

Interim Core Map Documentation for Bog Buck Moth (*Hemileuca maia menyanthevora*, Entity ID 6400)

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Interim Core Map Developer: Corteva Agriscience, LLC.

EPA Review Notes

The developers created this core map using the U.S. Environmental Protection Agency's (EPA) process available at: <https://www.epa.gov/endangered-species/process-epa-uses-develop-core-maps-pesticide-use-limitation-areas>. EPA reviewed the draft interim map and documentation and evaluated if: (1) the map and documentation are consistent with the agency's process; (2) areas included or excluded from the interim core map are consistent with the biology, habitat, and/or recovery needs of the species; (3) data sources are documented and appropriate; and (4) the GIS data and mapping process are consistent with the stated intention of the developer. EPA agrees that this map is a reasonable depiction of core areas for this species and was consistent with the agency's mapping process. This documentation was not prepared by EPA, but EPA may have edited this documentation for clarity or other purposes.

The core map developed for this species is considered interim and can be used to develop pesticide use limitation areas (PULAs). This core map incorporates information developed by the U.S. Fish and Wildlife Service (FWS) and made available to the public; however, the core map has not been formally reviewed by FWS. This interim core map may be revised in the future to incorporate expert feedback from FWS.

This core map does not replace or revise any range or designated critical habitat developed by FWS.

Species Summary

- **Location:** The bog buck moth is a large diurnal moth native to fens (groundwater-fed wetlands) in Oswego County, NY and Ontario, Canada. The U.S. population is located along the eastern shore of Lake Ontario in Oswego County, NY, and is comprised of five sites (Lakeside 1 through 5).
- **Critical habitat designated:** No
- **Habitat preferences:** The bog buck moth is restricted to open, calcareous, low shrub fens containing large amounts of buckbean. The sites in New York are considered medium fens. Medium fens are fed by waters that are moderately mineralized with pH values generally ranging from 4.5 to 6.5. Medium fens often occur as a narrow transition zone between a stream or lake and either a swamp or an upland community. Larvae rely primarily on the host plant *Menyanthes trifoliata* (commonly referred to as bogbean, bog buckbean, or buckbean).
- **Diet information:** Adults do not feed. Larvae rely primarily on the host plant *Menyanthes trifoliata*.

- **Dispersal:** The bog buck moth is sedentary (non-migratory) and therefore present within suitable habitat year-round, with life stage dependent on time of year. Movements of 0.5 km (0.3 mi) within suitable habitat are common. Most movements are likely to be limited to the highly localized fen habitat, but infrequent male dispersal events of a few kilometers are possible.
- **Timing considerations:** The bog buck moth's life cycle is similar to other *Hemileuca* species and generally completed within 1 year. Non-feeding adults emerge in the fall. After mating, female buck moths lay one large cluster of eggs on sturdy stems of a variety of plant species. The eggs overwinter until the following spring when they hatch into larvae. Pupation occurs by mid-July, and takes place below the underground, and then the pupal stage lasts about 2 months. The bog buck moth is univoltine (single adult flight period). The flight period lasts 4 weeks, generally from mid-September to October.
- **Notable relevant pesticide use sites:** Large-scale mosquitocide use occurs in Oswego County, NY. Pesticides are applied aerially for gypsy moth control. Neonicotinoid use is also mentioned in the species status assessment as a possible threat.
- **PULA Considerations:** Species is off-field during all life stages. Consider timing restrictions in September and October to reduce contact of adults with drift and restrictions from May until October to reduce indirect effects from a reduction in buckbean.

Description of Core Map

The proposed core map for the bog buck moth is biological information type, based on known locations named in FWS documents. This is supported by FWS species status and recovery documents (FWS 2020, 2023). In addition, more specific location information was obtained from the New York State Department of Environmental Conservation Species Status Assessment (NYS 2014).

Based on EPA's "best professional judgment classification" system, this core map has a "limited" rating (2) because it consists of known locations named in FWS documents.

The proposed core map is limited to areas within Oswego County, NY and covers 2,488 acres, as shown in Figure 1.

Mapping the known locations for the bog buck moth is a multi-step process that starts with listing and reviewing the known locations, refining the known locations because of changing names or ownership, and mapping the known locations. To map the known locations two data sources were used, 1) Protected Area Database US 4.0¹ and 2) the New York Natural Heritage Communities². Once the known locations were extracted from the source datasets, they were merged into the final core map using the workflow shown in Figure 2.

