerald	Temperate Swamp, Marsh/scrub-shrub	Not federally listed	Special Concern	Occurs in bogs, fens, and swamps with flowing water. Adults will forage in adjacent uplands. NH populations are limited to areas of Coos and Carroll counties. Not reported to occur in the Site vicinity as of July 2020.	Not Likely
Least bittern	Marsh/Shrub Wetland	Not federally listed	Special Concern	Found in freshwater and brackish marshes containing dense vegetation. Prefers wetland habitats >12.5 acres in size containing tall, emergent vegetation dispersed with open water (summarized in DeGraaf and Yamasaki 2001). Not reported to occur in the Site vicinity as of July 2020.	Not Likely
Little brown bat	Appalachian Oak-Pine, Spruce-Fir, Hemlock-Hardwood-Conifer, Northern Hardwood-Conifer,	Not federally listed	State Endangered	Found statewide in all forest types and utilize buildings and caves. Forages over wetlands, streams, and open areas. Previously very common but impacted by white-nose syndrome like many other NH bats, with a 99% decline in numbers at hibernaculum sites. Not recorded formally in the Site vicinity as of July 2020 but previously	Low

Species (common name)	Broad Habitat Association	Federal Listing	State Listing	Minimum/Special habitat requirements	Likelihood of Presence on Site Based on Minimum/Special Habitat Requirements
	Floodplain Forest, Temperate Swamp, Pine Barren, Caves and Mines			very common prior to white-nose syndrome. Per the WAP, primary protection strategy in NH is to protect summer colonies by prohibiting exclusion of bats from buildings from May 15-Aug 15. No buildings are present at the Site, therefore this BMP does not apply.	
Marbled salamander	Appalachian Oak-Pine	Not federally listed	State Endangered	Requires temporary, fishless ponds (i.e., vernal pools) for breeding. Utilizes forested habitat near palustrine wetlands. Wetlands must hold standing water for about 10 months to be considered viable habitat for this species (Noble and Brady 1933, Bishop 1941). Known NH populations limited to the southernmost areas of the state. Not formally recorded in the Site vicinity as of July 2020.	Not Likely
New England cottontail	Shrubland	Not federally listed	State Endangered	Requires large (two to 20 acres) early successional habitats, shrublands, and/or regenerating woodlands, as well as dense coniferous cover in the winter. Occupation of small patches attributed to nearness to large patches. Historically reported to occur in the Site vicinity, however only one population is currently reported in the Merrimack Valley (NHFG 2015) with dispersal to project areas unlikely due to lack of preferential habitat, potential corridors, and small population size.	Not Likely
Northern black racer	Appalachian Oak-Pine, Hemlock-Hardwood-Conifer, Rocky Ridge/Cliff/Talus, Grassland, Shrubland	Not federally listed	State Threatened	Associated with a variety of habitats, including early successional forests, old fields, rocky ledges, sand pits, and woodlands. NH populations use larger territories than southern populations, with mean home range >100 acres (NHFG 2015). Known to occur in the Site vicinity.	Possible
Northern harrier	Marsh & shrub wetland/ Shrubland	Not federally listed	State Endangered	Utilize a variety of open and semi-open habitat, including grassland, cattail marsh, salt marsh, shrub-steppe, and agricultural land. In NH, most frequently reported breeding in northern counties and wintering in coastal areas (NHFG 2015). The Site	Not Likely

Species (common name)	Broad Habitat Association	Federal Listing	State Listing	Minimum/Special habitat requirements	Likelihood of Presence on Site Based on Minimum/Special Habitat Requirements
				vicinity lacks critical habitat features required by this species.	
Northern leopard frog	Marsh & shrub wetland/ Shrubland	Not federally listed	Special Concern	Utilizes wet meadows and breeds in ponds, marshes, slow shallow streams, and weedy lake shores. Requires three distinct habitats to complete their life cycle: a breeding site, midsummer foraging habitat, and a water body suitable for overwintering. Not reported to occur in the Site vicinity but is recorded in surrounding towns and may be underreported. However, the Site vicinity lacks critical habitat features required by this species.	Not Likely
Northern long-eared bat	Appalachian Oak-Pine, Spruce-Fir, Hemlock-Hardwood-Conifer, Northern Hardwood-Conifer, Caves and Mines	Federally Threatened	State Endangered	Forages over ponds, clearings, and in forests. Requires specific hibernaculum conditions, typically found in mines/caves in winter, and to a lesser degree in man-made features that maintain temperatures between 2 and 7 degrees Celsius during the winter. Dead hardwoods with cavities and/or loose bark are considered important for summer maternity colonies. Similar to other bats, decimated by white-nosed syndrome at hibernaculum sites. Not formally recorded in the Site vicinity as of July 2020. Where considered present, the USFWS/USACE typically requires protection of known roost trees, protection of hibernaculum, and may request limitation of cutting from June to July during the pup season. No maternity roost trees or hibernaculum are known to occur on or near the Site.	Not Likely
Northern redbelly dace	Rivers and streams, Pond	Not federally threatened	Special Concern	Utilizes lower gradient, cool headwater streams and small ponds with minimal flow and overhanging vegetative cover. NH populations limited to western areas of the state. Not reported to occur in the Site vicinity as of July 2020.	Not Likely
Peregrine falcon	Developed, Rocky Ridge/Cliff/Talus	Not federally listed	State Threatened	Utilizes open habitats and open forested regions typically near water and abundant prey on rocky cliffs with ledges or cities with tall buildings. Observed in the Site vicinity at the time of assessment; however, project areas occur primarily in shrubland habitat not typically utilized by this species.	Low

Species (common name)	Broad Habitat Association	Federal Listing	State Listing	Minimum/Special habitat requirements	Likelihood of Presence on Site Based on Minimum/Special Habitat Requirements
Pied-billed grebe	Peatland, Marsh/Shrub Wetland	Not federally listed	State Threatened	Inhabits ponds or slow portions of streams with dense stands of emergent vegetation with some woody vegetation. Requires habitats between 5 and 12 acres for breeding. Known to occur in the Site vicinity, however project areas lack critical habitat features required by this species.	Not Likely
Pine barrens bluet	Peatland	Not federally listed	Special Concern	Inhabits coastal plain pond habitats over most of its range. Prefers sandy bottoms, low pH, emergent shoreline vegetation and peatland elements. Current NH records associated with only one site. Not reported to occur in the Site vicinity as of July 2020.	Not Likely
Puritan tiger beetle	Rivers and streams	Federally Threatened	State Endangered	Only NH populations are reported along the Connecticut River, where it utilizes sandy riverine beaches, including islands. Larvae burrow between sparse herbaceous vegetation in fine to medium sand particles at the upper margins of beaches. Not reported to occur in the Site vicinity as of July 2020.	Not Likely
Purple martin	Developed	Not federally listed	State Threatened	Found near salt marshes, fields, and other open, vegetated areas near water sources. Species is almost entirely reliant on man-made housing structures which are absent from the Site. Not reported to occur in the Site vicinity as of July 2020.	Not Likely
Rapids clubtail	Appalachian Oak-Pine, Northern Hardwood-Conifer, Hemlock-Hardwood-Conifer, Floodplain Forest, Rivers, and streams	Not federally listed	Special Concern	Utilizes moderate to large rivers with muddy to silty bottoms, sometimes with interspersed riffles. Adults forage in adjacent forests up to 200m from rivers (COSEWIC 2018). Occurs in low numbers in the Merrimack River and some of its tributaries, as well as the southernmost portion of the Connecticut River. Reported to occur in the Site vicinity. The northern and southernmost portions of the Site are located adjacent to the Merrimack River, however, are within heavily developed areas unlikely to provide upland habitat for this species, if present. All remaining project areas are approximately 1 mile from potential riverine habitat; therefore, the Site	Not Likely

Species (common name)	Broad Habitat Association	Federal Listing	State Listing	Minimum/Special habitat requirements	Likelihood of Presence on Site Based on Minimum/Special Habitat Requirements
				lacks critical habitat features required by this species.	
Ringed boghaunter	Appalachian Oak-Pine, Hemlock-Hardwood-Conifer, Peatland, Temperate Swamp, Marsh/Shrub Wetland	Not federally listed	State Threatened	Requires bogs/wetlands with extensive floating or suspended sphagnum and hydroperiods of variable depth, such as acidic fens. Adults require relatively intact forests up to 0.25 miles of wetland habitat (NHFG 2015). Known to occur in the Site vicinity. Some wetlands are present within project areas that may support this species; however, the Site is a maintained utility corridor with continuous areas of developed or open, predominantly scrub-shrub habitat not preferred by this species and may lack critical habitat features.	Low
Round whitefish	Rivers and streams	Not federally listed	State Threatened	In NH, utilizes medium to large lakes with deep, cold water habitat, and rivers. Spawns in shallow water over cobble and gravel. NH populations limited to Newfound Lake and the upper Connecticut River. Not reported to occur in the Site vicinity as of July 2020.	Not Likely
Rusty blackbird	Spruce-Fir, Peatland, Marsh/Shrub Wetland	Not federally listed	Special Concern	Breeds in stunted or regenerating spruce-fir-hardwood forest within 500 meters of a water source, such as streams, ponds, or fens. NH populations primarily found in Coos and Grafton county. Not reported to occur in Site vicinity as of July 2020.	Not Likely
Rusty-patched bumble bee	Developed/ Shrubland	Federally Endangered	State Endangered	Utilizes meadows, crop fields, orchards, gardens, and other locations with flowering plants. Nectar plants include sunflowers, asters, goldenrods, honeysuckles, and *Vaccinium* varieties. The Site contains some habitat that may support this species, however areas containing extensive flowering plant cover required by this species were not observed.	Low
Sea lamprey	Rivers and streams	Not federally listed	Special Concern	Spend adult lives in the ocean and return to large or coastal rivers to spawn in freshwater gravel substrate riffles and pond headwaters. Occurs in the Connecticut River, Merrimack River, and coastal rivers up to first barriers. Reported to occur in areas of the Merrimack River within the Site	Not Likely

Species (common name)	Broad Habitat Association	Federal Listing	State Listing	Minimum/Special habitat requirements	Likelihood of Presence on Site Based on Minimum/Special Habitat Requirements
				vicinity, recorded at the Hooksett Dam but rarely reported further upstream at the Amoskeag Dam Fishway (NHFG 2015), located in the vicinity of the southernmost portion of the Site. Waters in project areas are minor tributaries only and may drain to this watercourse upstream of these locations but are not anticipated to support this species.	
Shortnose sturgeon	Rivers and streams	Federally Endangered	State Endangered	Spawns in freshwater and utilizes freshwater rivers, estuaries, and nearshore coastal habitat. Not reported to occur in the Site vicinity as of July 2020.	Not Likely
Silver-haired bat	Appalachian Oak-Pine, Spruce-Fir, Hemlock-Hardwood-Conifer, Northern Hardwood-Conifer, Northern Swamp, Temperate Swamp	Not federally listed	Special Concern	Found in NH in summer. Forages in hardwood clear-cuts, and coniferous or mixed forest near lakes, streams, or ponds. Typically roosts in tree hollows. Not formally reported to occur in the Site vicinity as of July 2020.	Not Likely
Skillet clubtail	Appalachian Oak-Pine, Hemlock-Hardwood-Conifer, Floodplain Forest, Rivers, and streams	Not federally listed	Special Concern	Utilizes habitat adjacent to large, slow moving rivers. Most records in NH come from the Merrimack River between Canterbury and Manchester, and from the Contoocook River in Hopkinton (Hunt 2012). Reported to occur in the Site vicinity. The northern and southernmost portions of the Site are located adjacent to the Merrimack River, however, are within heavily developed areas unlikely to provide upland habitat for this species, if present. All remaining project areas are approximately 1 mile from potential riverine habitat; therefore, the Site lacks critical habitat features required by this species.	Not Likely
Smooth green snake	Peatland, Marsh/Shrub Wetland, Grassland, Shrubland,	Not federally listed	Special Concern	Favors varying types of open or lightly forested areas and grassland habitats. Utilizes rotting logs and animal burrows for breeding, as well as rock crevices during hibernation. Reported	Possible

Species (common name)	Broad Habitat Association	Federal Listing	State Listing	Minimum/Special habitat requirements	Likelihood of Presence on Site Based on Minimum/Special Habitat Requirements
	Rocky Ridge/Cliff/Talus			to occur in the Site vicinity. Consider adding identification information to plans, contact NHFG immediately upon observation, and safely relocate snakes outside of construction areas if observed.	
Sora	Marsh/Shrub Wetland	Not federally listed	Special Concern	Breeds in large marshes containing shallow or intermediate-depth water levels, and dominated by emergent cattails, sedges, and bulrushes. Not reported to occur in the Site vicinity as of July 2020.	Not Likely
Spotted turtle	Marsh/scrub-shrub, Temperate Swamp, Vernal Pool	Not federally listed	State Threatened	Utilizes a variety of wetlands including vernal pools, marshes, sedge meadows, streams, and forested/scrub shrub wetlands with standing water. Like all NH turtles, requires well-drained soil for nesting. Known to occur in the Site vicinity and observed at the time of assessment. Consider adding identification information to plans, contact NHFG immediately upon observation, and safely relocate reptiles outside of construction areas if observed.	Possible
Swamp darter	Pond, Rivers, and streams	Not federally listed	Special Concern	Utilizes small, vegetated ponds, impounded areas, low gradient streams, and large rivers. Prefer shallow areas with soft, muddy substrate, dense vegetation, and accumulated detritus. Known to occur in the Site vicinity however, project areas lack vegetated pools associated with watercourses that may support this species.	Not Likely
Timber rattlesnake	Appalachian Oak-Pine, Hemlock-Hardwood-Conifer, Shrubland, Rocky Ridge/Cliff/Talus	Not federally listed	State Endangered	Utilizes forested areas with rocky outcroppings, often in remote settings. Individual snakes have large home ranges and are susceptible to road mortality and newly emerged fungal diseases. Often reported in scattered locations throughout the southern half of New Hampshire extending into the White Mountains. Only one known extant population reported in 1992. Not formally reported in the Site vicinity as of July 2020.	Not Likely
Tricolored bat	Appalachian Oak-Pine, Spruce-Fir,	Not federally listed	State Endangered	Hibernate in caves and mines, and occasionally in other structures. Like other bats, this species has been	Not Likely

Species (common name)	Broad Habitat Association	Federal Listing	State Listing	Minimum/Special habitat requirements	Likelihood of Presence on Site Based on Minimum/Special Habitat Requirements
	Hemlock-Hardwood-Conifer, Northern Hardwood-Conifer, Floodplain Forest, Northern Swamp, Temperate Swamp, Caves and Mines			decimated by white-nosed syndrome. Protection of hibernaculum is considered of primary importance to this species. Data on summer habitat use is limited although there is data to suggest that maternity colonies are foliage roosters, and may prefer deciduous trees in the summer, possibly selecting oak and maple. Not formally reported to occur in the Site vicinity as of July 2020. Per the WAP, primary protection strategies in NH are to protect summer colonies by prohibiting exclusion of bats from buildings from May 15 - Aug 15, prevent occupied trees from being cut down, and protect qualities of mine hibernacula.	
Wood turtle	Rivers and streams, Floodplain Forest, Grassland, Shrubland	Not federally listed	Special Concern	Utilizes slow-moving streams and adjacent uplands (often within 600 feet of streams). Like all NH turtles, requires well-drained soil for nesting such as open sandy areas, banks, and meadows. Known to occur in the Site vicinity. Consider adding identification information to plans, contact NHFG immediately upon observation, and safely relocate reptiles outside of construction areas if observed.	Possible
Yellow-banded bumble bee	Developed/ Shrubland	Not federally listed	Special Concern	Utilizes meadows, crop fields, orchards, gardens, and other locations with flowering plants. Nectar plants include *Vaccinium* varieties, willows, roses, *Rubus* varieties, honeysuckles, asters, and goldenrods. The Site contains habitat that may support this species, however areas containing extensive flowering plant cover required by this species were not observed.	Low
Yellow bumble bee	Developed/ Shrubland	Not federally listed	Special Concern	Utilizes meadows, crop fields, orchards, gardens, and other locations with flowering plants. Nectar plants include honeysuckles, thistles, clovers, loosestrifes, vetches, and bee balms. The Site contains habitat that may support this species, however areas containing extensive flowering plant cover required by this species were not observed.	Low

3.4.4 POTENTIAL IMPACTS AND PROPOSED CONSERVATION MEASURES

The project includes the replacement of 13 existing utility structures along portions of the D121 Transmission Line in Bow and Hooksett for a distance of approximately 2.2 miles. Replacement of the existing utility structures is necessary in order to maintain the safety and reliability of the system. Additionally, Optical Ground Wire (OPGW) is proposed to replace existing static wire and improve the transmission line by serving to shield conductor wires below it from lightning and serve as a telecommunications path for internal communications. In order to more efficiently conduct routine maintenance of the existing D121 Transmission Line, work pad grading and access road improvements are proposed as part of this project (see Figure 4 – *D121 Transmission Line OPGW and Str Replacement Project*). The Site has historically been maintained as a utility ROW and contains transmission structures with some areas of historic access within predominantly Shrubland habitat. Timber matting will be used at crossings of existing wetlands to avoid temporary impacts, and no conversion of wetland habitats is proposed. No tree removal or conversion of forested habitat is proposed.

Based on a GIS analysis overlaying the Site Plan and Land Cover Type plans prepared by GZA, the proposed construction will convert approximately six acres of Shrubland habitat to Developed habitat for work pad grading and associated access improvements. Natural cover on the remaining 157 acres will remain in place and continue to be managed as a utility corridor. Based on GZA's assessment, the Site has some potential to support eight rare species including American eel, bald eagle, Blanding's turtle, eastern hognose snake, northern black racer, smooth green snake, spotted turtle, and wood turtle.

Based on a review of habitats, GZA offers the following BMP recommendations, as recommended in the WAP, and as requested by NHFG during a meeting between Eversource, GZA and NHFG on April 27, 2021.

1. Timber matting and erosion controls will be used for all temporary wetland crossings to avoid permanent wetland impacts and sedimentation. This serves to preserve wetland habitat and to maintain water quality. Prior to daily construction activity, timber matting will be reviewed for snakes and turtles. Impacts or potential impacts to vernal pools are to be avoided.

2. 2. Install temporary barriers (e.g., silt fence) at Structure 95 construction area where spotted turtle was observed to occur to exclude turtles and snakes from active construction areas. Avoid use of plastic or netted fencing. Fencing should be maintained bi-weekly and after major storm events.

3. Utilize "wildlife friendly" matting consisting of coco or jute, and lacking plastic mesh, if matting is utilized for final stabilization. Welded plastic or "biodegradable plastic" netting or thread (e.g., polypropylene) should not be used, per NHFG feedback on similar projects. This BMP is already included in project plans.

4. Bald eagle was observed in the Site vicinity, however NHB reports no nesting bald eagles have been recorded in the immediate vicinity of the Site. If nesting eagles are observed within 660 feet of construction, NHFG should be notified for further coordination.

5. Add Blanding's turtle, eastern hognose snake, northern black racer, smooth green snake, spotted turtle, and wood turtle identification information to construction plans, per request by NHFG. Guidance protocols for species identification by contractors will be included in daily tailboard information and additional reptile "sweeps" will be completed during erosion control monitoring. If observed on or near the site during construction, contact NHFG immediately upon observation, and safely relocate amphibians and reptiles out

of construction areas if observed. Observations of threatened and endangered species should be reported to NHFG by email at *RAARP@wildlife.nh.gov* and *Melissa.Doperalski@wildlife.nh.gov*, with photographs (if available).

6. Blanding's turtles, spotted turtles, or wood turtles observed laying eggs in project areas should be reported to Melissa Doperalski (603-479-1129), or Josh Megyesy (978-578-0802) at NHFG immediately for further guidance.

7. All observations of northern black racer snakes encountered from the end of September through the month of April will be immediately reported to the NHFG Department (Brendan Clifford 603-944-0885).

8. All observations of eastern hognose snake seen at any time must be immediately reported to the NHFG Department (Melissa Doperalski or Josh Megyesy) for further instructions.

In GZA's opinion, if the BMPs identified above are followed, the project design "will not jeopardize the continued existence of state or federally threatened and endangered species."

3.5 FINDING AND CONCLUSIONS

GZA has completed a wildlife assessment, as required by NHDES to support the submittal of an Alteration of Terrain permit by Eversource. The assessment included a review of state-wide wildlife data, classification and mapping of habitat types, wildlife documentation, and impact assessment for the proposed D121 Transmission Line Structure and OPGW Replacement Project. The following is a summary of our findings and conclusions:

- Blanding's turtle (*Emydoidea blandingii*), eastern hognose snake (*Heterodon platirhinos*), northern black racer (*Coluber constrictor constrictor*), peregrine falcon (*Falco peregrinus anatum*), wood turtle (*Glyptemys insculpta*), and spotted turtle (*Clemmys guttata*) are known to occur in the vicinity of the project (see NHB Memo NHB21-0607 and NHB21-0608). The Site contains Appalachian Oak-Pine habitat which may support eastern hognose snake and northern black racer, and Developed habitat which may support peregrine falcon. The Site also contains Marsh/Shrub Wetland habitat which may support Blanding's turtle and spotted turtle, and streams which may support wood turtle.

- Three major upland habitats and five wetland habitats including Appalachian-Oak-Pine, Developed Land, Shrubland, Marsh/Shrub Wetland, Peatland, Stream, Temperate Swamp, and Vernal Pool totaling approximately 143 acres were identified at the Site.

- Based on habitat evaluation, GZA ranked eight endangered, threatened, and special concern species as having potential to occur on or immediately adjacent to the Site, including American eel, bald eagle, Blanding's turtle, eastern hognose snake, northern black racer, smooth green snake, spotted turtle, and wood turtle. Bald eagle and spotted turtle were observed by GZA at the time of assessment. Remaining species have potential to occur based on review of habitat types and rare species records in Bow and Hooksett.

- GZA observed American kestrel, a State Special Concern species, and peregrine falcon, a State Threatened species in the vicinity of the Site at the time of assessment. Both species were observed in open, developed cover not present within the Site. Due to the specific habitat requirements of each species and the cover types where construction is proposed to occur, these species were deemed to have "low" potential to occur at the Site (see Table 1).

- GZA observed eastern towhee at the Site, which is listed as a Species of Greatest Conservation Need. The maintenance of the ROW as predominantly scrub-shrub habitat provides breeding habitat and measures proposed to protect other species on Site also provide conservation benefit to eastern towhee.

- In GZA's opinion, if conservation measures/BMPs are followed, the project design "will not appreciably jeopardize the continued existence of state or federally threatened and endangered species."

3.6 REFERENCES

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Appendix A – Limitations

USE OF REPORT

1. GZA GeoEnvironmental, Inc. (GZA) has prepared this report on behalf of, and for the exclusive use of Public Service Company of New Hampshire dba Eversource Energy ("Client") for the stated purpose(s) and location(s) identified in the report. Use of this report, in whole or in part, at other locations, or for other purposes, may lead to inappropriate conclusions; and we do not accept any responsibility for the consequences of such use(s). Further, reliance by any party not identified in the agreement, for any use, without our prior written permission, shall be at that party's risk, and without any liability to GZA.

STANDARD OF CARE

2. GZA's findings and conclusions are based on the work conducted as part of the Scope of Services set forth in the Report and/or proposal, and reflect our professional judgment. These findings and conclusions must be considered not as scientific or engineering certainties, but rather as our professional opinions concerning the data gathered and observations made during the course of our work. Conditions other than described in this report may be found at the subject location(s).

3. GZA's services were performed using the degree of skill and care ordinarily exercised by qualified professionals performing the same type of services, at the same time, under similar conditions, at the same or a similar property. No warranty, expressed or implied, is made.

LIMITS TO OBSERVATIONS

4. Natural resource characteristics are inherently variable. Biological community composition and diversity can be affected by seasonal, annual or anthropogenic influences. In addition, soil conditions are reflective of subsurface geologic materials, the composition and distribution of which vary spatially.

5. The observations described in this report were made on the dates referenced and under the conditions stated therein. Conditions observed and reported by GZA reflect the conditions that could be reasonably observed based upon the visual observations of surface conditions and/or a limited observation of subsurface conditions at the specific time of observation. Such conditions are subject to environmental and circumstantial alteration and may not reflect conditions observable at another time.

6. The conclusions and recommendations contained in this report are based upon the data obtained from a limited number of surveys performed during the course of our work on the site, as described in the Report. There may be variations between these surveys and other past or future surveys due to inherent environmental and circumstantial variability.

RELIANCE ON INFORMATION FROM OTHERS

7. Preparation of this Report may have relied upon information made available by Federal, state and local authorities; and/or work products prepared by other professionals as specified in the report. Unless specifically stated, GZA did not attempt to independently verify the accuracy or completeness of that information.

COMPLIANCE WITH REGULATIONS AND CODES

8. GZA's services were performed to render an opinion on the presence and/or condition of natural resources as described in the Report. Standards used to identify or assess these resources as well as regulatory jurisdiction, if any, are stated in the Report. Standards for identification of jurisdictional resources and regulatory control over them may vary between governmental agencies at Federal, state and local levels and are subject to change over time which may affect the conclusions and findings of this report.

NEW INFORMATION

9. In the event that the Client or others authorized to use this report obtain information on environmental regulatory compliance issues at the site not contained in this report, such information shall be brought to GZA's attention forthwith. GZA will evaluate such information and, on the basis of this work, may modify the conclusions stated in this report.

ADDITIONAL SERVICES

10. GZA recommends that we be retained to provide further investigation, if necessary, which would allow GZA to (1) observe compliance with the concepts and recommendations contained herein; (2) evaluate whether the manner of implementation creates a potential new finding; and (3) evaluate whether the manner of implementation affects or changes the conditions on which our opinions were made.

Appendix B – NHB Memo

CONFIDENTIAL DNCR

CONFIDENTIAL DNCR

CONFIDENTIAL DNCR

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Appendix C - Wildlife Habitat Assessment Field Data Form

Person Completing Form: Logan Young Date(s) of Assessment: April 26, 2021

Project Name: Wildlife Habitat Assessment – D121 Transmission Line Structure and Optical Ground Wire Replacement Project

I. SITE DESCRIPTION

Project Location: Eversource Energy Right-of-Way, Bow and Hooksett, NH

Site size:	Street:	Town:	County:
143 acres	Morgan Drive & Dicandra Drive (Bow), Poore Road (Hooksett)	Bow & Hooksett	Merrimack

Nearest Road: On Site Adjacent to Site _____ mi from Site

Type of Road: Dirt 2-Lane Paved 4-Lane Paved Interstate

Existing Structures on Site: Transmission utility lines

Adjacent Land Uses (check all that apply):

Forest	Shrubland	Grassland	Cropland
Wetland	Open Water	Residential	Pasture
Industrial/Commercial	Utility right-of-way	Quarry	
Other:			

Habitat Types Present:

Forest	Shrub/Old Field	Grass/Forb	Cultivated	Pine Barren
Pasture	Wetland	Open Water	Dunes	Marine
Sand/Gravel	Rocky Ridge/Cliff	Alpine	Developed	
Other:	GZA observed Appalachian-Oak-Pine, Developed Land, Shrubland, Marsh/Shrub Wetland, Peatland, Stream, Temperate Swamp, and Vernal Pool habitat on Site.			

Streams:

None Intermittent Perennial

Stream Order: 1 2 3 4 5 6

Water Bodies:

None	Small pond - natural	Small pond - constructed	Great pond	Estuary
Lake	Stormwater feature			

This form was developed based on the draft created this form was developed based on the draft "Wildlife Habitat Assessment Field Data Form" developed by the NH Fish and Game Department (NHFG), NH Audubon, and UNH Cooperative Extension. GZA updated the list of habitats based on information in the 2020 NHFG Wildlife Action Plan and habitat associations reported in New England Wildlife: Habitat, Natural History, and Distribution (DeGraaf and Yamasaki 2001).

Wetlands:

Forested	Sedge Meadow	Shallow Marsh	Deep Marsh
Shrub Swamp	Peatland/Bog	Vernal pool	Salt Marsh
Other:	GZA observed emergent and forested wetlands, peatland, and vernal pool habitat.		

Dominant Forest Types:

Aspen-Birch	Spruce-Fir	Red Oak	Northern Hardwood
Hemlock	Oak-Pine	Other:	

Forest Age Class:

Regeneration-Seedling Sapling-Pole Mature Older Growth

II. HABITATS AND ASSOCIATED POTENTIAL RARE WILDLIFE

Develop List of Potential Wildlife Species Present Based on the Site Description
This information, derived from the NH Wildlife Action Plan, provides insight into which species listed as threatened or endangered in NH have potential to inhabit an area. Since this is a potential list, fieldwork and judgement when assessing the impacts of a project are still essential.

Avoid or Minimize Impacts to the Following Habitats:

Wildlife Habitat[1]	Habitat Present	Size (acres)	Associated Listed Wildlife[2] (change to BOLD if present)	Comments
High elevation spruce-fir forest			American marten (*Martes americana*) American three toed-woodpecker (*Picoides dorsalis*) Bald eagle (*Haliaeetus leucocephalus*) Bicknell's Thrush (*Catharus bicknelli*) Canada lynx (*Lynx canadensis*) Eastern wolf (*Canis lupus*) Golden eagle (*Aquila chrysaetos*) Northern bog lemming (*Synaptomys borealis sphagnicola*) Spruce grouse (*Falcipennis canadensis*) SGCN Species Long-tailed shrew (*Sorex dispar*) Moose (*Alces alces*) Purple finch (*Haemorhous purpureus*) Ringed emerald (*Somatochlora albicincta*) Rock vole (*Microtus chrotorrhinus*)	

This form was developed based on the draft created this form was developed based on the draft "Wildlife Habitat Assessment Field Data Form" developed by the NH Fish and Game Department (NHFG), NH Audubon, and UNH Cooperative Extension. GZA updated the list of habitats based on information in the 2020 NHFG Wildlife Action Plan and habitat associations reported in New England Wildlife: Habitat, Natural History, and Distribution (DeGraaf and Yamasaki 2001).

