

ORIGINAL



State of New Jersey

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November 04, 2015

Ms. Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

Mr. Anthony Cox
Penn East Pipeline Company, LLC
One Meridian Boulevard
Suite 2C01
Wyomissing, Pa. 19610 77056

**RE: Proposed Penn East Pipeline Project
FERC Docket # CP15-558-000
Addendum to Comments on Final Resource Reports and
FERC Certificate Application
Hunterdon and Mercer Counties**

FILED
SECRETARY OF THE
COMMISSION
2015 NOV 17 A 9 45
FEDERAL ENERGY
REGULATORY COMMISSION

Dear Secretary Bose and Mr. Cox:

On October 28, 2015, the New Jersey Department of Environmental Protection's (Department) Office of Permit Coordination and Environmental Review (PCER) provided comment on the Final Resource Reports and Federal Energy Regulation Commission (FERC) Section 7(c) Certificate Application for the proposed Penn East Pipeline Project. The Department respectfully submits the following additional comments as an addendum to our comments of October 28, 2015.

New Jersey Natural Lands Trust

The proposed PennEast pipeline route traverses five NJNLT-managed properties within its Gravel Hill Preserve in Holland Township, Hunterdon County, NJ. The 400-foot pipeline study corridor also includes a portion of the NJNLT's Thomas F. Breden Preserve at Milford Bluffs (also within Holland Township), although PennEast has assured the NJNLT that it has no intention of using any portion of that preserve for construction or staging.

As early as March 2015 the NJNLT requested that PennEast avoid the Gravel Hill Preserve consistent with the NJNLT's statutory purpose as well as the presence of habitat for the state-endangered bobcat and a rare plant, wild comfrey. In addition to avoiding the existing preserve, the NJNLT requested that PennEast also avoid the larger Gravel

Hill Project Area. Based on the presence of rare species habitat, the NJNLT Board designated the lands within the Project Area boundary as a high priority for acquisition and inclusion in the Gravel Hill Preserve. Enclosed is the October 21, 2015 NJNLT comment letter to FERC.

In order to avoid the Gravel Hill Preserve and Project Area, the NJNLT requested that PennEast install the pipeline within county roads that surround the preserve. The enclosed attachment depicts PennEast's current proposed route through Gravel Hill Preserve along with NJNLT's proposed alternate route as depicted in the enclosed maps. Although PennEast assured the NJNLT that it would consider the road installation alternative, as well as an alternative of co-locating its pipeline within two existing transmission line rights of way, PennEast's September 2015 certificate application to FERC continues to show the pipeline being routed through the NJNLT's Gravel Hill Preserve. Notwithstanding its FERC application, PennEast has advised the NJNLT that it is still studying alternatives including the road installation alternative. However, in recent meetings PennEast's representatives have suggested that FERC discourages the placement of pipelines within roads or that the road installation may be too costly. The NJNLT respectfully submits that property preserved in perpetuity and that supports rare species habitat should not be designated as the preferred route if viable, less environmentally damaging alternatives exist. Portions of the Gravel Hill Preserve that are targeted in the application include a mature forest with a natural understory and a general absence of invasive plant species. If this forest was subject to clearing for the installation of the pipeline, it would detrimentally impact the understory species that thrive on a closed tree canopy and increase the likelihood for the introduction of invasive plant species, thereby permanently altering the integrity of this ecological community. The NJNLT believes that pipeline installation is feasible within the county roads that surround the preserve boundary. This is a rural low traffic area. The NJNLT is not aware of any existing infrastructure within the subject roadways and there appear to be viable options for detours during construction.

Based on these factors, we respectfully request that PennEast fully investigate alternatives to the current preferred route that would impact the Gravel Hill Preserve and avoid the NJNLT's Gravel Hill Preserve if a viable, less environmentally damaging alternative is available.

State Forestry Services, Natural Heritage Program Comments

PennEast must make every effort possible to avoid and minimize impacts to rare plant species and ecological communities within and adjacent to the proposed right-of-way. By database report dated August 7, 2015, the New Jersey Natural Heritage Program (Heritage) submitted a response to a Heritage database search request. The Heritage database report provided information to PennEast regarding records for rare plants species and ecological communities along PennEast's proposed route. In order to evaluate the environmental impacts associated with PennEast's proposed route, PennEast should be required to conduct rare plant surveys within the entire 400-foot PennEast pipeline study corridor and for an additional 200 feet to each side of the study corridor (collectively referred to as the "survey area"). The surveys should target the rare plant species listed on the Heritage database report as possibly on or within one mile of the

pipeline corridor, along with additional rare plant species occurrences not covered by the Flood Hazard Area Control Act rules but documented in the vicinity of the pipeline corridor, as well as all rare plant species documented in the two Natural Heritage Priority Sites crossed by the pipeline corridor. These thirty-two species are listed below.

In addition to these species, PennEast should document and report any other rare plant species that may be found in the survey area. The list of native plant species currently tracked by the Natural Heritage Program is available at:

<http://www.state.nj.us/dep/parksandforests/natural/heritage/spplant.html>

The procedures for surveying, documenting and reporting rare plant species are described in the protocols developed by the Office of Natural Lands Management (attached and previously provided to PennEast). Targeted surveys of the survey area should concentrate on the following rare plant species:

Agrimonia microcarpa, Small-fruit Grooveburr, G5 S2

Arnoglossum atriplicifolium, Pale Wild Caraway, State Endangered

Asclepias quadrifolia, Four-leaf Milkweed, G5 S3

Carex albursina, White Bear Lake Sedge, G5 S3

Carex bushii, Bush's Sedge, State Endangered

Carex hitchcockiana, Hitchcock's Sedge, G5 S3

Carex jamesii, James' Sedge, State Endangered

Carex planispicata, Narrow-leaf Sedge, State Endangered

Carex willdenowii var. *willdenowii*, Willdenow's Sedge, G5T5 S2

Chaerophyllum procumbens var. *procumbens*, Spreading Chervil, G5T5 S3

Cheilanthes lanosa, Hairy Lipfern, G5 S2

Chenopodium simplex, Maple-leaf Goosefoot, G5 S2

Chenopodium standleyanum, Stanley's Goosefoot, G5 S2

Crataegus holmesiana, Holmes' Hawthorn, State Endangered

Cuscuta cephalanthi, Buttonbush Dodder, State Endangered

Cynoglossum virginianum var. *virginianum*, Wild Comfrey, G5T5 S2

Dicentra canadensis, Squirrel-corn, State Endangered

Eragrostis frankii, Frank's Love Grass, G5 S2

Hybanthus concolor, Green Violet, State Endangered

Jeffersonia diphylla, Twinleaf, State Endangered
Lathyrus venosus, Veiny Vetchling, G5 SX
Monarda clinopodia, Basil Beebalm, State Endangered
Penstemon laevigatus, Smooth Beardtongue, State Endangered
Phaseolus polystachios var. *polystachios*, Wild Kidney Bean, G5T5? S2
Phlox divaricata var. *divaricata*, Wild Blue Phlox, State Endangered
Polygonum cilinode, Fringed Black-bindweed, G5 S3
Ranunculus micranthus, Rock Buttercup, G5 S2
Scutellaria nervosa, Veined Skullcap, G5 S2
Selaginella rupestris, Rock Spike-moss, G5 S2
Solidago speciosa var. *speciosa*, Showy Goldenrod, G5T5? S2
Taenidia integerrima, Yellow-pimpernel , G5 S3
Tradescantia ohiensis, Ohio Spiderwort, G5 S2

*Codes used in Natural Heritage reports are in the attached list.

As noted above, PennEast's proposed route traverses two Natural Heritage Priority Sites (NHPS)--the Goat Hill and Milford Bluffs NHPSs. NHPSs are areas identified on the Department's geographic information systems (GIS) coverage that conserve New Jersey's biological diversity, with particular emphasis on the habitat of endangered plant species, plant species of concern and ecological communities of concern.

While PennEast has assured the Department that it has no intention of using any portion of the NJNLT's Thomas F. Breden Preserve at Milford Bluffs for construction or staging, its proposed route will impact the larger Milford Bluffs NHPS. However, if PennEast takes the proposed alternate route to avoid the NJNLT's Gravel Hill Preserve, it will have the added benefit of also avoiding the Milford Bluffs NHPS (See New Jersey Natural Lands Trust Comments and the attached map of the Milford Bluffs Natural Heritage Priority Site). Similar to the NJNLT's proposed alternate route to avoid the Gravel Hill Preserve by using surrounding county roads, PennEast should avoid the Goat Hill NHPS by installing the pipeline within Goat Hill Road/Studdiford Street, the county road that is adjacent to the Goat Hill NHPS (see attached map of Goat Hill Natural Heritage Priority Site).

NJ Endangered and Nongame Species Program (ENSP)

General Comment

Endangered and Nongame Species Program (ENSP) staff has conducted a review of the PennEast proposed natural gas pipeline within NJ and the affected landscape. Please note if the proposed route changes from that submitted via the GIS shapefiles associated with Final Resource Reports, ENSP may have additional comments and/or concerns.

A list of *rare* species whose home ranges intersects Penn East's proposed pipeline can be found within the DEP's Landscape Project Map (GIS files for download at <http://www.nj.gov/dep/gis/landscape.html>). Please note while only rare species (endangered, threatened and special concern) are identified within the map, NJ's Endangered and Nongame Species Conservation Act (N.J.S.A. 23:2A-1-13) provides protection to all of NJ's native, nongame wildlife. In addition, birds are afforded additional protection under the federal Migratory Bird Treaty Act of 1918 and Bald and Golden Eagle Protection Act.

Depending on the species inhabiting the area where work will be conducted, restriction and activity dates (below) must be reviewed and compiled to ***provide the maximum protection*** to ensure there is no conflict between species. All rare species observation data obtained during required surveys is considered confidential and property of the State and permit applicant (i.e., Penn East). No wildlife or rare plant location data may be distributed in any format (e.g., maps, photographs, written or verbal communication, etc.) without written approval from the State Endangered and Nongame Species Program or Natural Heritage Program, respectively.

According to the information ENSP has reviewed, it appears Penn East's intended path of their pipeline extends through Hunterdon and Mercer Counties. Such an alignment will require the creation of a new right-of-way. In addition, according to the GIS files shared with ENSP, it appears the proposed study area will be 400 feet wide. Penn East shall clarify the width of the proposed permanent right of way. Any new right of way is a significant alteration of the landscape, fragmentation of habitat and presents an increased risk and disturbance to many of our native wildlife species.