¹ <https://www.sciencebase.gov/catalog/item/65294599d34e44db0e2ed7cf>

² <https://data.gis.ny.gov/datasets/nysdec::natural-heritage-communities/explore?location=43.608138%2C-76.178275%2C14.41>

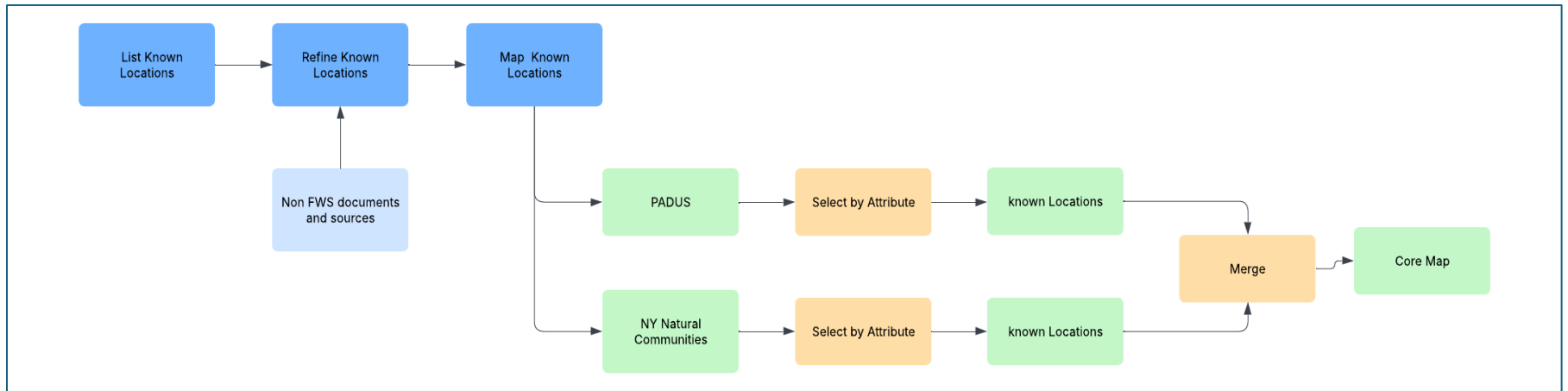


Figure 2. Generalized workflow for mapping the known locations of the bog buck moth.

Land Use Assessment

Using the CDL 2024 dataset an overlap assessment was conducted to determine the acres and overall agricultural crop percent overlap with the proposed core map. The results are presented in Table 1. Due to the small irregularly shaped polygons, the overall area reported is less than the core map area. The landscape is dominated by woody wetlands (45.6%), deciduous forest (35.4%) and herbaceous wetlands (5.3%).

Table 1. Land use assessment using Cropland Data Layer 2024 within proposed bog buck moth core map

Class Names	Acres	Percentage
<i>Background</i>	5	0.2%
<i>Soybeans</i>	0	0.0%
<i>Winter Wheat</i>	0	0.0%
<i>Alfalfa</i>	1	0.1%
<i>Other Hay/Non Alfalfa</i>	7	0.3%
<i>Potatoes</i>	0	0.0%
<i>Onions</i>	0	0.0%
<i>Clover/Wildflowers</i>	0	0.0%
<i>Fallow/Idle Cropland</i>	3	0.1%
<i>Apples</i>	1	0.0%
<i>Christmas Trees</i>	0	0.0%
<i>Open Water</i>	64	2.6%
<i>Developed/Open Space</i>	48	1.9%
<i>Developed/Low Intensity</i>	3	0.1%
<i>Developed/Med Intensity</i>	1	0.0%
<i>Developed/High Intensity</i>	1	0.1%
<i>Barren</i>	26	1.0%
<i>Deciduous Forest</i>	880	35.4%
<i>Evergreen Forest</i>	55	2.2%
<i>Mixed Forest</i>	10	0.4%
<i>Shrubland</i>	21	0.9%
<i>Grassland/Pasture</i>	94	3.8%
<i>Woody Wetlands</i>	1,135	45.6%
<i>Herbaceous Wetlands</i>	133	5.3%
<i>Total</i>	2,489	

Appendix 1. Species Information for the Bog Buck Moth

1. References

88 FR 15921. Endangered and Threatened Wildlife and Plants; Endangered Species Status for Bog Buck Moth. Federal Register 88(50):15921-15938.

FWS 2020. Species Status Assessment Report for the Bog Buck Moth (*Hemileuca maia menyenthevora*) (= *H. iroquois*). US Fish and Wildlife Service, Cortland, NY. <https://www.regulations.gov/document/FWS-R5-ES-2021-0029-0003>

FWS 2023. Recovery Outline for Bog Buck Moth (*Hemileuca maia menyenthevora*, = *H. iroquois*). https://ecos.fws.gov/docs/recovery_plan/BogBuckMoth%20Recovery%20Outline_final_27%20April%202023%20signed.pdf

NYS 2014. Species Status Assessment. New York State. https://extapps.dec.ny.gov/docs/wildlife_pdf/sgcnbogbbuckmoth.pdf

2. Background information

2.1. Species Information (FWS, 2020; 2023)

Status: The bog buck moth was listed as an endangered species in April 2023. No critical habitat has been designated.