Wildlife Habitat[1]	Habitat Present	Size (acres)	Associated Listed Wildlife[2] (change to BOLD if present)	Comments
			Sedge darner (*Aeshna juncea*)	
Low elevation spruce-fir forest			American three-toed woodpecker (*Picoides dorsalis*) Bald eagle (*Haliaeetus leucocephalus*) Canada lynx (*Lynx canadensis*) Canada warbler (*Cardellina canadensis*) Eastern red bat (*Lasiurus borealis*) Golden eagle (*Aquila chrysaetos*) Hoary bat (*Lasiurus cinereus*) Little brown bat (*Myotis lucifugus*) Northern bog lemming (*Synaptomys borealis sphagnicola*) Northern long-eared bat (*Myotis septentrionalis*) Rusty blackbird (*Euphagus carolinus*) Silver-haired bat (*Lasionycteris noctivagans*) Spruce grouse (*Falcipennis canadensis*) Tricolored bat (*Perimyotis subflavus*) <u>SGCN Species</u> Big brown bat (*Eptesicus fuscus*) Cape May warbler (*Setophaga tigrina*) Chimney swift (*Chaetura pelagica*) Moose (*Alces alces*) Northern goshawk (*Accipiter gentilis*) Ocellated emerald (*Somatochlora minor*) Olive-sided flycatcher (*Contopus cooperi*) Purple finch (*Haemorhous purpureus*) Ruffed grouse (*Bonsai umbrellas*)	
Northern hardwood-conifer forest			American marten (*Martes americana*) Bald eagle (*Haliaeetus leucocephalus*) Blue-spotted/Jefferson complex (*Ambystoma laterale/jeffersonianum*) Eastern red bat (*Lasiurus borealis*) Eastern small-footed bat (*Myotis leibii*) Eastern wolf (*Canis lupus*) Golden eagle (*Aquila chrysaetos*) Hoary bat (*Lasiurus cinereus*) Little brown bat (*Myotis lucifugus*) Northern bog lemming (*Synaptomys borealis sphagnicola*) Northern long-eared bat (*Myotis septentrionalis*) Rapids clubtail (*Gomphus quadricolor*) Silver-haired bat (*Lasionycteris noctivagans*)	

Wildlife Habitat[1]	Habitat Present	Size (acres)	Associated Listed Wildlife[2] (change to BOLD if present)	Comments
			Tricolored bat (*Perimyotis subflavus*) <u>SGCN Species</u> Big brown bat (*Eptesicus fuscus*) Canada warbler (*Cardellina canadensis*) Chimney swift (*Chaetura pelagica*) Long-tailed shrew (*Sorex dispar*) Moose (*Alces alces*) Northern goshawk (*Accipiter gentilis*) Olive-sided flycatcher (*Contopus cooperi*) Purple finch (*Haemorhous purpureus*) Ringed emerald (*Somatochlora albicincta*) Rock vole (*Microtus chrotorrhinus*) Ruffed grouse (*Bonsai umbrellas*) Scarlet tanager (*Piranga olivacea*) Sedge darner (*Aeshna juncea*) Southern bog lemming (*Synaptomys cooperi*) Veery (*Catharus fuscescens*) Wood thrush (*Hylocichla mustelina*)	
Hemlock-hardwood-conifer forest			Bald eagle (*Haliaeetus leucocephalus*) Blue-spotted/Jefferson complex (*Ambystoma laterale/jeffersonianum*) Common nighthawk (*Chordeiles minor*) Eastern box turtle (*Terrapene carolina carolina*) Eastern hognose snake (*Heterodon platirhinos*) Eastern red bat (*Lasiurus borealis*) Eastern small-footed bat (*Myotis leibii*) Eastern whip-poor-will (*Antrostomus vociferus*) Golden eagle (*Aquila chrysaetos*) Hoary bat (*Lasiurus cinereus*) Little brown bat (*Myotis lucifugus*) Northern black racer (*Coluber constrictor*) Northern long-eared bat (*Myotis septentrionalis*) Rapids clubtail (*Gomphus quadricolor*) Ringed boghaunter (*Gomphus quadricolor*) Silver-haired bat (*Lasionycteris noctivagans*) Skillet clubtail (*Gomphus ventricosus*) Timber rattlesnake (*Crotalus horridus*) Tricolored bat (*Perimyotis subflavus*)	

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Wildlife Habitat[1]	Habitat Present	Size (acres)	Associated Listed Wildlife[2] (change to BOLD if present)	Comments
			SGCN Species American woodcock (*Scolopax minor*) Big brown bat (*Eptesicus fuscus*) Black-billed cuckoo (*Coccyzus erythropthalmus*) Canada warbler (Cardellina canadensis) Chimney swift (*Chaetura pelagica*) Moose (*Alces alces*) Northern goshawk (*Accipiter gentilis*) Purple finch (*Haemorhous purpureus*) Ruffed grouse (*Bonsai umbrellas*) Scarlet tanager (*Piranga olivacea*) Veery (*Catharus fuscescens*) Wood thrush (*Hylocichla mustelina*)	
Appalachian oak-pine forest		61	Bald eagle (*Haliaeetus leucocephalus*) Blue-spotted/Jefferson complex (*Ambystoma laterale/jeffersonianum*) Cerulean warbler (*Setophaga cerulea*) Common nighthawk (*Chordeiles minor*) Coppery emerald (*Somatochlora georgiana*) Eastern box turtle (*Terrapene carolina carolina*) Eastern hognose snake (*Heterodon platirhinos*) Eastern red bat (*Lasiurus borealis*) Eastern small-footed bat (*Myotis leibii*) Eastern whip-poor-will (*Antrostomus vociferus*) Fowler's toad (*Anaxyrus fowleri*) Golden eagle (*Aquila chrysaetos*) Hoary bat (*Lasiurus cinereus*) Little brown bat (*Myotis lucifugus*) Marbled salamander (*Ambystoma opacum*) Northern black racer (*Coluber constrictor*) Northern long-eared bat (*Myotis septentrionalis*) Rapids clubtail (*Gomphus quadricolor*) Ringed boghaunter (*Gomphus quadricolor*) Silver-haired bat (*Lasionycteris noctivagans*) Skillet clubtail (*Gomphus ventricosus*) Timber rattlesnake (*Crotalus horridus*) Tricolored bat (*Perimyotis subflavus*) SGCN Species American woodcock (*Scolopax minor*)	

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Wildlife Habitat[1]	Habitat Present	Size (acres)	Associated Listed Wildlife[2] (change to BOLD if present)	Comments
			Big brown bat (*Eptesicus fuscus*) Black-billed cuckoo (*Coccyzus erythropthalmus*) Chimney swift (*Chaetura pelagica*) Eastern towhee (*Pipilo erythrophthalmus*) Moose (*Alces alces*) Northern goshawk (*Accipiter gentilis*) Purple finch (*Haemorhous purpureus*) Ruffed grouse (*Bonsai umbrellas*) Scarlet tanager (*Piranga olivacea*) Veery (*Catharus fuscescens*) Wood thrush (*Hylocichla mustelina*)	
Floodplain forest			Bald eagle (*Haliaeetus leucocephalus*) Blanding's turtle (*Emydoidea blandingii*) Blue-spotted/Jefferson complex (*Ambystoma laterale/jeffersonianum*) Cerulean warbler (*Setophaga cerulea*) Eastern red bat (*Lasiurus borealis*) Hoary bat (*Lasiurus cinereus*) Northern leopard frog (*Lithobates pipiens*) Rapids clubtail (*Gomphus quadricolor*) Skillet clubtail (*Gomphus ventricosus*) Spotted turtle (*Clemmys guttata*) Tricolored bat (*Perimyotis subflavus*) Wood turtle (*Glyptemys insculpta*) <u>SGCN Species</u> Big brown bat (*Eptesicus fuscus*) Eastern ribbonsnake (*Thamnophis sauritus*) Moose (*Alces alces*) Purple finch (*Haemorhous purpureus*) Veery (*Catharus fuscescens*) Wood thrush (*Hylocichla mustelina*)	
Northern swamp			Blue-spotted/Jefferson complex (*Ambystoma laterale/jeffersonianum*) Eastern red bat (*Lasiurus borealis*) Hoary bat (*Lasiurus cinereus*) Kennedy's emerald (*Somatochlora kennedyi*) Little brown bat (*Myotis lucifugus*) Silver-haired bat (*Lasionycteris noctivagans*) Tricolored bat (*Perimyotis subflavus*)	

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Wildlife Habitat[1]	Habitat Present	Size (acres)	Associated Listed Wildlife[2] (change to BOLD if present)	Comments
			<u>SGCN Species</u> American water shrew (*Sorex palustris albibarbis*) American woodcock (*Scolopax minor*) Big brown bat (*Eptesicus fuscus*) Canada warbler (*Cardellina canadensis*) Cape May warbler (*Setophaga tigrina*) Lyre-tipped spreadwing (*Lestes unguiculatus*) Mink frog (*Lithobates septentrionalis*) Moose (*Alces alces*) Ocellated emerald (*Somatochlora minor*) Olive-sided flycatcher (*Contopus cooperi*) Purple finch (*Haemorhous purpureus*) Veery (*Catharus fuscescens*)	
Temperate swamp		0.4	Blanding's turtle (*Emydoidea blandingii*) Blue-spotted/Jefferson complex (*Ambystoma laterale/jeffersonianum*) Coppery Emerald (*Somatochlora georgiana*) Eastern box turtle (*Terrapene carolina carolina*) Eastern red bat (*Lasiurus borealis*) Hoary bat (*Lasiurus cinereus*) Kennedy's emerald (*Somatochlora kennedyi*) Little brown bat (*Myotis lucifugus*) Ringed boghaunter (*Gomphus quadricolor*) Silver-haired bat (*Lasionycteris noctivagans*) Spotted turtle (*Clemmys guttata*) Tricolored bat (*Perimyotis subflavus*) <u>SGCN Species</u> American woodcock (*Scolopax minor*) Big brown bat (*Eptesicus fuscus*) Canada warbler (*Cardellina canadensis*) Moose (*Alces alces*) Olive-sided flycatcher (*Contopus cooperi*) Veery (*Catharus fuscescens*)	
Peatland		0.5	Blanding's turtle (*Emydoidea blandingii*) Blue-spotted/Jefferson complex (*Ambystoma laterale/jeffersonianum*) Kennedy's emerald (*Somatochlora kennedyi*) Northern harrier (*Circus cyaneus*)	

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Wildlife Habitat[1]	Habitat Present	Size (acres)	Associated Listed Wildlife[2] (change to BOLD if present)	Comments
			Pied-billed grebe (*Podilymbus Podiceps*) Pine barrens bluet (*Enallagma recurvatum*) Ringed boghaunter (*Gomphus quadricolor*) Rusty blackbird (*Euphagus carolinus*) Smooth green snake (*Liochlorophis vernalis*) Spotted turtle (*Clemmys guttata*) <u>SGCN Species</u> Eastern ribbonsnake (*Thamnophis sauritus*) Eastern towhee (*Pipilo erythrophthalmus*) Mink frog (*Lithobates septentrionalis*) Ocellated emerald (*Somatochlora minor*) Olive-sided flycatcher (*Contopus cooperi*) Sedge darner (*Aeshna juncea*)	
Permanently flooded marsh and/or naturally occurring shrub wetland		9	Bald eagle (*Haliaeetus leucocephalus*) Bank swallow (*Riparia riparia*) Blanding's turtle (*Emydoidea blandingii*) Blue-spotted/Jefferson complex (*Ambystoma laterale/jeffersonianum*) Common gallinule (*Gallinula galeata*) Eastern box turtle (*Terrapene carolina carolina*) Eastern hognose snake (*Heterodon platirhinos*) Fowler's toad (*Anaxyrus fowleri*) Kennedy's emerald (*Somatochlora kennedyi*) Least bittern (*Ixobrychus exilis*) Northern harrier* (*Circus cyaneus*) Northern leopard frog (*Lithobates pipiens*) Pied-billed grebe (*Podilymbus Podiceps*) Ringed boghaunter (*Gomphus quadricolor*) Rusty blackbird (*Euphagus carolinus*) Smooth green snake (*Liochlorophis vernalis*) Sora (*Porzana carolina*) Spotted turtle (*Clemmys guttata*) <u>SGCN Species</u> American black duck (*Anas rubripes*) American woodcock (*Scolopax minor*) Eastern ribbonsnake (*Thamnophis sauritus*) Lyre-tipped spreadwing (*Lestes unguiculatus*) Marsh wren (*Cistothorus palustris*)	

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Wildlife Habitat[1]	Habitat Present	Size (acres)	Associated Listed Wildlife[2] (change to BOLD if present)	Comments
			Mink frog (*Lithobates septentrionalis*) Moose (*Alces alces*) Olive-sided flycatcher (*Contopus cooperi*) Ruffed grouse (*Bonsai umbrellas*) Sedge wren (*Cistothorus platensis*)	
Vernal pool		0.5	Blanding's turtle (*Emydoidea blandingii*) Blue-spotted/Jefferson complex (*Ambystoma laterale/jeffersonianum*) Eastern hognose snake (*Heterodon platirhinos*) Fowler's toad (*Anaxyrus fowleri*) Marbled salamander (*Ambystoma opacum*) Spotted turtle (*Clemmys guttata*) <u>SGCN Species</u> Eastern ribbonsnake (*Thamnophis sauritus*) Lyre-tipped spreadwing (*Lestes unguiculatus*)	
Rivers and Streams		0.2	American brook lamprey (*Lethenteron appendix*) American eel (*Anguilla rostrata*) Appalachian tiger beetle (*Cicindela ancocisconensis*) Atlantic sturgeon+ (*Acipenser oxyrinchus*) Bald eagle (*Haliaeetus leucocephalus*) Banded sunfish+ (*Enneacanthus obesus*) Bank swallow (*Riparia riparia*) Brook floater+ (*Alasmidonta varicosa*) Burbot (*Lota lota*) Cobblestone tiger beetle+ (*Cicindela marginipennis*) Common loon+ (*Gavia immer*) Dwarf wedgemussel+ (*Alasmidonta heterodon*) Finescale dace (*Phoxinus neogaeus*) Fowler's toad+ (*Anaxyrus fowleri*) Northern leopard frog+ (*Lithobates pipiens*) Northern redbelly dace (*Chrosomus eos*) Puritan tiger beetle+ (*Cicindela puritana*) Rapids clubtail+ (*Gomphus quadricolor*) Round whitefish (*Prosopium cylindraceum*) Sea lamprey (*Petromyzon marinus*) Shortnose sturgeon+ (*Acipenser brevirostrum*) Skillet clubtail+ (*Gomphus ventricosus*) Swamp darter (*Etheostoma fusiforme*) Wood turtle (*Glyptemys insculpta*)	

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Wildlife Habitat[1]	Habitat Present	Size (acres)	Associated Listed Wildlife[2] (change to BOLD if present)	Comments
			SGCN Species Alewife floater+ (*Anodonta implicata*) Alewife+ (*Alosa pseudoharengus*) American shad+ (*Alosa sapidissima*) Brook trout (*Salvelinus fontinalis*) Creeper (*Strophitus undulatus*) Eastern pearlshell (*Margaritifera margaritifera*) Rainbow smelt (*Osmerus mordax*) Triangle floater (*Alasmidonta undulata*)	
Ponds and lakes			American eel (*Anguilla rostrata*) Bald eagle+ (*Haliaeetus leucocephalus*) Banded sunfish+ (*Enneacanthus obesus*) Bank swallow (*Riparia riparia*) Blueback herring+ (*Alosa aestivalis*) Bridle shiner+ (*Notropis bifrenatus*) Burbot (*Lota lota*) Common loon (*Gavia immer*) Eastern pondmussel+ (*Ligumia nasuta*) Finescale dace+ (*Phoxinus neogaeus*) Fowler's toad+ (*Anaxyrus fowleri*) Lake whitefish (*Coregonus clupeaformis*) Northern leopard frog (*Lithobates pipiens*) Northern redbelly dace (*Chrosomus eos*) Redfin pickerel+ (*Esox americanus*) Round whitefish (*Prosopium cylindraceum*) Swamp darter+ (*Etheostoma fusiforme*) SGCN Species Alewife floater+ (*Anodonta implicata*) Alewife+ (*Alosa pseudoharengus*) American black duck+ (*Anas rubripes*) Brook trout (*Salvelinus fontinalis*) Creeper (*Strophitus undulatus*) Lake trout (*Salvelinus namaycush*) Mink frog (*Lithobates septentrionalis*) Rainbow smelt (*Osmerus mordax*) Ringed emerald (*Somatochlora albicincta*) Sedge darner (*Aeshna juncea*) Triangle floater+ (*Alasmidonta undulata*)	

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Wildlife Habitat[1]	Habitat Present	Size (acres)	Associated Listed Wildlife[2] (change to BOLD if present)	Comments
Developed		5.4	American bumble bee (*Bombus pensylvanicus*) American kestrel (*Falco sparverius*) Cliff swallow (*Petrochelidon pyrrhonota*) Common nighthawk (*Chordeiles minor*) Peregrine falcon (*Falco peregrinus*) Purple martin (*Progne subis*) Rusty-patched bumble bee (*Bombus affinis*) Yellow bumble bee (*Bombus fervidus*) Yellow banded bumble bee (*Bombus terricola*) <u>SGCN Species</u> Chimney swift (*Chaetura pelagica*)	
Pine barren			Barrens Itame (*Speranza exonerata*) Barrens xylotype (*Xylotype capax*) Common nighthawk (*Chordeiles minor*) Cora moth (*Cerma cora*) Eastern hognose snake (*Heterodon platirhinos*) Eastern whip-poor-will (*Antrostomus vociferus*) Edward's hairstreak (*Satyrium edwardsii*) Fowler's toad (*Anaxyrus fowleri*) Frosted elfin butterfly (*Callophrys iris*) Karner blue butterfly (*Lycaeides Melissa samuelis*) Little brown bat (*Myotis lucifugus*) Phyllira tiger moth (*Grammia phyllira*) Pine pinion moth (*Lithophane lepida lepida*) Vesper sparrow (*Pooecetes gramineus*) <u>SGCN Species</u> Black-billed cuckoo (*Coccyzus erythropthalmus*) Blue-winged warbler (*Vermivora cyanoptera*) Broad-lined catopyrrha (*Catopyrrha coloraria*) Brown thrasher (*Toxostoma rufum*) Eastern towhee (*Pipilo erythrophthalmus*) Field sparrow (*Spizella pusilla*) Graceful clearwing (*Hemaris gracilis*) New Jersey tea spanworm (*Apodrepanulatrix liberaria*) Noctuid Moth (*Mesogona olivata*) Persius duskywing skipper (*Erynnis persius*) Pinion moth (*Lithophane lepida lepida*) Prairie warbler (*Setophaga discolor*)	

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Wildlife Habitat[1]	Habitat Present	Size (acres)	Associated Listed Wildlife[2] (change to BOLD if present)	Comments
			Sleepy duskywing (*Erynnis brizo*) Twilight moth (*Lycia rachelae*) Zale sp. 1 nr. Lunifera (*Zale lunifera*)	
Grassland			American bumble bee (*Bombus pensylvanicus*) American kestrel (*Falco sparverius*) American pipit (*Anthus rubescens*) Bank swallow (*Riparia riparia*) Cliff swallow (*Petrochelidon pyrrhonota*) Eastern box turtle (*Terrapene carolina carolina*) Eastern meadowlark (*Sturnella magna*) Grasshopper sparrow (*Ammodramus savannarum*) Horned lark (*Eremophila alpestris*) Northern black racer (*Coluber constrictor*) Northern harrier* (*Circus cyaneus*) Northern leopard frog (*Lithobates pipiens*) Purple martin (*Progne subis*) Rusty-patched bumble bee (*Bombus affinis*) Smooth green snake (*Liochlorophis vernalis*) Upland sandpiper (*Bartramia longicauda*) Vesper sparrow (*Pooecetes gramineus*) Wood turtle (*Glyptemys insculpta*) Yellow banded bumble bee (*Bombus terricola*) Yellow bumble bee (*Bombus fervidus*) <u>SGCN Species</u> Bobolink (*Dolichonyx oryzivorus*) Monarch (*Danaus plexippus*) Ruffed grouse (*Bonsai umbrellas*)	
Shrubland		66	American bumble bee (*Bombus pensylvanicus*) American kestrel (*Falco sparverius*) Eastern box turtle (*Terrapene carolina carolina*) Eastern hognose snake (*Heterodon platirhinos*) Eastern whip-poor-will (*Antrostomus vociferus*) Fowler's toad (*Anaxyrus fowleri*) New England cottontail (*Sylvilagus transitionalis*) Northern black racer (*Coluber constrictor*) Northern harrier (*Circus cyaneus*) Northern leopard frog (*Lithobates pipiens*) Rusty-patched bumble bee (*Bombus affinis*) Smooth green snake (*Liochlorophis vernalis*)	

Wildlife Habitat[1]	Habitat Present	Size (acres)	Associated Listed Wildlife[2] (change to BOLD if present)	Comments
			Timber rattlesnake (*Crotalus horridus*) Wood turtle (*Glyptemys insculpta*) Yellow banded bumble bee (*Bombus terricola*) Yellow bumble bee (*Bombus fervidus*) <u>SGCN Species</u> American woodcock (*Scolopax minor*) Black-billed cuckoo (*Coccyzus erythropthalmus*) Blue-winged warbler (*Vermivora cyanoptera*) Brown thrasher (*Toxostoma rufum*) Eastern towhee (*Pipilo erythrophthalmus*) Field sparrow (*Spizella pusilla*) Golden-winged warbler (*Vermivora chrysoptera*) Moose (*Alces alces*) Prairie warbler (*Setophaga discolor*) Ruffed grouse (*Bonsai umbrellas*)	
Southern NH sandy habitat			Eastern hognose snake (*Heterodon platirhinos*)	
Alpine			American pipit (*Anthus rubescens*) White mountain arctic (*Oeneis melissa semidea*) White mountain fritillary (*Boloria titania montinus*) <u>SGCN Species</u> Ringed emerald (*Somatochlora albicincta*)	
Caves and Mines			Eastern small-footed bat (*Myotis leibii*) Little brown bat (*Myotis lucifugus*) Northern long-eared bat (*Myotis septentrionalis*) Tricolored bat (*Perimyotis subflavus*) <u>SGCN Species</u> Big brown bat (*Eptesicus fuscus*)	
Rocky Ridge/Cliff/Talus			Common nighthawk (*Chordeiles minor*) Eastern small-footed bat (*Myotis leibii*) Golden eagle (*Aquila chrysaetos*) Northern black racer (*Coluber constrictor*) Peregrine falcon (*Falco peregrinus*) Smooth green snake (*Liochlorophis vernalis*) Timber rattlesnake (*Crotalus horridus*)	

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Wildlife Habitat[1]	Habitat Present	Size (acres)	Associated Listed Wildlife[2] (change to BOLD if present)	Comments
			SGCN Species Eastern towhee (*Pipilo erythrophthalmus*)	
Salt marsh			Common tern (*Sterna hirundo*) Northern harrier (*Circus cyaneus*) Purple martin (*Progne subis*) Red knot (*Calidris canutus*) Roseate tern (*Sterna dougallii*) Saltmarsh sparrow (*Ammodramus caudacutus*) Seaside sparrow (*Ammodramus maritimus*) Willet (*Tringa semipalmata*) SGCN Species Marsh wren (*Cistothorus palustris*) Nelson's sparrow (*Ammodramus nelsoni*) Sanderling (*Calidris alba*) Semipalmated sandpiper (*Calidris pusilla*) Whimbrel (*Numenius phaeopus*)	
Dune			American pipit (*Anthus rubescens*) Fowler's toad (*Anaxyrus fowleri*) Horned lark (*Eremophila alpestris*) Least tern (*Sterna antillarum*) Piping plover (*Charadrius melodus*) Red knot (*Calidris canutus*) Saltmarsh tiger beetle (*Cicindela marginata*) Willet (*Tringa semipalmata*) SGCN Species Ruddy turnstone (*Arenaria interpres*) Sanderling (*Calidris alba*) Semipalmated sandpiper (*Calidris pusilla*) Whimbrel (*Numenius phaeopus*)	
Coastal island			Common tern (*Sterna hirundo*) Red knot (*Calidris canutus*) Roseate tern (*Sterna dougallii*) SGCN Species Purple sandpiper (*Calidris maritima*) Ruddy Turnstone (*Arenaria interpres*) Sanderling (*Calidris alba*) Semipalmated sandpiper (*Calidris pusilla*)	

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Wildlife Habitat[1]	Habitat Present	Size (acres)	Associated Listed Wildlife[2] (change to BOLD if present)	Comments
			Whimbrel (*Numenius phaeopus*)	
Estuarine			Atlantic sturgeon (*Acipenser oxyrinchus*) Blueback herring (*Alosa aestivalis*) Red knot (*Calidris canutus*) Sea lamprey (*Petromyzon marinus*) Shortnose sturgeon (*Acipenser brevirostrum*) Willet (*Tringa semipalmata*) <u>SGCN Species</u> American black duck (*Anas rubripes*) American oyster (*Crassostrea virginica*) American shad (*Alosa sapidissima*) Rainbow smelt (*Osmerus mordax*) Ruddy turnstone (*Arenaria interpres*) Sanderling (*Calidris alba*) Semipalmated sandpiper (*Calidris pusilla*) Whimbrel (*Numenius phaeopus*)	
Marine			Atlantic sturgeon (*Acipenser oxyrinchus*) Blueback herring (*Alosa aestivalis*) Fin whale (*Balaenoptera physalus*) North Atlantic right whale (*Eubalaena glacialis*) Sea lamprey (*Petromyzon marinus*) Shortnose sturgeon (*Acipenser brevirostrum*) <u>SGCN Species</u> American shad (*Alosa sapidissima*) Atlantic sea scallop (*Placopecten magellanicus*) Horseshoe crab (*Limulus polyphemus*) Humpback whale (*Megaptera novaeangliae*) Northern shrimp (*Pandalus borealis*) Rainbow smelt (*Osmerus mordax*) Softshell clam (*Mya arenaria*)	

[1]Wildlife habitat classifications and associations are derived from the NH Wildlife Action Plan, published by NH Fish & Game (2015).

[2]Listed wildlife species are federally threatened (FT), federally endangered (FE), state threatened (SC), state endangered (SE), state special concern (SC), or Species of Greatest Conservation Need (SGCN).

*Northern harrier maintains a winter range of predominantly coastal wetlands and a breeding range confined to the northern and coastal portions of the state.

+Also present in large warmwater rivers

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Appendix D – Coordination with NHFG

Lindsey White

From: Tuttle, Kim <Kim.A.Tuttle@wildlife.nh.gov>
Sent: Friday, April 30, 2021 1:27 PM
To: Lindsey White; Lamb, Amy; Bouchard, Jessica
Cc: NHCWS Matthew Cardin (matthew.cardin@eversource.com); Deborah ZartaGier
Subject: RE: D121 Transmission Line Rare Species Review Summary 4-27-2021

Hello Lindsey,

CONFIDENTIAL DNCR

Thanks,

Kim Tuttle
Wildlife Biologist
NH Fish and Game
11 Hazen Drive
Concord, NH 03301
603-271-6544

From: Lindsey White <Lindsey.White@gza.com>
Sent: Friday, April 30, 2021 11:17 AM
To: Lamb, Amy <Amy.E.Lamb@dncr.nh.gov>; Tuttle, Kim <Kim.A.Tuttle@wildlife.nh.gov>; Bouchard, Jessica <Jessica.R.Bouchard@dncr.nh.gov>
Cc: NHCWS Matthew Cardin (matthew.cardin@eversource.com) <matthew.cardin@eversource.com>; Deborah ZartaGier <deborah.zartagier@gza.com>
Subject: D121 Transmission Line Rare Species Review Summary 4-27-2021

Hi Amy, Jessica and Kim,

Thank you all for meeting with myself and Matt Cardin on Tuesday, April 27th, 2021 regarding the D121 Transmission Line Structure Replacement and OPGW Project. As we mentioned, the D121 Transmission Line begins at the Merrimack Substation in Bow, and continues southerly through Hooksett and into Manchester for approximately 11.2 miles to the Eddy Substation in Manchester, New Hampshire. Eversource is proposing to replace a total of 35 existing utility poles along the D121 Transmission Line in the summer and fall of 2021, and is proposing to replace existing static wire with Optical Ground Wire (OPGW) in the winter of 2021 into 2022. Structure replacements are proposed in Bow (NHB21-0607), Hooksett (NHB21-0608) and Manchester (NHB21-0609). The proposed project involves maintenance work within an existing and maintained utility right-of-way (ROW) and does not propose expansion of the ROW. In addition, there is no vegetation maintenance scheduled for this project.

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ROW. Eversource intends to incorporate reptile construction BMPs including the following;

1. Prior to daily construction activities, timber matting will be reviewed for snakes and turtles. GZA will provide an environmental addendum to the daily tailboards by the contractors to include guidance on protocols for snakes and provide identification for spotted turtle, wood turtle, Blanding's turtle and northern black racer snake.
2. Observed snakes and turtles will be moved off of construction access roads to limit and prevent mortality to snakes and turtles during construction.
3. Erosion control matting, if utilized, will consist of jute matting. Matting with plastic mesh will be avoided to limit unintentional mortality to snakes.
4. At the conclusion of the project, a summary report of any rare species observations will be provided to the NHFG Nongame Program.
5. Impacts to vernal pools and potential vernal pools will be avoided.

The following notes will be added as well:

1. IF SPOTTED, WOOD OR BLANDING'S TURTLES ARE FOUND LAYING EGGS IN A WORK AREA, PLEASE CONTACT MELISSA DOPERALSKI (603-479-1129 cell) or JOSH MEGYESY (cell 978-578-0802) FOR FURTHER INSTRUCTIONS.
2. ALL OBSERVATIONS OF EASTERN HOGNOSE SNAKE SEEN AT ANY TIME MUST BE IMMEDIATELY REPORTED to the NHFG Department (MELISSA DOPERALSKI (603-479-1129 cell) or JOSH MEGYESY (cell 978-578-0802) FOR FURTHER INSTRUCTIONS. Please attempt to photograph this species to send to us for verification.
3. All observations of northern black racer snakes encountered from the end of September through the month of April will be immediately reported to the NHFG Department (Melissa Doperalski 603-479-1129 (cell) or Brendan Clifford 603-271-0463) as this indicates a potential hibernaculum in the area. We will attempt to photograph this species if possible.
4. Replacement of D121 Structures 1, 2 and 3 will begin after July 2021 to avoid/limit disturbance to nesting peregrine falcons by avoiding the typical peregrine fledgling period.

[redacted]
CONFIDENTIAL DNCR

NHB confirmed that since there is no vegetation clearing proposed as part of this project, there are no concerns for giant rhododendron, and no surveys need to be conducted for this plant.

NHB confirmed that since work is to take place within the existing and maintained ROW, it is not anticipated that downy false foxglove would be impacted, and no surveys need to be conducted for this plant.

The following rare plant species surveys will occur within proposed access routes in 20-ft width swaths following proposed access and permitting plans prepared by GZA, and surveys will also occur within proposed 100-ft by 100-ft work pads as shown on proposed access and permitting plans prepared by GZA in the following locations:

Survey Area 1: [redacted]

- Licorice Goldenrod
  - Timeframe: Late May and early June
  - Surveys to be focused in areas of low lying herbaceous vegetation, and not in areas of woody vegetation, dense stands of bushes or saplings.
- Wild Lupine
  - Timeframe: Late May and early June
  - Surveys to be focused in areas of low lying herbaceous vegetation, and not in areas of woody vegetation, dense stands of bushes or saplings

Locations of survey areas struck out to preserve confidentiality of rare species locations.

Survey Area 2: [redacted]

- Licorice Goldenrod
  - Timeframe: Late May and early June
  - Surveys to be focused in areas of low lying herbaceous vegetation, and not in areas of woody vegetation dense stands of bushes or saplings

Survey Area 3: [redacted]

- Licorice Goldenrod
  - Timeframe: Late May and early June
  - Surveys to be focused in areas of low lying herbaceous vegetation, and not in areas of woody vegetation dense stands of bushes or saplings

Survey Area 4: [redacted]

- Long Spined Sandbur
  - Timeframe: July to September

Survey Area 5: [redacted]

- Clasping Milkweed
  - Timeframe: Late June to July

GZA can provide survey updates as work progresses, and at the end of the rare plant survey field work (ending with Long Spined Sandbur), GZA will prepare a brief narrative report summarizing our findings.

If NHB and NHFG concur, GZA and Eversource will proceed with this plan and will submit this email correspondence as part of our wetland permit applications.

Thank you!
Lindsey

Lindsey E. White
Project Manager
GZA | 5 Commerce Park North | Bedford, NH 03110
o: 603.232.8753 | c: 603.770.5752 | lindsey.white@gza.com | www.gza.com | LinkedIn

** Please note*: Our office is currently working remotely. I can be reached at 603.770.5752.

Locations of survey areas struck out to preserve confidentiality of rare species locations.

Appendix E – Qualified Wildlife Biologist Resume

RESUME

Tracy L. Tarr, CWS, CESSWI

Associate Principal

Summary of Experience

Tracy is an environmental consultant that specializes in wildlife assessment, natural resource identification, and permitting. She manages field teams and oversees complex natural resource data collection and permitting efforts. She specializes in a variety of ecological assessment services including protected species surveys, wetland function-value assessment, vernal pool assessments, wetland delineation, natural community mapping, wildlife habitat assessments, watershed planning, mitigation design, and construction monitoring. She has permitted a diversity of projects at the local, state, and federal level including residential projects, commercial developments, municipal infrastructure projects, and utility corridors. Tracy also specializes in municipal projects that integrate natural resource assessment and planning. Tracy previously served as the Chair of the Gilmanton Conservation Commission and as the Secretary of the NH Association of Conservation Commissions. She is currently a member of the NH Association of Natural Resource Scientists Legislative Committee and serves as the northern New England technical practice lead for ecological services at GZA.

Education

B.S., Wildlife Management
University of New Hampshire, 1997
M.S., Natural Resources: Wildlife Ecology
University of New Hampshire, 2000

Licenses & Registrations

New Hampshire Certified Wetland Scientist, CWS #281)
Certified Erosion, Sediment and Stormwater Inspector, #388

Affiliations

- New Hampshire Association of Natural Resource Scientists
- Gilmanton Conservation Commission, Past Chair

Areas of Specialization

- Wildlife Habitat Evaluation
- Wetland Permitting
- Invasive Species Mapping
- Mitigation Design
- Rare Species Assessment
- Vernal Pool Identification & Evaluation
- Construction Monitoring
- G.I.S. Mapping

Relevant Project Experience

WILDLIFE AND RARE SPECIES ASSESSMENT

Wildlife Biologist, HSR, Illinois. Completed meander surveys for ornate box turtle and trapping surveys for Blanding's turtle. Led multi-state field team.

Wildlife Biologist/Wetland Scientist, Project Manager, Round Pond Dam Expansion Project, New Hampshire. Completed a multi-year trapping and radio-telemetry study of Blanding's turtle (*Emydoidea blandingii*), a State Endangered species, to model and predict impacts of a proposed reservoir expansion project. Ms. Tarr provided wildlife evaluations, rare species documentation, habitat mapping, wetland delineation, function-value assessments, and impact analysis for a proposed water reservoir expansion project at Round Pond. The project was specifically designed to assess the potential impacts of raising the outlet elevation of Round Pond by approximately 10 feet.

Wildlife Biologist, Mike Eon Associates, Biddeford, Maine. Completed wildlife habitat mapping field work and impact assessment evaluations for Blanding's turtle.

