Biodiversity and ecological potential of Plum Island, New York






Appendix C: Conservation guides

New York Natural Heritage Program

Appendix C: Conservation guides

NY Natural Heritage conservation guides are also available online at http://guides.nynhp.org/.

Marine Rocky Intertidal

Marine rocky intertidal (close up) with Forbes sea star on Fisher's Island

Photo credits: *Gregory J. Edinger*

System Marine

Subsystem Marine Intertidal

Did you know?
Organisms of marine rocky intertidal environments are adapted to survive under particularly dynamic conditions. The organisms (e.g., algae, sea stars, barnacles, mussels) of this community are exposed to moisture changes, temperature extremes, wave energy, and water salinity changes. For example, as the water recedes during low tide, pools remain in the low spots of the rocky substrate. The organisms that spend low tide within these pools face heat and desiccation stress as the water warms from the sun and evaporates, concentrating the salt levels to a level higher than that of the ocean. Following a heavy rain, however, the water salinity of the tide pools may become close to that of freshwater.

Summary

Protection Not listed in New York State, not listed federally.

Rarity G5, S1

A global rarity rank of G5 means: Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.
A state rarity rank of S1 means: Typically 5 or fewer occurrences, very few remaining individuals, acres, or miles of stream, or some factor of its biology makes it especially vulnerable in New York State.

Conservation Status in New York

There are probably less than 40 occurrences statewide. A few documented occurrences have good viability, but the level of protection of most occurrences is uncertain. This community has a very limited distribution in the state and is restricted to the portions of the state that have rocky ocean shorelines. There are at least two large, high quality examples (Fishers Island and Montauk Point). The current trend of this community is probably stable

in the short term, but may decline slightly in the future due to moderate threats that include alteration of the natural shoreline, invasive species, and sea level rise.

Short-term Trends

The number and acreage of marine rocky intertidal communities in New York have probably remained stable in recent decades as a result of coastal protection regulations, although some examples may be reduced in size by the spread of non-native invasive marine algae.

Long-term Trends

The number and acreage of marine rocky intertidal communities in New York has probably declined moderately from historical numbers likely correlated to the alteration of the ocean shoreline by development.

Larger occurrences of this natural community (>12.5 acres) are protected under NY State wetland laws.

Conservation and Management

Threats

The primary threat to marine rocky intertidal communities is the spread of non-native marine algae (e.g., Codium fragile). In addition, marine rocky intertidal communty occurrences are threatened by trampling, shoreline development, pollution run-off from upland areas, and trash dumping. Ocean derived pollution may threaten marine rocky intertidal communities. Over-collecting of tidal pool fauna may be a minor threat at a few sites.

Conservation Strategies and Management Practices

Where practical, establish and maintain a natural shoreline buffer to reduce storm-water, pollution, and nutrient run-off, while simultaneously capturing sediments before they reach the rocky shore. Buffer width should take into account the erodibility of the surrounding soils, slope steepness, and current land use. Avoid habitat alteration within the intertidal area and surrounding landscape. Restore sites affected by unnatural disturbance (e.g, remove obsolete sea walls and drain pipes in order to restore the natural tidal regime). Prevent the spread of invasive exotic species into the intertidal area through appropriate direct management.

Development and Mitigation Considerations

When considering development activities, minimize actions that will change what water carries and how water travels to the rocky shore. Water traveling over-the-ground as run-off usually carries an abundance of silt, clay, and other particulates during (and often after) a construction project. While still suspended in the water, these particulates make it difficult for aquatic animals to find food; after settling to the bottom, these particulates bury small plants and animals and alter the natural functions of the community in many other ways. Development activities near this community type should strive to minimize particulate-laden run-off into this community. Water traveling on the ground or seeping through the ground also carries dissolved minerals and chemicals. Fertilizers, detergents,

and other chemicals that increase the nutrient levels in tidal areas. Herbicides and pesticides often travel far from where they are applied and have lasting effects on the quality of the natural community.

Inventory Needs

Survey for occurrences statewide to advance documentation and classification of marine rocky intertidal areas. A statewide review of marine rocky intertidal communities is desirable. Minimally, revisit sites with records older than ten years, and ideally collect plot data for all occurrences across littoral zones. Continue searching for large sites in good condition (A- to AB-ranked).

Research Needs

Research the influence that sea level rise has on the structure and composition of marine rocky intertidal areas. Research is needed to determine the distribution and invasiveness of Codium fragile and other non-native organisms to this community. Research composition of marine rocky intertidal areas statewide in order to characterize floral and faunal variations across the littoral gradient.