Resiliency, redundancy, and representation (the 3Rs)

3Rs	Requisites	Metric
Resiliency (able to withstand stochastic events)	Healthy populations	Populations with: <ul style="list-style-type: none"> • Both sexes present • Sufficient survival of all life stages • Sufficient number of bog buck moths to survive bust portion of boom and bust cycles • Stable to increasing trend over last 10 years (10 generations) • Multiple occupied suitable habitat patches within metapopulations • Sufficient habitat size • Sufficient habitat quality • Intact hydrology and ecological processes
Representation (to maintain evolutionary capacity)	Maintain adaptive diversity	Healthy populations distributed across areas of unique adaptive diversity (e.g./ across latitudinal gradients) with sufficient connectivity for periodic genetic exchange.
Redundancy (to withstand catastrophic events)	Sufficient distribution of healthy populations	Sufficient distribution to guard against catastrophic events significantly compromising species adaptive diversity.
Redundancy (to withstand catastrophic events)	Sufficient number of healthy populations	Adequate number of healthy populations to buffer against catastrophic losses of adaptive diversity.

Figure 1. Ecological requirements for species-level viability (Table 2.5, FWS, 2020)

Habitat, Life History, and Ecology (FWS, 2020)

Life History: The bog buck moth’s life cycle is similar to other *Hemileuca* species and generally completed within 1 year. Non-feeding adults emerge in the fall. After mating, female buck moths lay one large cluster of eggs on sturdy stems of a variety of plant species. The eggs overwinter until the following spring when they hatch into larvae. While early instar larvae rely primarily on the host plant *Menyanthes trifoliata* (commonly referred to as bogbean, bog buckbean, or buckbean), eggs are never laid on these plants as they die back each year rendering them unavailable for overwintering. Pupation occurs by mid-July, and takes place below the surface, and then the pupal stage lasts about 2 months. The bog buck moth is univoltine (exhibiting a single adult flight period). The flight period lasts 4 weeks, generally from mid-September to October. While the flight period within a population can last up to one-month, individual adults survive for less than 2 weeks with 9 and 12 days being the oldest females and males observed in New York. Based on experience with other *Hemileuca* species, the life span probably averages 3 to 4 days for males and, once mated, 2 to 3 days for females. **Adults do not feed.**

Life Stage	Life History Information
Adults	<ul style="list-style-type: none"> • Flight period for one month with individual adults living less than two weeks • Require appropriate flying weather of warm fall days with no rain and low winds • Males fly throughout suitable habitat in search of females • Females have limited flights and lure males using pheromones • Females require perennial plants with bare sections of sturdy small stems above substrate, near buckbean for oviposition
Eggs	<ul style="list-style-type: none"> • Require perennial plants with bare sections of sturdy small stems above substrate, near buckbean for shelter • Snow cover may protect eggs from freezing or desiccation
Larvae	<ul style="list-style-type: none"> • Gregarious in early instars and not in late instars • Require buckbean and other plants for shelter • Feed primarily on leaves of buckbean • Also feed on leaves of other plants if limited buckbean or in later instars • We assume bog buck moth are similar to other <i>Hemileuca</i> larvae with faster growth rates and shorter instars when larvae are able to bask to warm themselves and eat new leaves
Pupae	<ul style="list-style-type: none"> • Larvae move into leaf litter or substrate before pupating • They do not use cocoons, but may spin loose silk web • May remain in pupal state for one year if fall conditions are unsuitable for adult flight
All	<ul style="list-style-type: none"> • Habitat specialists • Residents (nonmigratory)

Figure 2. Summary of bog buck moth life history information by life stage (Table 2.3, FWS 2020)

Habitat: The bog buck moth is restricted to open, calcareous, low shrub fens containing large amounts of buckbean. The sites in New York are considered medium fens. Medium fens are fed by waters that are moderately mineralized with pH values generally ranging from 4.5 to 6.5. Medium fens often occur as a narrow transition zone between a stream or lake and either a swamp or an upland community. The dominant species in medium fens are usually wooly-fruit sedge (*Carex lasiocarpa*) and sweet-gale (*Myrica gale*), with a variety of characteristic shrubs and herbs generally less than 5 m (16.4 ft) in height. Bog rosemary (*Andromeda glaucophylla*), leatherleaf (*Chamaedaphne calyculata*), cranberry, spatulate-leaved sundew (*Drosera intermedia*), three-way sedge (*Dulichium arundinaceum var. arundinaceum*),

and green arrow arum (*Peltandra virginica*) are only characteristic of medium fens, compared to any of the other calcareous fens found in New York.

The buckbean is intolerant of shade and is not found under shrubs. In addition to requiring buckbean and supplemental host plants for larval feeding, the species also requires plants with sturdy upright stems for oviposition.