Wildlife Biologist, Groundwater Exploration, Bethel, Connecticut. Completed construction surveys for eastern box turtle (*Terrapene Carolina carolina*), bog turtle (*Glyptemys muhlenbergii*), spotted turtle (*Clemmys guttata*), and wood turtle (*Glyptemys insculpta*). Oversaw electrofishing effort to characterize fisheries on Site.

Wildlife Biologist, South Coast Rail, Berkeley, Massachusetts. Sub-permittee for construction surveys for eastern box turtle. Oversaw implementation of turtle monitoring.

Erosion Control Monitor for the P145 Transmission Line, Concord, New Hampshire. Provided construction monitoring services and assessed drill locations for the State Endangered Blanding's turtle.

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Wildlife Biologist/Associate Principal, Winchester Economic Development Authority, Winchester, New Hampshire. Completed a multi-season survey for black racer (*Coluber constrictor*) as part of Alteration of Terrain permitting for the project. Responsible for developing methods and coordination with the New Hampshire Fish and Game Department.

Project Manager, Eastman Development, LLC, Brookline, New Hampshire. Completed a survey for eastern hognose snake (*Heterodon platirhinos*) and black racer on a 40-acre Site.

Wetland Scientist/Associate Principal, Town of Exeter, Exeter, New Hampshire. Completed a peer review of rare species, exemplary community and vernal pool surveys.

Wildlife Biologist, Battis Farm, Amesbury, Massachusetts. Completed a survey for bobolink (*Dolichonyx oryzivorus*) and prepared a grassland bird management plan for the Battis Barm Conservation Property.

Project Manager, Riverwoods at Durham, Durham, New Hampshire. Oversaw and completed a winter pellet survey for New England cottontail (*Sylvilagus transitionalis*).

Wildlife Biologist/Associate Principal, Commercial Development, Seabrook, New Hampshire. Responsible for the development of wetland mitigation enhancement plan and overseeing wildlife relocation measures during construction including relocation of turtles, amphibians and fish. Documented new location of a special concern fish species.

Wildlife Biologist, BlueWave, Naples, Maine. Completed a deer wintering habitat survey, amphibian egg mass counts, and talus rock survey for bats.

Wildlife Biologist/Project Manager, Substation, New Hampshire. Assessed common raven (*Corvus corax*) habitat use and behavior over approximately five square miles, and developed a management plan for reducing power outages caused by ravens.

Wildlife Biologist, Waste Management of New Hampshire, Inc., Rochester, New Hampshire. Completed a Phase 1 bat assessment on a 598 acre commercial property to evaluate habitat suitability for the northern log-eared bat (*Myotis septentrionalis*), a federally Threatened species. Ms. Tarr completed all field work, report preparation, and coordination with the U.S. Fish and Wildlife Service.

Wildlife Biologist, Thermogen Industries, Eastport, Maine. Completed wildlife habitat assessment, rare species documentation, natural community mapping, intertidal and subtidal field surveys, wetland delineation, shoreland/surface water delineation, wetland functions and values assessment, and preliminary natural resource impact evaluation for a proposed 200- to 300-thousand metric-ton-per-year torrefied wood production facility on the site. Ms. Tarr worked directly with State regulators including fisheries biologists to identify permitting needs and options for the proposed facility.

Wildlife Biologist, Pats Peak, Henniker, New Hampshire. Completed biomonitoring evaluations spanning the course of 10 years in Cascade Brook to assess the potential impacts of water withdrawal for snowmaking. Ms. Tarr completed biomonitoring evaluations including macroinvertebrate sampling, electrofishing evaluations, and habitat assessments. Ms. Tarr worked directly with the New Hampshire Department of Environmental Services (NHDES) to properly identify the implications of the data and highlight other contributing landscape factors to the data.

Project Manager, Town of Merrimack, New Hampshire. Prepared the first documented town-wide Comprehensive Beaver Management Plan in New Hampshire. The Plan was designed to minimize flood impacts caused by beaver, maintain important natural resources associated with beaver ponds, and minimize long-term municipal infrastructure maintenance costs. As part of this work, Ms. Tarr evaluated beaver activity at over 35 locations, developed a Beaver Habitat Suitability Model, identified appropriate best management practices for water level control, obtained cost estimates and bids, and completed construction monitoring.

Wildlife Biologist, Sunningdale Residential Development, Somersworth, New Hampshire. Completed a wildlife assessment to document wildlife habitats and species, and identify best management practices to maintain and manage wildlife habitats.

Tracy L. Tarr, CWS, CESSWI

Associate Principal

Coordinated a review for grassland birds and New England cottontail. Developed a Conservation Easement Baseline Documentation report.

Wildlife Biologist, North Keene Substation, Keene, New Hampshire. Prepared a wildlife assessment to document wildlife habitats, species, and best management practices.

RARE PLANT SURVEYS

Project Manager,340 and 386 Distribution Line Project, Rochester, New Hampshire. Completed natural resource evaluation and permitting for the reconstruction of two distribution lines. Also completed survey for six State Threatened/Endangered species including button sedge (*Carex bullata*), clustered sedge (*Carex cumulata*), dwarf huckleberry (*Gaylussacia bigeloviana*), long's bulrush (*Scirpus longii*), nuttall's reed grass (*Calamagrostis cinnoides*), and variable sedge (*Carex polymorpha*).Flagged populations and monitored during construction.

Project Manager, 324 Distribution Line Project, Bedford and Manchester, New Hampshire. Completed surveys for river birch (*Betula nigra*) and long-leaved bluet (*Houstonia longifolia*). Coordinated survey data with the Natural Heritage Bureau.

Wetland Scientist, H141/R193 Transmission Line Uprate Project, Danville, Sandown, Chester, Fremont, and Exeter, New Hampshire. Completed survey for fringed gentian (*Gentianopsis crinita*), a State Threatened plant species. Mapped rare plant locations, completed local permitting, and completed construction monitoring. Documented wood turtle in the utility corridor.

Project Manager, BCS Environmental & Land Law, LLC, New Durham, New Hampshire. Completed survey for small-whorled pogonia.

Wetland Scientist, BlueWave, Naples, Maine. Completed and oversaw surveys for small-whorled pogonia.

Wetland Scientist, E194/U181 Transmission Line, Greenland and Portsmouth, New Hampshire. Oversaw surveys for great bur-reed (*Sparganium eurycarpum*), and development of best management practices to protect plants during construction.

WETLAND DELINEATION, ASSESSMENT & PERMITTING

Wetland Scientist, Town of Webster Wetland Assessment, Webster, New Hampshire. Developed a town-wide wetland assessment and ranked 25 wetlands using the NH Method to assist the Town in the development of a wetland ordinance template and town-wide wetland maps.

Wetland Scientist, Various Utility Corridors (e.g., L163 Transmission Line, W185 Distribution Line), New Hampshire. Completed wetland delineation field work and mapping. Oversaw the development of wetland permitting and access plans.

Wetland Scientist, Martin Meadow Dam, Lancaster, New Hampshire. Completed shoreland assessment and wetland function-value assessment field work in support of the upgrades to Martin Meadow Dam. Coordinated reviews with federal and state agencies, and permitted the reconstruction of the dam.

Project Manager, City of Portsmouth Athletic Fields, Portsmouth, New Hampshire. Completed wetland function-value assessment, vernal pool surveys, and permitting for the construction of three new municipal athletic fields. Coordinated local, state, and federal permitting, completed agency and municipal permitting meetings, and developed the mitigation plan for the project.

Wetland Scientist, James Pond, Exeter/Richmond, Rhode Island. Completed wetland delineation field work and documentation on approximately 900 acres of predominantly wooded and remote terrain. Prepared a beaver management plan and modeled habitat suitability of the Site.

Wetland Scientist, Plymouth Village Water & Sewer District, Plymouth, New Hampshire. Completed wetland delineation, assessment, and permitting for the replacement of a force main sewer line and access culverts along approximately 3,600 linear feet bordering the Baker River.

Tracy L. Tarr, CWS, CESSWI

Associate Principal

Wetland Scientist, Marsh Property, Greenland, New Hampshire. Completed wetland assessment field work and permitting for a bank stabilization project on Great Bay. Designed a joint planting stabilization plan.

Wetland Scientist, Albacore Park, Portsmouth, New Hampshire. Completed wetland delineation and wetland function-value assessment field work in support of the upgrades to the Albacore Park facility and associated submarine basin.

Project Manager, Town of Merrimack, New Hampshire. Completed wetland delineation on town conservation property in support of a trail parking lot project. Also, prepared the first documented town-wide Comprehensive Beaver Management Plan in New Hampshire. The Plan was designed to minimize flood impacts caused by beaver, maintain important natural resources associated with beaver ponds, and minimize long-term municipal infrastructure maintenance costs. As part of this work, Ms. Tarr evaluated beaver activity at over 35 locations, developed a Beaver Habitat Suitability Model, identified appropriate best management practices for water level control, obtained cost estimates and bids, and completed construction monitoring.

Wetland Scientist, Dartmouth College, New Hampshire. Completed wetland function-value assessment field work along 1.25-miles of a proposed alternative energy pipeline route. Wetlands were assessed utilizing the U.S. Army Corps of Engineers' Highway Methodology Workbook Supplement (ACOE, September 1999). Ms. Tarr also prepared GIS overlays of wetlands, conservation lands, wildlife habitats, and recreation areas to identify ecologically sensitive areas and assist with project scoping and impact minimization.

Wetland Scientist, Lomastro Property, Dover, New Hampshire. Completed state and local permitting for a permeable paver and retaining wall project on the Bellamy River. Successfully obtained state wetlands permit and local conditional use permit for work within 50-feet of saltmarsh habitat.

Wetland Scientist, Island Path Property, Hampton, New Hampshire. Completed wetland assessment field work, as well as local, state, and federal permitting for a residential project located in the tidal buffer zone of Great Bay.

Wetland Scientist, Public Service Company of New Hampshire. Completed wetland delineation and natural resources assessment on a 75-acre mitigation property. Wetland boundaries were delineated in accordance with the 1987 ACOE Wetlands Delineation Manual and the January 2012 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region. A global positioning system (GPS) was used to locate and map wetlands on the site. Ms. Tarr also identified potential vernal pools and rare species habitats, and completed wetland function-value assessment field work. Ms. Tarr prepared the project report and completed GIS overlays to document the natural resource values of the targeted mitigation property.

WETLAND RESTORATION DESIGN AND MONITORING

Wetland Scientist, South Coast Rail, Berkeley, Massachusetts. Prepared an invasive species management plan for four wetland mitigation areas, and oversaw wetland mitigation construction monitoring and remedial measures.

Wildlife Biologist, Maverick Development, Auburn, New Hampshire. Completed vernal pool assessment field work and prepared a Vernal Pool Creation Plan as part of project mitigation.

Wetland Scientist, Ball Hill Wind Energy, Hanover, New York. Developed mitigation plans for a wetland mitigation site. Completed wetland delineation, wildlife documentation, and plan preparation.

Wetland Scientist, City of Keene, New Hampshire. Developed stream and wetland restoration plans to improve wetland functions including flood protection, sediment retention, nutrient removal and wildlife habitat. Completed wetland permitting and construction monitoring for a one-acre wetland restoration area. Oversaw plant selection and installation in the restoration area.

Wetland Scientist, Portsmouth Development Authority, Portsmouth, New Hampshire. Completed wetland mitigation monitoring for a wetland buffer enhancement project associated with the South Entrance Multi-use Path project. Responsible for native plant selection, and planting plan development and contractor oversight.

Tracy L. Tarr, CWS, CESSWI

Associate Principal

UTILITY CORRIDOR ASSESSMENT AND PERMITTING

Project Manager, L176 Transmission Line Rebuild Project, Franklin, Tilton, Belmont, and Laconia, New Hampshire. Completed natural resource data collection, as well as local, state, and federal permitting for the rebuild of a 13.5-mile transmission line. Presented the project at local River Advisory Committee, Conservation Commission, Planning Board, and Zoning Board of Adjustment hearings. Successfully acquired state wetland permit, shoreland permits, PUC water crossing permit, DOT permits, and conditional use permits.

Senior Project Manager, H123 Transmission Line, Merrimack and Litchfield, New Hampshire. Oversaw data collection and local, state, and federal permitting for the rebuild of the transmission line.

Project Manager, Y151 Transmission Line, Hudson, New Hampshire. Completed data collection, wetland assessment, and local, state, and federal permitting for the rebuild of the Y151 Transmission Line.

Project Manager, 381 Transmission Line, Winchester, New Hampshire. Completed wetland assessments and local, state, and federal permitting for the rebuild of the 381 Transmission Line and construction of culverts for a permanent access road. Oversaw construction monitoring.

Project Manager, 379 Transmission Line, Hinsdale, Winchester, Richmond, and Troy, New Hampshire. Oversaw permitting, archeological assessment, and construction monitoring for structure and ground wire replacement work.

Associate Principal, M127 Transmission Line, Sunapee, Springfield, New London, Wilmot, Andover, and Franklin, New Hampshire. Oversaw data collection, vernal pool assessment, permitting, tree clearing, and construction monitoring for the project.

Project Manager, 346X2 Distribution Line Project, Tuftonboro, New Hampshire. Completed vernal pool assessment, wetland function value assessment, permitting, and construction monitoring for the construction of a new distribution line.

Project Manager, Q166 Transmission Line, Fitzwilliam and Troy, New Hampshire. Completed natural resource data collection, as well as local, state, and federal permitting for the construction of a new transmission line. Also, completed construction monitoring.

Project Manager, L163 and K174 Transmission Line TRRP Projects, New Hampshire. Completed natural resource data collection and permitting review for multiple Transmission ROW Reliability Projects. Oversaw field oversight during project implementation.

Project Manager, J147 Transmission Line, Danville and Kingston, New Hampshire. Completed data collection, local/state/federal permitting, and construction monitoring for structure and davit arm replacement work.

Wetland Scientist, Peaslee Tap, Danville, New Hampshire. Completed local permitting for the construction of the Peaslee Tap.

Project Manager, South Peterborough Substation, Peterborough, New Hampshire. Completed wetland function-value assessment, state permitting, and construction monitoring for the re-construction of a distribution line at the substation.

WATERSHED MANAGEMENT

Project Manager, City of Biddeford, Biddeford, Maine. Worked directly with the City of Biddeford and Maine Department of Environmental Protection (DEP) to prepare a Watershed Management Plan for Thatcher Brook. The brook is listed on DEP's Impaired Water Bodies list for primary and secondary contact recreation impairment (bacteria) and aquatic life use violations due to macroinvertebrate impairments. Previous studies of the brook yielded limited macroinvertebrate samples. Ms. Tarr developed a specific macroinvertebrate and habitat evaluation for Thatcher Brook to enhance and supplement existing biomonitoring data. These data were used to develop habitat restoration recommendations and structural retrofit recommendations with the goal of improving the water quality of the brook to meet Class B water quality criteria.

Project Manager, Long Creek Watershed Management District, Maine. Hired as a sole-source contractor to review the Long Creek Watershed Management Plan and recommend possible changes in data collection, monitoring, and habitat/retrofit implementation in the watershed.

Tracy L. Tarr, CWS, CESSWI

Associate Principal

INVASIVE SPECIES MANAGEMENT PLAN DEVELOPMENT & MONITORING

Wetland Scientist for the Whittier Bridge, I-95 Improvement Project, Newburyport, Amesbury, and Salisbury, Massachusetts. Mapped invasive plants along 4-miles of highway and prepared GIS and map overlaps for invasive species management. Worked with the MassDOT and the contractor to develop an Invasive Plant Management Plan.

Wetland Scientist,Swanzey Roundabout Construction, Swanzey, New Hampshire. Developed the invasive species management plan for the project and completed construction monitoring.

Wetland Scientist, Essential Power, Newington, New Hampshire. Oversaw wetland delineation and the development of special permits to support vegetation and invasive species management.

CONSTRUCTION MONITORING

Erosion Control Inspector, Y170 Transmission Line and 386/386A/340 Distribution Line Project, Farmington, Milton, and Rochester, New Hampshire. Provided full-time construction monitoring services over the course of six months for an 8-mile power line project involving four overlapping existing and new lines. Ms. Tarr prepared the Stormwater Pollution Prevention Plan (SWPPP) and provided SWPPP monitoring services, erosion control inspections, wetland delineation, and rare species and exemplary community mapping. Ms. Tarr worked daily with contractors to address local, state, and federal environmental permitting requirements.

Erosion Control Inspector, Merrimack Valley Reliability Project, Tewksbury and Dracut Massachusetts and Hudson, New Hampshire. Completed erosion control monitoring and contractor training on behalf of the contractor. During construction, completed sweeps for rare turtles and snakes including wood turtle and black racer.

Erosion Control Inspector, H137 Transmission Line, Bow, New Hampshire. Provided construction monitoring services and environmental compliance oversight. Conducted weekly and post-storm inspections and interacted with construction managers and operators to implement Best Management Practices (BMPs) for erosion control and sensitive archaeological resources.

Assistant Project Manager, Public Service Company of New Hampshire. Prepared Stormwater Pollution Prevention Plans and Notice of Termination documents for multiple transmission line projects.

Relevant Experience Prior to GZA

Senior Project Manager/Wildlife Biologist, Stoney Ridge Environmental, LLC (2007 – 2012)

NHSC, Inc. (a.k.a. NH Soil Consultants, Inc.) (2000-2002, 2003-2007)

Wetland Systems Biologist, New Hampshire Fish & Game Department (2002/2003)

Research Technician, University of New Hampshire (1994-1997, 1999-2000)

- Lead field technician for southern New Hampshire Blanding's turtle study
- UNH Deer Research Facility
- UNH Animal Research Laboratory
- Technician for Impacts of a Watchable Wildlife Site (completed avian point count surveys, small mammal trapping, and moose behavior assessments)

Research Technician, NEIWPCC/EPA, Deformed frog survey (1997)

Tracy L. Tarr, CWS, CESSWI

Associate Principal

Publications

Stone, A.L., Mitchell F., Van de Poll, R., Rendall, N., Leo, M., West, M., Ammann, A., Andrews, C., Tarr, T., Tilton, M.A., Adams, C., et al., "Method for Inventorying and Evaluating Freshwater Wetlands in New Hampshire (NH Method; June 2011 Update)," University of New Hampshire Cooperative Extension, June 2011

Baber, M.J., Fleishman, E., and Babbitt, K.J., and Tarr, T.L. "The relationship between wetland hydroperiod and nestedness patterns in assemblages of larval amphibians and predatory macroinvertebrates," Oikos, 2004

Tarr, T.L., Baber, M.J., and Babbitt, K.J., "Patterns of larval amphibian distribution along a wetland hydroperiod gradient," Canadian Journal of Zoology, 2003

Tarr, T. and Babbitt, K.J., "Effects of habitat complexity and predator identity on predation of *Rana clamitans* larvae," Amphibian-Reptilia, 2002

Tarr, T. and Babbitt, K.J., "First record of *Dibolocelus ovatus* (Coleoptera:Hydrophilidae) in New Hampshire," Entomological News, 2001

RESUME

Logan Young

Scientist I

Summary of Experience

Mr. Young is an environmental scientist specializing in wildlife and habitat assessment, natural resource identification, field data collection, and construction monitoring. Additional areas of experience include natural resource permitting, landscape mitigation, and geospatial analysis. He regularly reviews best management practices for wildlife assessments, listed species, and construction erosion controls, and assists in all aspects of permitting at a state and local level. Mr. Young has experience prior to GZA in managing volunteer-based wildlife conservation programs, as well as managing stakeholder relationships through outreach for large-scale utility projects.

Education

B.S., Ecology and Spatial Analysis, University of New Hampshire, 2012

Licenses & Registrations

40-hour HAZWOPER

Affiliations

- New Hampshire Association of Natural Resource Scientists

Areas of Specialization

- Wildlife Habitat Evaluation
- Rare Species Assessment
- Construction Monitoring
- Environmental Permitting
- GIS Mapping and Analysis
- Public Outreach and Involvement
- Tree and Shrub Identification
- Avian Surveys
- Reptile Surveys

Relevant Project Experience

GZA WILDLIFE AND RARE SPECIES SURVEY

Wildlife Biologist, HSR, Will County, Reptile Survey, Illinois, 2020. Conducted presence/absence surveys for turtle species in existing high-speed rail corridor. Field work consisted of meander surveys for ornate box turtle (*Terrapene ornata ornata*) in national prairie preserve, aquatic trapping surveys for Blanding's turtle (*Emydoidea blandingii*), and evaluation of survey areas based on historic presence reports and habitat features to predict potential utilization of target species in rail corridor.

Wildlife Biologist, BJ's Wholesale Club, Aquatic Wildlife Relocation, Seabrook, New Hampshire, 2020. Conducted aquatic wildlife surveys during wetland dredge and fill activity for new construction of a retail warehouse. Aquatic wildlife was captured using electrofishing equipment and relocated on site. Special concern species American eel (*Anguilla rostrata*) were identified and relocated off-site with coordination from NH Fish and Game. Post-construction mitigation requirements include expansion of an existing pond and monitoring establishment of wildlife and native vegetation on site.

Wildlife Biologist, Town of Winchester, Northern Black Racer Survey, Winchester, New Hampshire, 2020. Conducted a presence/absence survey for NH State Threatened northern black racer (*Coluber constrictor constrictor*) within a 63-acre parcel prior to construction of a proposed commercial development. Visual assessments for reptiles were completed along random traverse routes throughout all habitat types within the property, as well as identifying locations of greater potential habitat capable of supporting the species. Survey included coordination with NH Fish and Game to temporarily collect target species, if encountered, and conduct additional biomonitoring survey.

WILDLIFE AND RARE SPECIES ASSESSMENT

Wildlife Biologist, Bedford RLG Properties, LLC, Wildlife Assessment, Bedford, New Hampshire. Identified and documented the presence of wildlife species within a 27-acre parcel to support permitting of a proposed commercial development, with an emphasis on use by listed species in NH. Visual and audio techniques were used to assess the presence of avian, mammal, reptile, insect, fish, and botanical species along random traverse routes throughout the property. Habitat types were identified and used to characterize potential utilization of the parcel by local fauna. Findings included recommendations on best management practices for proposed construction and future land use.

Logan Young

Scientist I

Wildlife Biologist, Bowers Landing of Merrimack II, Wildlife Assessment, Merrimack, New Hampshire. Identified and documented the presence of wildlife species within an 8-acre parcel to support permitting of a proposed residential subdivision, with an emphasis on use by listed species in NH. Visual and audio techniques were used to assess the presence of avian, mammal, reptile, insect, fish, and botanical species along random traverse routes throughout the property. Habitat types were identified and used to characterize potential utilization of the parcel by local fauna. Findings included recommendations on best management practices for proposed construction and future land use.

Wildlife Biologist, BJ's Wholesale Club, Wildlife Assessment, Seabrook, New Hampshire. Identified and documented the presence of wildlife species within a 24-acre parcel to support permitting of proposed additions to new construction of a retail warehouse, with an emphasis on use by listed species in NH. Visual and audio techniques were used to assess the presence of avian, mammal, reptile, insect, fish, and botanical species along random traverse routes throughout the property. Habitat types were identified and used to characterize potential utilization of the parcel by local fauna. Findings included recommendations on best management practices for proposed construction and future land use.

Wildlife Biologist, Ducal Development, LLC, Wildlife Assessment, Hollis, New Hampshire. Identified and documented the presence of wildlife species within a 55-acre parcel to support permitting of a proposed commercial development, with an emphasis on use by listed species in NH. Visual and audio techniques were used to assess the presence of avian, mammal, reptile, insect, fish, and botanical species along random traverse routes throughout the property. Habitat types were identified and used to characterize potential utilization of the parcel by local fauna. Findings included recommendations on best management practices for proposed construction and future land use.

Wildlife Biologist, Dwarkamai Temple, Wildlife Assessment, Hudson, New Hampshire. Identified and documented the presence of wildlife and botanical species within a 10-acre parcel to support permitting of a proposed religious temple, with an emphasis on use by endangered, threatened, special concern species and species of greatest conservation need. Visual and audio techniques were used to assess the presence of avian, mammal, reptile, insect, fish, and botanical species along random traverse routes throughout the property. Habitat types were identified and used to characterize potential utilization of the parcel by local fauna. Findings included recommendations on best management practices for proposed construction and future land use.

Wildlife Biologist, FedEx Distribution Center, Wildlife Assessment, Chesterfield, New Hampshire. Identified and documented the presence of wildlife species within a 24-acre parcel to support permitting of a proposed improvements to a distribution center, with an emphasis on use by listed species in NH. Visual and audio techniques were used to assess the presence of avian, mammal, reptile, insect, fish, and botanical species along random traverse routes throughout the property. Habitat types were identified and used to characterize potential utilization of the parcel by local fauna. Findings included recommendations on best management practices for proposed construction and future land use.

Wildlife Biologist, Proposed Cluster Subdivision, Wildlife Assessment, Spofford, New Hampshire. Identified and documented the presence of wildlife species within a 29-acre parcel to support permitting of a proposed residential subdivision, with an emphasis on use by listed species in NH. Visual and audio techniques were used to assess the presence of avian, mammal, reptile, insect, fish, and botanical species along random traverse routes throughout the property. Habitat types were identified and used to characterize potential utilization of the parcel by local fauna. Findings included recommendations on best management practices for proposed construction and future land use.

Wildlife Biologist, Proposed Residential Subdivision, Wildlife & Deer Wintering Area Assessment, Newbury, New Hampshire. Identified and documented the presence of wildlife species and potential deer wintering areas within a 50-acre parcel to support permitting of a proposed residential development, with an emphasis on use by listed species in NH. Visual and audio techniques were used to assess the presence of avian, mammal, reptile, insect, fish, and botanical species along random traverse routes throughout the property. Habitat types were identified and used to characterize potential utilization of the parcel by local fauna. Potential deer wintering areas were assessed by habitat characterization, canopy density, and presence/absence survey of white-tailed deer. Findings included recommendations on best management practices for proposed construction and future land use.

Logan Young

Scientist I

Wildlife Biologist, Proposed Tradesman Shops, Wildlife Assessment, Manchester, New Hampshire. Identified and documented the presence of wildlife species within a 4-acre parcel to support permitting of a proposed commercial development, with an emphasis on use by listed species in NH. Visual and audio techniques were used to assess the presence of avian, mammal, reptile, insect, fish, and botanical species along random traverse routes throughout the property. Habitat types were identified and used to characterize potential utilization of the parcel by local fauna. Findings included recommendations on best management practices for proposed construction and future land use.

Wildlife Biologist, Roscommon Investments, LLC, Wildlife Assessment, Nashua, New Hampshire. Identified and documented the presence of wildlife species within a 5-acre parcel to support permitting of a proposed commercial development, with an emphasis on use by listed species in NH. Visual and audio techniques were used to assess the presence of avian, mammal, reptile, insect, fish, and botanical species along random traverse routes throughout the property. Habitat types were identified and used to characterize potential utilization of the parcel by local fauna. Findings included recommendations on best management practices for proposed construction and future land use.

Wildlife Biologist, Shepherd's Hill Subdivision, Wildlife Assessment, Hudson, New Hampshire. Identified and documented the presence of wildlife species within a 17-acre parcel to support permitting of a proposed residential subdivision, with an emphasis on use by listed species in NH. Visual and audio techniques were used to assess the presence of avian, mammal, reptile, insect, fish, and botanical species along random traverse routes throughout the property. Habitat types were identified and used to characterize potential utilization of the parcel by local fauna. Findings included recommendations on best management practices for proposed construction and future land use.

Wildlife Biologist, Waste Management of New Hampshire, Wildlife Assessment, Rochester, New Hampshire. Identified and documented the presence of wildlife species within a 5-acre parcel to support permitting of a proposed materials recovery facility, with an emphasis on use by listed species in NH. Visual and audio techniques were used to assess the presence of avian, mammal, reptile, insect, fish, and botanical species along random traverse routes throughout the property. Habitat types were identified and used to characterize potential utilization of the parcel by local fauna. Findings included recommendations on best management practices for proposed construction and future land use.

Wildlife Biologist, Olson Development, Wildlife Assessment, Hollis, New Hampshire. Identified and documented the presence of wildlife species within a 17-acre parcel to support permitting of a proposed residential subdivision. Visual and audio assessments for avian and mammal species were conducted along random traverse routes throughout the property in order to characterize utilization of the parcel by local fauna.

NON-GZA WILDLIFE AND RARE SPECIES SURVEY

Field Monitor & Program Manager - NH Audubon, Massabesic Center, Cavity Nesting Survey, Auburn, New Hampshire, 2016-2021. Manager and field lead for annual surveys of cavity nesting bird species at Massabesic Lake. Survey focuses on population dynamics of species in decline including eastern bluebird (*Sialia sialis*), tree swallow (*Tachycineta bicolor*), and house wren (*Troglodytes aedon*). Surveys include visual identification of breeding species, recording fledgling success, and managing habitat for introduced and invasive species. Program also employs and assesses techniques for management of house sparrow (*Passer domesticus*).

Field Observer - NH Audubon, Carter Hill Orchard, Seasonal Hawk Watch, Concord, New Hampshire, 2016-2020. Annual field observer during fall migration survey in the Merrimack River Valley. Surveys include identification of species in flight, recording presence, relative abundance, and seasonal timing of avian species with a focus on raptors.

Field Observer - NH Audubon & Harris Center, Pack Monadnock Raptor Observatory, Seasonal Hawk Watch, Warner, New Hampshire, 2016-2020. Annual field observer during fall migration survey in the Monadnock region. Surveys include identification of species in flight, recording presence, relative abundance, and seasonal timing of avian species with a focus on raptors.

Logan Young

Scientist I

Field Observer – NH Audubon, Massabesic Center, Summer Bat Colony Survey, Auburn, New Hampshire, 2016. Field observer for NH State Endangered little brown bat (*Myotis lucifugus*). Survey included species identification via acoustic survey and visual count of bats leaving maternity roost. Counts were conducted at beginning and end of pupping season to assess reproductive success.

Field Observer - Baltimore Bird Club, Cromwell Valley Park, Seasonal Hawk Watch, Parkville, Maryland, 2015. Field observer during fall migration survey in the Chesapeake Bay Basin region. Surveys include identification of species in flight, recording presence, relative abundance, and seasonal timing of avian species with a focus on raptors.

Field Observer – NH Audubon, McLane Center, Chimney Swift Survey, Concord & Manchester, New Hampshire, 2014. Field observer for NH State Special Concern species chimney swift (*Chaetura pelagica*) during roost count surveys in Concord and Manchester, NH. Surveys included presence/absence in urban environments, identification of night roosts, and relative abundance in documented roost sites.

LANDSCAPE PLANNING AND RESTORATION

Environmental Scientist I, Eversource Energy, K105 Restoration Monitoring, Goffstown, New Hampshire. Post-construction monitoring for landscape restoration efforts to stabilize and prevent erosion of a sensitive property. Conducted quarterly site assessment, provided best management recommendations, and generated quarterly inspection reports of restoration progress for stakeholders from 2018-2020.

Environmental Scientist I, Eversource Energy, Seacoast Reliability Project Landscape Mitigation, Madbury, Durham, Newington, and Portsmouth, New Hampshire. Designed landscape plans for 47 properties following construction of the F107 Transmission Line. Plans designed to mitigate the view of new construction throughout the corridor in collaboration with landowners, representatives of the general public and historic resources, and utility vegetation maintenance requirements. Oversaw implementation of landscape plans by contractors, maintained schedule of work, and performed QA/QC evaluations.

INVASIVE SPECIES MANAGEMENT

Environmental Scientist I, Eversource Energy, Seacoast Reliability Project Landscape Mitigation, Durham, New Hampshire. Designed management plan for removal of Japanese Knotweed (*Reynoutria japonica*) at University of New Hampshire campus to support landscape mitigation following construction of underground segments of F107 Transmission Line.

NATURAL RESOURCE ASSESSMENTS

Environmental Scientist I, Eversource Energy, M127 Transmission Line Structure Replacement Project, Sunapee, New London, Springfield, Andover, Franklin, New Hampshire. Completed vegetative inventory and assessment of functions and values of delineated wetlands to assist permitting of proposed work areas for utility structure replacements.

Environmental Scientist I, Eversource Energy, E194/U181 Transmission Line Structure Replacement Project, Newington and Portsmouth, New Hampshire. Completed vegetation inventory and assessment of functions of delineated wetlands to assist permitting of proposed work areas for utility structure replacements.

Environmental Scientist I, Rennie Farm Remediation System, Hanover, New Hampshire. Completed vegetative inventory and assessment of functions and values of delineated wetlands to assist permitting of proposed work areas for utility structure replacements.

Experience Prior to GZA

Public Outreach Specialist, Eversource Energy, Transmission Line ROW Reliability Project, Various Towns, New Hampshire. Maintained relationship between client and project stakeholders during comprehensive vegetation removal throughout utility rights-of-way in New Hampshire. Managed all stakeholder needs, landowner communications and site reviews, and facilitated resolution of all stakeholder concerns during each project phase.