Rare Species

Snowy Egret (*Egretta thula*)
Piping Plover (*Charadrius melodus*)
Seaside Plantain (*Plantago maritima var. juncoides*)

Identification Comments

A community inhabiting rocky shores that are washed by rough, high-energy ocean waves. Characteristic organisms are attached marine algae, mussels, sea stars, urchins, and barnacles that can withstand the impact of the waves and periodic desiccation. The community is typically rich in species. Attached organisms usually cover more than 60% of the substrate, especially at the lower intertidal zone.

Characteristic marine algae attached to the rocks include knotted wrack (Ascophyllum nodosum), rockweeds (Fucus vesiculosis, F. spiralis), Irish moss (Chondrus crispus), green seaweed (Blidingia minima), hollow green weeds (Enteromorpha prolifera, E. intestinalis), sea lettuce (Ulva lactuca), green fleece (Codium fragile), filamentous green algae (Rhizoclonium tortuosum, R. riparium), red algae (Hildenbrandia sp.), and red tubed weed (Polysiphonia lanosa).

Characteristic marine invertebrates include common blue mussel (Mytilus edulis), northern rock barnacle (Balanus balanoides), common periwinkle (Littorina littorea), rough periwinkle (Littorina saxatilis), little gray barnacle (Chthamalus fragilis), oyster drill (Urosalpinx cinerea), and Atlantic dogwinkle (Nucella lapillus).

Tidal pools may include ribbed mussel (Geukensia demissa), Forbes' sea star (Asterias forbesi), eastern mudsnail (Ilyanassa obsoleta), hermit crabs (Pagurus spp.), and eastern oyster (Crassostrea virginica).

The Best Time to See

Rocky marine intertidal communities can be observed throughout the year, but during the warm months, when the water is warm enough for wading, this community is particularly pleasant and interesting to explore. At low tide, isolated tide pools remain in the low spots of the rock, and a variety of algae, invertebrate animals, and fish can be easily observed.

Characteristics Most Useful for Identification

A rocky intertidal shoreline exposed to high-energy wave action. Often 60% or more of the rocky substrate is covered with attached organisms, such as algae, mussels, barnacles, sea stars, and other invertebrates. At low tide, rocky intertidal communities have isolated tide pools that contain algae and animals, which are trapped until the next high tide.

Elevation Range

Known examples of this community have been found at elevations between 0 feet and 0 feet.

Similar Ecological Communities

Marine intertidal mudflats: Unlike marine rocky intertidal communities, which have high-energy wave action and rocky substrates, marine intertidal mudflats are charaterized by quiet waters and unconsolidated soils. Marine intertidal mudflats occur on fine silt or sand that is rich in organic material. They are exposed at low tide, and have a diverse array of invertebrates that provide important fuel for migrating and breeding shorebirds.

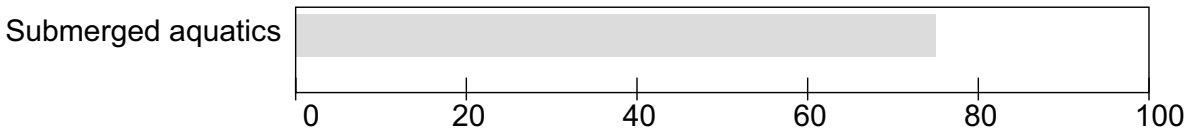
Brackish intertidal shore: Brackish intertidal shore communities occur on rocky substrate, but they are not exposed to the high-energy wave action of marine rocky intertidal communities, and they are flooded tidally with water that is brackish (ranging from 0.5 to 18 ppt). Marine rocky intertidal communities are flooded tidally with full-strength ocean water, which is higher in salt content.

Brackish intertidal mudflats: Unlike marine rocky intertidal communities, which have high-energy wave action and rocky substrates, brackish intertidal mudflats are charaterized by quiet waters, unconsolidated soils, and lower water salinity values. Marine rocky intertidal communities are flooded tidally with full-strength ocean water, which is higher in salt content.

Characteristic Species

Submerged aquatics
Ascophyllum nodosum
Blidingia minima
Chondrus crispus
Codium fragile
Enteromorpha intestinalis
Enteromorpha prolifera
Fucus spiralis
Fucus vesiculosis

Hildenbrandia spp.
Polysiphonia lanosa
Rhizoclonium riparium
Rhizoclonium tortuosum
Ulva lactuca



This figure helps visualize the structure and "look" or "feel" of a typical marine rocky intertidal. Each bar represents the amount of "coverage" for all the species growing at that height. Because layers overlap (shrubs may grow under trees, for example), the shaded regions can add up to more than 100%.