The bog buck moth is sedentary (non-migratory) and therefore present within suitable habitat year-round. Movements of 0.5 km (0.3 mi) within suitable habitat are common. The bog buck moth should be capable of flying several to many kilometers but seldom leaves its habitat. In New York, some movement between certain sites that are close together is likely to occur. In New York, bog buck moth dispersal events were not observed but there is potential for an adult bog buck moth to disperse with strong winds or powered flight if surrounding vegetation do not impede them. Three males were captured on sticky traps in unsuitable habitat located between the Lakeside 1 and Lakeside 2 sites in New York supporting some movement outside of suitable habitat but well within 2 km (1.24 mi). Movements are likely to be limited to the highly localized fen habitat but that infrequent male dispersal events of a few kilometers is possible.

Diet: Larvae rely primarily on the host plant *Menyanthes trifoliata* (commonly referred to as bogbean, bog buckbean, or buckbean). Early instar larvae feed primarily on buckbean leaves unless the leaves are not yet available due to early spring site conditions. For example, at a site in New York, the earliest hatching larvae fed on cranberry (*Vaccinium macrocarpon*) until buckbean leafed out on or about May 24th, and by June 14th, 72 percent of larvae were observed feeding on buckbean. While buckbean is essential for early stages of larval growth, late instar larvae have been observed feeding less on buckbean (25 percent) and more on *V. macrocarpon* (54 percent) and *Carex* spp. (16 percent). Overall, buckbean is essential but other foodplants may be important, particularly in later larval stages. In Ontario, larvae regularly must feed on plants other than buckbean simply because buckbean is not abundant enough to provide enough foliage as larvae mature. And while larvae must start out on buckbean, other plants form the majority of the diet later on. Adults do not feed.

Pollination Type and Pollinator: N/A

Taxonomy: The bog buck moth is a silk moth in the Saturniidae family and the *Hemileuca* genus.

Relevant Pesticide Use Sites: Large-scale mosquitocide use occurs in Oswego County, NY. Pesticides are applied aerially for gypsy moth control. Neonicotinoid use is also mentioned in the species status assessment as a possible threat.

Relevant Recovery Criteria and Actions:

Recovery Actions New York (FWS 2023)

- Enhance protection at extant sites by establishing buffers areas around sites.
- Investigate potential new sites in New York State by assessing medium fens for habitat suitability to support bog buck moth and for possible introduction of bog buck moth.
- Assess the status of the species at extant sites by conducting fall moth surveys and egg counts.
- Conduct site-specific management actions to maintain and improve conditions of extant subpopulations at the Lakeside site, including restoring habitat, addressing succession, managing invasive species, and managing water levels.

- Conduct habitat restoration to increase the size of suitable habitats that provide food source and host plants and address succession and invasive species at the Lakeside sites in coordination with NYSDEC and The Nature Conservancy in New York.
- Continue developing research plans with academic institutions (i.e., State University of New York, College of Environmental Science and Forestry) (ESF) and others to investigate the cause of extirpation at the Oswego Inland site; assess impacts from pesticides, flooding, and parasitoids; the effects of egg and larvae parasitism on population dynamics; pupation habitat; immigration to and emigrations from population sites; and long-term populations dynamics.
- Develop a long-term monitoring plan to survey all sites to assess progress toward recovery over time.
- Initiate captive management with academic institutions (ESF) to determine how best to raise sufficient numbers of bog buck moth, augment extant sites, reintroduce bog buck moth to extirpated sites in Oswego County, and possibly introduce bog buck moth to other suitable sites in New York.
- Determine population viability parameters for bog buck moth populations.

2.2. Range

The bog buck moth is found in Ontario, Canada and in New York, United States. The U.S. population is found along the eastern shore of Lake Ontario in Oswego County, NY. The species range from ECOS is shown in Figure 3.