Logan Young

Scientist I

Coordinator of Volunteers, NH Audubon, Auburn and Concord, New Hampshire. Coordinated all volunteer-staffed programs throughout NH including natural resource education programs and research initiatives for imperiled species in NH. Led stewardship efforts for NH Audubon conserved lands and conducted training for wildlife surveys. Participated in research initiatives for bald eagle (*Halialeetus leucocephalus*), bobolink (*Dolichonyx oryzivorus*), chimney swift, common nighthawk (*Chordeiles minor*), eastern bluebird, tree swallow, and peregrine falcon (*Falco peregrinus*).

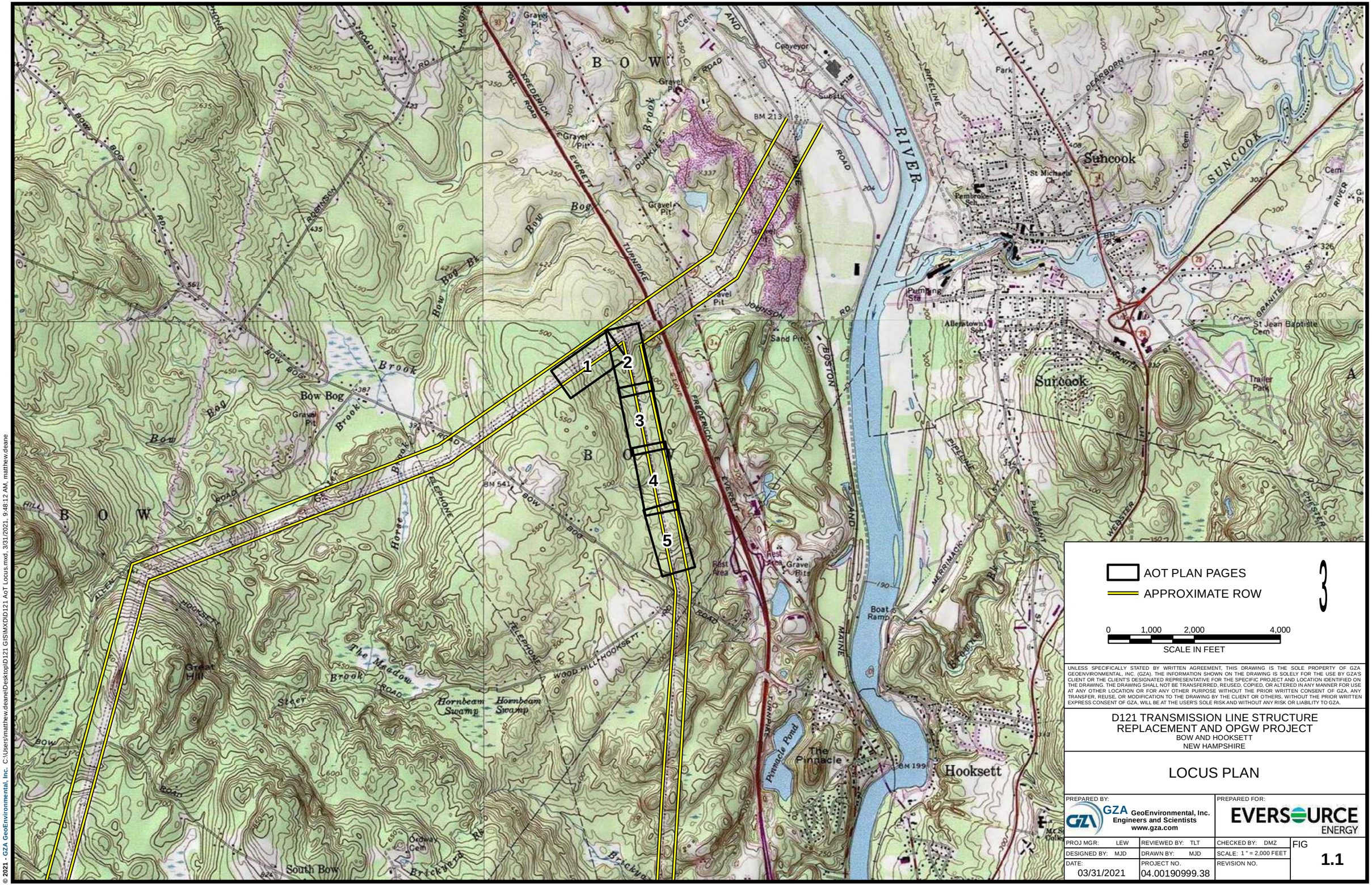
Certifications/Training

- OSHA 10-Hour Construction Certification
- HAZWOPER 40-hour Certification

Volunteer Activities

- NH Audubon

Figures



AOT PLAN PAGES

APPROXIMATE ROW

3

0 1,000 2,000 4,000

SCALE IN FEET

D121 TRANSMISSION LINE STRUCTURE REPLACEMENT AND OPGW PROJECT

BOW AND HOOKSETT
NEW HAMPSHIRE

LOCUS PLAN

PREPARED BY:
GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR:
EVERSOURCE ENERGY

PROJ MGR: LEW	REVIEWED BY: TLT	CHECKED BY: DMZ	FIG 1.1
DESIGNED BY: MJD	DRAWN BY: MJD	SCALE: 1 " = 2,000 FEET	
DATE: 03/31/2021	PROJECT NO. 04.00190999.38	REVISION NO.	

6

7

8

9

AOT PLAN PAGES

APPROXIMATE ROW

3

0 1,000 2,000 4,000

SCALE IN FEET

D121 TRANSMISSION LINE STRUCTURE REPLACEMENT AND OPGW PROJECT

BOW AND HOOKSETT
NEW HAMPSHIRE

LOCUS PLAN

PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: EVERSOURCE ENERGY	
PROJ MGR: LEW	REVIEWED BY: TLT	CHECKED BY: DMZ	FIG 1.2
DESIGNED BY: MJD	DRAWN BY: MJD	SCALE: 1 " = 2,000 FEET	
DATE: 03/31/2021	PROJECT NO. 04.00190999.38	REVISION NO.	

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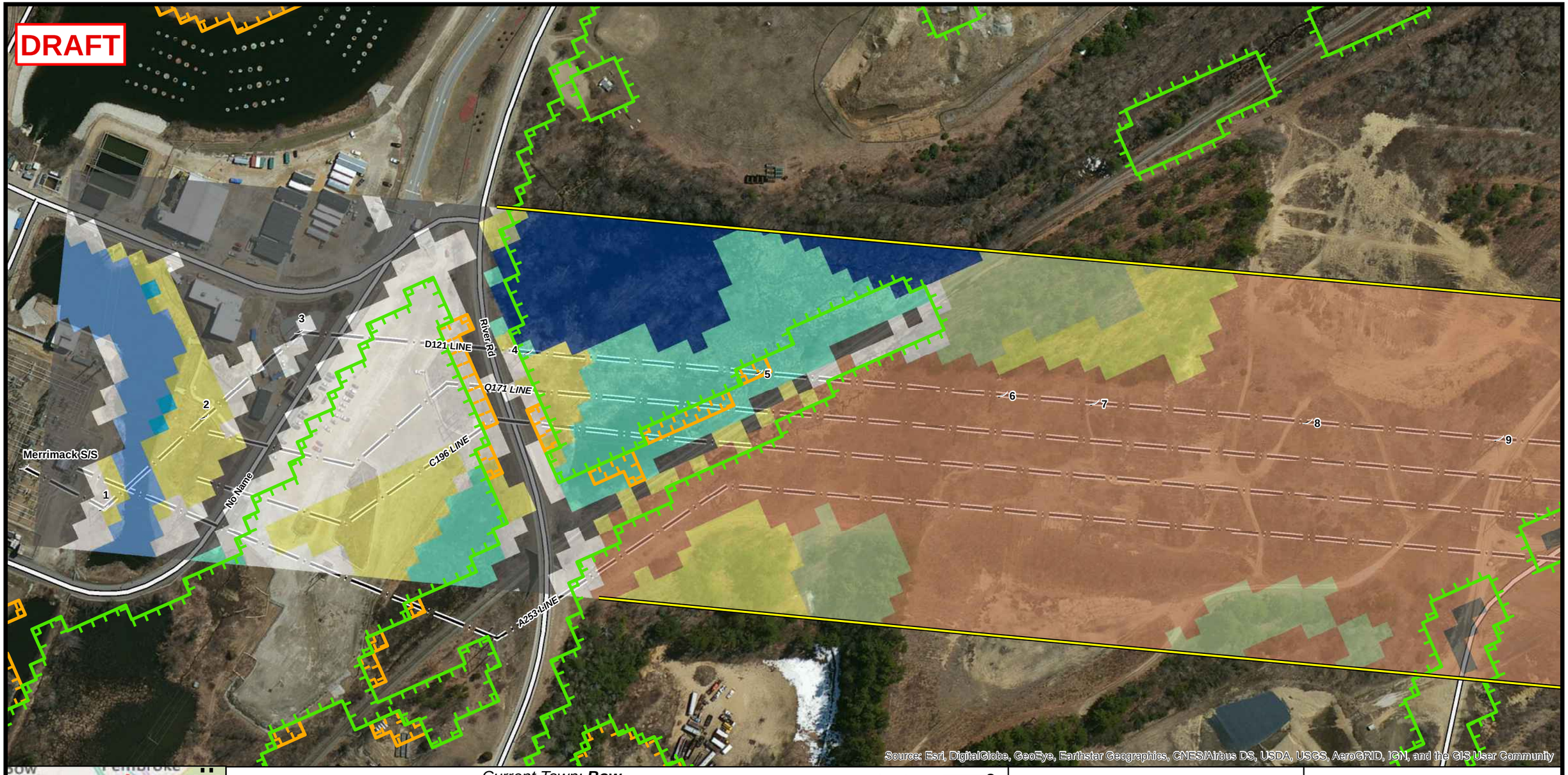

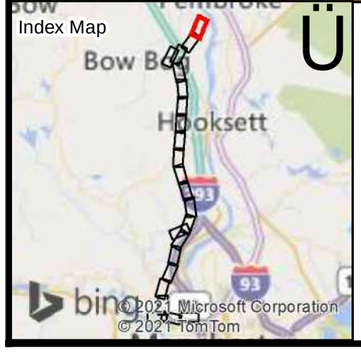

Bow

Current Town: **Bow**

Manchester

EXISTING STRUCTURE
TRANSMISSION LINE
APPROXIMATE ROW
TOWN BOUNDARY
NHDOT ROADS

WAP 2020 HABITAT TIERS
1 Highest Ranked Habitat in New Hampshire
2 Highest Ranked Habitat in Biological Region
3 Supporting Landscapes

WAP 2020 LAND COVER TYPE
Appalachian Oak-Pine
Developed Impervious
Developed or Barren land
Grassland
Hemlock-Hardwood-Pine
Open Water
Peatland
Pine Barren
Sand/Gravel
Temperate Swamp
Marsh and Shrub Wetland

NOTES:
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0 100 200 400 Feet

D121 TRANSMISSION LINE
OPGW AND STR REPLACEMENT PROJECT

WAP 2020 LAND COVER TYPE
AND HABITAT TIERS
MAY 12, 2021

BOW, HOOKSETT, & MANCHESTER
NEW HAMPSHIRE
PAGE 1 OF 23

Project No.: 04.0190999.38

1 inch = 200 feet

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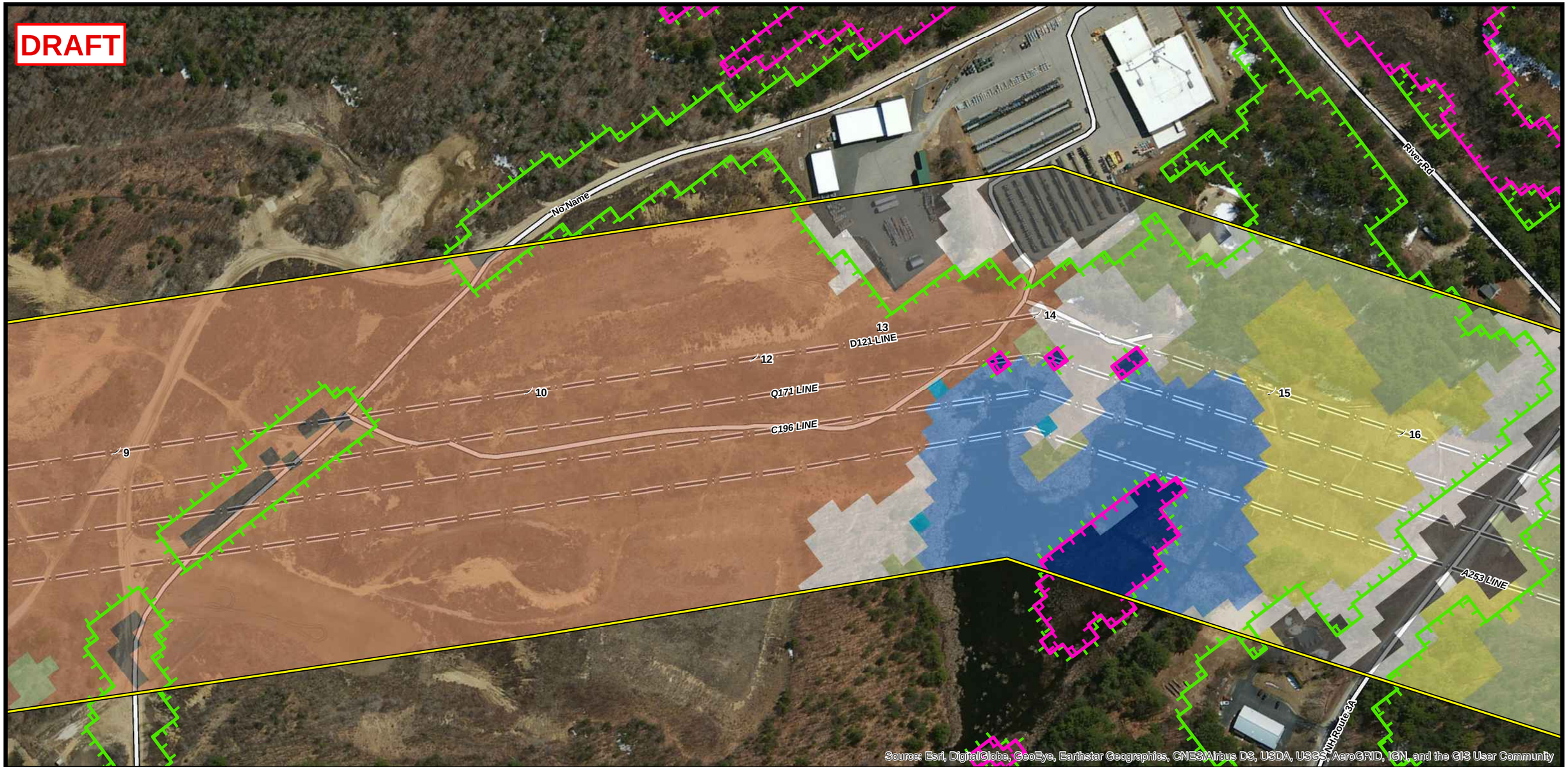

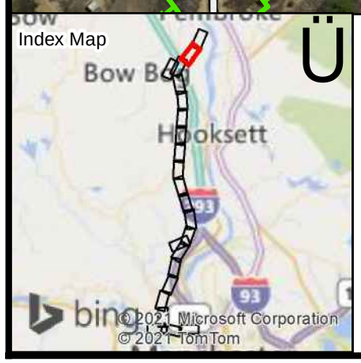

Bow

Current Town: **Bow**

Manchester

EXISTING STRUCTURE
TRANSMISSION LINE
APPROXIMATE ROW
TOWN BOUNDARY
NHDOT ROADS

WAP 2020 HABITAT TIERS
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D121 TRANSMISSION LINE
OPGW AND STR REPLACEMENT PROJECT

WAP 2020 LAND COVER TYPE
AND HABITAT TIERS
MAY 12, 2021

BOW, HOOKSETT, & MANCHESTER
NEW HAMPSHIRE
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Project No.: 04.0190999.38

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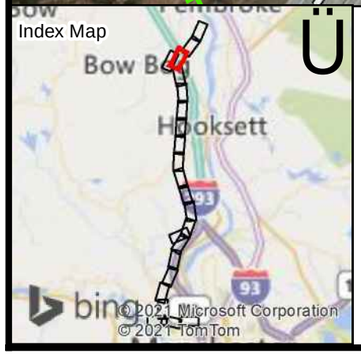
DRAFT

River Rd
NH Route 3A
Interstate 93 N
Interstate 93 S
D121 LINE
A253 LINE
Q171 LINE
C196 LINE
Old Johnson Rd
16
17
18
19
20
21
22
23
24
25
26
27

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Index Map



Current Town: **Bow**

Bow — Manchester

EXISTING STRUCTURE
TRANSMISSION LINE
APPROXIMATE ROW
TOWN BOUNDARY
NHDOT ROADS

WAP 2020 HABITAT TIERS
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0 100 200 400 Feet

D121 TRANSMISSION LINE
OPGW AND STR REPLACEMENT PROJECT

WAP 2020 LAND COVER TYPE
AND HABITAT TIERS
MAY 12, 2021

BOW, HOOKSETT, & MANCHESTER
NEW HAMPSHIRE
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Project No.: 04.0190999.38

1 inch = 200 feet

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DRAFT

D121 LINE

22

Q171 LINE

C196 LINE

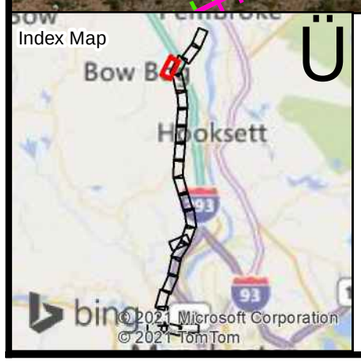
Morgan Dr

A253 LINE

Old Johnson Rd

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Index Map



Bow

Current Town: **Bow**

Manchester

EXISTING STRUCTURE
TRANSMISSION LINE
APPROXIMATE ROW
TOWN BOUNDARY
NHDOT ROADS

WAP 2020 HABITAT TIERS

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D121 TRANSMISSION LINE
OPGW AND STR REPLACEMENT PROJECT

WAP 2020 LAND COVER TYPE
AND HABITAT TIERS
MAY 12, 2021

BOW, HOOKSETT, & MANCHESTER
NEW HAMPSHIRE
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Project No.: 04.0190999.38

1 inch = 200 feet

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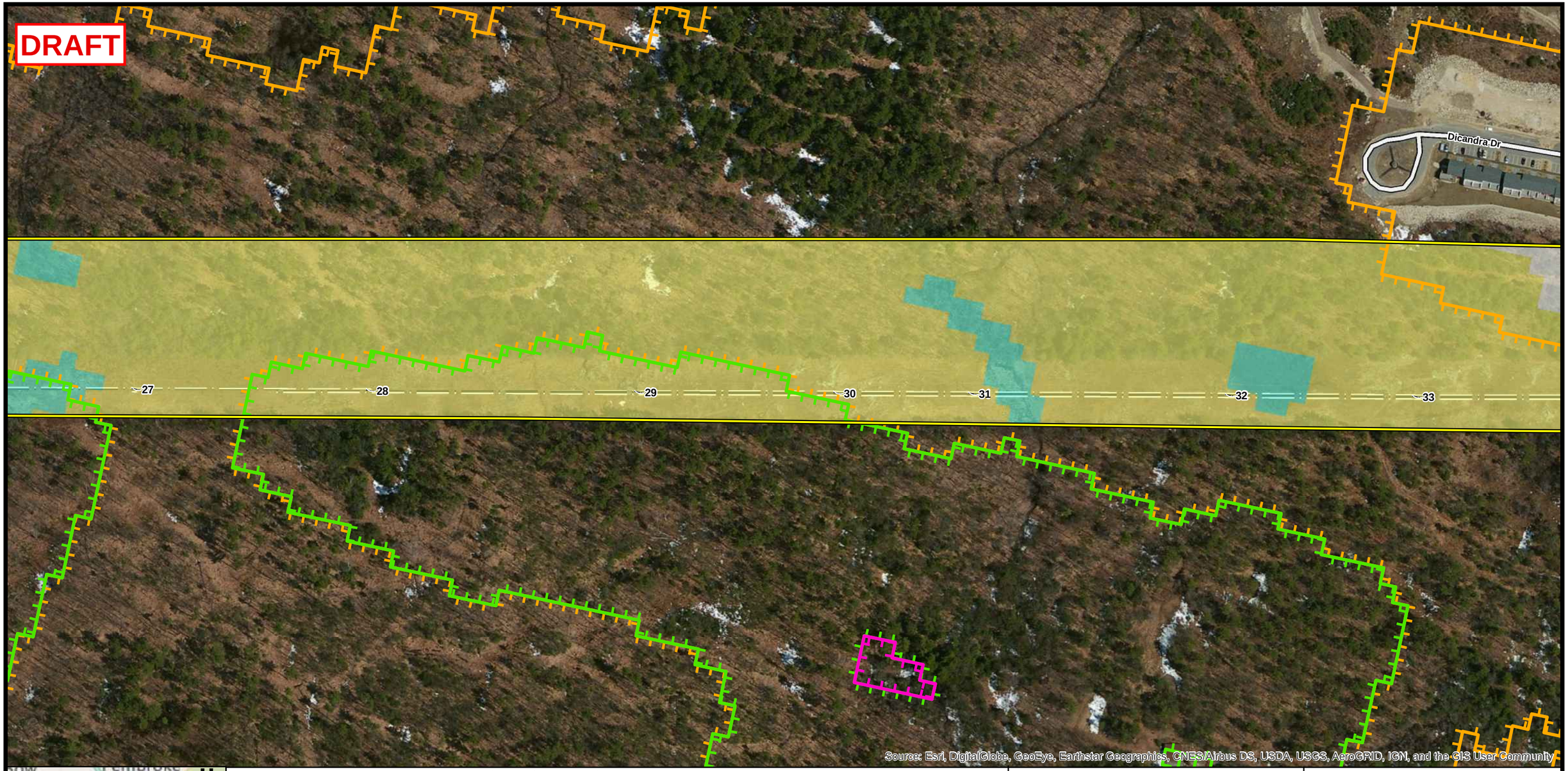

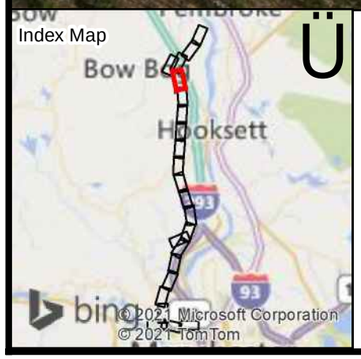

Bow

Current Town: **Bow**

Manchester

EXISTING STRUCTURE
TRANSMISSION LINE
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TOWN BOUNDARY
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WAP 2020 HABITAT TIERS
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D121 TRANSMISSION LINE
OPGW AND STR REPLACEMENT PROJECT

WAP 2020 LAND COVER TYPE
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MAY 12, 2021

BOW, HOOKSETT, & MANCHESTER
NEW HAMPSHIRE
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Project No.: 04.0190999.38

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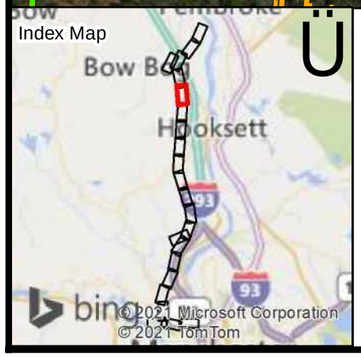

Bow — Current Town: **Bow/Hooksett** — Manchester

EXISTING STRUCTURE
TRANSMISSION LINE
APPROXIMATE ROW
TOWN BOUNDARY
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D121 TRANSMISSION LINE
OPGW AND STR REPLACEMENT PROJECT

WAP 2020 LAND COVER TYPE
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MAY 12, 2021

BOW, HOOKSETT, & MANCHESTER
NEW HAMPSHIRE
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Project No.: 04.0190999.38

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DRAFT

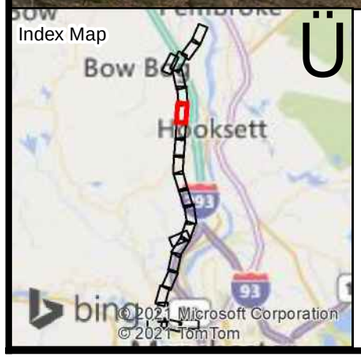
POTENTIAL OFF-ROW ACCESS
USING WOODS ROAD
FROM PINE STREET AT I-93
RAMP WEST OF OVERPASS

41 42 43 44 45 46 47

HOOKSETT
BOW

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Index Map



Bow — Current Town: **Hooksett** — Manchester

EXISTING STRUCTURE
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D121 TRANSMISSION LINE
OPGW AND STR REPLACEMENT PROJECT

WAP 2020 LAND COVER TYPE
AND HABITAT TIERS
MAY 12, 2021

BOW, HOOKSETT, & MANCHESTER
NEW HAMPSHIRE

Project No.: 04.0190999.38

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EVERSOURCE ENERGY

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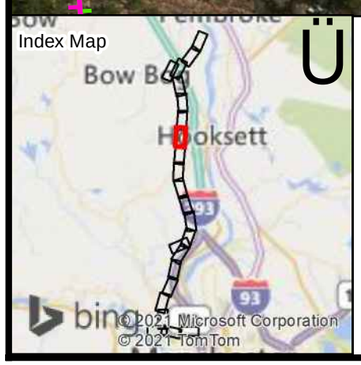
DRAFT

48 49 50 51 52 53 54

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Index Map



Bow — Current Town: **Hooksett** — Manchester

EXISTING STRUCTURE
TRANSMISSION LINE
APPROXIMATE ROW
TOWN BOUNDARY
NHDOT ROADS

WAP 2020 HABITAT TIERS
1 Highest Ranked Habitat in New Hampshire
2 Highest Ranked Habitat in Biological Region
3 Supporting Landscapes

WAP 2020 LAND COVER TYPE
Appalachian Oak-Pine
Developed Impervious
Developed or Barren land
Grassland
Hemlock-Hardwood-Pine
Open Water
Peatland
Pine Barren
Sand/Gravel
Temperate Swamp
Marsh and Shrub Wetland

NOTES:
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0 100 200 400 Feet

D121 TRANSMISSION LINE
OPGW AND STR REPLACEMENT PROJECT

WAP 2020 LAND COVER TYPE
AND HABITAT TIERS
MAY 12, 2021

BOW, HOOKSETT, & MANCHESTER
NEW HAMPSHIRE
PAGE 8 OF 23

Project No.: 04.0190999.38

1 inch = 200 feet

EVERSOURCE ENERGY

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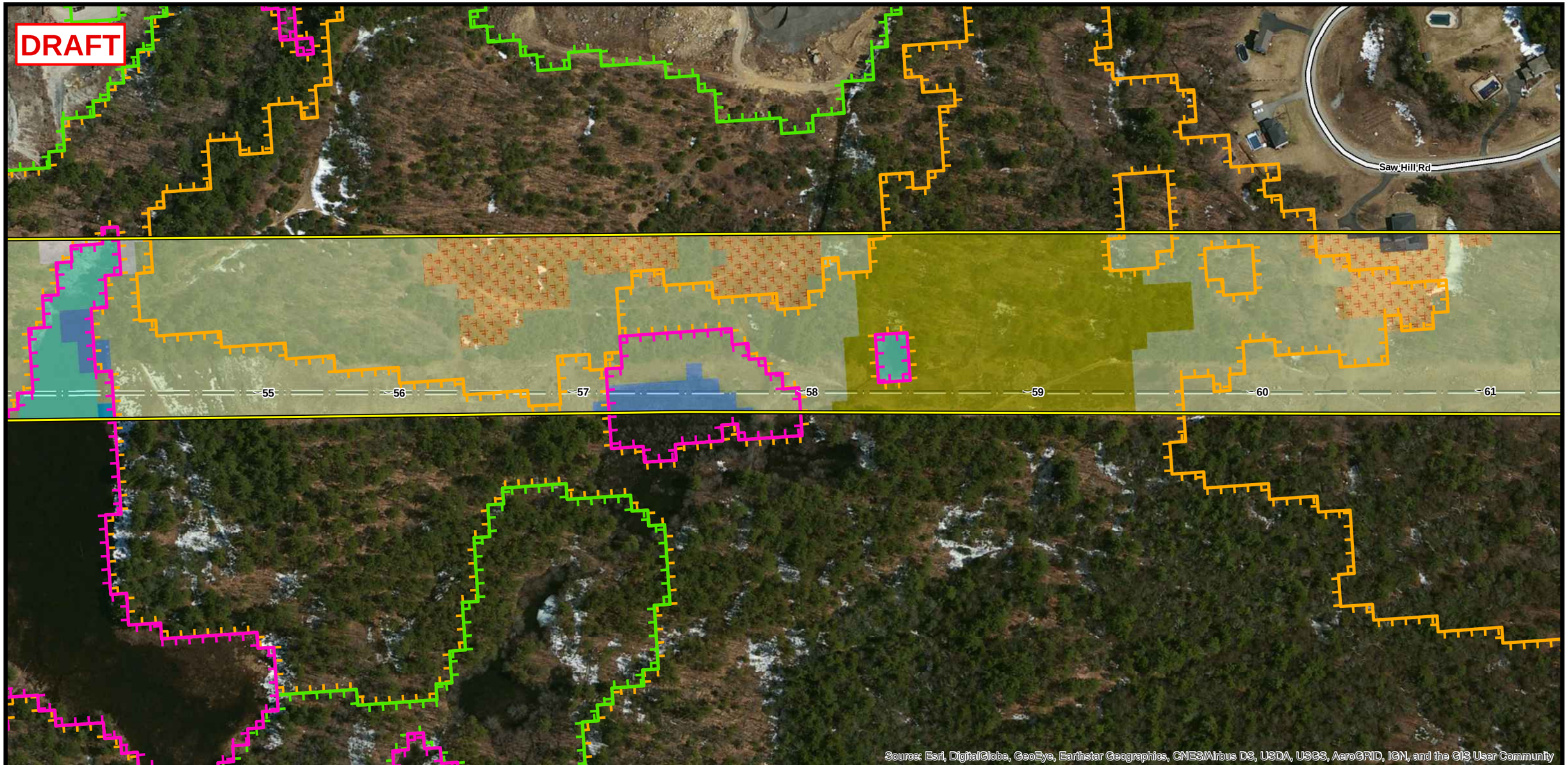

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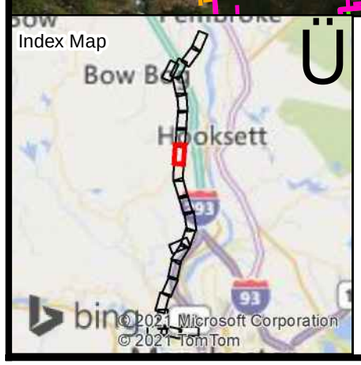

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BOW, HOOKSETT, & MANCHESTER
NEW HAMPSHIRE
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Saw Hill Rd

Cross Rd

Hackett Hill Rd

61 62 63 64 65 66 67 68 69

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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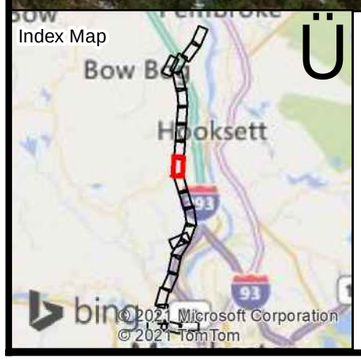

Bow

Current Town: **Hooksett**

Manchester

EXISTING STRUCTURE
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BOW, HOOKSETT, & MANCHESTER
NEW HAMPSHIRE
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POTENTIAL OFF-ROW ACCESS FROM ABUTTING PROPERTY

70 71 72 73 74 75 76

No Name

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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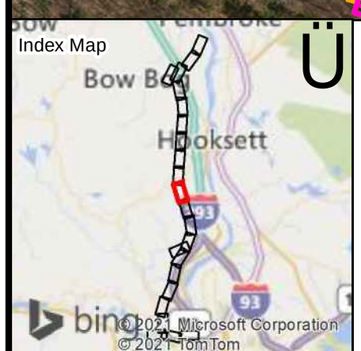

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D121 TRANSMISSION LINE
OPGW AND STR REPLACEMENT PROJECT

WAP 2020 LAND COVER TYPE
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MAY 12, 2021

BOW, HOOKSETT, & MANCHESTER
NEW HAMPSHIRE
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Project No.: 04.0190999.38

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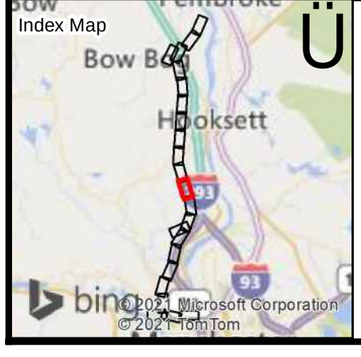