International Vegetation Classification System Associations

This New York natural community encompasses all or part of the concept of the following International Vegetation Classification (IVC) natural community associations. These are often described at finer resolution than New York's natural communities. The IVC is developed and maintained by NatureServe.

New England Rocky Intertidal Community (CEGL006341)

NatureServe Ecological System Associations

This New York natural community falls into the following ecological system(s). Ecological systems are often described at a coarser resolution than New York's natural communities and tend to represent clusters of associations found in similar environments. The ecological systems project is developed and maintained by NatureServe.

Acadian Coastal Salt Marsh (CES201.578)

Additional Resources

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New York Natural Heritage Program
625 Broadway, 5th Floor,
Albany, NY 12233-4757
Phone: (518) 402-8935
acris@nynhp.org

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- New York State Office of Parks, Recreation and Historic Preservation

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This guide was authored by

Maritime Beach

Maritime beach at Breezy Point, Gateway National Recreation Area

Photo credits: *Aissa L. Feldmann*

System Terrestrial

Subsystem Open Uplands

Did you know?
Maritime beaches and dunes provide important nesting ground for birds such as piping plover, least tern, common tern, and roseate tern.

Summary

Protection Not listed in New York State, not listed federally.

Rarity G5, S3

A global rarity rank of G5 means: Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.
A state rarity rank of S3 means: Typically 21 to 100 occurrences, limited acreage, or miles of stream in New York State.

Conservation Status in New York

There are an estimated 1000 miles of maritime beach on Long Island covering about 10,000 to 16,000 acres; there may be more than 30 to 50 extant occurrences statewide. The several documented occurrences of this community have good viability and are protected on public or private conservation land. The community is restricted to the ocean shoreline of the Coastal Lowlands ecozone in Suffolk, Richmond, Queens, Kings, and Nassau Counties. Although the number of maritime beaches may have increased slightly when formerly long, continuous examples were fragmented by development, the overall trend for the community is declining as a result of coastal development and recreational overuse.

Short-term Trends

Although the number of maritime beaches may have increased slightly when formerly long, continuous examples were fragmented by development, the acreage of maritime beach in New York has probably declined in recent decades as a result of coastal development and recreational overuse. Community viability/ecological integrity is suspected to be slowly

declining, primarily due to anthropogenic alterations (both physical and hydrological) to beach/dune/swale dynamics and coastal development (e.g., fragmentation, shoreline hardening, road construction, and community destruction).

Long-term Trends

Although the number of maritime beaches in New York may have increased substantially from historical numbers when formerly long, continuous examples were fragmented by development into numerous large and small stretches of beach, their aerial extent and viability are suspected to have declined substantially over the long-term. These declines are likely correlated with coastal development and associated changes in connectivity, hydrology, water quality, and natural processes.

Conservation and Management

Threats

Threats to maritime beaches in New York include driving on the beach (ATVs and four-wheel drive vehicles), fragmentation by development, barriers to connectivity between the open ocean and the beach/dune system, trampling, increased horseback riding, trash, and invasion by exotic species, including winged pigweed (Cycloloma atriplicifolium) and Oriental bittersweet (Celastrus orbiculata). Processes that create and maintain maritime beaches have been disrupted by hydrologic alterations to tidal dynamics, fragmentation, shoreline hardening, altered sediment budgets, and management practices like beach replenishment.

Conservation Strategies and Management Practices

Maintain dynamic beach and dune processes, prevent recreational overuse (driving on the beach is particularly destructive) and encourage the public to carry away all of their trash. Monitor rare plant and animal populations, including seabeach amaranth (Amaranthus pumilus) and beach-dune tiger beetle (Cicindela hirticollis), and the nesting use of beaches by species such as the horseshoe crab and the piping plover. Take measures (e.g., install fencing and predator exclosures) to prevent disturbance to critical areas. Ensure connectivity between maritime dunes, maritime beaches, salt marshes, and the open ocean to allow seed dispersal and to enable species to freely move between habitats during nesting season. Remove shoreline armoring to increase overland sediment input; improve water quality by reducing or eliminating sewer and stormwater discharge and pesticide application; restore tidal regime by removing culverts, dikes, and impoundments, plugging ditches, and replacing static flow restriction devices with those that are calibrated for local tidal hydrology.