- Penn East has proposed that construction of this pipeline begin in February 2017 and construction be completed in November 2017.
 - This proposed construction schedule does not, at this time, appear to be attainable as Penn East must comply with seasonal or timing-based proposals to minimize harm to State listed species and/or their habitats or to comply with similar permit conditions. The burden shall remain on the permittee to adhere to any timing restrictions.
 - Penn East should be particularly aware of timing restrictions for any tree clearing regarding bird and bat habitat.
- Penn East proposes restoration and monitoring during and after construction of the pipeline.

- Penn East should provide a restoration and monitoring plan to DEP (and any other pertinent agencies) during the permit application process and include information regarding any *potential need* to bring in clean soil to backfill any construction related area.
- In any future review by ENSP, the following information shall also be included:
 - Method to traverse stream crossings (e.g., directional drill, trench).
 - Water used to test the pipeline: ENSP recommends DEP require Penn East to identify potential water sources in advance and submit the details prior to permit approvals to allow ENSP sufficient review period to assess potential wildlife impacts.
 - Discharge of dewatered effluent or test water: how and where any dewatered effluent or test water will be reintroduced to the ground or other discharge point as well as how any discharge will meet environmental standards.
 - Expected water drawdown at any stream crossing impacted by pipeline drilling method.
 - Proposed width of temporary work space, additional temporary work space and the permanent easement. If the width varies along the length of the ROW, PEP must provide GIS shape files to clearly illustrate these variations.
 - Plans for proposed access roads (GIS shape files of the locations, widths, identify which are to be permanent versus will be restored with revegetation, etc.).

Specific Final Resource Reports Comment

Please note the Endangered and Nongame Species Program (ENSP) has *not* received:

- 1) The *confidential* resource reports regarding wildlife survey efforts. Therefore ENSP has reviewed and commented on only the publicly available resource reports 1 (*General Project Description*) and 3 (*Fisheries, Vegetation, and Wildlife*).
- 2) A revised milepost shapefile that aligns with the most currently proposed pipeline route and as such, it is unclear as to whether the resource reports reference a formerly proposed route (March 2015) or the most recently proposed route (September 2015). Therefore, ENSP's comments below regarding the resource report(s) references to the milepost markers refer to those contained within the shapefile dated March 26, 2015, and not the most currently proposed pipeline route. Any changes or varying materials must be reviewed by ENSP.

Resource Report 1: General Project Description

Section 1.2, pg. 1-10: Why are there varying pipe diameters within New Jersey? Is there a potential that PennEast will return in the future to "upgrade" the pipes to those with larger diameters and therefore, again impact our Natural Resources by another construction project?

Section 1.3.1, Pipeline Facilities, pg. 1-18:

- The permanent right-of-way easement will be approximately 50ft wide.
 - What will be the permanent easement width where PennEast parallels the existing right-of-way? The greater the width, the greater the risk to and impacts on reptiles, amphibians and small mammals.
- PennEast will evaluate whether additional workspace beyond the 100ft wide corridor will be needed “after additional surveys, landowner negotiations, agency consultations and engineering are performed”.
 - Could this occur *after* FERC and State approval of the current plan? If additional land is needed:
 - PennEast must conduct wildlife surveys in the additional habitat plus the biologically appropriate buffers (as described in ENSP’s comments in March, May and September, 2015) and likely, plant and historic resources/archaeological surveys.
 - NJ DEP must review the data to assess potential impacts.

Section 1.4, Cumulative Impacts, pg. 1-45, 2nd paragraph and Section 1.4.3, Potential Cumulative Impacts, pg. 1-56, 1st paragraph:

- PennEast’s description of New Jersey’s landscape *is not accurate*. While this area does contain residential communities and existing rights-of-way, it is highly agricultural with forested oases and corridors scattered throughout. Some of the agricultural lands are horse pastures or hay farms that provide habitat for grassland birds, invertebrates and small mammals. The forested oases provide much needed suitable habitat for forest-dwelling wildlife and forest-associated migratory birds, bats and invertebrates, and the corridors provide a suitable dispersal path to larger forested parcels. Although PennEast has attempted to minimize their impacts on the forested habitat, this project will further fragment these forest oases and corridors,

Section 1.4.3.4, Wildlife, pg. 1-58:

- PennEast fails to acknowledge the potential long-term impacts to reptiles, amphibians and small mammals with the creation of a new right-of-way *and* the widening of the existing right-of-way such as the increased exposure to predation as they traverse the open landscape, the alteration of the microclimate to the neighboring forests and scrub-shrub habitats, decreased foraging habitat for forest-dwelling species, etc.

Section 1.4.3.6, Socioeconomics, pg. 1-60:

- A notable comment: While PennEast is attempting to co-locate with an existing right-of-way, they describe the possibility of future transmission lines or pipelines co-locating with their “new” right-of-way, potentially leading to future cumulative impacts on wildlife and other natural resources.
 - **ENSP Response:** Does this mean the right-of-way may be further widened in the future?

Section 1.5.2.4, Pre-Blasting in Streams, pg. 1-84:

- “PennEast will submit a blasting plan to NJ DEP prior to the commencement of blasting activities...”
 - **ENSP Response:** ENSP needs to know **during this review period (i.e., before project approval)** which streams are proposed for such blasting to include in the assessment of potential impacts on wildlife.

Resource Report 3: Fisheries, Vegetation, and Wildlife

Section 3.3.2, pg. 3-31, Forest Impacts:

- 1st paragraph states EPA suggested voluntary one-to-one tree replacement for deforested areas but PennEast states that areas not needed for operation (i.e., temporary workspace) will be “allowed to reforest naturally”. They later state that they will comply with NJ’s No-Net Loss Reforestation Act.
 - **ENSP Response:** Please clarify these statements to ensure NJ’s deforested areas will not be left to regenerate on their own.

Section 3.4.1.2, pg. 3-43 & 3-44, Migratory Birds, New Jersey:

- Pgs. 3-43, Baldpate Mountain (IBA)
 - **ENSP Response:** Sourland Mountain Region Macrosite should also be addressed as it is an IBA containing breeding regional-responsibility species, significant congregations and exceptional diversity of breeding landbirds, and significant migrant stopover/flyover of landbirds. Baldpate Mountain is a part of this IBA Macrosite for the same reasons previously described as well as containing breeding red-shouldered hawks.
- Pgs. 3-44, Musconetcong Gorge (IBA)
 - **ENSP Response:** Over 6 miles of the proposed pipeline are in the Musconetcong Gorge IBA. On Page 3-44 the MP#s indicate that the proposed pipeline extends just over 1 mile within this IBA.

Section 3.4.2, pg. 3-47, Potential Impacts and Mitigation and Section 3.5.3, Cumulative Impacts:

- **ENSP Response:** PennEast fails to acknowledge the potential long-term impacts to reptiles, amphibians and small mammals with the creation of a new right-of-way **and** the widening of the existing right-of-way such as the increased risk of predation as they traverse the open landscape, the alteration of the microclimate to the neighboring forests and scrub-shrub habitats, decreased foraging habitat for forest-dwelling species, etc.
- Pg. 3-47, Impact Minimization Techniques to be used by the Project, 1st bullet and Appendix 3C: “...USFWS Adaptive Management Practices for Conserving Migratory Birds...”, and “No tree clearing that may impact migratory birds April 1 – August 31”, respectively.
 - **ENSP Response:** Tree clearing should be avoided April 1 – August 31 for migratory birds, March 1 – July 31 for woodlands raptors, and April 1 – August 15 for Red-headed Woodpeckers.

Section 3.4.2, Potential Impacts and Mitigation

- Pg. 3-47, last bullet: Describes long-term management/maintenance of the right-of-way to establish “more beneficial wildlife habitat”.
- Pg. 3-48, 3rd bullet: Describes long-term management/maintenance of the right-of-way to include mowing between September 11 and March 14 to prevent impacts to grassland birds.
- In a few other places within the State Species-New Jersey section, there are right-of-way management timing restrictions for specific species.
 - **ENSP Response:** Is PennEast willing to implement ENSP’s right-of-way management strategies to minimize harm to all wildlife; i.e., not just select species? This may shorten the mowing window.

Section 3.5.1, Existing Resources

- Pg. 3-50, 1st complete paragraph: States E/T surveys have been completed on accessible lands.
 - **ENSP Response:** According to the descriptions of survey effort and/or habitat assessments in Sections 3.5.1.1 and 3.5.1.3, it sounds as though PennEast consultants *did not complete* the required surveys on accessible lands but rather depended on the NJ DEP’s Landscape Project Map and field habitat assessments. ENSP required surveys be conducted for a variety of species regardless of what was identified in the Landscape Project Map as the map is a tool and not a definitive valuation of species habitat. For any species whose survey effort for their presence/absence was based on Landscape Project Map and habitat assessments, they will likely need to resurvey using more appropriate methods given the project activity will impact more habitat than that along the right-of-way.
 - Per ENSP comments in March, May and September 2015, survey efforts must target the right-of-way proposed for any activity, associated access roads and a biologically-appropriate buffer of the adjacent habitats for each species or species group. The survey buffer will vary depending on the species and life-history requirements; all of which must be considered in the proposed survey methods. It does not appear this occurred.
 - **ENSP Response:** PennEast did not provide ENSP staff with survey proposals for review and approval (prior to any wildlife-related survey efforts). This is highly recommended in an effort to *minimize the risk of failing to conduct adequate surveys*.
 - **ENSP Response:** PennEast has not provided ENSP staff with surveyors’ qualifications for review and approval (prior to any wildlife-related survey efforts). This is highly recommended in an effort to *minimize the risk of failing to obtain qualified personnel to conduct the wildlife surveys*.

Section 3.5.1.1, Federal Species

- Pg. 3-60, 1st paragraph: States bat surveys will “likely” be required if trees >5” dbh will be felled. **ENSP requires surveys** on all conserved lands that will be impacted by the activities associated with this project.