Bow — *Current Town:* ***Hooksett*** — Manchester

- EXISTING STRUCTURE
- TRANSMISSION LINE
- APPROXIMATE ROW
- TOWN BOUNDARY
- NHDOT ROADS

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WAP 2020 LAND COVER TYPE
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MAY 12, 2021

BOW, HOOKSETT, & MANCHESTER
NEW HAMPSHIRE
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Project No.: 04.0190999.38

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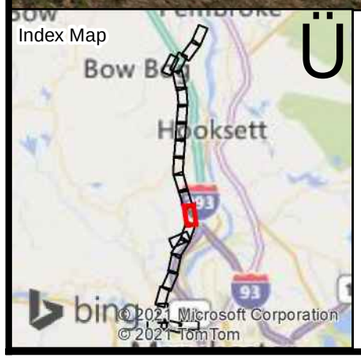

Bow — *Current Town:* ***Hooksett*** — Manchester

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D121 TRANSMISSION LINE
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WAP 2020 LAND COVER TYPE
AND HABITAT TIERS
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BOW, HOOKSETT, & MANCHESTER
NEW HAMPSHIRE
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91 92 93 94 95 96 97 98

Briar Ct

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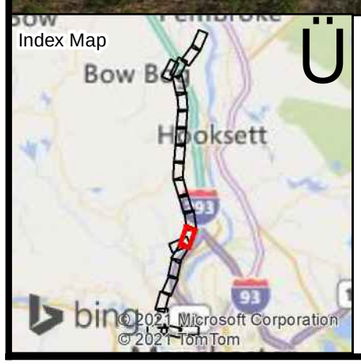

Bow — Current Town: **Hooksett** — Manchester

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D121 TRANSMISSION LINE
OPGW AND STR REPLACEMENT PROJECT

WAP 2020 LAND COVER TYPE
AND HABITAT TIERS
MAY 12, 2021

BOW, HOOKSETT, & MANCHESTER
NEW HAMPSHIRE
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Project No.: 04.0190999.38

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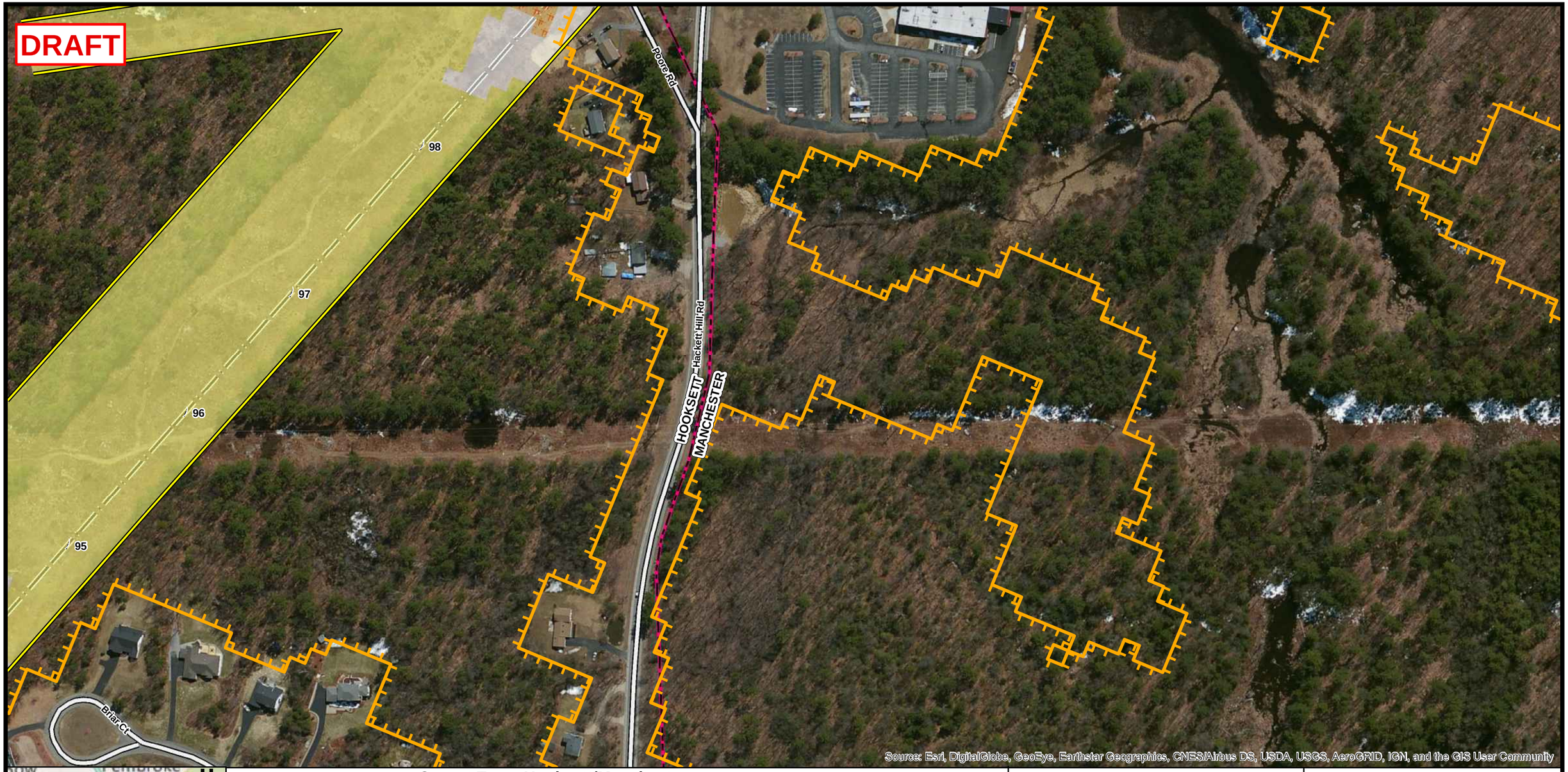

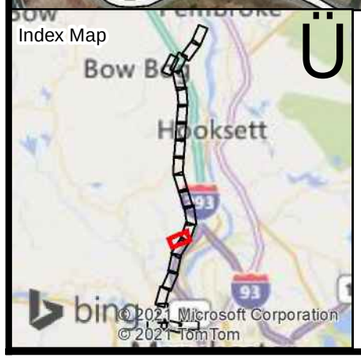

Bow — *Current Town:* ***Hooksett/Manchester*** — *Manchester*

- EXISTING STRUCTURE
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- NHDOT ROADS

WAP 2020 HABITAT TIERS

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BOW, HOOKSETT, & MANCHESTER
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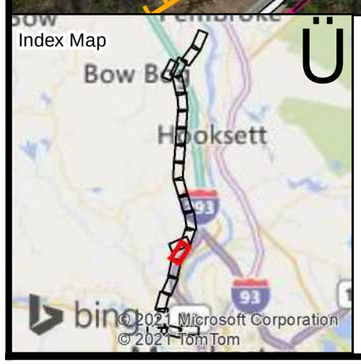

Bow — Current Town: **Hooksett/Manchester** — Manchester

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BOW, HOOKSETT, & MANCHESTER
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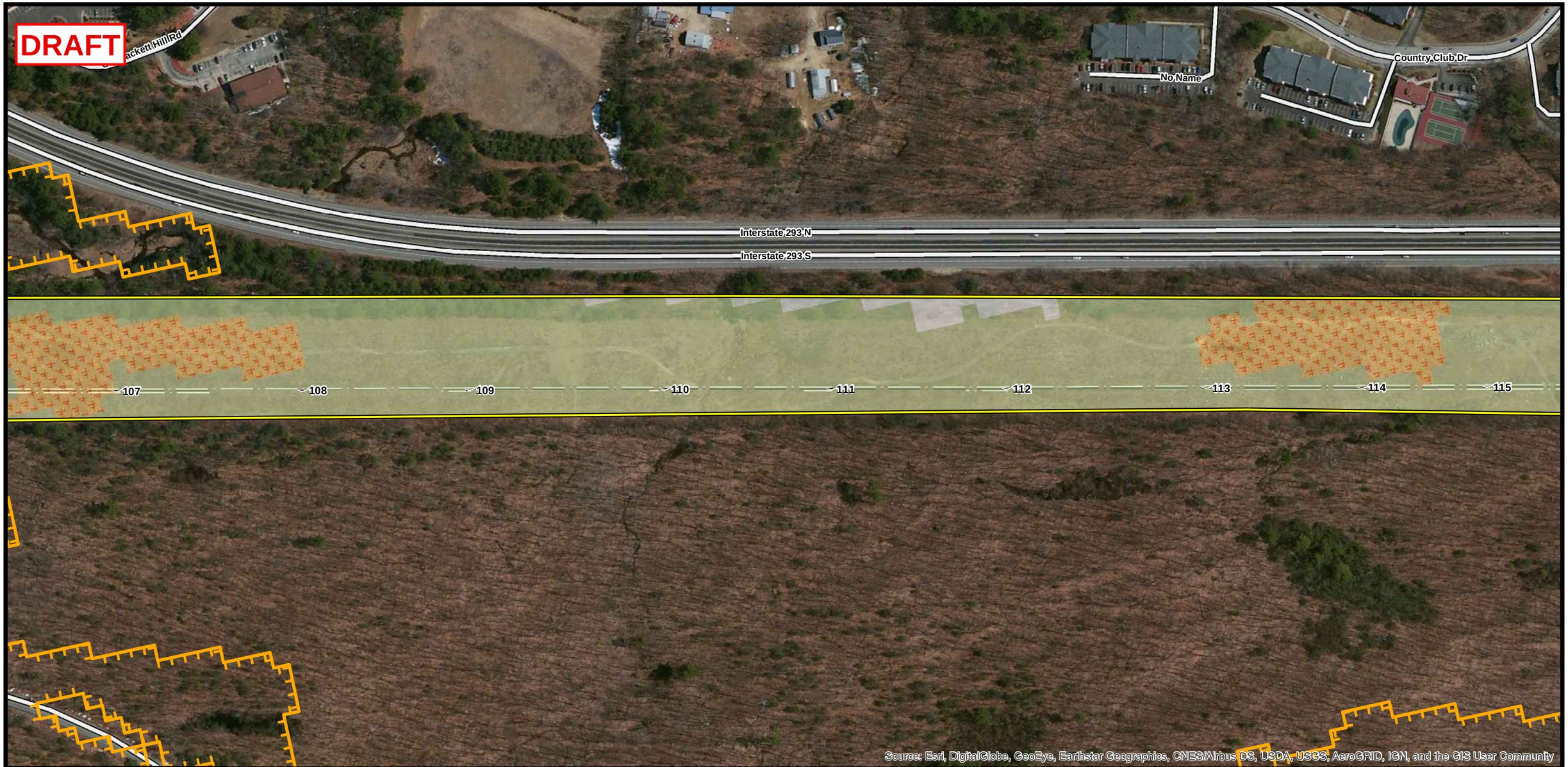

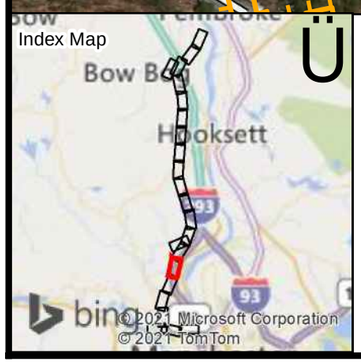

Bow

Current Town: **Manchester**

Manchester

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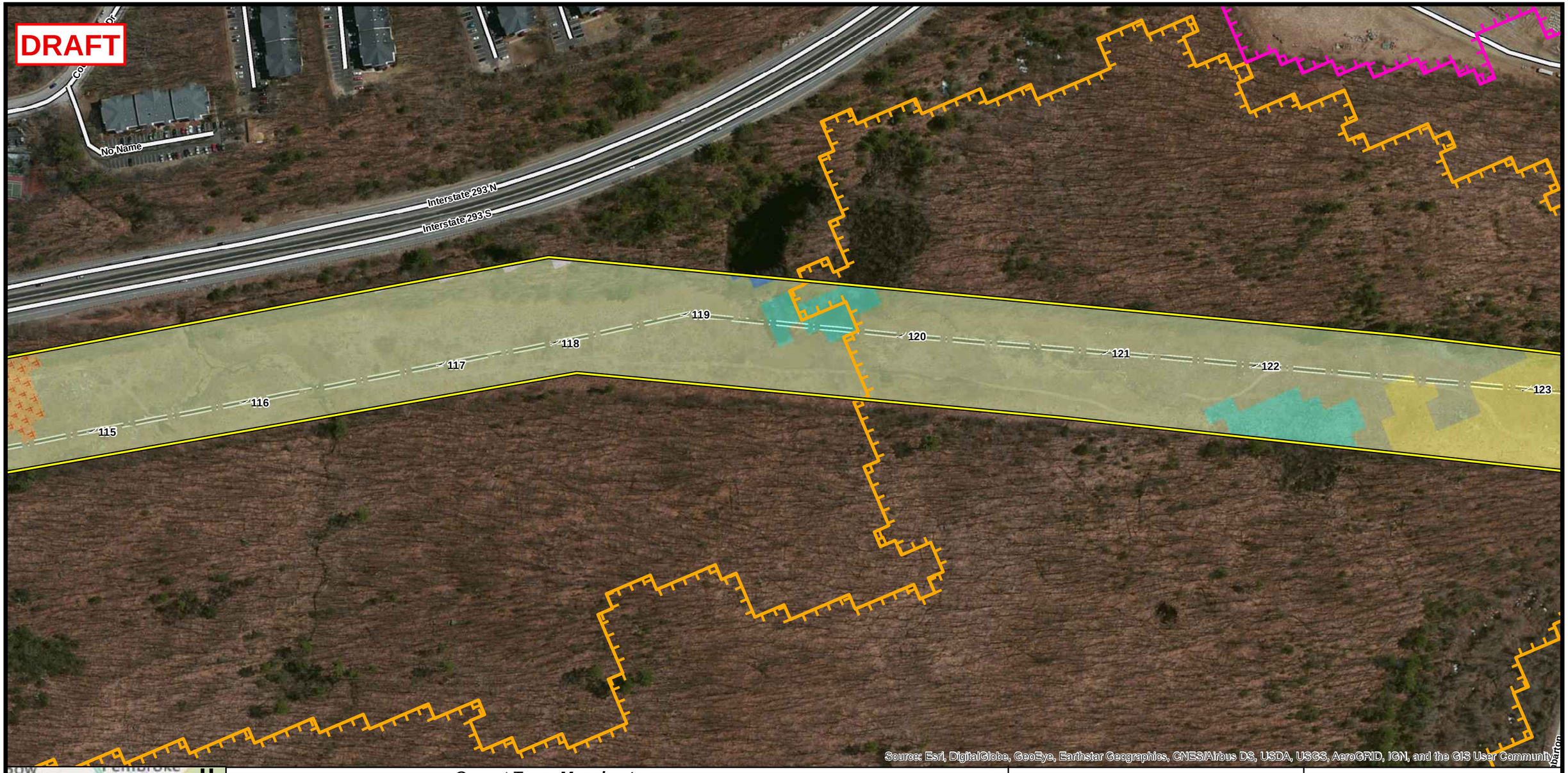

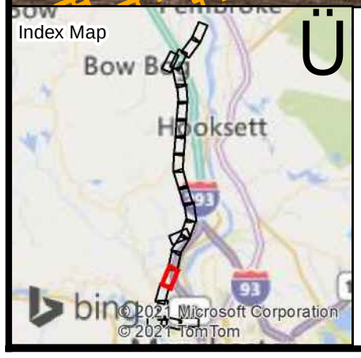

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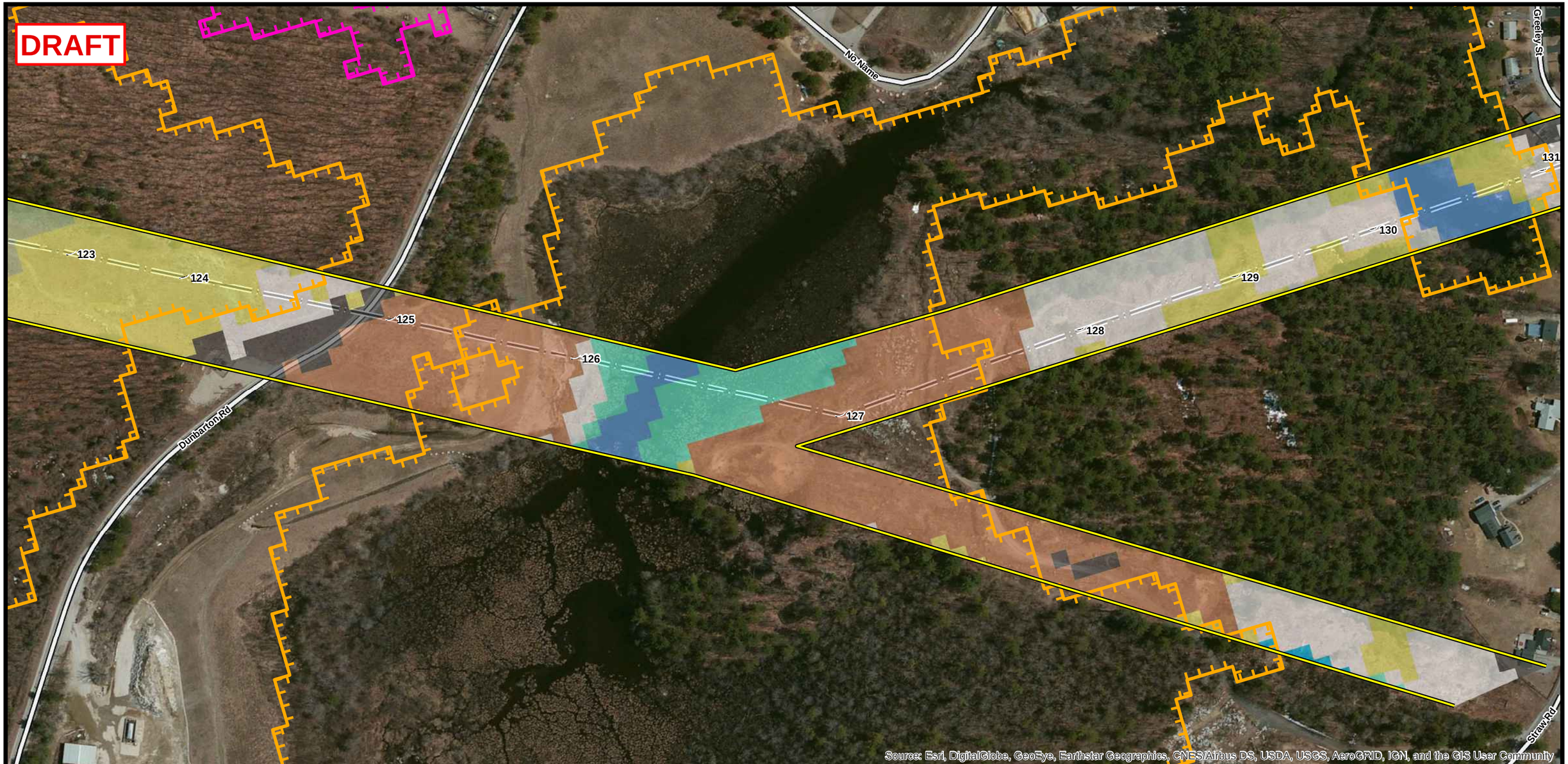

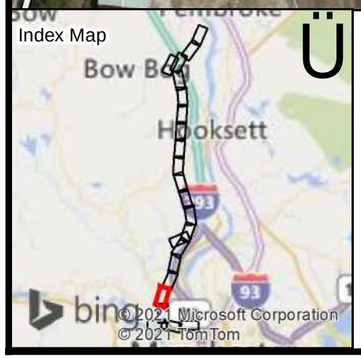

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Current Town: ***Manchester***

WAP 2020 LAND COVER TYPE

Appalachian Oak-Pine
Developed Impervious
Developed or Barren land
Grassland
Hemlock-Hardwood-Pine
Open Water
Peatland
Pine Barren
Sand/Gravel
Temperate Swamp
Marsh and Shrub Wetland

Manchester

NOTES:
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0 100 200 400 Feet

D121 TRANSMISSION LINE
OPGW AND STR REPLACEMENT PROJECT

WAP 2020 LAND COVER TYPE
AND HABITAT TIERS
MAY 12, 2021

BOW, HOOKSETT, & MANCHESTER
NEW HAMPSHIRE
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Project No.: 04.0190999.38

1 inch = 200 feet

EVERSOURCE ENERGY

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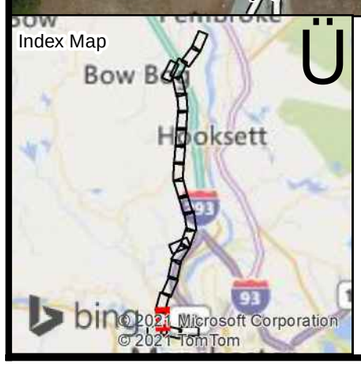

Bow

Current Town: **Manchester**

Manchester

EXISTING STRUCTURE
TRANSMISSION LINE
APPROXIMATE ROW
TOWN BOUNDARY
NHDOT ROADS

WAP 2020 HABITAT TIERS
1 Highest Ranked Habitat in New Hampshire
2 Highest Ranked Habitat in Biological Region
3 Supporting Landscapes

WAP 2020 LAND COVER TYPE
Appalachian Oak-Pine
Developed Impervious
Developed or Barren land
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Open Water
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D121 TRANSMISSION LINE
OPGW AND STR REPLACEMENT PROJECT

WAP 2020 LAND COVER TYPE
AND HABITAT TIERS
MAY 12, 2021

BOW, HOOKSETT, & MANCHESTER
NEW HAMPSHIRE
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Project No.: 04.0190999.38

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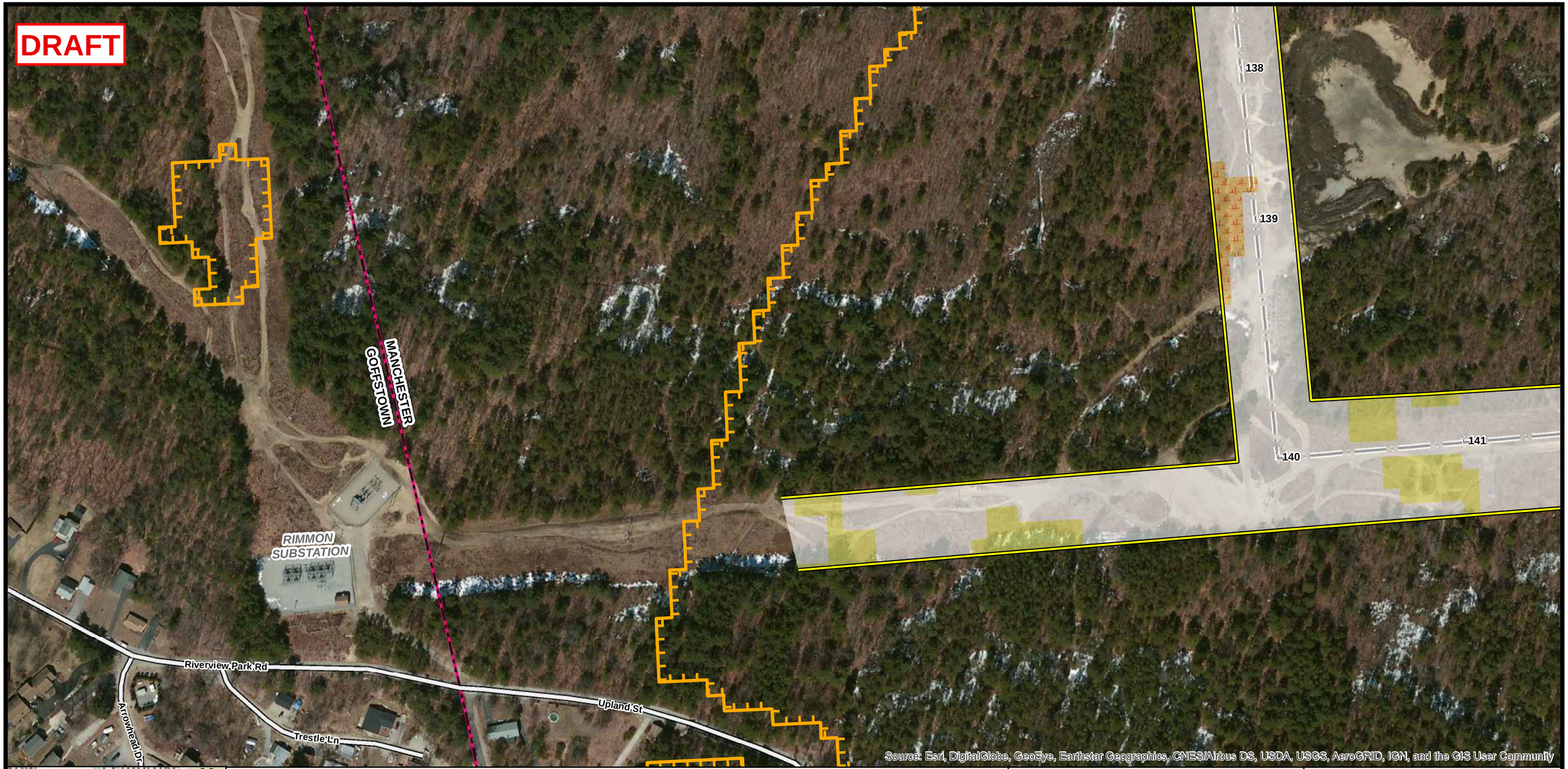

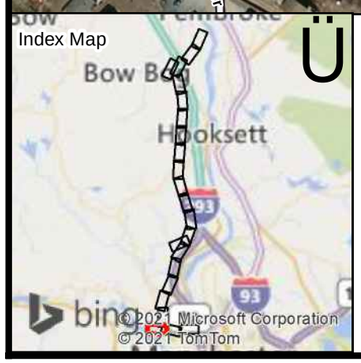

Bow — Current Town: **Manchester** — Manchester

EXISTING STRUCTURE
TRANSMISSION LINE
APPROXIMATE ROW
TOWN BOUNDARY
NHDOT ROADS

WAP 2020 HABITAT TIERS
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2 Highest Ranked Habitat in Biological Region
3 Supporting Landscapes

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OPGW AND STR REPLACEMENT PROJECT

WAP 2020 LAND COVER TYPE
AND HABITAT TIERS
MAY 12, 2021

BOW, HOOKSETT, & MANCHESTER
NEW HAMPSHIRE
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Project No.: 04.0190999.38

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137
138
139
140
141
142
143
144
145
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Goffstown Rd
Greer St
Debloice St

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Index Map

Bow

Current Town: **Manchester**

Manchester

EXISTING STRUCTURE
TRANSMISSION LINE
APPROXIMATE ROW
TOWN BOUNDARY
NHDOT ROADS

WAP 2020 HABITAT TIERS
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2 Highest Ranked Habitat in Biological Region
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D121 TRANSMISSION LINE
OPGW AND STR REPLACEMENT PROJECT

WAP 2020 LAND COVER TYPE
AND HABITAT TIERS
MAY 12, 2021

BOW, HOOKSETT, & MANCHESTER
NEW HAMPSHIRE
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Project No.: 04.0190999.38

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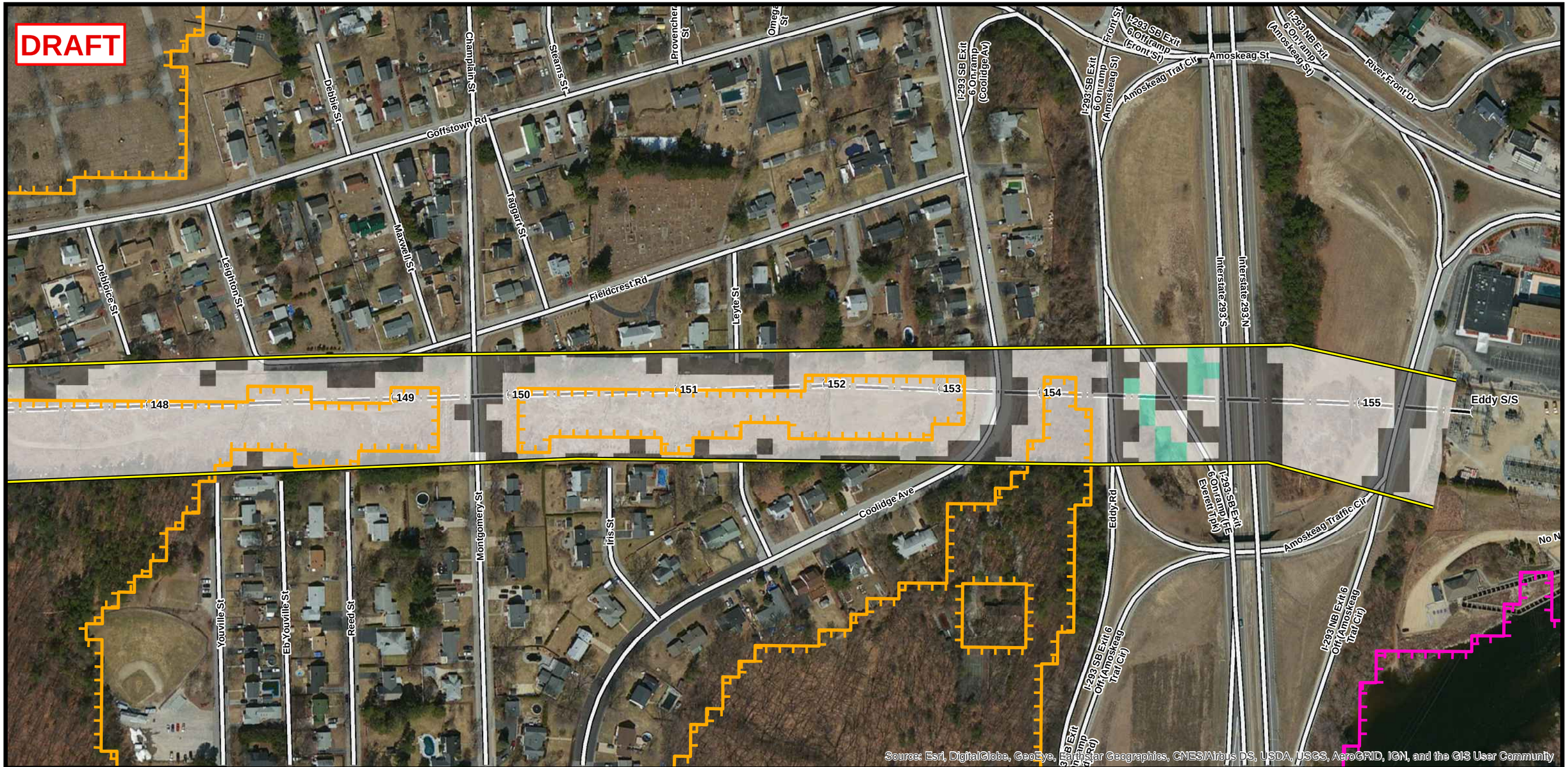

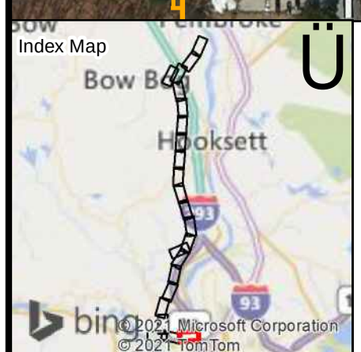

Bow — Current Town: **Manchester** — Manchester

EXISTING STRUCTURE
TRANSMISSION LINE
APPROXIMATE ROW
TOWN BOUNDARY
NHDOT ROADS

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D121 TRANSMISSION LINE
OPGW AND STR REPLACEMENT PROJECT

WAP 2020 LAND COVER TYPE
AND HABITAT TIERS
MAY 12, 2021

BOW, HOOKSETT, & MANCHESTER
NEW HAMPSHIRE
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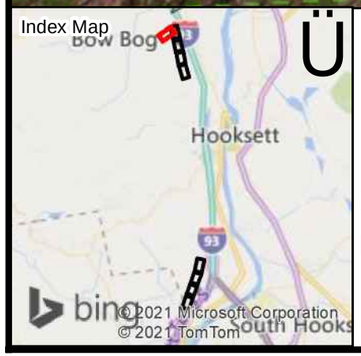

Bow

Current Town: **Bow**

Manchester

- PHOTO POINTS
- EXISTING STRUCTURE
- EXISTING STRUCTURE TO BE REPLACED
- TRANSMISSION LINE
- APPROXIMATE ROW
- AOT DISTURBANCE AREA
- NHDOT ROADS
- TOWN BOUNDARY
- ADJUSTED FLOWLINE
- DELINEATED WETLAND