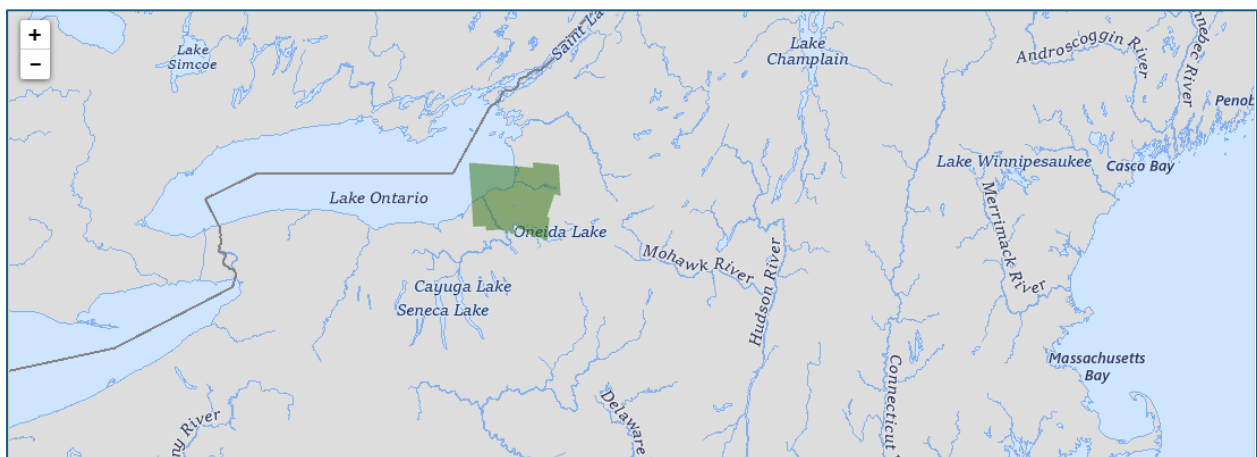


Figure 3. ECOS range (green) for the bog buck moth (<https://ecos.fws.gov/ecp/species/8023>). The total acreage of the range is approximately 840,331 acres.

2.3. Critical Habitat

No critical habitat has been described or designated for the bog buck moth.

2.4. Known Locations

As of the 2020 species status assessment, there are two known extant populations in Canada and one known extant population in the United States. There is one additional extirpated population (Jefferson County, NY) and one presumed extirpated population (Oswego Inland Site Population) in the U.S. The U.S. population is located along the eastern shore of Lake Ontario in Oswego County, NY and is comprised of five sites (Lakeside 1 through 5). To the southwest, the Oswego Inland Site population is a single site with two fen openings (Figure 4).