- Indiana and Northern Long-eared Bat Surveys
 - Pg. 3-61:
 - States that surveys have been conducted (on accessible lands) in NJ which seems to contradict previous indications of completed surveys. There are 4 survey points in the "RR3_Bat_sites..." shapefile out of 157 proposed locations.
 - **ENSP Response:** Please clarify as there appears to be a significant amount of survey work to be completed.
 - States that the exclusion of unsuitable habitat was negotiated by USFWS and PGC.
 - **ENSP Response:** Habitat within NJ was also excluded through negotiations with ENSP. Please include this clarification within the document.
 - Pg. 3-62:
 - States indicates that that timing restrictions for tree clearing will only be required within 0.25 mile of documented northern long-eared bat/eastern small-footed bat occurrences.
 - **ENSP Response:** Timing restrictions should be followed across all potential habitat regardless of whether bats of interest were captured during the surveys given the difficulty of confirming negative data (i.e., the bats' absence).
- Dwarf Wedgemussel
 - Pg. 3-73, 1st paragraph:
 - States Penn East will use HDD to cross the Delaware River and therefore, will not impact mussels.
 - **ENSP Response:** Although HDD is preferred, mussel surveys are required if suitable habitats are identified given the potential for "plans" to change during the course of the project and/or accidents (e.g. inadvertent return) may occur. Completed surveys will allow ENSP to assess [potential] impacts on extant populations and have a better understanding of the population enabling ENSP to work with Penn East should HDD be deemed inappropriate on site or an accident occurs.
 - States no mussel surveys are anticipated for this project.
 - **ENSP Response:** As stated previously, if Penn East consultants based their habitat assessment solely on Landscape Project Maps, it is likely they failed to identify other mussel occurrences ENSP personnel believe intersect the newest proposed line. Please see ENSP comments regarding survey efforts dated September 30, 2015.

Section 3.5.1.3, State Species-New Jersey

- All species:
 - **ENSP Response:** Who conducted the surveys and what are their qualifications? DEP has only recently received resumes and/or approved surveyor lists for bats and bog turtles, respectively.
 - **ENSP Response:** Were the surveys conducted on all conserved and regulated lands or just those already valued through Landscape Project Map? If the latter, the surveys are insufficient.
- Pg. 3-85, Red-headed Woodpecker: "...tree clearing will be avoided March 31 – July 31..."
 - **ENSP Response:** Tree clearing should be avoided April 1 – August 15 to avoid adverse impacts to breeding Red-headed Woodpeckers.
- Pg. 3-88, Southern Gray Treefrog:
 - **ENSP Response:** Southern Gray Treefrog does not range this far north and therefore there are no impacts to this species.

Section 3.5.2, Potential Impacts and Mitigation

- Pg. 3-89:
 - 1st bullet regarding Long-eared bats: States "Timing restrictions on timber clearing in specific areas and 0.25-mile buffer in vicinity of known hibernacula."
 - **ENSP Response:** Winter tree clearing should be the policy regardless of whether or not bats of interest are netted during surveys given the difficulty of proving negative data (i.e., the bats' absence).
 - 3rd bullet regarding Dwarf Wedgemussel: States Penn East's plan for the avoidance of in-water work in the Delaware River.
 - **ENSP Response:** As per comments under 3.5.1.1, Dwarf Wedgemussel, surveys must be conducted. ENSP has documented additional mussel sightings in the Delaware River (Yellow Lampmussels), above and below the crossing, than what is identified in the current version of the Landscape Project Map, supporting ENSP's need to have the most current available data *prior* to assessing the potential impacts of this project.
 - **ENSP Response:** ENSP is concerned about the alternate route, which positions the Penn East pipeline through the Stony Brook, a location also believed to have rare mussels. As such, mussel surveys must be performed if suitable habitats are present.
 - Bulleted list must be revised to show the appropriate time period to avoid tree clearing (i.e., April 1 – August 15) for Red-headed Woodpeckers.
- Pg. 3-90, 1st paragraph: States "Anticipated mitigation measures will include restricting tree clearing to winter months to prevent impacts to bat species..."

- **ENSP Response:** Winter tree clearing should be the policy regardless of whether or not bats of interest are netted during surveys given the difficulty of proving negative data (i.e., the bats' absence).

Appendix 3C

- **ENSP Response:** Tree clearing should be avoided April 1 – August 31 for migratory birds, March 1 – July 31 for woodlands raptors, and April 1 – August 15 for Red-headed Woodpeckers.

Required Surveys Pertaining to Rare and Nongame Wildlife:

All required surveys must be conducted by qualified personnel. Permit applicant must demonstrate to the State's Division of Land Use Regulation (DLUR) and Endangered and Nongame Species Program (ENSP) that all members of each survey team responsible for the various surveys are qualified and experienced in identifying the target species (visually and audibly, if appropriate) and/or target habitats described below *in New Jersey and/or comparable geographic locations*, and obtain approval from ENSP for the proposed survey method. Survey efforts will target the right-of-way proposed for any activity, associated access roads and a biologically-appropriate buffer of the adjacent habitats for each species or species group. The survey buffer will vary depending on the species and life-history requirements; all of which must be considered in the proposed survey methods. PEP is responsible for contacting ENSP personnel to determine the necessary survey buffers for each species, species group or area.

All public and non-profit lands (with landowner consent)

Birds

1. *Nesting periods for rare species/species suites:*

At the time of this review, bird species documented within or adjacent to the proposed pipeline include: Wood thrush, veery, northern parula, Red-headed woodpecker (NB), Yellow-breasted chat, brown thrasher, American kestrel, Savannah sparrow, bobolink, grasshopper sparrow, eastern meadowlark, great-blue herons and raptors.

Please note, the list below is not a comprehensive list of species that may be encountered along the proposed pipeline route, but provided for reference only regarding some of the potential critical periods PEP may need to consider in their planning efforts.

All must comply with State timing and activity restrictions and the federal Migratory Bird Treaty Act of 1918 to protect nesting birds and their young.

Nesting periods:

- a. Forest birds (general "land birds"): April 15 – August 31
- b. Grassland birds: March 15 – September 10 (double-brooded)
- c. Shrub birds: April 1 – August 31

- d. Red-headed Woodpecker: April 1 – August 15
- e. American Bitterns: April 15 – August 1.
- f. Least Bitterns: April 15 – August 1
- g. Great Blue Herons: March 15 – August 15.
- h. Sedge Wrens: April 15 – October 15
- i. Pied-billed Grebe – April 15 – August 1
- j. Raptors:
 - 1) American Kestrel: April 15 – July 31
 - 2) Bald Eagle: January 1 – July 31
 - 3) Barn Owl: February 1 – August 30
 - 4) Barred Owl: March 1 – June 15
 - 5) Broad-winged: April 14 – August 31
 - 6) Cooper's Hawk: March 1 – July 31
 - 7) Long-eared Owl: April 15 – September 30
 - 8) Northern Harrier: March 1 – July 31
 - 9) Northern Goshawk: March 1 – June 30
 - 10) Osprey: March 1 – August 31
 - 11) Peregrine Falcon: March 1 – July 15
 - 12) Red-shouldered Hawk: March 1 – June 30
 - 13) Sharp-shinned Hawk: March 1 – July 31
 - 14) Short-eared Owl: April 15 – September 30

2. *Surveys:*

- a. Surveys for raptors and their nest/cavity trees
 - o Are required on public lands (federal, state, county, local lands, and non-profit lands with the organization's consent). The applicant is required to conduct surveys within suitable habitats for nesting birds and/or their nests/cavity nest trees to provide more detailed information to the DEP for the permit review process. Surveys must be conducted during the nesting periods.
 - Surveys must target all woodland raptor species (Barred Owls, Red-shouldered Hawks, Northern Goshawks, Cooper's Hawks, Sharp-shinned Hawks and Broad-winged Hawks).
 - o Are not required on private lands. However, to avoid the risk of an incidental take of rare (and nongame) raptors on both government-owned and private lands, and thus avoid a violation of the NJ Endangered and Nongame Species Conservation Act (N.J.S.A. 23:2A-1-13) and the federal Migratory Bird Treaty Act (1918), PEP must avoid the destruction, alteration or disturbance of raptor nests and cavity nest trees during their nesting periods (see *1. Nesting periods for rare species/species suites* and *Overview* above).
- b. Breeding bird surveys are required on all public lands (federal, state, county, local lands, and non-profit lands with the organization's consent) in all habitat types and encouraged for private lands. The recommended dates to conduct surveys for breeding birds are as follows:

- General “breeding birds”: May 25 – June 15
 - Grassland birds: May 1 – July 30
 - Red-headed Woodpecker: May 1 - June 15
- c. Water-associated birds such as Great Blue Herons, Sedge Wrens and Pied-billed Grebe may occur along part(s) of the proposed pipeline. The applicant is required to conduct surveys within suitable habitats for these species in search of nests and/or rookeries for Great Blue Herons and individuals and/or active nests of Sedge Wrens and Pied-billed Grebes.
- d. Secretive marsh birds, including but not limited to American and Least Bitterns, may occur along part(s) of the proposed pipeline. The applicant is required to conduct surveys within suitable habitats for secretive marsh bird species and their nests to provide more detailed information to the DEP for the permit review process. Target nesting periods for scheduling such surveys.

1) Surveyors must implement the survey protocol found at:

http://www.tidalmarshmonitoring.org/pdf/Conway2008_NorthAmericanMarshBirdSurveyProtocols.pdf

Insects (butterflies, dragonflies, damselflies)

1. Surveys:

- a. Although the habitat is currently not valued as rare-species habitat per the DEP’s Landscape Project Map and most current database, the applicant *will* be required to conduct surveys for rare insects on conserved/public lands where suitable habitat crosses the ROW and access roads. Results of any such surveys may compel the department to request additional surveys on private lands.

Bats

1. Critical periods:

- a. April 1 – September 30: No tree removal

2. Surveys:

- a. If additional bat species (other than Indiana Bat) are federal listed, permit applicant may be required to conduct surveys in suitable habitats. All bat surveys should follow the protocols described by the USFWS. Current guidelines for Indiana Bat (Indiana Bat Summer Survey Guidelines 2014) list survey effort for, in this case, linear projects. These guidelines *may* be sufficient, but that must be determined by USFWS. Surveys may include acoustic surveys and/or mist netting surveys. All proposed survey efforts must be reviewed and approved by ENSP prior to implementation. All bat species captured should be documented and included in the final report. ENSP will provide field data sheets for documenting all bat captures.

Reptiles and amphibians

If the project is approved, PennEast Pipeline *may* be required to have [multiple] ENSP-approved herpetologists on site to locate and remove reptiles and amphibians from harm’s way during site preparation, construction, restoration and revegetation. If

Northern Copperheads are discovered, State-approved venomous snake monitors will be required.

Turtles (Bog, Wood, Spotted, Box):

1. Critical periods:

- a. Hibernation:
 - i. Bog Turtle – October 1 – April 1
 - ii. Wood Turtle – November 15 – March 15
 - iii. Spotted Turtle – October 1 – April 1
 - iv. Eastern Box Turtle – October 1 – April 1
- b. Nesting: May 15 – July 15

2. Surveys:

- a. Coordinate with USFWS – NJ Field Office when in areas mapped for Bog Turtle to determine need for Phase I and Phase II surveys.
- b. Surveys may be needed to assess streams for wood turtle hibernation potential in areas where stream crossings are necessary between November 15 and March 15.