Land Cover Type

- APPALACHIAN OAK-PINE
- DEVELOPED
- MARSH/SHRUB WETLAND
- PEATLAND
- SHRUBLAND
- STREAM
- TEMPERATE SWAMP
- VERNAL POOL

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0 50 100 200 Feet

D121 TRANSMISSION LINE
OPGW AND STR REPLACEMENT PROJECT

ALTERATION OF TERRAIN
LAND COVER TYPE PLANS
MAY 10, 2021

BOW AND HOOKSETT
NEW HAMPSHIRE
PAGE 1 OF 9

Project No.: 04.0190999.38

1 inch = 100 feet

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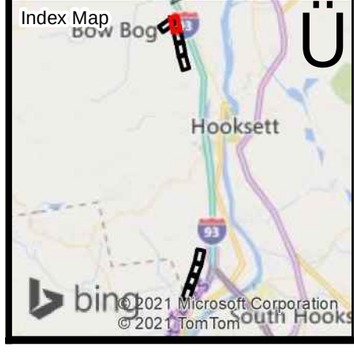

Bow

Current Town: **Bow**

Manchester

PHOTO POINTS
EXISTING STRUCTURE
EXISTING STRUCTURE TO BE REPLACED
TRANSMISSION LINE
APPROXIMATE ROW
AOT DISTURBANCE AREA
NHDOT ROADS
TOWN BOUNDARY
ADJUSTED FLOWLINE
DELINEATED WETLAND

Land Cover Type

APPALACHIAN OAK-PINE
DEVELOPED
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D121 TRANSMISSION LINE
OPGW AND STR REPLACEMENT PROJECT

ALTERATION OF TERRAIN
LAND COVER TYPE PLANS
MAY 10, 2021

BOW AND HOOKSETT
NEW HAMPSHIRE
PAGE 2 OF 9

Project No.: 04.0190999.38

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EVERSOURCE ENERGY

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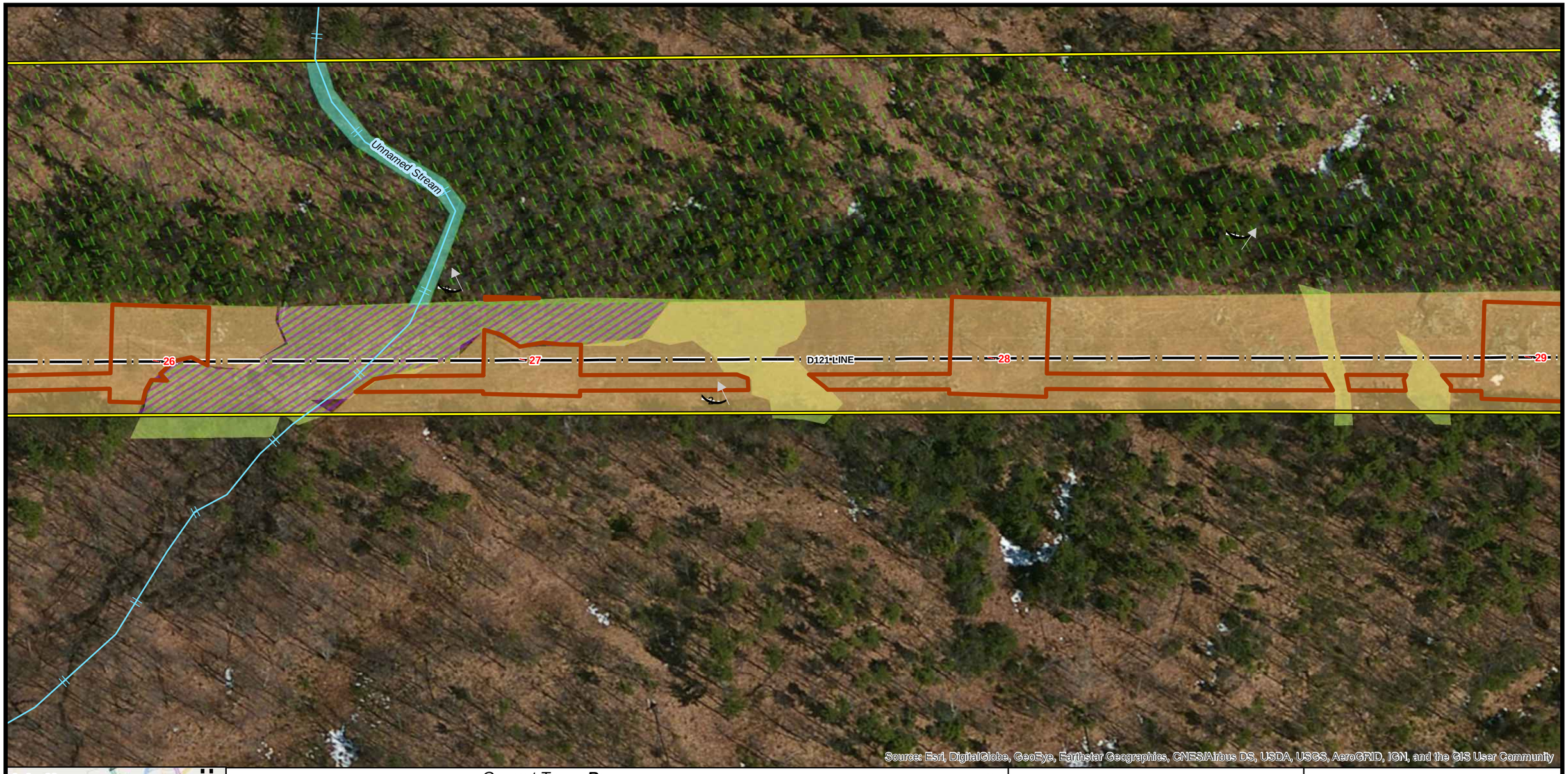
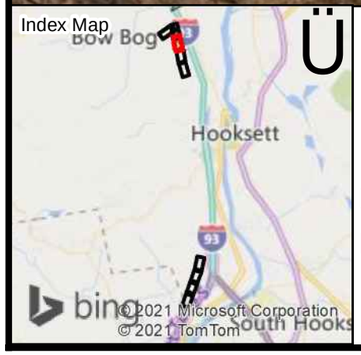


Index Map



Bow

- PHOTO POINTS
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- EXISTING STRUCTURE TO BE REPLACED
- TRANSMISSION LINE
- APPROXIMATE ROW
- AOT DISTURBANCE AREA
- NHDOT ROADS
- TOWN BOUNDARY
- ADJUSTED FLOWLINE
- DELINEATED WETLAND

Current Town: ***Bow***

Land Cover Type

- APPALACHIAN OAK-PINE
- DEVELOPED
- MARSH/SHRUB WETLAND
- PEATLAND
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- TEMPERATE SWAMP
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Manchester

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D121 TRANSMISSION LINE
OPGW AND STR REPLACEMENT PROJECT

ALTERATION OF TERRAIN
LAND COVER TYPE PLANS
MAY 10, 2021

BOW AND HOOKSETT
NEW HAMPSHIRE
PAGE 3 OF 9

Project No.: 04.0190999.38

1 inch = 100 feet

EVERSOURCE ENERGY

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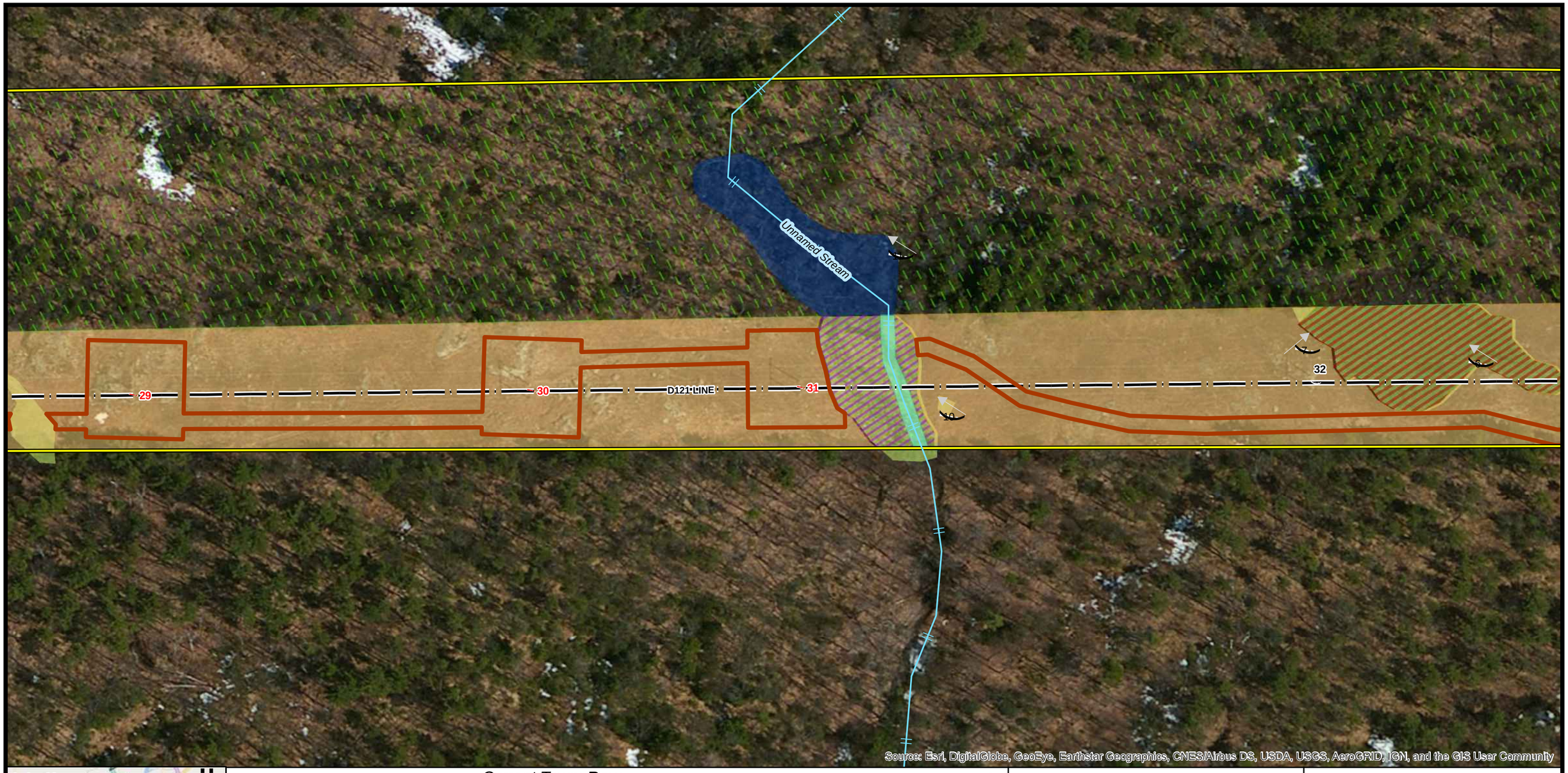

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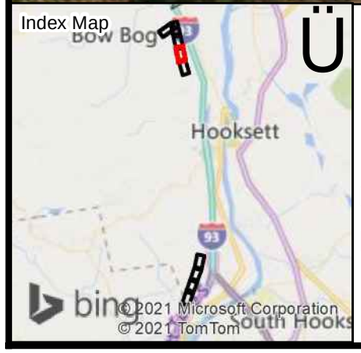

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Current Town: ***Bow***

Land Cover Type

- APPALACHIAN OAK-PINE
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OPGW AND STR REPLACEMENT PROJECT

ALTERATION OF TERRAIN
LAND COVER TYPE PLANS
MAY 10, 2021

BOW AND HOOKSETT
NEW HAMPSHIRE
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Project No.: 04.0190999.38

1 inch = 100 feet

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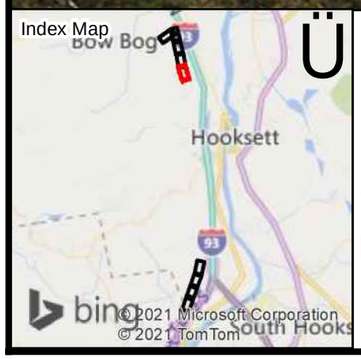

Bow

Current Town: ***Bow***

Manchester

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- EXISTING STRUCTURE TO BE REPLACED
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Land Cover Type

- APPALACHIAN OAK-PINE
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OPGW AND STR REPLACEMENT PROJECT

ALTERATION OF TERRAIN
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MAY 10, 2021

BOW AND HOOKSETT
NEW HAMPSHIRE
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Project No.: 04.0190999.38

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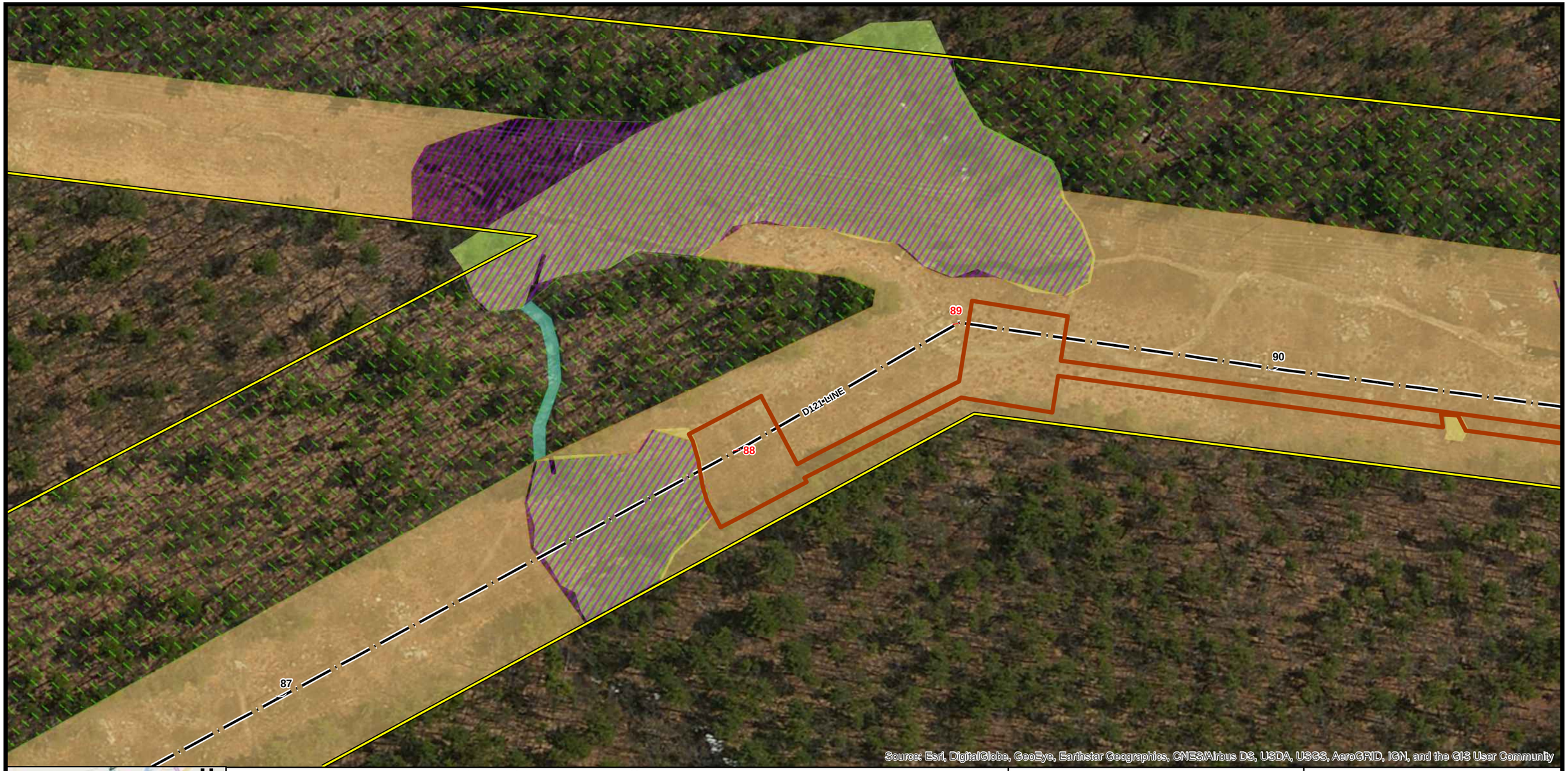

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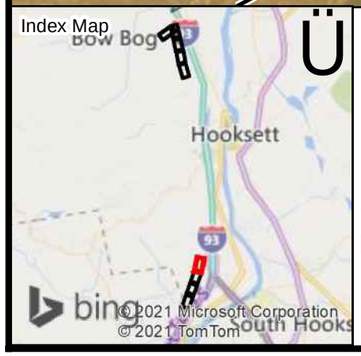

Bow

Current Town: ***Hooksett***

Manchester

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- APPROXIMATE ROW
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- NHDOT ROADS
- TOWN BOUNDARY
- ADJUSTED FLOWLINE
- DELINEATED WETLAND

Land Cover Type

- APPALACHIAN OAK-PINE
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D121 TRANSMISSION LINE
OPGW AND STR REPLACEMENT PROJECT

ALTERATION OF TERRAIN
LAND COVER TYPE PLANS
MAY 10, 2021

BOW AND HOOKSETT
NEW HAMPSHIRE
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Project No.: 04.0190999.38

1 inch = 100 feet

EVERSOURCE ENERGY

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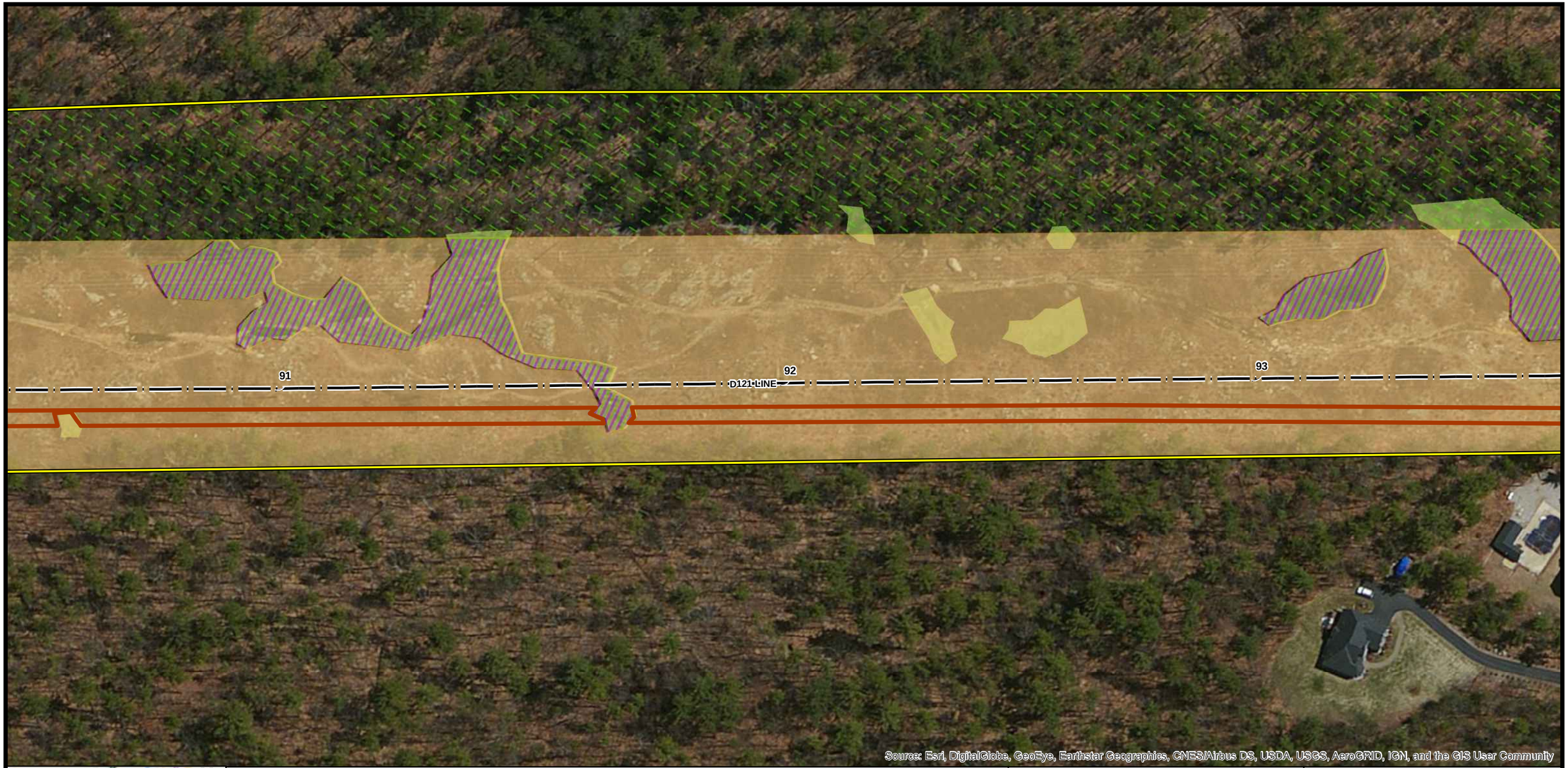

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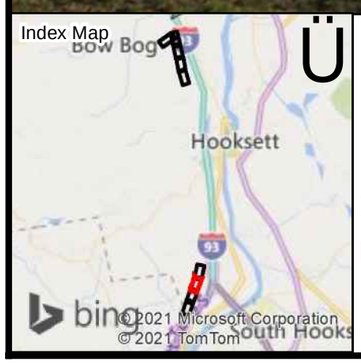

Bow

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Current Town: ***Hooksett***

Land Cover Type

- APPALACHIAN OAK-PINE
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0 50 100 200 Feet

D121 TRANSMISSION LINE
OPGW AND STR REPLACEMENT PROJECT

ALTERATION OF TERRAIN
LAND COVER TYPE PLANS
MAY 10, 2021

BOW AND HOOKSETT
NEW HAMPSHIRE
PAGE 7 OF 9

Project No.: 04.0190999.38

1 inch = 100 feet

EVERSOURCE ENERGY

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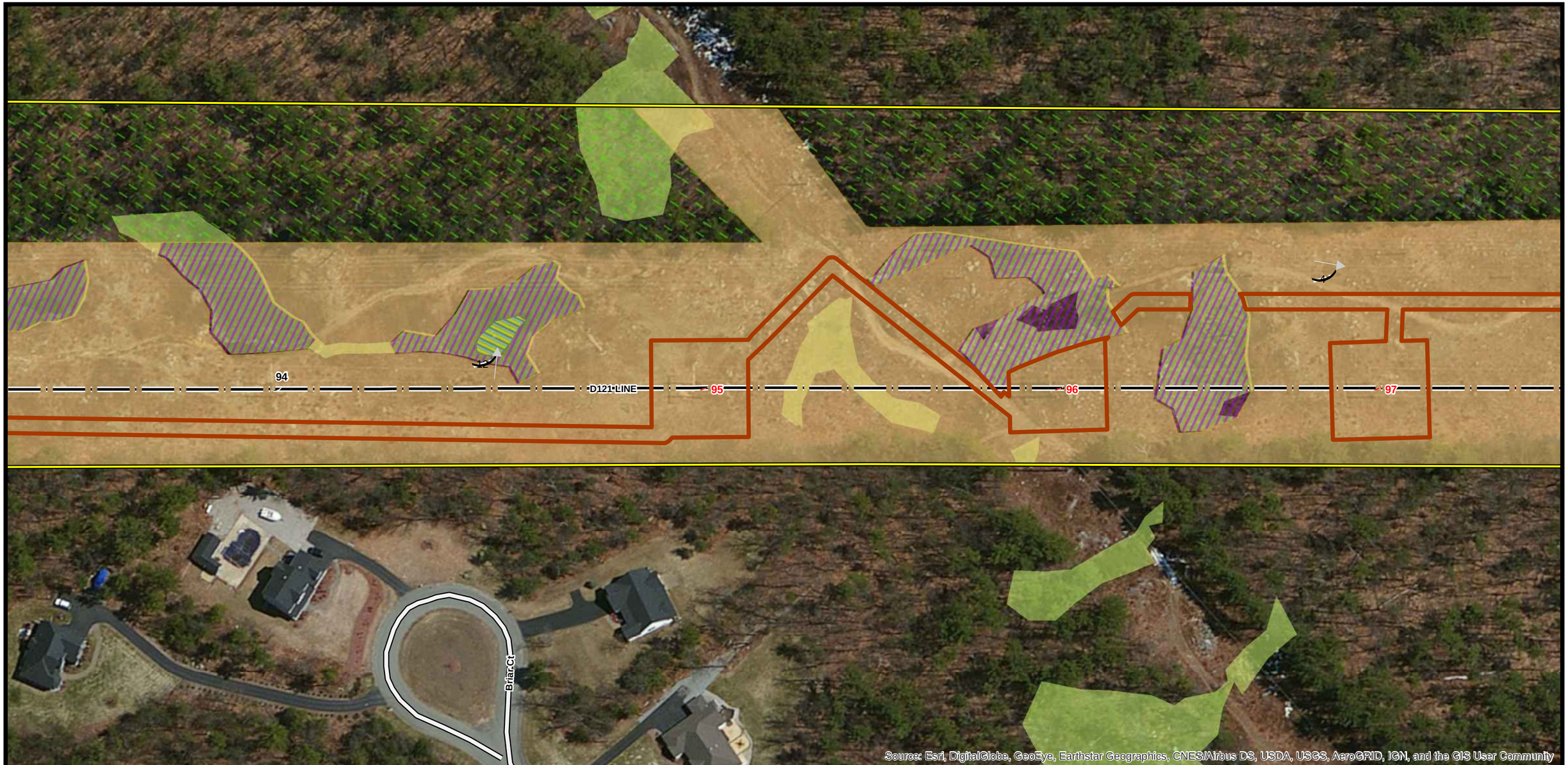
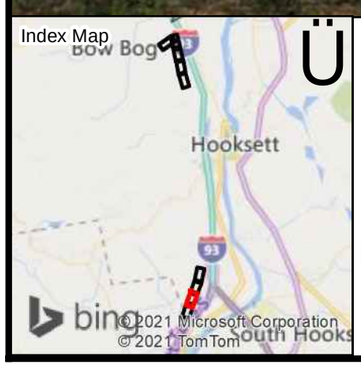


Index Map



Bow

- PHOTO POINTS
- EXISTING STRUCTURE
- EXISTING STRUCTURE TO BE REPLACED
- TRANSMISSION LINE
- APPROXIMATE ROW
- AOT DISTURBANCE AREA
- NHDOT ROADS
- TOWN BOUNDARY
- ADJUSTED FLOWLINE
- DELINEATED WETLAND

Current Town: ***Hooksett***

Land Cover Type

- APPALACHIAN OAK-PINE
- DEVELOPED
- MARSH/SHRUB WETLAND
- PEATLAND
- SHRUBLAND
- STREAM
- TEMPERATE SWAMP
- VERNAL POOL

Manchester

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OPGW AND STR REPLACEMENT PROJECT

ALTERATION OF TERRAIN
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MAY 10, 2021

BOW AND HOOKSETT
NEW HAMPSHIRE
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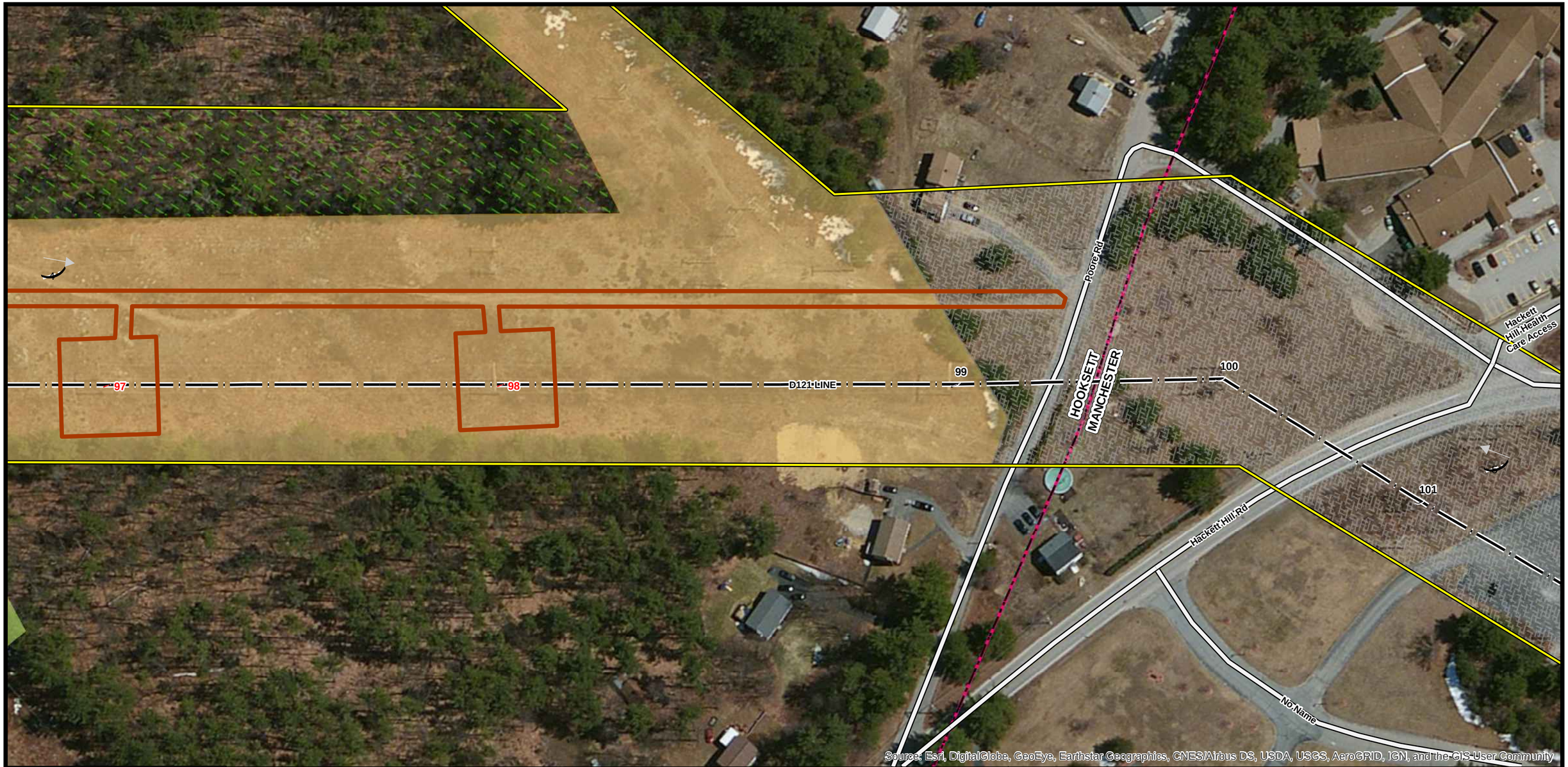

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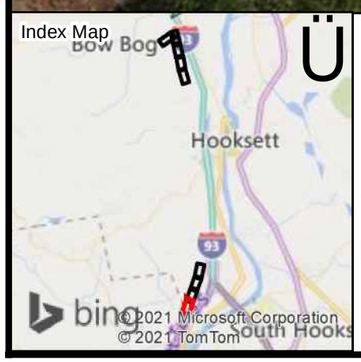

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ALTERATION OF TERRAIN
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MAY 10, 2021