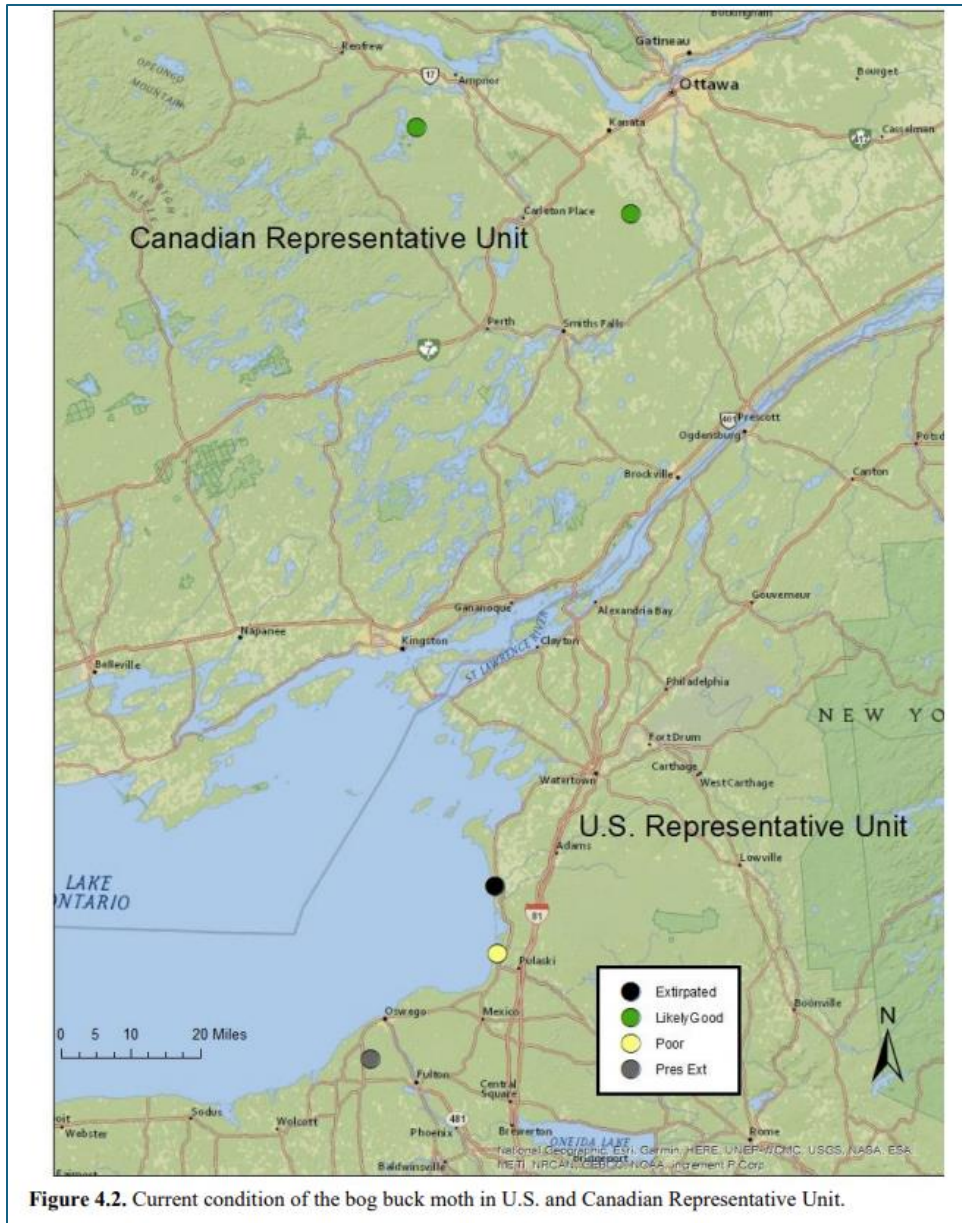


Figure 4. Populations of bog buck moth in Canada and the United States. The black dot represents the extirpated population in Jefferson County, the yellow dot represents the Lakeside populations, and the grey dot represents the Oswego Inland site. The green dots are the Canadian populations (FWS 2020).

All populations are located within the bed of former glacial Lake Iroquois and Champlain Sea (Figure 5).

- Lakeside Population, Oswego County, NY: This metapopulation comprises 5 sites that are in fen openings separated by inhospitable habitat, but these span a total linear distance of 3.2 km (2 mi), set 100 to 500 m (328 to 1640 ft) east of Lake Ontario
 - Lakeside 1 - 2 ha (5 ac) (presumed extirpated)
 - No direct connection to Lake Ontario but is indirectly connected via adjacent wetlands and is influenced by water levels of Lakeside 2. Once single fen with Lakeside 2 but cottage road was installed and separated the two. Receives drainage from campground on north side from culvert under a road.

- Lakeside 2 - 25 ha (61 ac) (presumed extirpated)
 - No direct connection to Lake Ontario but is indirectly connected via surface level of adjacent Pond which is connected to Lake Ontario. Once single fen with Lakeside 1 but cottage road was installed and separated the two
- Lakeside 3 - 81 ha (201 ac) including Lakeside 4 (presumed extirpated)
- Lakeside 4 (presumed extirpated)
- Lakeside 5 - 40 ha (100 ac)
- Oswego Inland Site Population, Oswego County, NY:
 - Single site with two fen openings (metapopulation dynamics at a smaller scale) - 35 ha (86 ac)
 - Presumed extirpated

All Lakeside subpopulations in New York occur on protected lands owned by the State of New York or conservation organizations. The Nature Conservancy owns the Lakeside 1 and 2. The NYSDEC owns Lakeside 3, 4, and 5. Central NY Land Trust owns the Oswego Inland Site and has periodically conducted invasive species management to restore native habitat and is working with adjacent landowners to reduce nutrient inputs, and pesticide and herbicide use. Per the 2023 listing rule, only the Lakeside 5 site remains extant (Figure 6).

From the New York State Department of Environmental Conservation (NYS 2014) Species Status Assessment, locations in Oswego County include:

- Rainbow Shores Bog, owned by The Nature Conservancy
- Deek Creek/Mud Creek, owned by NY State
- Deer Creek Marsh South, owned by NY State
- Selkirk Fen, owned by NY State
- South Pond Fen, owned by The Nature Conservancy
- Silver Lake, owned by Save the County Land Trust



Figure 5. Species locations in Oswego County, NY (NYS 2014)

Country	Population/Subpopulation	Ownership	Protection Status	Condition Status
U.S.	Jefferson County Population	NYSDEC	Protected/Public	Extirpated
U.S	Oswego Inland Site Population	Central New York Land Trust	Protected/Private	Presumed Extirpated
U.S	Lakeside Subpopulations			
	Lakeside 1	The Nature Conservancy	Protected/Public	Presumed Extirpated
	Lakeside 2	The Nature Conservancy	Protected/Public	Presumed Extirpated
	Lakeside 3	NYSDEC	Protected/Public	Poor
	Lakeside 4	NYSDEC	Protected/Public	Poor
	Lakeside 5	NYSDEC	Protected/Public	Poor
Canada	White Lake Subpopulations			
	White Lake North	Private	Unprotected	Unknown/Likely Good based on rebound of adult numbers in 2020.
	White Lake South	Private	Unprotected	Unknown. No surveys in recent years.
Canada	Richmond Fen Subpopulations			
	Richmond Fen North	Private	Unprotected	Unknown. No surveys in recent years.
	Richmond Fen South	Private	Unprotected	Unknown/Likely Good based in instar larval counts in 2020.

Figure 6. Protection status of bog buck moth populations (FWS 2023).

2.5. Additional Information

N/A

Appendix 2. Core Map Development

1. References and Software

Software used: *ArcGIS Pro 3.4.0*

2. Datasets Used in Core Map Development

2.1. Range

Range data (Figure 3) was extracted from https://ecos.fws.gov/docs/species/shapefiles/usfws_complete_species_current_range.zip which was downloaded on Feb 5, 2025. The range is approximately 840,331 acres.