All regulated land and water

Turtles (Bog, Wood, Spotted):

3. Critical periods:

- c. Hibernation:
 - i. Bog Turtle – October 1 – April 1
 - ii. Wood Turtle – November 15 – March 15
 - iii. Spotted Turtle – October 1 – April 1
- d. Nesting: May 15 – July 15

4. Surveys:

- c. Coordinate with USFWS – NJ Field Office when in areas mapped for Bog Turtle to determine need for Phase I and Phase II surveys.
- d. Surveys may be needed to assess streams for wood turtle hibernation potential in areas where stream crossings are necessary between November 15 and March 15.

Vernal Pools:

1. Critical periods:

- a. Vernal Pool Breeding Periods (most species): March 1 – June 1; Marbled Salamander: September 15 – October 31.

2. Surveys:

- a. Although the habitat has already been valued as rare-species habitat per the DEP's Landscape Project Map and most current database, the applicant *will be* required to conduct surveys for vernal pool or rare amphibian presence

- and/or critical habitat use via the Division of Land Use Regulation's permitting process.
- b. Both diurnal and nocturnal surveys are used to assess species use of vernal pools during the breeding period. Frog call surveys and egg mass/spermatophore surveys can be used to document presence.
 - c. Wetlands/waters potentially meeting "vernal habitat" certification requirements pursuant to NJAC 7:7A-1.4 must be identified on submitted plans or in a separate report which references any such potential vernal habitat area using – at least in part - the same wetland delineation nomenclature as is depicted on submitted plans. Completed datasheets reflecting hydrologic conditions and observed fauna should be included, as should aerial photographs depicting potential vernal habitat locations.

Mussels

1. Critical periods:

- a. Glochidial release times (generally spring, early summer)
- b. Spawning times (generally late summer, early fall)
- c. Brook Floater: Apr 1-Jun 30; Aug 1 – Sep 30
- d. Green Floater: Apr 1 – Jun 30; Aug 1 – Sep 30
- e. Dwarf Wedgemussel: Apr 1 – Jun 15; Aug 1 – Nov 1
- f. Yellow Lampmussel; Apr 1 – Jun 30; Aug 1 – Oct 15
- g. Tidewater Mucket: Apr 1 – Jun 15; Sep 15 – Nov 1
- h. Eastern Pondmussel; May 15 – Jul 30; Aug 1 – Sep 30
- i. Triangle Floater: dates unknown
- j. Creeper: dates unknown
- k. Eastern Lampmussel: dates unknown

2. Surveys:

- a. Although the habitat has not been valued as rare-species habitat per the DEP's Landscape Project Map and most current database, the applicant is required to conduct habitat assessments at all stream crossings where project activities may impact aquatic habitat; this includes access roads. If an area is determined to be suitable for freshwater mussels, a mussel survey must be conducted prior to construction to provide more detailed information to the DEP for the permit review process.
 - 1) The permit applicant must develop and submit for review and approval by the Division of Fish and Wildlife, Endangered and Nongame Species Program (contact: Jeanette Bowers-Altman, 856-629-0261), a proposed survey protocol designed to investigate the occurrence of listed freshwater mussels in areas determined to be suitable. This survey should propose both visual survey and random excavation survey techniques, and must comprehensively cover the project area. The proposal must identify the contractor(s) who would perform the survey, and identify their experience performing aquatic surveys, in particular surveys for mussels. The survey

should be designed to be conducted between May 1 and September 30 of the calendar year.

- 2) If listed freshwater mussels are located the permit applicant must propose an impact avoidance plan designed to protect individuals/populations which occur at the immediate project site, as well as downstream of the project area. The impact avoidance plan must identify all best management plans (BMP's) such as coffer dams, sediment barriers or silt curtains which will be employed prior to, during, and following implementation of the activities authorized by this permit. No site preparation, clearing, grading or disturbance may occur until the impact avoidance plan has been approved in writing by the Department.
- b. If work is to be conducted within or proximate to an identified Dwarf wedgemussel area, surveyors must be recognized on the U.S. Fish and Wildlife Service's (NJ Field Office) List of Qualified Dwarf Wedgemussel Surveyors.
- c. While there are other locations where mussels are found, the Stony Brook is of particular concern since several listed species have been documented within and/or proximate to the proposed pipeline route. Full scale mussel surveys should be performed at this location (see above under section *Mussels*, 3a and 3b).

Birds

Nesting periods for rare species/species suites:

Please note the list below is not a comprehensive list of species that may be encountered along the proposed pipeline route, but provided for reference only regarding some of the potential critical periods PEP may need to consider in their planning efforts.

All must comply with State timing and activity restrictions and the federal Migratory Bird Treaty Act of 1918 to protect nesting birds and their young.

Nesting periods:

- a. American Bitterns: April 15 – August 1.
- b. Least Bitterns: April 15 – August 1
- c. Great Blue Herons: March 15 – August 15
- d. Sedge Wrens: April 15 – October 15
- e. Pied-billed Grebe: April 15 – August 1

3. *Surveys:*

- a. Water-associated birds such as Great Blue Herons, Sedge Wrens and Pied-billed Grebe may occur along part(s) of the proposed pipeline. The applicant is required to conduct surveys within suitable habitats for these species in search of nests and/or rookeries for Great Blue Herons and individuals and/or active nests of Sedge Wrens and Pied-billed Grebes.
- b. Secretive marsh birds, including but not limited to American and Least Bitterns, may occur along part(s) of the proposed pipeline. The applicant is required to conduct surveys within suitable habitats for secretive marsh bird

species and their nests to provide more detailed information to the DEP for the permit review process. Target nesting periods for scheduling such surveys.

1) Surveyors must implement the survey protocol found at:

http://www.tidmarshmonitoring.org/pdf/Conway2008_NorthAmericanMarshBirdSurveyProtocols.pdf

D&R Canal (~5.5 ac southeast of Lambertville) and Ted Stiles Preserve at Baldpate Mountain

Snakes (Northern Copperheads):

At the time of this review (September 2015), ENSP is not aware of hibernacula, transient basking habitat or gestation/birthing habitats along the proposed route.

1. Critical periods:

- a. Hibernation, ingress to and egress from hibernacula: September 10 – March 1
- b. Nesting/Gestation/Birthing: July 1 – September 10

2. Surveys:

- a. Surveys must be conducted to identify hibernacula, transient basking habitat and/or gestation/birthing habitats within these areas along the proposed pipeline route, access roads and a 200m buffer of these areas and proposed work space.

If you have additional questions, please contact Kris Schantz at (908) 638-4381 or via e-mail, Kris.Schantz@dep.nj.gov.

Bureau of Surface Water Permitting

Any discharge of construction dewatering to any surface water body requires a New Jersey Pollutant Discharge Elimination System (NJPDES) surface water permit from the Department's Bureau of Surface Water Permitting. Any discharge of contaminated water would require additional permit(s) and/or would not be a regulated discharge.

If you have any questions regarding any discharge to surface water, please contact Kelly Perez at (609) 292-4860.

Thank you for giving the New Jersey Department of Environmental Protection the opportunity to provide additional addendum comment on the Final Resource Reports and FERC Certificate Application for the proposed Penn East Pipeline Project.

Sincerely,



John Gray, Esq.
Deputy Chief of Staff

Enclosures

cc: Medha Kochhar, FERC
Ruth Foster, NJDEP-PCER
Angela Skowronek, NJDEP-Air Quality Planning
Peg Hanna, NJDEP – Air Quality Mobile Sources
Jan Gheen, NJDEP-Water Allocation
Kelly Davis, NJDEP-Fish and Wildlife
Jesse West-Rosenthal, NJDEP- Historic Preservation
Chris Squazzo, NJDEP-Land Use
Dennis Contois, NJDEP - Land Use
Kevin Appelget, NJDEP - Green Acres
Diane Dow, NJDEP – Land Use
Ginger Kopkash, NJDEP - Land Use
JoDale Legg, NJDEP - Land Use Mitigation
Robin Madden, NJDEP – NHRG
Cari Wild, NJDEP-NHRG
Patrick Sheppard, NJDEP - Land Use
Michael Palmquist, NJDEP – Enforcement
Christina Albizati, NJDEP-Land Use T+E
Robert Cartica, NJDEP –NHRG ENSP
Kris Schantz, NJDEP – NHRG ENSP
Richard Dalton, NJGS
Dan Kuti, NJDEP-Stormwater
Ronald Bannister, NJDEP – Stormwater
Kelly Perez, NJDEP – Surface Water
Jeff England, Penn East
Sean Sparks, Tetra Tech
Bernard Holcomb, AECOM
Marilyn Lennon, PS&S



The New Jersey
NATURAL LANDS TRUST

October 21, 2015

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

RE: Docket# CP15-558

Dear Secretary Bose:

Please accept this comment on behalf of the New Jersey Natural Lands Trust (NJNLT), an independent New Jersey state agency that is in but not of the New Jersey Department of Environmental Protection. As prescribed by law, the NJNLT is governed by an 11-member Board of Trustees, six of whom are representatives of conservation organizations. The New Jersey Legislature created the NJNLT in 1968 as an organization that could accept land donations and ensure their protection in perpetuity by resisting the exercise of eminent domain by public agencies. The New Jersey Legislature specifically gave the NJNLT this authority in response to attempts at that time to condemn and develop preserved property. Another critical mission of the NJNLT is to conserve elements of biodiversity including habitat for rare plant and animal species, and rare ecological communities.

The proposed PennEast pipeline route traverses five NJNLT-managed properties within its Gravel Hill Preserve in Holland Township, Hunterdon County, NJ. The 400-foot pipeline study corridor also includes a portion of the NJNLT's Thomas F. Breden Preserve at Milford Bluffs (also within Holland Township), although PennEast has assured the NJNLT that it has no intention of using any portion of that preserve for construction or staging.

As early as March 2015 the NJNLT requested that PennEast avoid the Gravel Hill Preserve consistent with the NJNLT's statutory purpose as well as the presence of habitat for the state-endangered bobcat and a rare plant, wild comfrey. In addition to avoiding the existing preserve, the NJNLT requested that PennEast also avoid the larger Gravel Hill Project Area. Based on the presence of rare species habitat, the NJNLT Board designated the lands within the Project Area boundary as a high priority for acquisition and inclusion in the Gravel Hill Preserve.