BOW AND HOOKSETT
NEW HAMPSHIRE
PAGE 9 OF 9

Project No.: 04.0190999.38

1 inch = 100 feet

EVERSOURCE ENERGY

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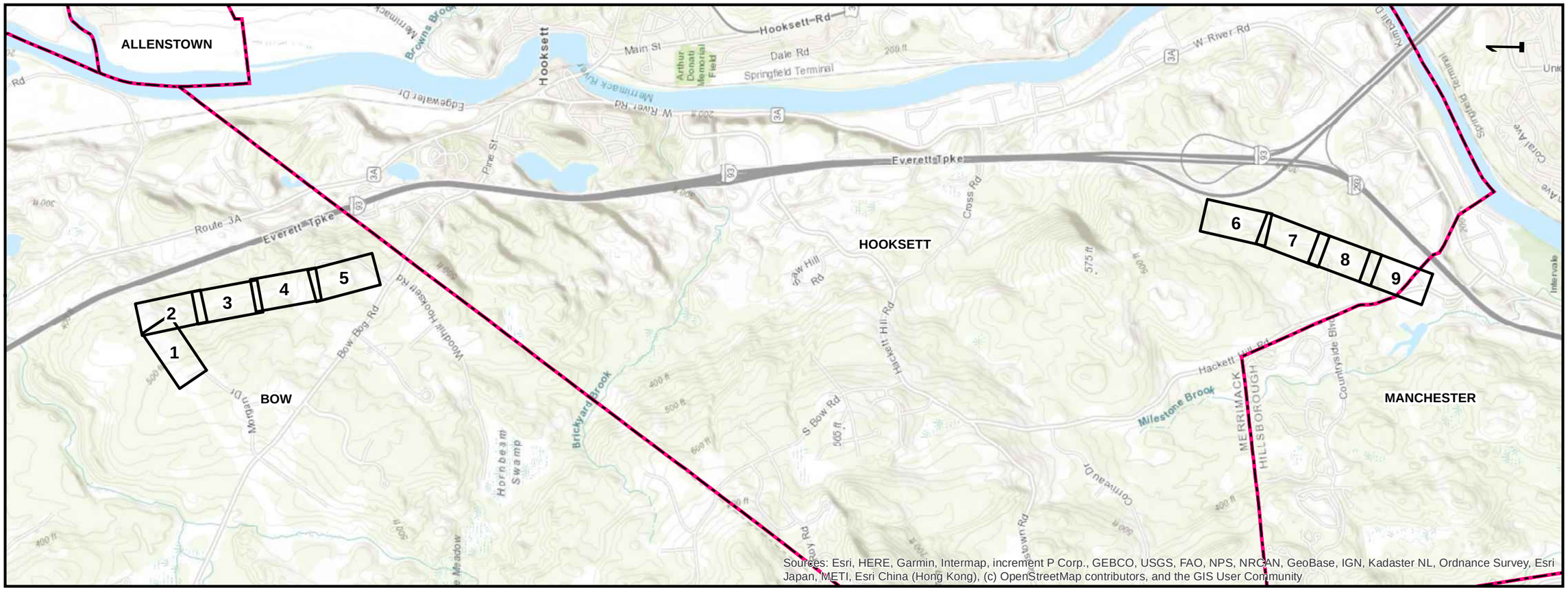
D121 TRANSMISSION LINE OPGW AND STRUCTURE REPLACEMENT PROJECT

ALTERATION OF TERRAIN PERMITTING PLANS

BOW AND HOOKSETT
NEW HAMPSHIRE
3/31/2021



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INDEX OF FIGURES

1 inch = 2,500 feet

T1: TITLE SHEET
1-9: MAP SHEETS
S1: NOTES
S2: DETAILS
S3: DETAILS (CONTINUED)

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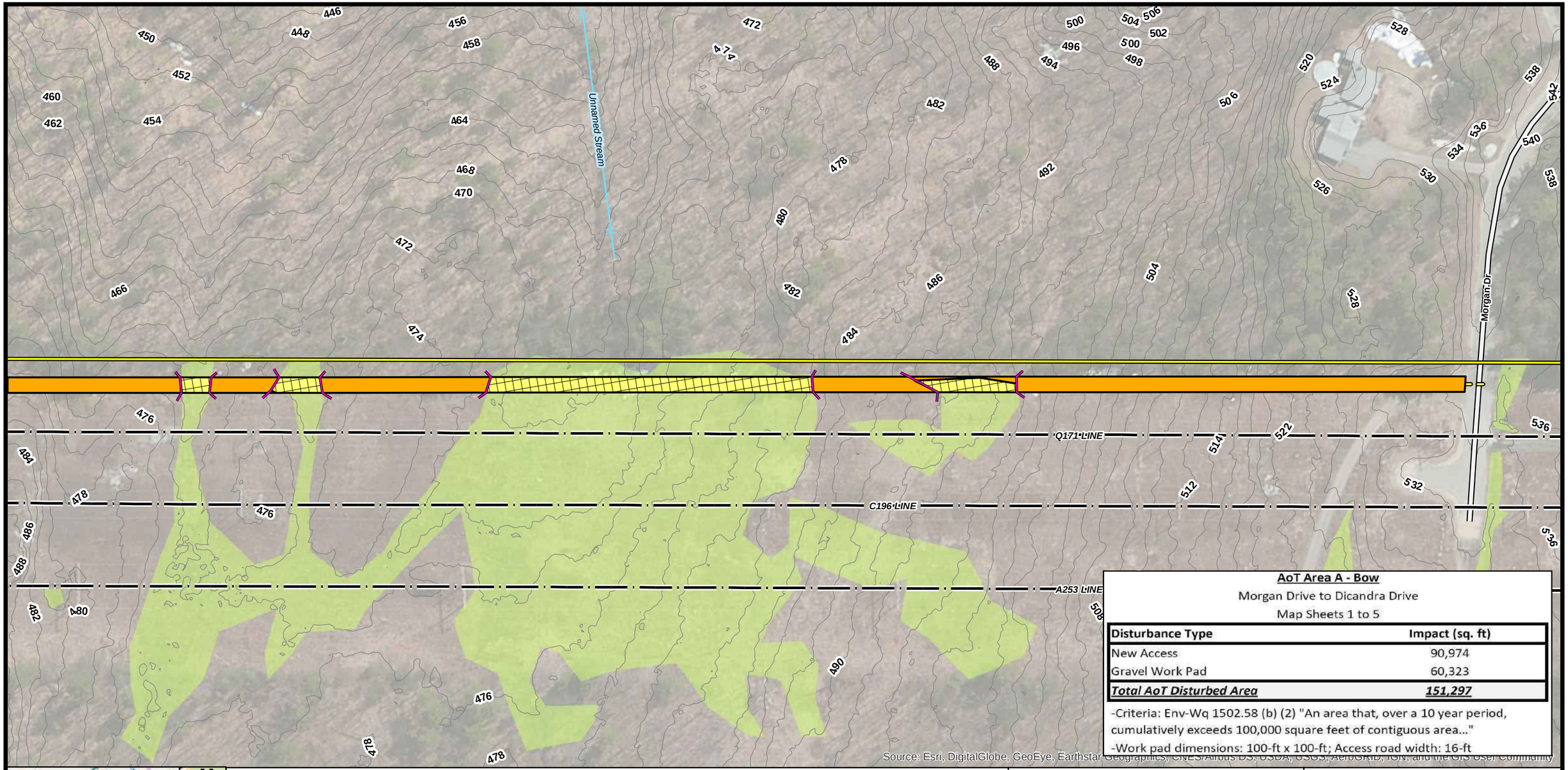

AoT Area A - Bow

Morgan Drive to Dicandra Drive

Map Sheets 1 to 5

Disturbance Type	Impact (sq. ft)
New Access	90,974
Gravel Work Pad	60,323
Total AoT Disturbed Area	***151,297***

-Criteria: Env-Wq 1502.58 (b) (2) "An area that, over a 10 year period, cumulatively exceeds 100,000 square feet of contiguous area..."

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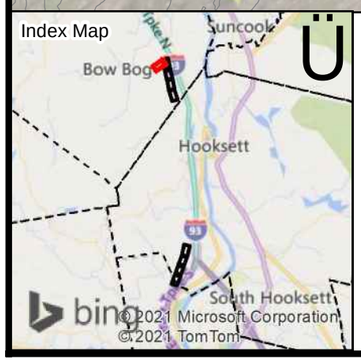

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Current Town: ***Bow***

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D121 TRANSMISSION LINE
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APRIL 08, 2021

BOW AND HOOKSETT
NEW HAMPSHIRE
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Project No.: 04.0190999.38

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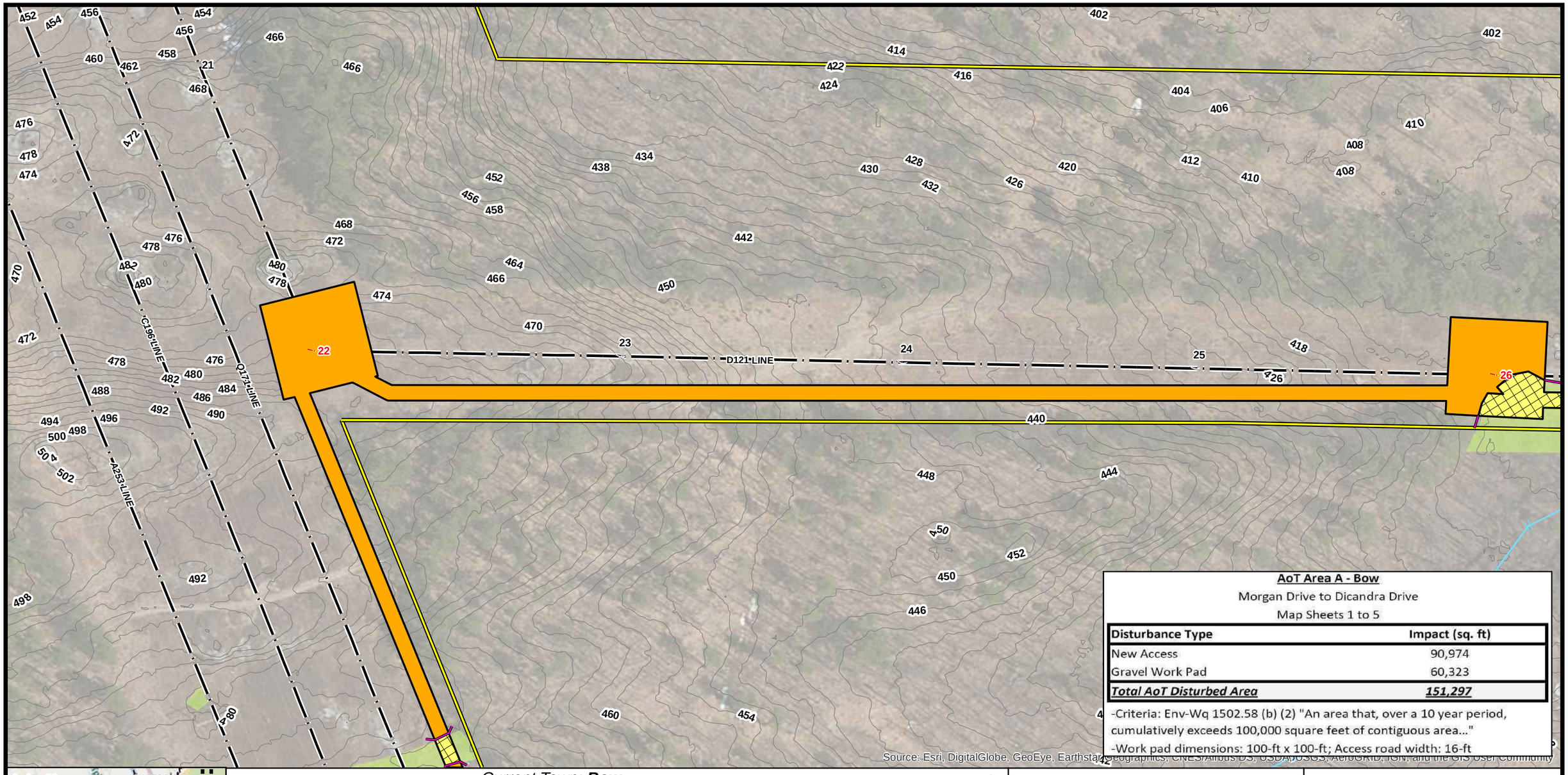

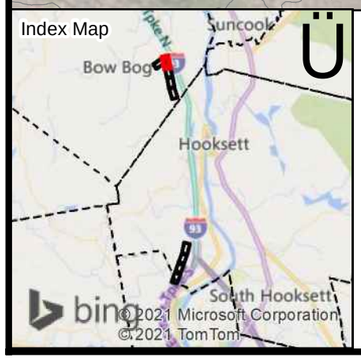

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BOW AND HOOKSETT
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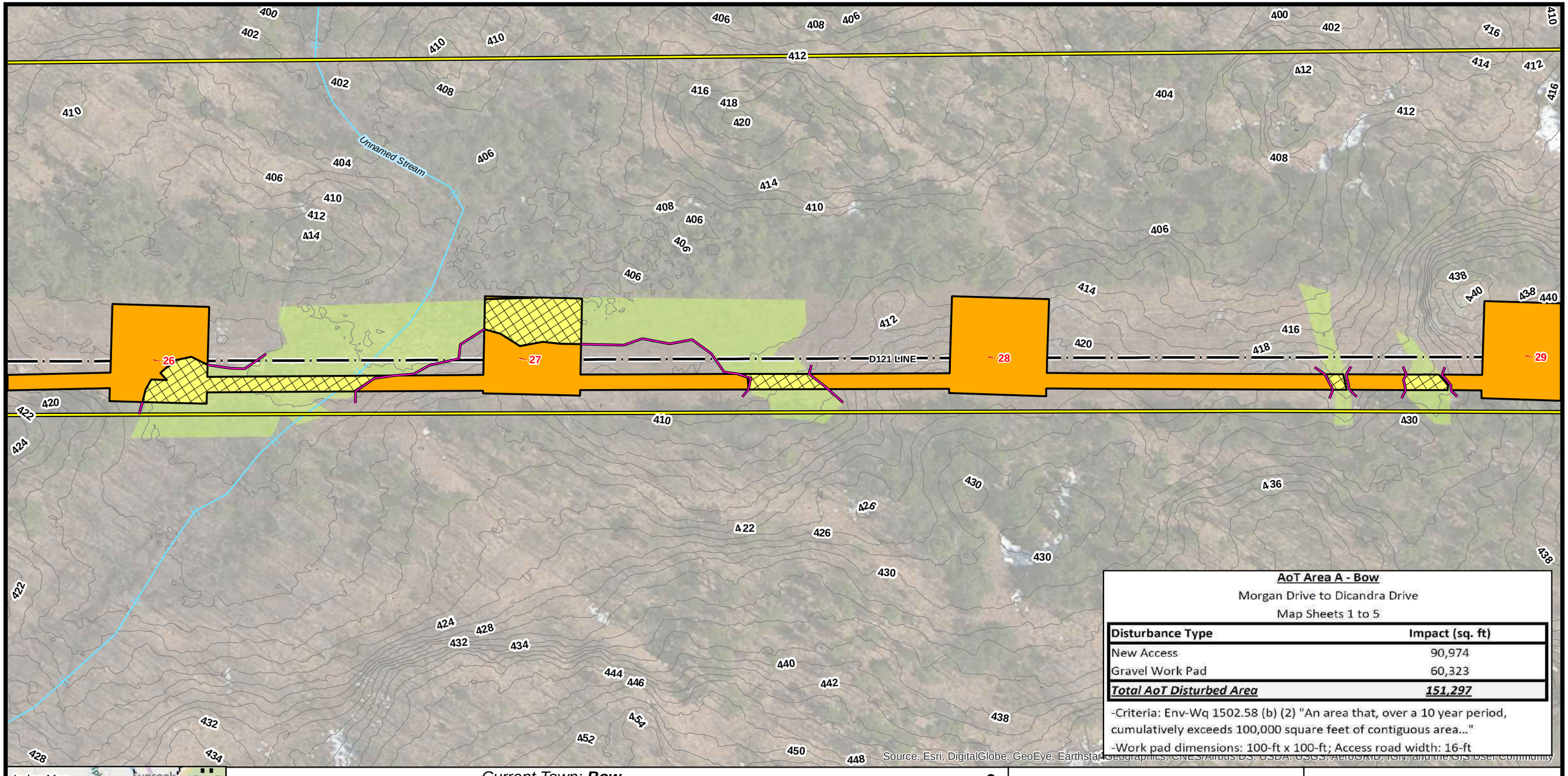

AoT Area A - Bow

Morgan Drive to Dicandra Drive

Map Sheets 1 to 5

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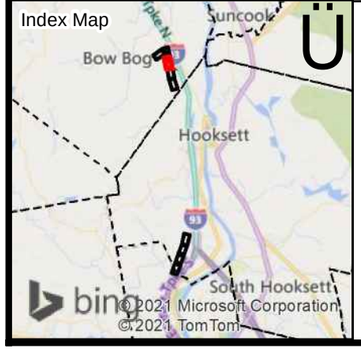
Index Map



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*Current Town: **Bow***

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OPGW AND STR REPLACEMENT PROJECT

ALTERATION OF TERRAIN
PERMITTING PLANS
APRIL 08, 2021

BOW AND HOOKSETT
NEW HAMPSHIRE
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Project No.: 04.0190999.38

1 inch = 100 feet

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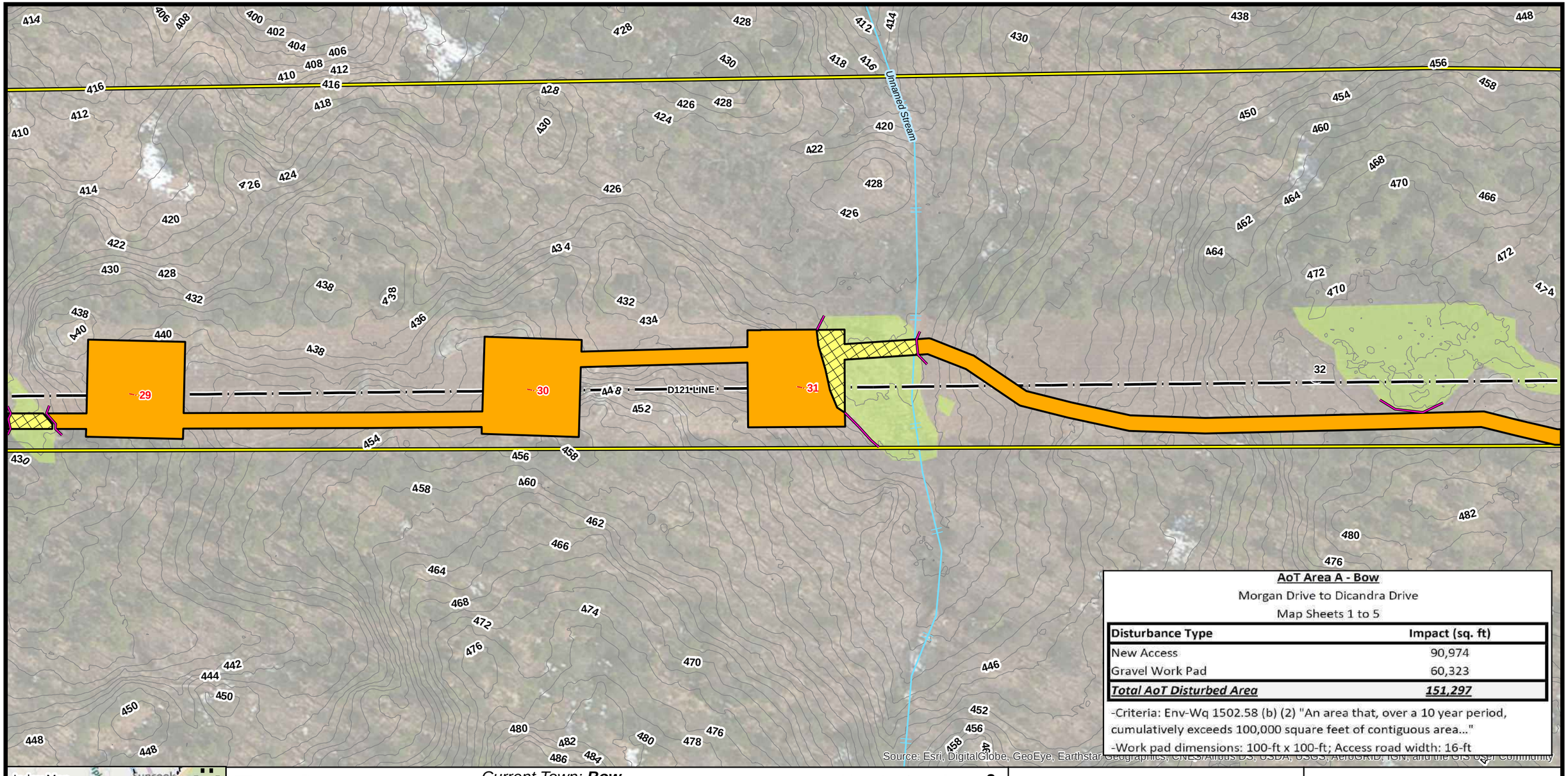

AoT Area A - Bow

Morgan Drive to Dicandra Drive

Map Sheets 1 to 5

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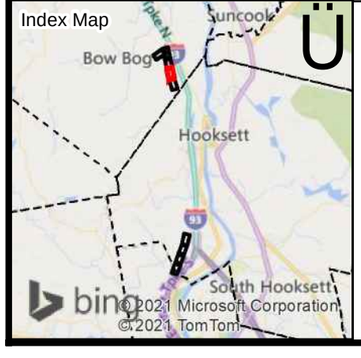

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OPGW AND STR REPLACEMENT PROJECT

ALTERATION OF TERRAIN
PERMITTING PLANS
APRIL 08, 2021

BOW AND HOOKSETT
NEW HAMPSHIRE
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Project No.: 04.0190999.38

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D121-LINE

Dicandra Dr

AoT Area A - Bow

Morgan Drive to Dicandra Drive

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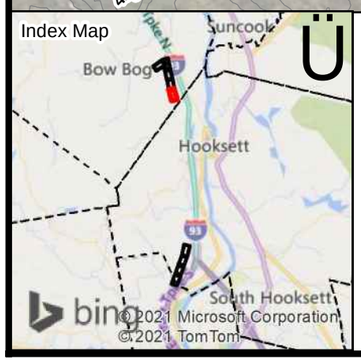

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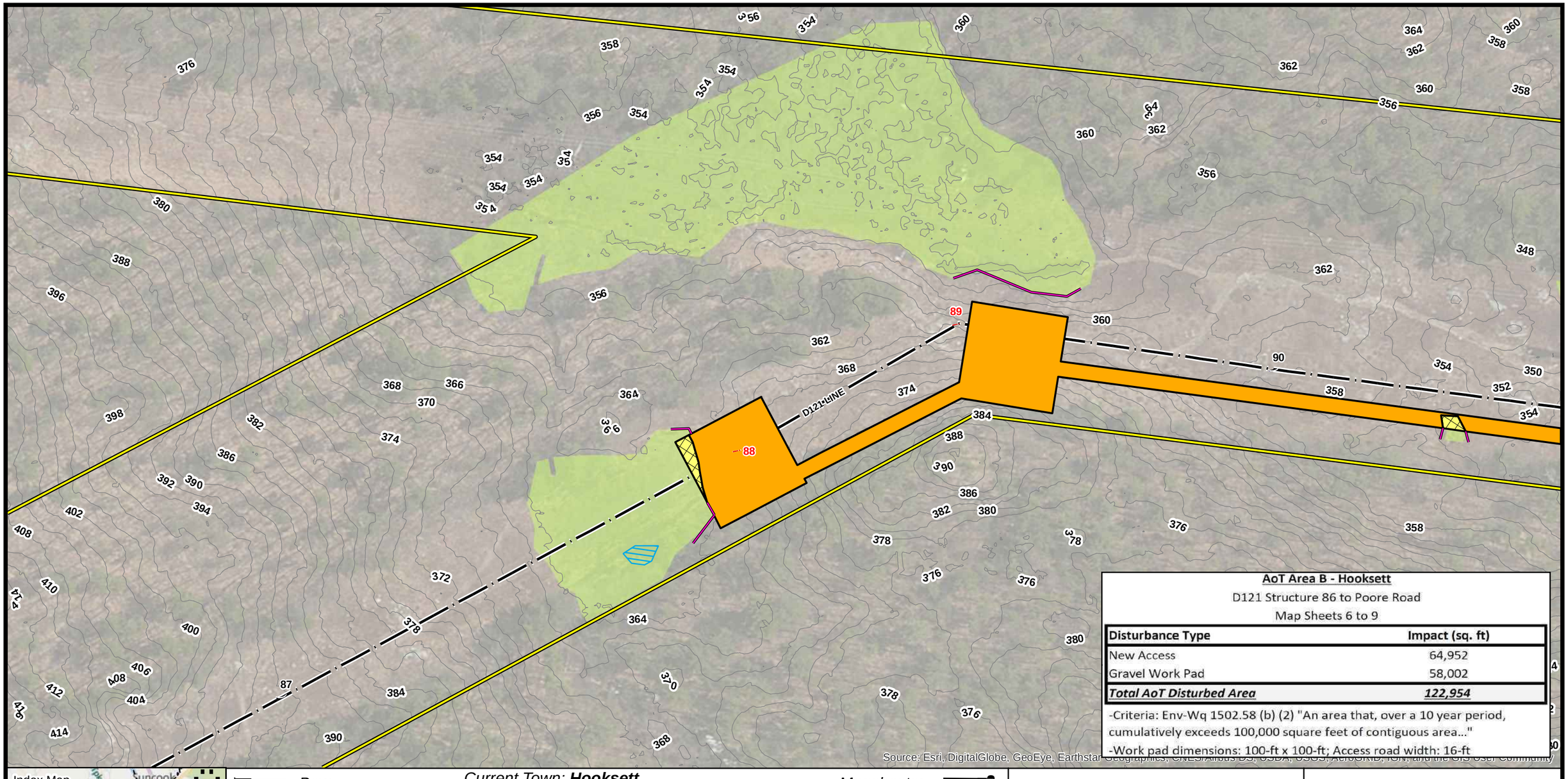


AoT Area B - Hooksett

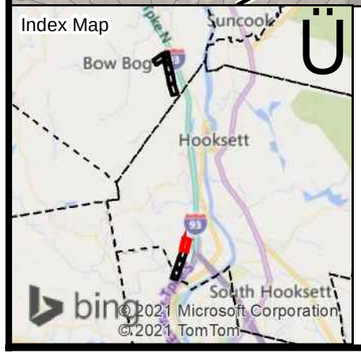
D121 Structure 86 to Poore Road

Map Sheets 6 to 9

Disturbance Type	Impact (sq. ft)
New Access	64,952
Gravel Work Pad	58,002
Total AoT Disturbed Area	***122,954***

-Criteria: Env-Wq 1502.58 (b) (2) "An area that, over a 10 year period, cumulatively exceeds 100,000 square feet of contiguous area..."

-Work pad dimensions: 100-ft x 100-ft; Access road width: 16-ft



Bow

Current Town: **Hooksett**

Manchester

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BOW AND HOOKSETT
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PAGE 6 OF 9

Project No.: 04.0190999.38

1 inch = 100 feet

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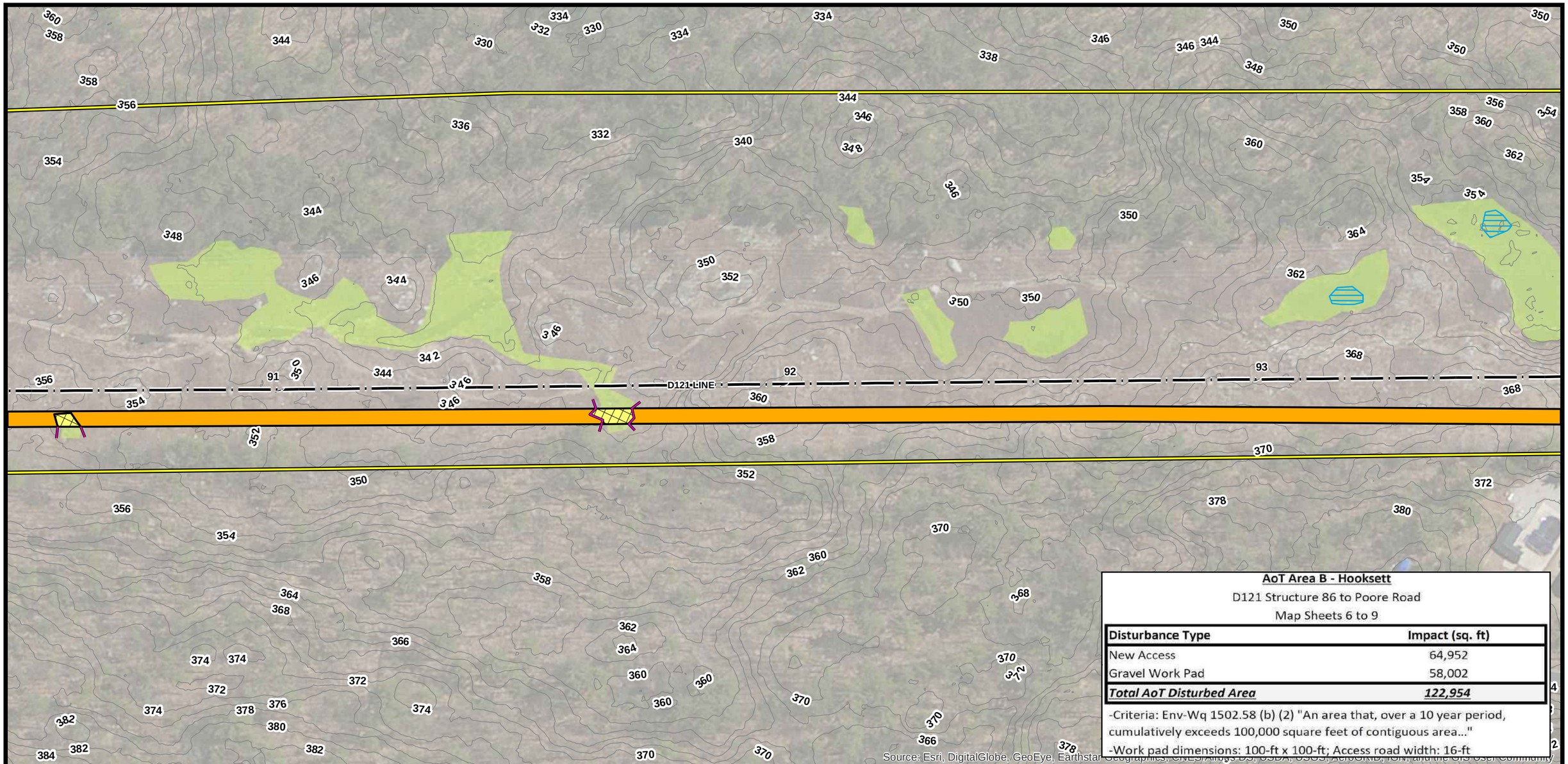

AoT Area B - Hooksett

D121 Structure 86 to Poore Road

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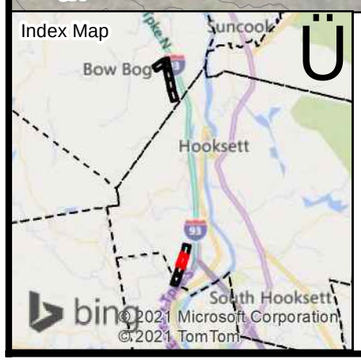

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2. TRANSMISSION LINE AND TRANSMISSION STRUCTURES WERE PROVIDED BY EVERSOURCE ENERGY.
3. RAILROAD, NHDOT ROADS, NHD FLOWLINES, PARCEL BOUNDARIES AND TOWN BOUNDARY WERE OBTAINED FROM NH GRANIT CLEARINGHOUSE.
4. APPROXIMATE ROW WAS GENERATED USING MILESHEETS PROVIDED BY EVERSOURCE ENERGY.
5. WETLAND DATA WAS PROVIDED BY EVERSOURCE.
6. 2FT ELEVATION CONTOURS WERE GENERATED USING LIDAR DATA OBTAINED FROM NH GRANIT CLEARINGHOUSE.
7. WETLAND DELINEATION OCCURRED PREDOMINANTLY IN THE MAINTAINED ROW.

0 50 100 200 Feet

D121 TRANSMISSION LINE
OPGW AND STR REPLACEMENT PROJECT

ALTERATION OF TERRAIN
PERMITTING PLANS
APRIL 08, 2021

BOW AND HOOKSETT
NEW HAMPSHIRE
PAGE 7 OF 9

Project No.: 04.0190999.38

1 inch = 100 feet

EVERSOURCE ENERGY

GZA GeoEnvironmental, Inc.
Engineers and Scientists
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Path: C:\Users\matthew.deane\Desktop\D121 GIS\MXD\D121 Structure Repl AoT Plans.mxd

D121-LINE

95

96

97

Briar Ct

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

AoT Area B - Hooksett

D121 Structure 86 to Poore Road

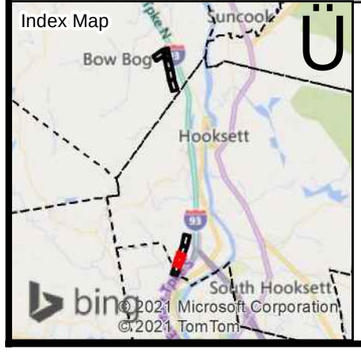
Map Sheets 6 to 9

Disturbance Type	Impact (sq. ft)
New Access	64,952
Gravel Work Pad	58,002
Total AoT Disturbed Area	***122,954***

-Criteria: Env-Wq 1502.58 (b) (2) "An area that, over a 10 year period, cumulatively exceeds 100,000 square feet of contiguous area..."