2.2. Critical Habitat

Critical Habitat has not been designated for this species

2.3. Protected Area Data base US 4.0

The USGS Protected Areas Database of the United States (PAD-US) is the nation's inventory of protected areas, including public land and voluntarily provided private protected areas, identified as an A-16 National Geospatial Data Asset in the Cadastre. The PAD-US is an ongoing project with several published versions of a spatial database including areas dedicated to the preservation of biological diversity, and other natural (including extraction), recreational, or cultural uses, managed for these purposes through legal or other effective means. The database was originally designed to support biodiversity assessments; however, its scope expanded in recent years to include all open space public and nonprofit lands and waters. Most are public lands owned in fee (the owner of the property has full and irrevocable ownership of the land); however, permanent and long-term easements, leases, agreements, Congressional (e.g. 'Wilderness Area'), Executive (e.g. 'National Monument'), and administrative designations (e.g. 'Area of Critical Environmental Concern') documented in agency management plans are also included. The PAD-US strives to be a complete inventory of U.S. public land and other protected areas, compiling "best available" data provided by managing agencies and organizations. The dataset was downloaded on April 7, 2025, from <https://www.sciencebase.gov/catalog/item/65294599d34e44db0e2ed7cf>.

2.4. Natural Heritage Communities

The Natural Heritage Communities layer represents element occurrences of significant natural communities (ecological communities), as recorded in the New York Natural Heritage Program's Biodiversity Database (Biotics). An element occurrence is one natural community type at one location. Examples of community types include deep emergent marsh, red maple-hardwood swamp, dwarf shrub bog, hemlock-northern hardwood forest, and tidal creek. Natural community occurrences in this dataset are considered significant from a statewide perspective. NY Natural Heritage documents all occurrences of community types that are rare in New York State. For more common community types, NY Natural Heritage documents occurrences where the community at that location is ranked as being of excellent or good quality, by meeting specific, documented criteria for size, undisturbed and intact condition, and quality of the surrounding landscape. A natural community is an assemblage of interacting plant and animal populations that share a common environment; the particular assemblage of plant and animal species occurs across the landscape in areas with similar environmental conditions. Significant natural communities are rare or high-quality wetlands, forests, grasslands, ponds, streams, and other types of

habitats, ecosystems, and natural areas. NY Natural Heritage tracks locations of significant natural communities because they serve as habitat for a wide range of plants and animals, both rare and common; and because community occurrences in good condition support intact ecological processes and provide ecological value and services. The dataset was downloaded on May 16, 2025 from <https://data.gis.ny.gov/datasets/nysdec::natural-heritage-communities/explore?location=43.608138%2C-76.178275%2C14.41>.

2.5. Core Map Development

The first step in developing the core map for the bog buck moth was to list and refine the known locations. Refinements are needed because of name changes or even ownership changes of relevant parcels or protected areas. The known locations reviewed are:

- Rainbow Shores Bog, owned by The Nature Conservancy
- Deer Creek/Mud Creek, owned by NY State
- Deer Creek Marsh South, owned by NY State
- Selkirk Fen, owned by NY State
- South Pond Fen, owned by The Nature Conservancy
- Silver Lake, owned by Save the County Land Trust

Review of spatial data and information displayed in the ESRI basemap it was concluded that:

- Rainbow Shores Bog is part of Rainbow Shores Preserve
- Deer Creek Marsh WMA includes both Deer Creek/Mud Creek and Deer Creek Marsh South
- Silver Lake is known as Fen at Silver Lake
- Silver Lake is also known as Mud Pond Fen west of Regan Silver Lake

Using this information, first the PADUS 4.0 database was reviewed, and four known locations could be mapped using PADUS, including:

- Rainbow Shores Preserve
- Deer Creek Marsh WMA
- Selkirk Fen
- Silver Lake

The “Select by Attribute” tool was used, and the selected records were exported to a new layer named “BBM_PADUS4_RelPreserves”.

Because not all known locations could be mapped with PADUS 4.0 and additional data sources were found at the New York GIS data clearinghouse that described the natural heritage communities of the state.

The [Natural Heritage Communities | NYS GIS Clearinghouse Data](#) was used to select known locations, and the following were available:

- Deer Creek Marsh
- Silver Lake
- South Pond Fen
- Rainbow Shores

Some of these locations overlap with the known locations extracted from the PADUS 4.0 database but provided additional refinements and coverage of the known locations. The “Select by Attribute” tool was used, and the selected records were exported to a new layer named “BBM_NYHeritage”. The resulting dataset was reprojected from NAD 1983 UTM Zone 18N to NAD 1983 Contiguous USA Albers using the “Project” tool to ensure that both datasets have the same coordinate reference system. The reprojected dataset is named “BBM_NYHeritage_Albers”.

Next, the two created layers were merged into a single dataset using the “Merge” tool. The field “Location” in BBM_NYHeritage_Albers was mapped to the “Unit name” field in BBM_PADUS4_RelPreserves. The output file name is BBM_PADUS4_RelPreserve_Merge.