In order to avoid the Gravel Hill Preserve and Project Area, the NJNLT requested that PennEast install the pipeline within county roads that surround the preserve. The enclosed attachment depicts PennEast's current proposed route through Gravel Hill Preserve along with NJNLT's

proposed alternate route. Although PennEast assured the NJNLT that it would consider the road installation alternative, as well as an alternative of co-locating its pipeline within two existing transmission line rights of way, PennEast's September 2015 application to FERC continues to show the pipeline being routed through the NJNLT's Gravel Hill Preserve. Notwithstanding its FERC application, PennEast has advised the NJNLT that it is still studying alternatives including the road installation alternative. However, in recent meetings PennEast's representatives have suggested that FERC discourages the placement of pipelines within roads or that the road installation may be too costly.

FERC has an obligation to ensure that approved projects do not result in significant environmental impacts and that reasonable and feasible alternatives are fully vetted. The NJNLT respectfully submits that property preserved in perpetuity and that supports rare species habitat should not be designated as the preferred route if viable, less environmentally damaging alternatives exist. Portions of the Gravel Hill Preserve that are targeted in the application include a mature forest with a natural understory and a general absence of invasive plant species. If this forest was subject to clearing for the installation of the pipeline, it would detrimentally impact the understory species that thrive on a closed tree canopy and increase the likelihood for the introduction of invasive plant species, thereby permanently altering the integrity of this ecological community. The NJNLT believes that pipeline installation is feasible within the county roads that surround the preserve boundary. This is a rural low traffic area. The NJNLT is not aware of any existing infrastructure within the subject roadways and there appear to be viable options for detours during construction.

Based on these factors, we respectfully request that FERC fully investigate alternatives to the current preferred route that would impact our Gravel Hill Preserve and require PennEast to avoid the NJNLT's Gravel Hill Preserve if a viable, less environmentally damaging alternative is available.

Thank you for the opportunity to provide this comment.

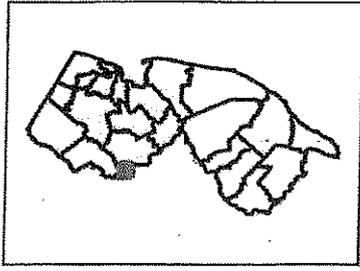
Sincerely,



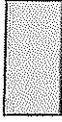
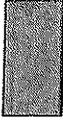
Michael Catania
Chair

c: Medha Kochhar, FERC
Anthony Cox, PennEast
Jeff England, PennEast
Marilyn Lennon, PS&S
Ruth Foster, NJDEP, PCER
Rich Boornazian, NJDEP, NHRG
Lynn Fleming, NJDEP, SFS
Robin Madden, NJDEP, NHRG
Robert Cartica, NJNLT

New Jersey



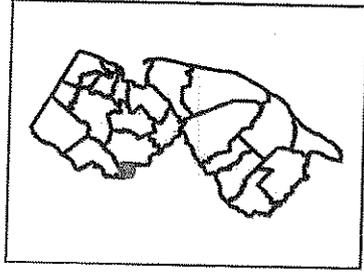
Legend

-  PennEast Proposed Route
-  Proposed Alternate
-  NJNLT Lands
-  NJNLT Project Area

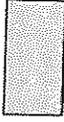
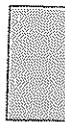


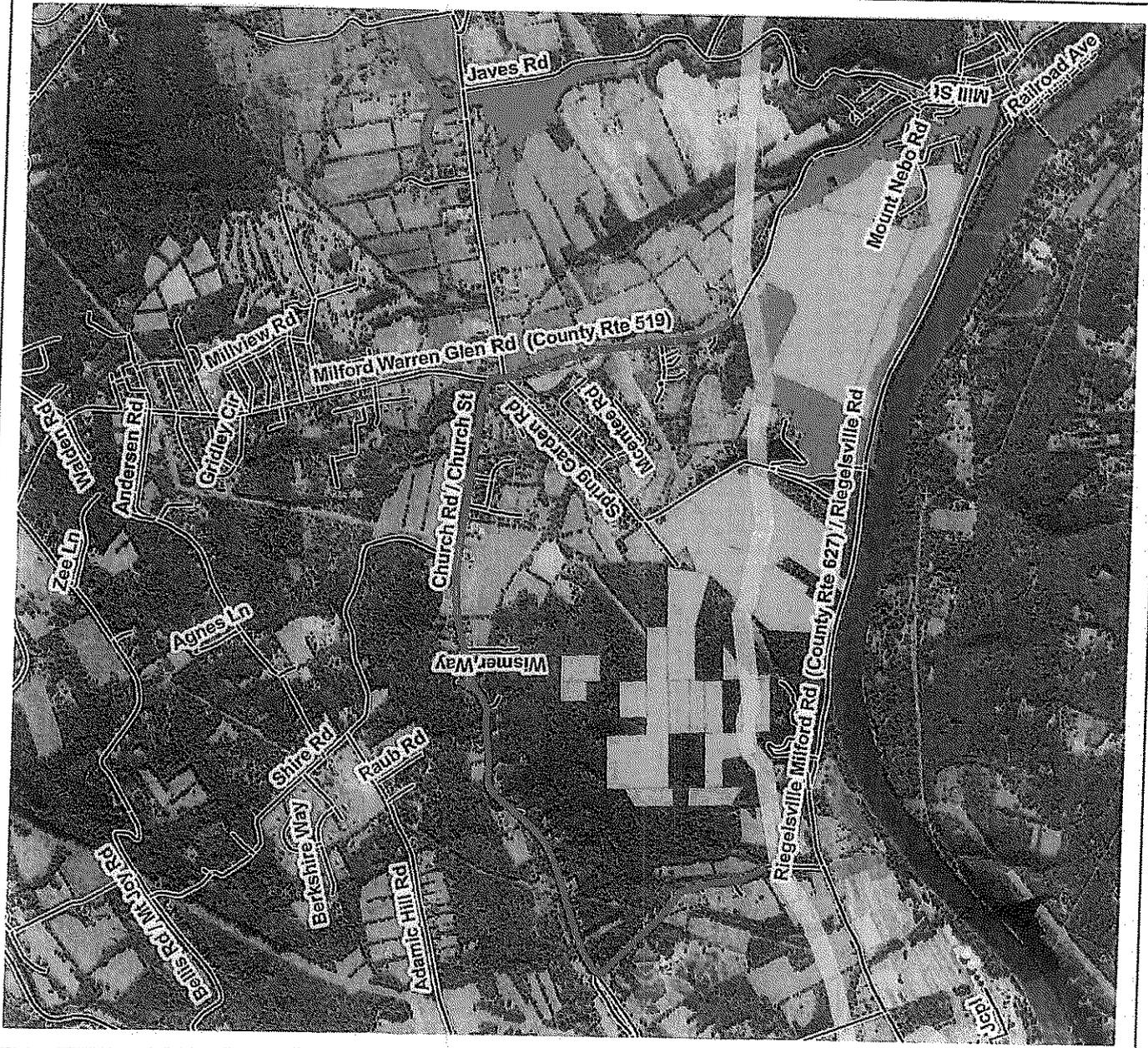
**Milford Bluffs
Natural Heritage Priority Site**

New Jersey



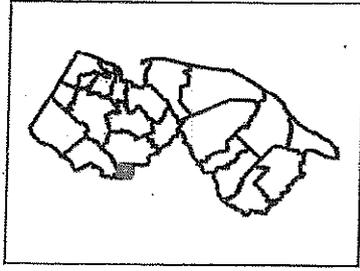
Legend

-  PennEast
-  Proposed Pipeline
-  Proposed Alternate
-  Natural Heritage Priority Site
-  Natural Lands Trust



NJNLT Proposed Alternate Pipeline Route to Avoid Gravel Hill Preserve and NJNLT Project Areas

New Jersey



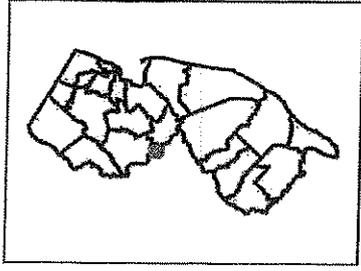
Legend

-  PennEast
-  Proposed Pipeline
-  Proposed Alternate
-  NJNLT Preserve
-  NJNLT Project Area

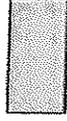
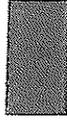


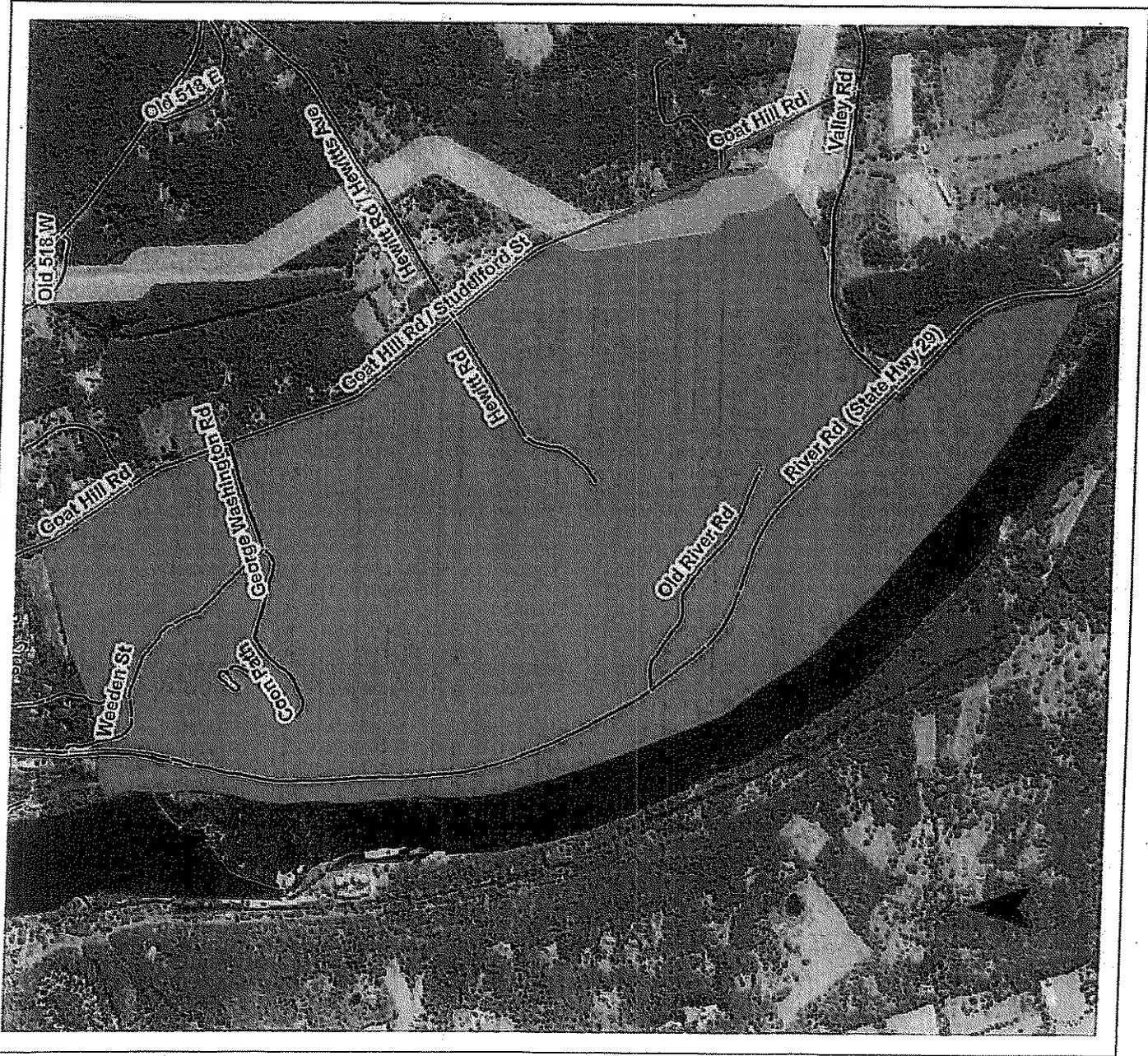
Goat Hill
Natural Heritage Priority Site