Development and Mitigation Considerations

Minimize or eliminate hardened shoreline and avoid dumping dredge spoil onto maritime beaches. This community is best protected as part of a large salt marsh complex. Protected areas should encompass the full mosaic of low salt marsh, high salt marsh, marine intertidal mudflats, saltwater tidal creek, salt panne, and salt shrub communities to allow dynamic ecological processes (sedimentation, erosion, tidal flushing, and nutrient cycling) to continue. Connectivity to estuarine, brackish, and freshwater tidal communities; upland dunes; and shallow offshore communities should be maintained. Connectivity

between these habitats is important not only for nutrient flow and seed dispersal, but also for animals that move between them seasonally. Similarly, fragmentation of linear beaches should be avoided. Bisecting roads and developments significantly disrupt biota and alter physical dune processes.

Inventory Needs

Surveys and documentation of additional occurrences are needed, as are data on rare and characteristic animals.

Research Needs

Future research on maritime beaches should include monitoring community response to sea level rise, sediment starvation, and permanent flooding and studying nutrient exchange processes and relationships to adjacent communities (e.g., salt marsh complexes and maritime dunes).

Rare Species

Dune Sandspur (*Cenchrus tribuloides*)
Marsh Straw Sedge (*Carex hormathodes*)
Snowy Egret (*Egretta thula*)
Yellow-crowned Night-Heron (*Nyctanassa violacea*)
Seabeach Amaranth (*Amaranthus pumilus*)
Thickleaf Orach (*Atriplex dioica*)
Black Skimmer (*Rynchops niger*)
Piping Plover (*Charadrius melodus*)
Gull-billed Tern (*Gelochelidon nilotica*)
Least Tern (*Sternula antillarum*)
Common Tern (*Sterna hirundo*)
Roseate Tern (*Sterna dougallii*)
Seabeach Knotweed (*Polygonum glaucum*)
Narrow-leaf Sea-blite (*Suaeda linearis*)
Small's Knotweed (*Polygonum aviculare ssp. buxiforme*)
Golden Dock (*Rumex fueginus*)
A Noctuid Moth (*Oncocnemis riparia*)
A Moth (*Lepipolys perscripta*)

Identification Comments

A community with extremely sparse vegetation that occurs on unstable sand, gravel, or cobble ocean shores above mean high tide, where the shore is modified by storm waves and wind erosion. The upper margin of a maritime beach often grades into the base of a primary maritime dune, or other maritime community, such as maritime shrubland or one of the maritime forests.

The Best Time to See

Maritime beaches are scenic year-round! Enjoy a visit in the middle of the summer when the ocean is warm for swimming.

Characteristics Most Useful for Identification

Characteristic species include beachgrass (Ammophila breviligulata), sea-rocket (Cakile edentula ssp. edentula), seaside atriplex (Atriplex patula), seabeach atriplex (A. arenaria), seabeach sandwort (Honckenya peploides), salsola (Salsola kali), seaside spurge (Chamaesyce polygonifolia), seabeach knotweed (Polygonum glaucum), and seabeach amaranth (Amaranthus pumilus).

Elevation Range

Known examples of this community have been found at elevations between 0 feet and 5 feet.

Similar Ecological Communities

Marine intertidal gravel/sand beach: Marine intertidal gravel/sand beaches are marine communities that are fully exposed at low tide and extend inland to the limit of mean high tide. Maritime beaches are terrestrial and are located in a band just above this tidal limit.

Sand beach: Sand beaches are similar, structurally, to maritime beaches but they occur on the unstable sandy shores of large freshwater lakes instead of on the maritime coast.

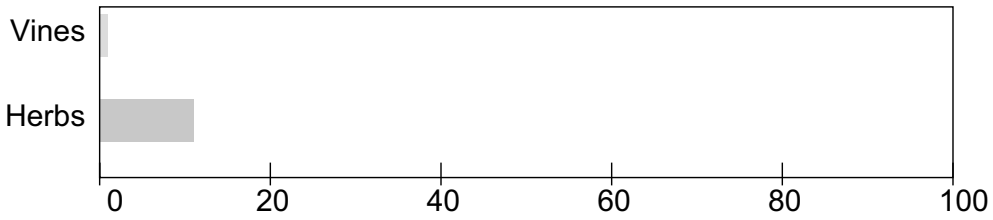
Characteristic Species

Vines

Eastern Poison Ivy (*Toxicodendron radicans*)