The final step in this core map development process was to dissolve the latter with overlapping polygons into a single feature representing the core map. To achieve this a new text field named “Species” was added to the merged file and populated with the value ‘Bog buck moth’. The species field was then used to dissolve all polygons into a single feature.

2.6. Data Reviewed but not Used in Development

Data from NatureServe Explorer Pro or Global Biodiversity Information Facility (GBIF) was not considered for this species because the data resolution was insufficient for mapping the small fens where this species is located. iNaturalist had 4 occurrences in New York for this species, all of which were within the limits of the proposed core map when accounting for the obscuring of coordinates.

3. Proposed Core Map

The proposed core map for the bog buck moth is shown in Figure 7.

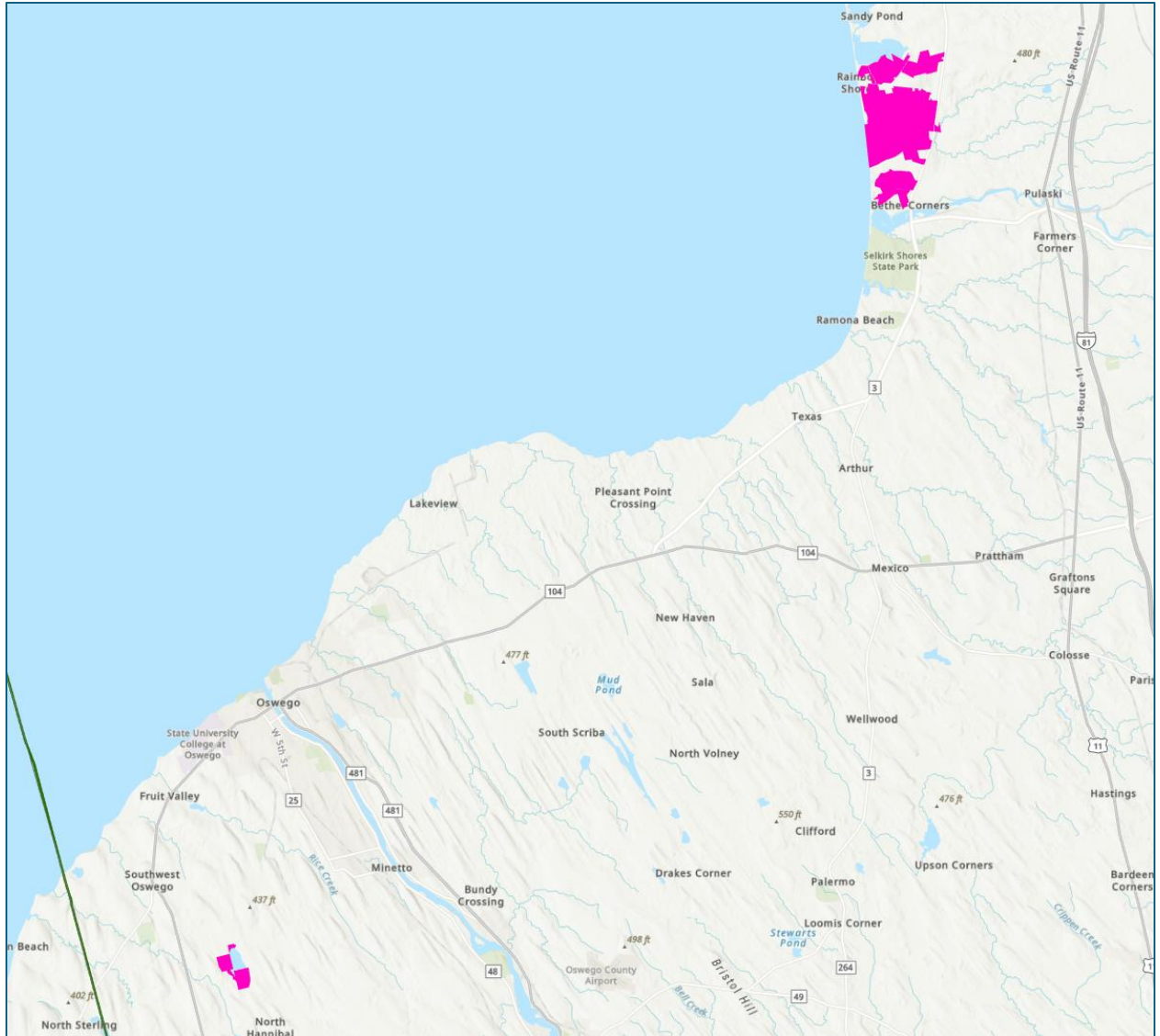


Figure 7. Proposed core map for the bog buck moth (*Hemileuca maia menyanthevora*, = *H. Iroquois*, pink).