New Jersey



Legend

-  PennEast
-  Proposed Pipeline
-  Proposed Alternate
-  Natural Heritage Priority Site



EXPLANATIONS OF CODES USED IN NATURAL HERITAGE REPORTS

FEDERAL STATUS CODES

The following U.S. Fish and Wildlife Service categories and their definitions of endangered and threatened plants and animals have been modified from the U.S. Fish and Wildlife Service (F.R. Vol. 50 No. 188; Vol. 61, No. 40; F.R. 50 CFR Part 17). Federal Status codes reported for species follow the most recent listing.

- LE** Taxa formally listed as endangered.
- LT** Taxa formally listed as threatened.
- PE** Taxa already proposed to be formally listed as endangered.
- PT** Taxa already proposed to be formally listed as threatened.
- C** Candidate taxa for which the Service currently has on file sufficient information on biological vulnerability and threat(s) to support proposals to list them as endangered or threatened species.
- S/A** Similarity of appearance species.

STATE STATUS CODES

Two animal lists provide state status codes after the Endangered and Nongame Species Conservation Act of 1973 (N.J.S.A. 23:2A-13 et. seq.): the list of endangered species (N.J.A.C. 7:25-4.13) and the list defining status of indigenous, nongame wildlife species of New Jersey (N.J.A.C. 7:25-4.17(a)). The status of animal species is determined by the Nongame and Endangered Species Program (ENSP). The state status codes and definitions provided reflect the most recent lists that were revised in the New Jersey Register, Monday, June 3, 1991.

- D** Declining species—a species which has exhibited a continued decline in population numbers over the years.
- E** Endangered species—an endangered species is one whose prospects for survival within the state are in immediate danger due to one or many factors – a loss of habitat, over exploitation, predation, competition, disease. An endangered species requires immediate assistance or extinction will probably follow.
- EX** Extirpated species—a species that formerly occurred in New Jersey, but is not now known to exist within the state.
- I** Introduced species—a species not native to New Jersey that could not have established itself here without the assistance of man.
- INC** Increasing species—a species whose population has exhibited a significant increase, beyond the normal range of its life cycle, over a long term period.
- T** Threatened species—a species that may become endangered if conditions surrounding the species begin to or continue to deteriorate.
- P** Peripheral species—a species whose occurrence in New Jersey is at the extreme edge of its present natural range.
- S** Stable species—a species whose population is not undergoing any long-term increase/decrease within its natural cycle.
- U** Undetermined species—a species about which there is not enough information available to determine the status.

Status for animals separated by a slash(/) indicate a dual status. First status refers to the state breeding population, and the second status refers to the migratory or winter population.

SC Special Concern – applies to animal species that warrant special attention because of some evidence of decline, inherent vulnerability to environmental deterioration, or habitat modification that would result in their becoming a Threatened species. This category would also be applied to species that meet the foregoing criteria and for which there is little understanding of their current population status in the state.

Plant taxa listed as endangered are from New Jersey's official Endangered Plant Species List N.J.S.A. 131B-15.151 et seq.

E Native New Jersey plant species whose survival in the State or nation is in jeopardy.

REGIONAL STATUS CODES FOR PLANTS AND ECOLOGICAL COMMUNITIES

LP Indicates taxa listed by the Pinelands Commission as endangered or threatened within their legal jurisdiction. Not all species currently tracked by the Pinelands Commission are tracked by the Natural Heritage Program. A complete list of endangered and threatened Pineland species is included in the New Jersey Pinelands Comprehensive Management Plan.

HL Indicates taxa or ecological communities protected by the Highlands Water Protection and Planning Act within the jurisdiction of the Highlands Preservation Area.

EXPLANATION OF GLOBAL AND STATE ELEMENT RANKS

The Nature Conservancy developed a ranking system for use in identifying elements (rare species and ecological communities) of natural diversity most endangered with extinction. Each element is ranked according to its global, national, and state (or subnational in other countries) rarity. These ranks are used to prioritize conservation work so that the most endangered elements receive attention first. Definitions for element ranks are after The Nature Conservancy (1982: Chapter 4, 4.1-1 through 4.4.1.3-3).

GLOBAL ELEMENT RANKS

G1 Critically imperiled globally because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) making it especially vulnerable to extinction.

G2 Imperiled globally because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extinction throughout its range.

G3 Either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range (e.g., a single western state, a physiographic region in the East) or because of other factors making it vulnerable to extinction throughout its range; with the number of occurrences in the range of 21 to 100.

G4 Apparently secure globally; although it may be quite rare in parts of its range, especially at the periphery.

G5 Demonstrably secure globally; although it may be quite rare in parts of its range, especially at the periphery.

GH Of historical occurrence throughout its range i.e., formerly part of the established biota, with the expectation that it may be rediscovered.

GU Possibly in peril range-wide but status uncertain; more information needed.

GX Believed to be extinct throughout range (e.g., passenger pigeon) with virtually no likelihood that it will be rediscovered.

G? Species has not yet been ranked.

GNR Species has not yet been ranked.

STATE ELEMENT RANKS

- S1** Critically imperiled in New Jersey because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres). Elements so ranked are often restricted to very specialized conditions or habitats and/or restricted to an extremely small geographical area of the state. Also included are elements which were formerly more abundant, but because of habitat destruction or some other critical factor of its biology, they have been demonstrably reduced in abundance. In essence, these are elements for which, even with intensive searching, sizable additional occurrences are unlikely to be discovered.
- S2** Imperiled in New Jersey because of rarity (6 to 20 occurrences). Historically many of these elements may have been more frequent but are now known from very few extant occurrences, primarily because of habitat destruction. Diligent searching may yield additional occurrences.
- S3** Rare in state with 21 to 100 occurrences (plant species and ecological communities in this category have only 21 to 50 occurrences). Includes elements which are widely distributed in the state but with small populations/acreage or elements with restricted distribution, but locally abundant. Not yet imperiled in state but may soon be if current trends continue. Searching often yields additional occurrences.
- S4** Apparently secure in state, with many occurrences.
- S5** Demonstrably secure in state and essentially ineradicable under present conditions.
- SA** Accidental in state, including species (usually birds or butterflies) recorded once or twice or only at very great intervals, hundreds or even thousands of miles outside their usual range; a few of these species may even have bred on the one or two occasions they were recorded; examples include European strays or western birds on the East Coast and vice-versa.
- SE** Elements that are clearly exotic in New Jersey including those taxa not native to North America (introduced taxa) or taxa deliberately or accidentally introduced into the State from other parts of North America (adventive taxa). Taxa ranked SE are not a conservation priority (viable introduced occurrences of G1 or G2 elements may be exceptions).
- SH** Elements of historical occurrence in New Jersey. Despite some searching of historical occurrences and/or potential habitat, no extant occurrences are known. Since not all of the historical occurrences have been field surveyed, and unsearched potential habitat remains, historically ranked taxa are considered possibly extant, and remain a conservation priority for continued field work with the expectation they may be rediscovered.
- SP** Element has potential to occur in New Jersey, but no occurrences have been reported.
- SR** Elements reported from New Jersey, but without persuasive documentation which would provide a basis for either accepting or rejecting the report. In some instances documentation may exist, but as of yet, its source or location has not been determined.
- SRF** Elements erroneously reported from New Jersey, but this error persists in the literature.
- SU** Elements believed to be in peril but the degree of rarity uncertain. Also included are rare taxa of uncertain taxonomical standing. More information is needed to resolve rank.
- SX** Elements that have been determined or are presumed to be extirpated from New Jersey. All historical occurrences have been searched and a reasonable search of potential habitat has been completed. Extirpated taxa are not a current conservation priority.

- SXC** Elements presumed extirpated from New Jersey, but native populations collected from the wild exist in cultivation.
- SZ** Not of practical conservation concern in New Jersey, because there are no definable occurrences, although the taxon is native and appears regularly in the state. An SZ rank will generally be used for long distance migrants whose occurrences during their migrations are too irregular (in terms of repeated visitation to the same locations), transitory, and dispersed to be reliably identified, mapped and protected. In other words, the migrant regularly passes through the state, but enduring, mappable element occurrences cannot be defined.
- Typically, the SZ rank applies to a non-breeding population (N) in the state – for example, birds on migration. An SZ rank may in a few instances also apply to a breeding population (B), for example certain lepidoptera which regularly die out every year with no significant return migration.
- Although the SZ rank typically applies to migrants, it should not be used indiscriminately. Just because a species is on migration does not mean it receives an SZ rank. SZ will only apply when the migrants occur in an irregular, transitory and dispersed manner.
- B** Refers to the breeding population of the element in the state.
- N** Refers to the non-breeding population of the element in the state.
- T** Element ranks containing a "T" indicate that the infraspecific taxon is being ranked differently than the full species. For example *Stachys palustris* var. *homotricha* is ranked "G5T? SH" meaning the full species is globally secure but the global rarity of the var. *homotricha* has not been determined; in New Jersey the variety is ranked historic.
- Q** Elements containing a "Q" in the global portion of its rank indicates that the taxon is of questionable, or uncertain taxonomical standing, e.g., some authors regard it as a full species, while others treat it at the subspecific level.
- .1** Elements only, ever documented from a single location.