Herbs

Seabeach Amaranth (*Amaranthus pumilus*)
American Beachgrass (*Ammophila breviligulata ssp. breviligulata*)
Pearly Everlasting (*Anaphalis margaritacea*)
Halberd-leaf Saltbush (*Atriplex patula*)
American Sea-rocket (*Cakile edentula*)
Coast-blite Goosefoot (*Chenopodium rubrum*)
Jimsonweed (*Datura stramonium*)
Fragrant Cudweed (*Gnaphalium obtusifolium*)
Beach Pea (*Lathyrus japonicus*)
Common Evening-primrose (*Oenothera biennis*)
Seabeach Knotweed (*Polygonum glaucum*)
Russian Thistle (*Salsola kali*)
Seaside Goldenrod (*Solidago sempervirens*)



This figure helps visualize the structure and "look" or "feel" of a typical maritime beach. Each bar represents the amount of "coverage" for all the species growing at that height. Because layers overlap (shrubs may grow under trees, for example), the shaded regions can add up to more than 100%.

International Vegetation Classification System Associations

This New York natural community encompasses all or part of the concept of the following International Vegetation Classification (IVC) natural community associations. These are often described at finer resolution than New York's natural communities. The IVC is developed and maintained by NatureServe.

North Atlantic Upper Ocean Beach (CEGL004400)

NatureServe Ecological System Associations

This New York natural community falls into the following ecological system(s). Ecological systems are often described at a coarser resolution than New York's natural communities and tend to represent clusters of associations found in similar environments. The ecological systems project is developed and maintained by NatureServe.

Atlantic Coastal Plain Northern Sandy Beach (CES203.301)

Additional Resources

Links

Long Island Beaches
http://www.loving-long-island.com/long-island-beaches.html

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New York Natural Heritage Program
625 Broadway, 5th Floor,
Albany, NY 12233-4757
Phone: (518) 402-8935
acris@nynhp.org

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Maritime Bluff

Maritime bluff at Shadmoor State Park

Photo credits: *Aissa L. Feldmann*

System Terrestrial

Subsystem Open Uplands

Did you know?
The planners of the Montauk Point Lighthouse were well aware of erosion. The government agents noted that "Montauk Point is washed by the sea in storms" and "wastes very fast." They erected the lighthouse at the extreme west end of the Turtle Hill plateau at a distance of approximately 300 feet from the bluff. Over the past 200 years approximately 200 feet of Montauk Point has been washed into the Atlantic Ocean. Today the lighthouse stands less than 100 feet from the edge of the maritime bluff.

Summary

Protection Not listed in New York State, not listed federally.

Rarity G4, S2

A global rarity rank of G4 means: Apparently secure globally, though it may be quite rare in parts of its range, especially at the periphery.
A state rarity rank of S2 means: Typically 6 to 20 occurrences, few remaining individuals, acres, or miles of stream, or factors demonstrably make it very vulnerable in New York State.

Conservation Status in New York

There are an estimated 5 to 30 extant occurrences statewide. One currently documented occurrence has good viability and is located on public conservation land. The community is currently known from the Coastal Lowlands ecozone of eastern Long Island in Suffolk County. The overall trend for the community is suspected to be slightly declining due to recreational overuse and coastal development.

Short-term Trends

Although the number of maritime bluffs may have increased slightly when formerly long, continuous examples were fragmented by development, their acreage in New York has probably declined in recent decades as a result of coastal development and recreational overuse.

Long-term Trends

Although the number of maritime bluffs in New York may have increased slightly from historical numbers when formerly long, continuous examples were fragmented by development into numerous large and small stretches, their aerial extent and viability are suspected to have declined substantially over the long-term. These declines are likely correlated with coastal development and associated changes in connectivity, tidal hydrology, and natural processes.

Conservation and Management

Threats

The primary threat to maritime bluffs in New York is likely to be recreational overuse; specifically, climbing and sliding on the cliffs increases erosion. Invasive exotic species that appear on the bluffs include rugosa rose (Rosa rugosa) and Oriental bittersweet (Celastrus scandens). In some cases, exotics are being planted to stabilize the dunes. Additional threats include fragmentation of bluffs by development; stairways for beach access; and barriers to connectivity between the open ocean, the beach, and the bluffs. Broad threats to maritime beach dynamics also threaten maritime bluffs. Hydrologic alterations to tidal dynamics, shoreline fragmentation and hardening, altered sediment budgets, and management practices like beach replenishment affect the natural cycles of sand deposition and attrition and subsequently change the rate of erosion of the bluffs.