-Work pad dimensions: 100-ft x 100-ft; Access road width: 16-ft

Index Map



Bow

Current Town: **Hooksett**

Manchester

- EXISTING STRUCTURE
- EXISTING STRUCTURE TO BE REPLACED
- APPROXIMATE ROW
- TRANSMISSION LINE
- DISTRIBUTION LINE
- AOT DISTURBANCE AREA
- TEMPORARY WETLAND IMPACTS
- STRAW WATTLE
- 2FT ELEVATION CONTOUR
- DELINEATED WETLAND
- NHD FLOWLINE
- PROPOSED ACCESS ROUTE
- TOWN BOUNDARY
- NHDOT ROADS
- GATE
- STONEWALL
- POTENTIAL VERNAL POOL

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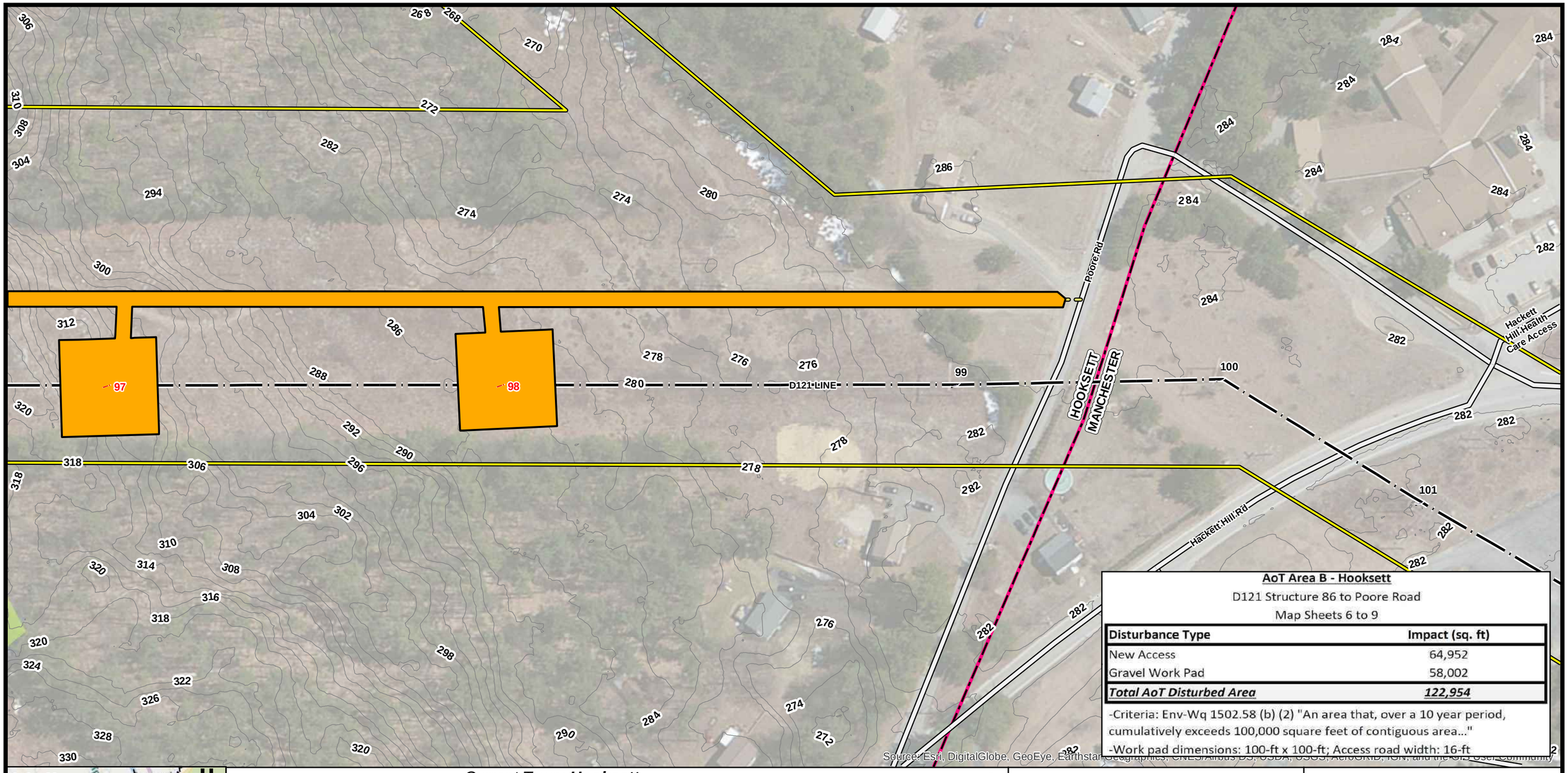

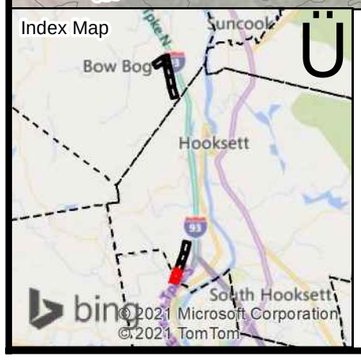

Bow

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PAGE 9 OF 9

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CONSTRUCTION SEQUENCE:

1. WETLAND BOUNDARIES TO BE CLEARLY MARKED PRIOR TO THE START OF CONSTRUCTION.

2. SEDIMENT AND EROSION CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH THE DETAIL PROVIDED, AS NECESSARY.

3. WETLAND IMPACTS ASSOCIATED WITH WETLAND CROSSINGS ARE REQUIRED FOR ACCESS BETWEEN STRUCTURES WITHIN THE RIGHT OF WAY.

4. ADEQUATE PRECAUTION SHALL BE EXERCISED TO AVOID SPILLAGE OF FUEL OILS, CHEMICALS, OR SIMILAR SUBSTANCES; NO FUELS, LUBRICANTS, CHEMICALS OR SIMILAR SUBSTANCES SHALL BE STORED BENEATH TREES OR IN THE VICINITY OF ANY WETLANDS, RIVER, STREAM OR OTHER BODY OF WATER; OR IN THE VICINITY OF NATURAL OR MAN-MADE CHANNELS LEADING THERETO. NO POWER EQUIPMENT SHALL BE STORED, MAINTAINED, OR FUELED IN ANY AREA ADJACENT TO A WETLAND, RIVER, STREAM OR OTHER BODY OF WATER.

5. REMOVE COMPLETELY ALL CONTAMINATION FROM ANY SPILLAGE OF CHEMICALS OR PETROLEUM PRODUCT WITH COMPLETE REHABILITATION OF THE AFFECTED AREA.

6. ACCESS ROUTES HAVE BEEN SELECTED TO PREVENT DEGRADATION OF THE RIGHT-OF-WAY AND MINIMIZE ENVIRONMENTAL IMPACT. OPERATIONS SHALL BE CONFINED TO THE SPECIFIED ACCESS ROUTES WITHIN THE PROPOSED WETLAND IMPACT AREA. ACCESS ROUTES SHALL NOT EXCEED A 16 FOOT-WIDTH.

7. IMPACT TO VEGETATION WITHIN WETLANDS WILL BE LIMITED TO THE EXTENT NECESSARY TO PLACE THE TIMBER MATS WHERE REQUIRED.

8. LOW GROWING VARIETIES OF VEGETATION ADJACENT TO WETLANDS SHALL BE PRESERVED TO THE EXTENT POSSIBLE. STUMPS AND ROCKS SHALL NOT BE REMOVED, AND THERE SHALL BE NO EXCAVATIONS, FILLS OR GRADING DONE ADJACENT TO WETLANDS, UNLESS MINOR EXCAVATIONS IS NEEDED FOR ACCESS.

9. TIMBER MATS WILL BE USED ALONG ACCESS ROUTES WITHIN WETLAND AREAS. THESE MATS ARE CONSTRUCTED OF HEAVY TIMBERS OR COMPOSITE MATERIAL, BOLTED TOGETHER, AND ARE PLACED END-TO-END IN THE WETLAND TO SUPPORT HEAVY EQUIPMENT. ALL SWAMP MATS SHALL BE PLACED AND REMOVED SO AS NOT TO CAUSE ANY RUTS, CHANNELS OR DEPRESSIONS, OR OTHERWISE CAUSE ANY UNDUE DISTURBANCE TO WETLANDS.

10. IF TIMBER MAT BMP IS NOT SUFFICIENT DUE TO HIGH WATER, ADDITIONAL BMP'S MAY INCLUDE THE PLACEMENT OF GEOTEXTILE FABRIC, 3"-4" STONE, AND GRAVEL TO PROVIDE A SUITABLE ROAD BED. A TEMPORARY CULVERT MAY BE REQUIRED IN AREAS OF HIGH FLOW TO MAINTAIN HYDROLOGIC CONNECTIVITY. ALL MATERIAL WILL BE REMOVED FROM JURISDICTIONAL AREAS AFTER CONSTRUCTION COMPLETION.

11. NO MATERIAL SHALL BE PLACED IN ANY LOCATION OR IN ANY MANNER SO AS TO IMPAIR SURFACE WATER FLOW INTO, THROUGH OR OUT OF ANY WETLAND AREA. NO INSTALLATION SHALL CREATE AN IMPOUNDMENT THAT WILL IMPEDE THE FLOW OF WATER OR CAUSE FLOODING.

12. NO MATERIAL SHALL BE TAKEN FROM THE WETLANDS AREA EXCEPT THAT WHICH MUST NECESSARILY BE REMOVED FOR THE STRUCTURE OR FOUNDATION PLACEMENT OR STABILIZATION. ALL EXCESS MATERIAL TAKEN FROM THE WETLAND WILL BE REMOVED FROM THE SITE.

13. ANY PROPOSED SUPPORT FILLS SHALL BE CLEAN GRAVEL AND STONE, FREE OF WASTE METAL PRODUCTS, ORGANIC MATERIALS AND SIMILAR DEBRIS AND SHALL NOT EXCEED THE AMOUNT PERMITTED. THIS ALLOWABLE FILL IS THE ONLY FILL THAT MAY REMAIN IN THE WETLAND AFTER CONSTRUCTION. ALL CUT AND FILLS SLOPES SHALL BE SEEDED/LOAMED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.

14. INSTALL NEW POLES IN THE LOCATIONS DESIGNATED ON THE PERMITTING PLANS.

15. CABLE INSTALLATION WILL BE PERFORMED IN A MANNER SO AS TO AVOID, OR LIMIT TO THE MAXIMUM EXTENT POSSIBLE, TRAVERSING WETLANDS WITH HEAVY EQUIPMENT. IN SOME CASES, A HELICOPTER MAY BE USED DURING THE INSTALLATION TO MINIMIZE IMPACTS.

16. ALL SWAMP MATS, MATERIAL, AND DEBRIS WILL BE REMOVED FROM THE WORK AREA UPON THE COMPLETION OF CONSTRUCTION.

17. UPLAND DISTURBED AREAS SHALL BE RESTORED AND STABILIZED UPON COMPLETION OF CONSTRUCTION. WORK PAD RESTORATION SHOULD INCLUDE REDUCING THE WORK PAD TO A 30 BY 60 FOOT AREA, AND REDUCING SLOPES TO A MAXIMUM OF 25%. STOCKPILED MATERIAL SHOULD BE SPREAD TO REDUCE ANY UNNECESSARY SLOPES. GRAVEL WORK PADS AND SLOPES SHOULD BE SCARIFIED TO A MINIMUM OF 3" BEFORE SPREADING TOPSOIL/LOAM.

18. ALL TEMPORARY WETLAND IMPACTS WILL BE RE-GRADED TO ORIGINAL CONTOURS FOLLOWING CONSTRUCTION. NEW ENGLAND EROSION CONTROL/RESTORATION MIX, AVAILABLE THROUGH NEW ENGLAND WETLAND PLANTS, INC., 820 WEST STREET, AMHERST, MA 01002, 413-548-8000, OR EQUIVALENT SEED MIX SHALL BE APPLIED IN WETLAND AREAS THAT ARE NOT INUNDATED, AS NECESSARY.

19. SEDIMENT AND EROSION CONTROL MEASURES WILL BE EVALUATED AND REMOVED IF NECESSARY UPON THE COMPLETION OF CONSTRUCTION.

20. COMMERCIAL LOAM WILL NOT BE USED AS PART OF RESTORATION. ONLY IN-SITU TOPSOIL WILL BE USED TO RESTORE DISTURBED AREAS.

21. WHERE OPTIMAL TURTLE BREEDING AREAS OVERLAP WITH DISTURBANCE (AS DETERMINED BY AN ENVIRONMENTAL MONITOR), MINERAL SOILS WILL BE SCARIFIED TO ALLEVIATE COMPACTION AND BECOME MORE SUITED FOR TURTLE BREEDING.

WINTER CONSTRUCTION NOTES

1. PROP0SED VEGETATED AREAS WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED. STABILIZATION METHODS SHALL INCLUDE SEEDING AND MULCH, AND INSTALLATION OF EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS.

2. DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE TEMPORARILY STABILIZED WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS.

3. AFTER NOVEMBER 15TH, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3 INCHES OF CRUSHED GRAVEL (NHDOT 304.3).

GENERAL NOTES:

OWNER: EVERSOURCE ENERGY
13 LEGENDS DRIVE
HOOKSETT, NH 03106

1. BASE PLAN PROVIDED BY EVERSOURCE ENERGY. EVERSOURCE ENERGY PROVIDED THE WETLAND DATA. EVERSOURCE ENERGY PROVIDED THE UTILITY DESIGN.

2. JURISDICTIONAL WETLANDS WERE DELINEATED BY TIGHE AND BOND IN 2018, IN ACCORDANCE WITH THE 1987 U.S. ARMY CORPS OF ENGINEERS' "WETLANDS DELINEATION MANUAL, TECHNICAL REPORT Y-87-1," AND REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTH CENTRAL AND NORTHEAST REGION," JANUARY 2012. WETLANDS WERE REVIEWED BY GZA GEOENVIRONMENTAL, INC. IN JANUARY AND FEBRUARY 2019.

3. GZA PERFORMED A WETLANDS FUNCTION AND VALUES ASSESSMENT IN ACCORDANCE WITH THE ACOE'S "HIGHWAY METHODOLOGY WORKBOOK SUPPLEMENT," SEPTEMBER 1999, IN THE TOWN OF STRAFFORD.

4. SITE PLAN IS FOR PERMITTING PURPOSES ONLY AND DOES NOT REPRESENT A PROPERTY BOUNDARY SURVEY.

5. THE PROJECT WILL BE MANAGED IN A MANNER THAT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER AGR 3800 RELATIVE TO INVASIVE SPECIES.

6. IN ACCORANCE WITH ENV-WQ 1505.02, THE SMALLEST PRACTICAL AREA SHALL BE DISTURBED DURING CONSTRUCTION, BUT IN NO CASE SHALL EXCEED 5 ACRES AT ANY ONE TIME BEFORE DISTURBED AREAS ARE STABILIZED. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
   - A MINIMUM 85 PERCENT VEGETATED GROWTH HAS BEEN ESTABLISHED
   - A MINIMUM OF 3 INCHES OF NON-EROSIVE MATERIAL HAS BEEN INSTALLED
   - OR, EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.

7. IN THE EVENT THAT A RARE OR THREATENED SPECIES IS OBSERVED, THE NEW HAMPSHIRE FISH AND GAME AND NEW HAMPSHIRE NATURAL HERITAGE BUREAU WILL BE NOTIFIED. TURTLE NESTING SEASON EXTENDS FROM LATE MAY THROUGH THE BEGINNING OF JULY. IF WOOD, BLANDING'S OR SPOTTED TURTLES ARE FOUND LAYING EGGS IN THE WORK AREA, CONTACT MELISSA DOPERALSKI AT 603-271-1738 OR JOSH MEGYESY AT 603-271-1125 FOR FURTHER INSTRUCTIONS. OBSERVATIONS OF NORTHERN BLACK RACER SNAKES SEEN IN ANY AREA FROM THE END OF SEPTEMBER THROUGH THE MONTH OF APRIL MUST BE IMMEDIATELY REPORTED TO THE NHFG DEPARTMENT (BRENDAN CLIFFORD AT 603-271-0463 OR MELISSA DOPERALSKI AT 603-271-1738). IF NORTHERN BLACK RACER IS FOUND IN A WORK AREA FROM NOVEMBER THROUGH THE MONTH OF APRIL, WORK SHALL IMMEDIATELY CEASE AND THE OBSERVATION MUST BE REPORTED TO THE NHFG (BRENDAN CLIFFORD OR MELISSA DOPERALSKI).

8. TEMPORARY OR PERMANENT IMPACTS TO IDENTIFIED POTENTIAL OR SUSPECT VERNAL POOLS ARE PROHIBITED. ANY OBSERVATION OF ANY ADDITIONAL SUSPECT VERNAL POOLS ARE TO BE REPORTED TO NHFG PERSONNEL.

EROSION CONTROL NOTES:

1. INSTALLATION OF EROSION CONTROL GRINDINGS AND/OR SILT FENCES SHALL BE COMPLETE PRIOR TO THE START OF WORK IN ANY GIVEN AREA. EROSION CONTROLS SHALL BE USED DURING CONSTRUCTION AND REMOVED WHEN ALL SLOPES HAVE A HEALTHY STAND OF VEGETATION COVER. EROSION CONTROL MEASURES SHALL BE INSPECTED ON A WEEKLY BASIS AND AFTER .25" OR GREATER RAINFALL EVENTS.

2. AS REQUIRED, CONSTRUCT TEMPORARY BERMS, SILTATION FENCES, SEDIMENT TRAPS, ETC. TO PREVENT EROSION & SEDIMENTATION OF WETLANDS.

3. THE WORK AREA SHALL BE GRADED AND OTHERWISE SHAPED IN SUCH A MANNER AS TO MINIMIZE SOIL EROSION, SILTATION OF DRAINAGE CHANNELS, DAMAGE TO EXISTING VEGETATION, AND DAMAGE TO PROPERTY OUTSIDE LIMITS OF THE WORK AREA. EROSION CONTROL GRINDINGS WILL BE NECESSARY TO ACCOMPLISH THIS END.

4. ANY STRIPPED TOPSOIL SHALL BE STOCKPILED, WITHOUT COMPACTION, AND STABILIZED AGAINST EROSION, AS NECESSARY.

5. PERMANENT OR TEMPORARY COVER MUST BE IN PLACE BEFORE THE GROWING SEASON ENDS. WHEN SEEDED AREAS ARE NOT MULCHED, PLANTINGS SHOULD BE MADE FROM EARLY SPRING TO MAY 20 OR FROM AUGUST 15 TO SEPTEMBER 15. NO DISTURBED AREA SHALL BE LEFT EXPOSED DURING WINTER MONTHS, PLANT ANNUAL RYEGRASS PRIOR TO OCTOBER 15TH.

6. EROSION CONTROLS SHALL BE INSPECTED WEEKLY AND AFTER EVERY HALF-INCH OF RAINFALL.

7. EROSION CONTROL MATTING, IF REQUIRED, WILL CONSIST OF JUTE MATTING. MATTING WITH WELDED PLASTIC OR 'BIODEGRADABLE PLASTIC' NETTING OR THREAD WILL BE AVOIDED TO LIMIT UNINTENTIONAL MORTALITY TO SNAKES.

D121 TRANSMISSION LINE
OPGW AND STRUCTURE REPLACEMENT PROJECT
BOW AND HOOKSETT
NEW HAMPSHIRE

NOTES

PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: EVERSOURCE ENERGY	
PROJ MGR: LEW	REVIEWED BY: TLT	CHECKED BY: DMZ	SHEET S1
DESIGNED BY: MJD	DRAWN BY: MJD	SCALE:	
DATE: 03/31/2021	PROJECT NO. 04.0190999.38	REVISION NO.	

Best Management Practices (BMP's) for Straw wattles

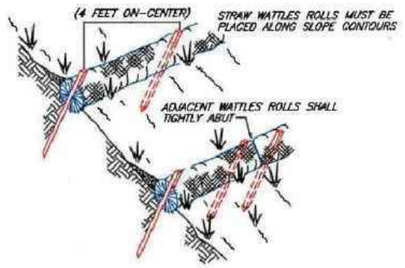
Definition and purpose:
Straw wattles are burlap rolls filled with straw that trap sediment and interrupt water flow by reducing slope lengths.

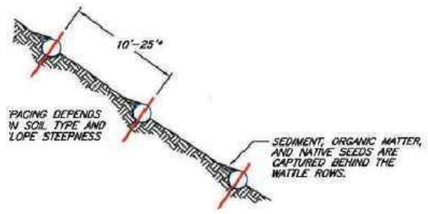
Applications:
* Along erodible or unstablizied slopes
* Spread overland waterflow
* Trap sediment
* Around storm drain inlets to slow water and settle out sediment
* Overlap ends approximately 6 inches

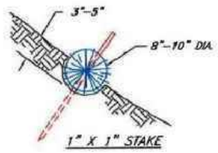
Installation:
Straw wattles are installed parallel to slope contours and perpendicular to sheet flow.

Spacing* - Dependent on slope length, soil steepness and soil type (general range 10 - 25').

Trenching - 2"-5" inch trench
Stacking - at each end and four foot on center (i.e. 25 foot wattle uses 6 stacks)







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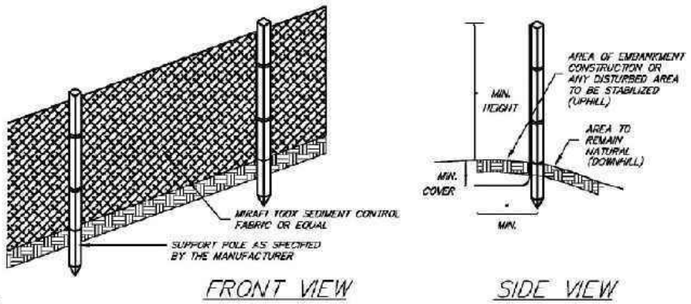
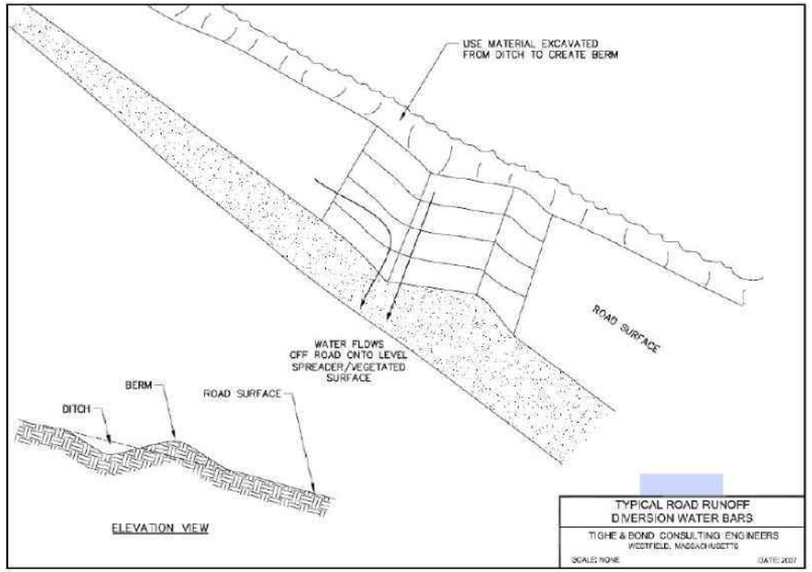
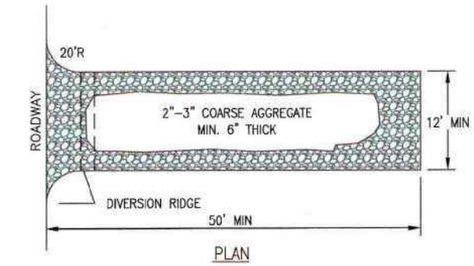


NOTES (SILT FENCE)
1. THE HEIGHT OF THE BARRIER SHALL NOT EXEED 36 INCHES.
2. WHEN JOINTS ARE NECESSARY, FILTER CLOTH SHALL BE SPLICED TOGETHER ONLY AT A SUPPORT POST, WITH A MINIMUM 6—INCH OVERLAP, AND SECURELY SEALED. SEE MANUFACTURER'S RECOMMENDATIONS.
3 POSTS SHALL BE PLACED AT A MAXIMUM OF 10 FEET APART AT THE BARRIER LOCATION AND DRIVEN SECURELY INTO THE GROUND (MINIMUM OF 12 INCHES). WHEN EXTRA STRENGTH FABRIC IS USED WITHOUT THE WIRE SUPPORT FENCE, POST SPACING SHALL BE AS MANUFACTURER RECOMMENDS.
4. A TRENCH SHALL BE EXCAVATED APPROXIMATELY 6 INCHES WIDE AND 6 INCHES DEEP ALONG THE LINE OF POSTS AND UPSLOPE OF THE BARRIER IN ACCORDANCE WITH RECOMMENDATIONS
5. THE FABRIC SHALL NOT EXTEND MORE THAN 36 INCHES ABOVE THE ORIGINAL GROUND SURFACE, AND WILL EXTEND A MINIMUM OF 8 INCHES INTO THE TRENCH. FILTER FABRIC SHALL NOT BE STAPLED TO EXISTING TREES.
6. THE TRENCH SHALL BE BACKFILLED AND THE SOIL COMPACTED OVER THE FILTER FABRIC.
7. FABRIC BARRIERS SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UPSLOPE AREA HAS BEEN PERMANENTLY STABILIZED.
8. FILTER BARRIERS SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST ONCE DAILY DURING PROLONGED RAINFALL AND ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
9. SHOULD THE FABRIC DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE BARRIER STILL BE NECESSARY, THE FABRIC SHALL BE REPLACED PROMPTLY.
10. SEDIMENT DEPOSITS SHOULD BE REMOVED WHEN THEY REACH APPROXIMATELY ONE—HALF THE HEIGHT OF THE BARRIER.
11. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE OR FILTER BARRIER IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM TO THE EXISTING GRADE, PREPARED AND SEEDED.



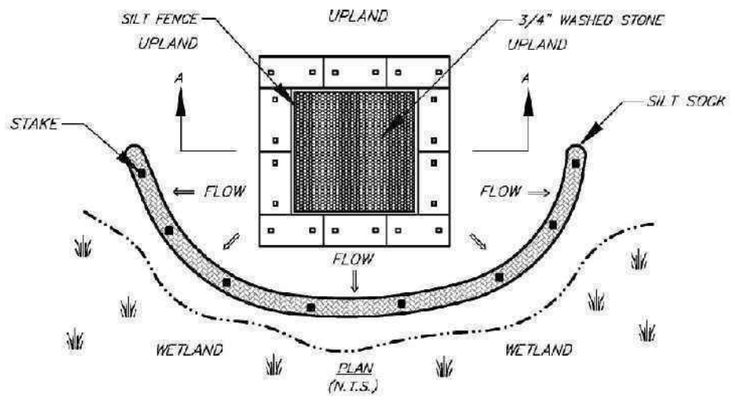


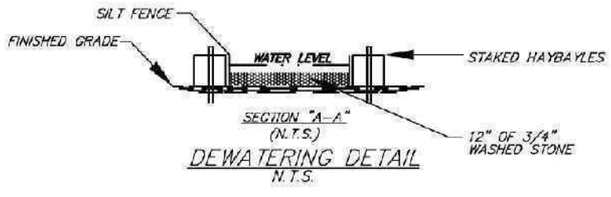
NOTES:
1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.

2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY.

CONSTRUCTION ENTRANCE

NOT TO SCALE





DEWATERING DETAIL
N.T.S.

D121 TRANSMISSION LINE
OPGW AND STRUCTURE REPLACEMENT PROJECT
BOW AND HOOKSETT
NEW HAMPSHIRE

BMP DETAILS

PREPARED BY:
GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR:
EVERSOURCE ENERGY

PROJ MGR: LEW	REVIEWED BY: TLT	CHECKED BY: DMZ	SHEET S2
DESIGNED BY: MJD	DRAWN BY: MJD	SCALE:	
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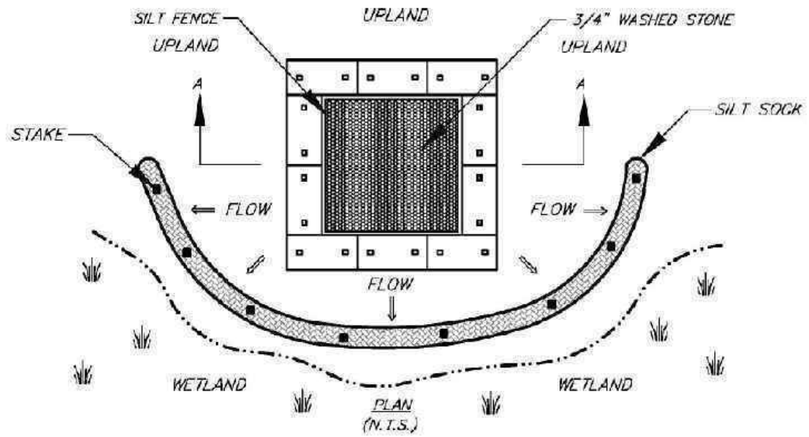

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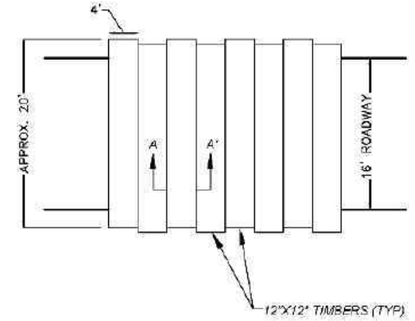
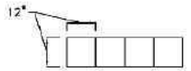
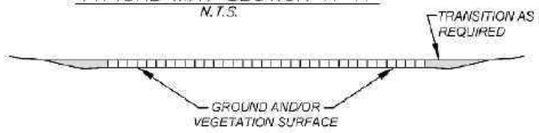
N.T.S.



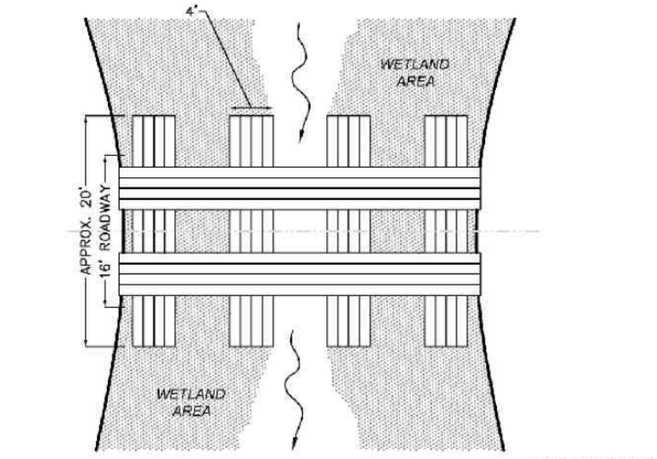
TYPICAL SWAMP MAT PLAN VIEW
N.T.S.



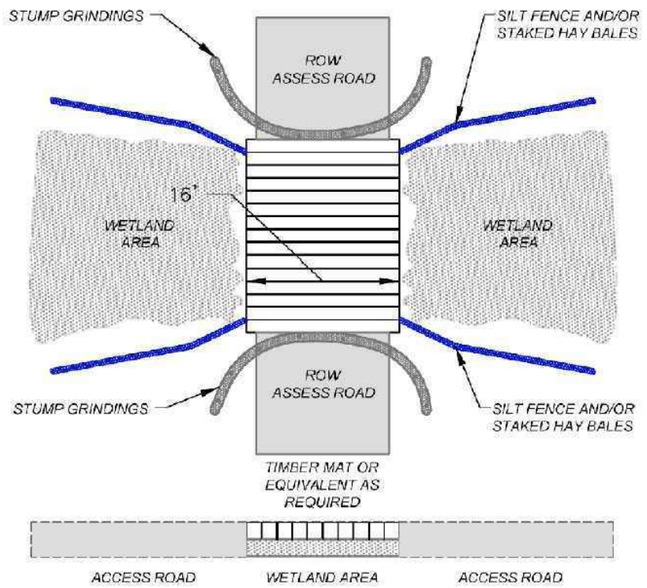
TYPICAL MAT SECTION A-A
N.T.S.



TYPICAL SWAMP MAT SECTION DETAIL
N.T.S.



TYPICAL STREAM CROSSING
N.T.S.



TYPICAL WETLAND CROSSING
N.T.S.

D121 TRANSMISSION LINE
OPGW AND STRUCTURE REPLACEMENT PROJECT
BOW AND HOOKSETT
NEW HAMPSHIRE

BMP DETAILS

PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: EVERSOURCE ENERGY	
PROJ MGR: LEW	REVIEWED BY: TLT	CHECKED BY: DMZ	SHEET S3
DESIGNED BY: MJD	DRAWN BY: MJD	SCALE:	
DATE: 03/31/2021	PROJECT NO. 04.0190999.38	REVISION NO.	

GZA GeoEnvironmental, Inc.

Redaction Date: 8/4/2023 10:22:50 AM

Redaction Log

Total Number of Redactions in Document: 7

Redaction Reasons by Page

Page	Reason	Description	Occurrences
44	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
45	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
46	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
47	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
65	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	2
66	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1

Redaction Log

Redaction Reasons by Exemption

Reason	Description	Pages (Count)
CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	44(1) 45(1) 46(1) 47(1) 65(2) 66(1)