Note: To express uncertainty, the most likely rank is assigned and a question mark added (e.g., G2?). A range is indicated by combining two ranks (e.g., G1G2, S1S3).

IDENTIFICATION CODES

These codes refer to whether the identification of the species or community has been checked by a reliable individual and is indicative of significant habitat.

These codes are not included on all Natural Heritage Reports.

- Y** Identification has been verified and is indicative of significant habitat.
- BLANK** Identification has not been verified but there is no reason to believe it is not indicative of significant habitat.
- ?** Either it has not been determined if the record is indicative of significant habitat or the identification of the species or community may be confusing or disputed.

Attachment A

New Jersey Natural Heritage Program Additional Guidance on Ecological Community Inventory and Mapping

At least five relevé plots and five recon plots shall be located and sampled to aid in classification of communities. The following general vegetation sampling methodology shall be used:

- Most detailed quantitative relevé plot sampling of ecological community types will be conducted within rare, exemplary or higher conservation value patches/polygons.
- Less detailed “recon plots” and “recon patch plots” (descriptive plots with percent cover or cover class of dominant species) shall be used to document common ecological community types and lower priority polygons.
- Least detailed “rapid assessment samples” shall be used to document polygons encountered during preliminary ground truthing, roughly estimated as the minimum number needed to adequately map and ground truth all ecological community types. Community type and dominant species are recorded.
- Relevé and recon samples will include documenting percent-cover estimates of all or most plant species within a 100 to 400-square meter (m²) circular, square, or rectangular plot (determined by community type, size and orientation on the landscape), and sampling methods appropriate for the particular community type, vegetation structure, patch size, and shape will also be considered. Most closed canopy forest types will require up to 400-square meter (m²) sample plots. Examples of minimal sample area for other community types are as follows (Mueller-Dombois and Ellenberg, 1974):

Community Type	Minimal Sample Area
Forests	200-500m ²
Shrublands	50-100 m ²
Dwarf-shrub heath	10-25 m ²
Grasslands	50-100 m ²
Herbaceous communities	10-25 m ²
Moss communities	1-4 m ²
Lichen communities	0.1-1.0 m ²

- The center point of relevé plots will be marked with a wire stake flag and locational data collected with 1-5 meter GPS accuracy as indicated above.
- Relevé plots will be digitally photographed at high resolution from the plot's northern, southern, eastern and western edges facing the marked center point. Photographs file names should include cardinal direction.

Relevé Plot: Percent-cover values for all species by stratum will be measured to the nearest 1-percent within a defined relevé plot (e.g., 100 to 400 m² [328 ft² to 1312 ft²]). For some species in the plot that are impractical to measure to the nearest 1-percent cover, percent-cover class estimates (as described for recon plots) will be used.

Recon Plot: Percent-cover values for dominant and diagnostic species by stratum will be divided into cover classes within a defined or visually estimated recon plot (e.g., 100 to 400 m² [328 ft² to 1312 ft²]), using the following species cover classes: 75 to 100 percent, 50 to 75 percent, 25 to 50 percent, 5 to 25 percent, 1 to 5 percent, less than 1 percent, and P=present cover unknown. Cover classes for each stratum and species should be written out on the field forms; number codes representing each cover class should not be used. Either Braun-Blanquet or Domin Cover Class can be used, but one must be chosen and used consistently.

Braun-Blanquet Cover Scale Values	Domin Cover Scale Values
5 = 76 - 100%	10 = 91 - 100%
4 = 51 - 75%	9 = 76 - 90%
3 = 26 - 50%	8 = 51 - 75%
2 = 6 - 25%	7 = 34 - 50%
1 = 1 - 5%	6 = 26 - 33%
+ = <1%	5 = 11 - 25%
	4 = 4 - 10%
	3 = 1 - 4%
	2 = <1% Several individuals but less than 1% cover
	1 = 1 - 2 individuals. No measurable cover. Individuals with normal vigor.
	+ = a single individual. No measurable cover.

Recon Patch Plots: Percent-cover values for dominant and diagnostic species by stratum will be divided into cover classes, using the natural bounds of a small patch occurrence to define the sampling area and using the same following species cover classes: 75 to 100 percent, 50 to 75 percent, 25 to 50 percent, 5 to 25 percent, 1 to 5 percent, less than 1 percent, and P=present cover unknown.

The following references are recommended to aid in ecological community inventory and mapping, including relevé plot sampling:

- **National Park Service – Vegetation Mapping Inventory (VMI)** protocol at <https://science.nature.nps.gov/im/inventory/veg/>
- **USDA United States Forest Service - Existing Vegetation Classification and Mapping Technical Guide Version 1.1** at: http://www.fs.fed.us/emc/rig/documents/protocols/vegClassMapInv/EV_TechGuideV1-1-2.pdf
- **NatureServe Biodiversity Inventory of Natural Lands** (Cutko, 2009) report and appendices (use Google Chrome) at: http://www.natureserve.org/sites/default/files/publications/biodiversityinventorymanual_main.pdf and: http://www.natureserve.org/sites/default/files/publications/biodiversityinventorymanual_appendices.pdf
- FGDC. 2008. **National Vegetation Classification Standard, Version 2 FGDC-STD-005-2008 (version 2)**. Vegetation Subcommittee, Federal Geographic Data Committee, FGDC Secretariat, U.S. Geological Survey. Reston, VA. 55 pp. + Appendices. <https://www.fgdc.gov/standards/projects/FGDC-standards-projects/vegetation>
- **A Flexible, Multipurpose Method for Recording Vegetation Composition and Structure**. Peet, R.K., T.R. Wentworth, and P.S. White. 1998. A flexible, multipurpose method for recording vegetation composition and structure. *Castanea* 63:262-274. <http://cvs.bio.unc.edu/pubs/castanea63;262.pdf>
- **Handbook for Collecting Releve Data** (Minnesota Natural Heritage Program, 2012) at: http://files.dnr.state.mn.us/eco/mcbs/releve/releve_singlepage.pdf
- **Virginia Natural Heritage Program (VANHP) standard plot data collection field form and instructions** at: http://www.dcr.virginia.gov/natural_heritage/documents/nh_plotform_04062011.pdf and http://www.dcr.virginia.gov/natural_heritage/documents/nh_plotform_instructions.pdf
- **Aims and Methods of Vegetation Ecology**. Mueller-Dombois, Dieter and Heinz Ellenberg. 1974. *Aims and Methods of Vegetation Ecology*, John Wiley & Sons, New York. 547 p.

Attachment B

New Jersey Natural Heritage Program Procedures for Collection of Voucher Specimens

Collection of a voucher specimen is required if the surveyor encounters a native or invasive taxon of questionable identification, or that constitutes an unusual or unique find (e.g., new to the State, outside of its range, etc.). Exceptions are noted below.

A voucher specimen may be required as defined above for any vascular (or non-vascular, if requested) plant taxa with a Natural Heritage Program (NHP) rank of S3S4, S3, S2, S1, SH, SX, SU (or any combination of these ranks) that is documented on a project site. Specimens also should be collected for any taxa believed to be an addition to New Jersey's flora. Depending on project need (including scope, total funding, duration, etc.) voucher specimens may also be requested for native species of other state ranks or nonindigenous plant taxa.

It is the responsibility of the surveyor, upon completion of the project, to submit standard mounted and labeled herbarium specimens to the NHP or to another repository as directed by the NHP. The following links provide excellent guidelines in the collection, pressing, mounting, and labeling of herbarium specimens:

<http://herbarium.desu.edu/pfk/page23/page24/files/herbariummaking.pdf>

<http://www.mobot.org/mobot/molib/fieldtechbook/pressing.shtml>

<http://www.rbg.ca/Document.Doc?id=125>

The following restrictions apply to the collection of voucher specimens:

1. Plants ranked as S1.1 are not to be collected without prior authorization.
2. Underground parts of plants listed as state endangered or plants ranked as S1 are not to be collected from populations of less than 50 individuals.
3. Only above ground portions of plants may be collected for plants listed as state endangered or plants ranked as S1 which occur in populations numbering 30-49 individuals.
4. No voucher specimens will be collected for any plant species, regardless of state rank, for populations of less than 30 individuals.
5. No voucher specimens will be collected for any orchid species or for any species of *Trillium*.

6. No voucher specimens will be collected for any plants species that are federally listed or are candidates for federal listing without prior authorization.
7. No voucher specimens will be collected for any species ranked as S2 or S3 in populations of less than 30 individuals.
8. Only a single voucher specimen per plant species will be collected for any species regardless of Natural Heritage state rank unless prior authorization is granted.
9. The collection of voucher specimens are restricted to state owned or state managed lands and will be only collected by authorized individuals who have written permission from the appropriate state agency.
10. Digital photographs are to be submitted as positive documentation in all cases were a physical specimen is not collected due to any of the above restrictions.
11. All voucher specimens and photographs are the exclusive property of the State of New Jersey.

ATTACHMENT B

Recommended Rare Plant Species and Ecological Community Survey Protocols To Ensure Adequate Baseline Data Prior to Habitat Disturbance or Management

State Forestry Services
Office of Natural Lands Management

March 18, 2015

Overview

With few exceptions, comprehensive inventories of the flora and ecological communities are not available for most lands in New Jersey. These elements of biodiversity are the focus of the Office of Natural Lands Management (ONLM). Data is collected and maintained in the New Jersey Natural Heritage (or Biotics) Database, the Department's digital and manual file of locational information on occurrences of rare plant species and ecological communities. Most of this information is based on an extensive examination of New Jersey's rich history of botanical exploration followed by more than 30 years of targeted surveys to relocate historical records. To a lesser extent, data is collected during *de novo* surveys of suitable habitats or is based on the reports of local experts. The classification and mapping of ecological communities is a more recent development, and occurrences of rare communities are not as well represented in the Biotics Database as are those for rare plant species.

The following protocols are considered by the ONLM to be the minimum necessary in order to adequately survey sites and determine the locations and composition of the rare elements of biodiversity tracked by the Natural Heritage Program. Application of these protocols by qualified botanical and ecological professionals will create a baseline that may be used to determine the biodiversity value or importance of a site, to guide habitat management to preserve or enhance occurrences of these elements, to assess the biodiversity impact of proposals to alter or destroy the habitat supporting these resources, and/or to design mitigation in those instances where avoidance of impacts to species or ecological communities is not possible.

The following protocols are generic in nature and may need to be tailored by the ONLM to meet the specific survey requirements of individual projects and applications. Factors that may result in survey protocol modifications include but are not limited to project area acreage, community composition and topographic conditions.

Ecological Community Survey and Mapping

Ecological community characterization and mapping will follow the classification provided in *A Preliminary Natural Community Classification for New Jersey* (<http://www.nj.gov/dep/parksandforests/natural/heritage/nclass.pdf>). The ONLM, Natural Heritage Program webpage (<http://www.nj.gov/dep/parksandforests/natural/heritage/index.html>) should be consulted regarding any changes or updates to New Jersey's ecological community classification.

New Jersey Natural Heritage Program *Ecological Community Reporting Forms* (site survey summary of plots, community element occurrence record, community plot data), provided by the ONLM, shall be used to record the existence, status, and location of occurrences of each rare ecological community encountered during the survey.

Digital photographs (with a date associated with each photo) of rare communities will be taken. GPS coordinates for locations of occurrences of rare ecological communities will be recorded and documented using a GPS receiver capable of collecting data with a horizontal accuracy of 1-5 meters. GPS coordinate data will be provided in ESRI shapefile format, or in a Microsoft Excel spreadsheet or Access file, with coordinate records labeled to reference the reporting form associated with that record. GPS data with an accuracy of 1-5 meters will include information about the coordinate system, datum used for data collection, and accuracy of each reading. GPS data collected for occurrence boundary lines or other large features will be provided in ESRI shapefile format and will include the coordinate system datum, and accuracy level used in the shapefile. Further information about GPS data collection standards is available at: http://www.nj.gov/dep/gis/GPSStandards_2011.pdf

Depending on the acreage and diversity of the project area, a single field season is the minimum needed to perform all tasks required to classify and map ecological community types. Multiple field seasons may be needed to adequately survey some sites.

An iterative process involving community ecologist(s) and botanist(s) using desktop geospatial analysis (GA), photo-interpretation (PI), and multiple field sampling events will be used to identify and verify ecological community types, resulting in a GIS ecological community map.

1. **Desktop geospatial analysis:** A desktop analysis and identification of vegetation signatures using the most up-to-date readily available aerial imagery will be performed as an initial GA and PI (although the communities will not be mapped until the locations are assessed on the ground by the project botanist(s) during subsequent tasks). Vegetation signatures shall be assessed using combinations of color value, chroma or saturation, texture, crown height or width, size, density, pattern and taxa. Areas for follow-up in the field will be identified based on vegetation signature complexes, where multiple ecological communities may be attributed to similar image signatures. The GIS analyst(s) and project botanist(s) will work together to develop a list of likely ecological community

types anticipated to occur. The result will be specific spatial locations of unique and complex vegetation signatures and a list of likely mapping units for the botanist(s) and GIS analyst(s) to visit and document during the initial field assessment.

2. **Initial Field Assessment:** An initial field assessment will verify the results of the geospatial analysis and provide field maps with locations of presumed ecological community types identified and generate rapid assessment plot data. Locations of the desktop-identified unique vegetation signatures will be loaded onto a sub-meter Trimble or comparable GPS unit(s) for field location and documentation and will be plotted on hard-copy field maps. During fieldwork, the project botanist(s) will place plots in areas identified as a unique ecological community and will then collect rapid assessment vegetation data from the plots. A sufficient number of rapid assessment sample plots will be completed to adequately map and ground truth each ecological community type. Some plots may need to be sampled one additional time during the year to search for rare plants flowering in different seasons. GPS locations will be collected during this field effort for reference, calibration, and documentation of specific vegetation signatures as they occur on the ground. Additionally, the field team will delineate the boundaries of the ecological community type within which the plot is located on a geo-referenced field map.
3. **Development of draft ecological community type map:** GA and PI will continue using data collected during the initial field assessment to develop a draft ecological community type map. PI shall be based on data gathered during the initial field assessment (annotated field maps, rapid assessment plots, GPS data), as well as spatial ecology, landscape position (elevation, slope, aspect), vegetation species and community composition, vegetation signatures on imagery, and visible hydrology. This step will result in a draft ecological community type map that will then require field verification.
4. **Field assessment of draft ecological community type map and relevé plot sampling:** Relevé plots are quantitative plots of a set area delineated with measuring tapes where every species and its percent cover or cover class is recorded. Reconnaissance, or recon, plots are visually established plots of a set area where only dominant species percent cover or cover class are listed. Both types of plot samples include other vegetation structure and environmental information.

Fieldwork shall be conducted to assess the draft ecological community type map generated, including relevé plot data collection. This field effort will provide an opportunity for field assignment of polygons potentially lacking assigned ecological community types or needing verification or refinement. An assessment of the ecological community type map will be refined through a combination of annotating geo-referenced field maps and collecting GPS coordinates. Particular emphasis will be placed on the spatial accuracy of targeted communities.

Additional detail on plot sampling methodology and recommended references may be found in Attachment A.

5. **Revision of draft ecological community type map:** The draft ecological community type map will be revised and updated based on data collected during the field assessment to incorporate the relevé sampling data. The output of this step will be a revised ecological community type map of the entire area, with ecological community types assigned to all polygons in the GIS database.
6. **Final field assessment and final ecological community type map:** A final field assessment will be required to further refine the ecological community type map. During this task, an area-wide assessment of the ecological community type map will be performed. Areas and community types for which issues were noted throughout the mapping process will be revisited to further refine the results. Fieldwork in this effort will focus on communities of concern to ensure map accuracy for these areas. Refinements to the ecological community type map will be made in the field, and GPS data will be collected and provided to the GIS analyst for map revisions. A final ecological community type map will be produced using data collected during the final field assessment event.

Rare Plant Species Survey

Target plant species will include those species on the *List of Endangered Plant Species and Plant Species of Concern* (<http://www.nj.gov/dep/parksandforests/natural/heritage/njplantlist.pdf>). The ONLM, Natural Heritage Program webpage (<http://www.nj.gov/dep/parksandforests/natural/heritage/index.html>) should be consulted regarding any changes or updates to New Jersey's rare plant species lists.

A Request for Natural Heritage Data Services (<http://www.nj.gov/dep/parksandforests/natural/heritage/index.html#datarequest>) will be submitted to the ONLM in advance of the survey to determine if any occurrence records for endangered plants or plant species of concern exist within and in the vicinity of the project area.

Natural Heritage Program Rare Plant Species Reporting Forms (http://www.nj.gov/dep/parksandforests/natural/heritage/textfiles/NHRPSR_Form.docx) will be completed to record the existence, status, and location of occurrences of each rare species discovered during the survey.

Plant nomenclature will follow classification from the Biota of North America Program (BONAP) Taxonomic Data Center Query Page (<http://bonap.net/tdc>), Traditional Classification nomenclature (accessed by selecting "Traditional Classification" from the drop-down menu in

the “Families” column). Also acceptable is Gleason and Cronquist’s (1991) Manual of Vascular Plants of Northeastern United States and Adjacent Canada (1991, New York Botanical Garden).

For most projects, a minimum of two field seasons will be required to perform all tasks required to survey for rare plant species occurrences. However, at the direction of the ONLM, this may be modified depending on various factors, including the acreage and diversity of the project area and the number of qualified professional botanists employed.

Digital photographs (with a date associated with each photo) of each reported taxa will be taken. If a native or invasive taxon of questionable identification or a species that constitutes an unusual or unique find (e.g., new to the state, outside of its range, etc.) is encountered, collection of a voucher specimen will be completed in accordance with NJDEP Natural Heritage Program procedures.

GPS coordinates for locations of occurrences of rare and invasive species and negative surveys (i.e., locations of surveys for which no rare species were found) will be recorded and documented using a GPS receiver capable of collecting data with a horizontal accuracy of 1-5 meters. Data collection for invasive species should focus on those occurrences that pose a threat to populations of rare plant species. GPS coordinate data will be provided in ESRI shapefile format, or in a Microsoft Excel spreadsheet or Access file, with coordinate records labeled to reference the reporting form associated with that record. GPS data with an accuracy of 1–5 meters will include information about the coordinate system, datum used for data collection, and accuracy of each reading. GPS data collected for occurrence boundary lines or other large features will be provided in ESRI shapefile format and will include the coordinate system datum, and accuracy level used in the shapefile. Further information about GPS data collection standards is available at: http://www.nj.gov/dep/gis/GPSStandards_2011.pdf.

If ecological community mapping and relevé plot sampling preceded the plant surveys (see above), a desktop analysis and review of the mapping and relevé results will be used to first identify unique communities. This will help identify and eliminate areas with low diversity and focus the species surveys to maximize the likelihood of observing the targeted plant species.

Plant surveyors will initiate field work by conducting visual assessments along existing trails, access roads, or other rights of way and will then conduct meandering searches through each of the plant communities. In addition, focused searches will be conducted in habitats that are likely to contain rare species, such as wetlands, pond edges and talus slopes. Search activities will be modified as needed to focus on known locations of rare plants and on similar habitats that may also support rare plant populations.

The surveys will target the ideal survey windows for most groups of plants by conducting a minimum of one survey event every two weeks from April through October, for a total of at least 14 survey events annually over a period of two complete field seasons (at least 28 survey events

in all over two years). The duration and extent of each survey event will be determined in consultation with the ONLM before the beginning of the field season, and will depend on the project area and survey acreage involved, the number of qualified botanists employed and their familiarity with the flora of the project area, and other factors.

For each occurrence of plant species ranked as S1.1, SH.1, SH, SX.1 or SX discovered during the course of the rare plant survey, the surveyors will contact the ONLM by email as soon as possible but no later than 72 hours after the discovery. The same requirement applies to native plants species that are believed to be additions to New Jersey's flora.

If surveyors encounter a plant of questionable identification or one that constitutes an unusual or unique find, a voucher specimen will be collected. Refer to Attachment B for New Jersey Natural Heritage Program procedures for collection of voucher specimens.

In addition to reporting on those taxa included in the *List of Endangered Plant Species and Plant Species of Concern*, a comprehensive list of the flora observed in the project area will be developed from all of the fieldwork and submitted with the other deliverables to the ONLM.

Completed Natural Heritage Program Rare Plant Species Reporting Forms and accompanying data files (GPS data, digital photographs and voucher specimens) as specified above will be submitted to the ONLM within one month of the discovery or revisit to previously documented occurrence of each occurrence of a rare plant species. The remaining data (comprehensive list of flora, negative survey data and data concerning invasive species) will be submitted within two months of the conclusion of the field season.