Conservation Strategies and Management Practices

Maintain the dominant ecological processes responsible for keeping this dynamic community in disclimax. Natural disturbances, including wave erosion and strong offshore winds, should be expected to lead to slumping, cliff retreat, and sea cave formation. Prevent recreational overuse and encourage the public to stay on marked trails. In particular, continue to restrict sliding and climbing on the face of the bluffs using signage and fencing. In places where trails run directly along the top edge of maritime bluffs, those trails should be re-routed away from the edge and split rail fences could be used to direct visitors to designated overlooks. Because the face of the bluffs can be expected to migrate inland, it is important to protect adequate open space to accommodate such change. Avoid planting invasive exotic species to stabilize the bluffs; if stabilization of this inherently unstable community is necessary, select native plants, perhaps American beachgrass (Ammophila breviligulata). Prevent the spread of invasive exotic species into the bluffs through appropriate direct management and by minimizing potential dispersal corridors, such as beach access trails and stairways.

Development and Mitigation Considerations

This community is best protected as part of a large maritime system, encompassing grasslands, shrublands, bluffs, heathland, forests, barrens, and dunes. Development should avoid fragmentation of such systems to allow for nutrient flow, seed dispersal, and seasonal animal migrations within them. Bisecting trails, roads, and developments can also allow exotic plant and animal species to invade and potentially increase 'edge species' (such as raccoons, skunks, and foxes). Connectivity to brackish and freshwater tidal communities and to shallow offshore communities should also be maintained as much as possible to maintain "maritime" conditions, which imply deposition of salt spray and shearing from offshore winds.

Inventory Needs

Surveys and documentation of additional occurrences are needed, as are data on rare and characteristic animals.

Research Needs

A study could investigate the effects of sea level rise and changes in oceanic dynamics with global climate change on the dynamic erosive processes of this community.

Identification Comments

A sparsely vegetated community that occurs on vertical exposures of unconsolidated material, such as small stone, gravel, sand, and clay, that is exposed to maritime forces, such as water, ice, or wind. There are very few woody species present because of the unstable substrate. The most abundant species are usually annual and early successional herbs. These bluffs are adjacent to maritime and marine communities and are actively eroded by oceanic forces.

The Best Time to See

These dramatic bluffs are scenic year round. Visit during the summer and enjoy the beach below.

Characteristics Most Useful for Identification

The maritime bluff is comprised of areas of unvegetated, near vertical morainal sand cliffs, and less steep (about 45 degrees) areas of slumped bluff-face at the base of the bluff that support American beachgrass (Ammophila breviligulata), seaside goldenrod (Soligago sempervirens), and bayberry (Myrica pensylvanica).

Elevation Range

Known examples of this community have been found at elevations between 1 feet and 60 feet.

Similar Ecological Communities

Shale cliff and talus community: Shale cliff and talus community occurs inland on nearly vertical exposures of shale bedrock and includes ledges and small areas of talus rather than on unconsolidated morainal sand cliffs adjacent to the ocean.

Calcareous cliff community: Calcareous cliff communities occur on vertical exposures of calcareous bedrock types, such as dolomite or limestone rather than on unconsolidated morainal sand cliffs adjacent to the ocean.

Great Lakes bluff: Great Lakes bluffs also occur on vertical exposures of unconsolidated material but they are adjacent to one of the Great Lakes rather than adjacent to the ocean.

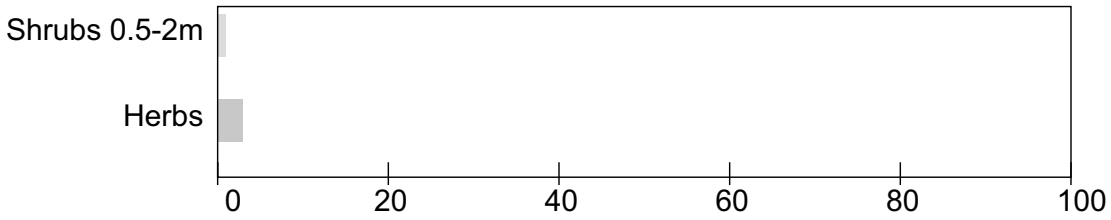
Cliff community: Cliff communities occur on bedrock outcrops that are usually inland from the ocean rather than on unconsolidated morainal sand cliffs adjacent to the ocean.

Maritime dunes: Maritime dunes form on active and stabilized sand dunes that have a low, rolling form. They are often vegetated, either with a near monoculture of American beachgrass or with a mix of grasses and forbs. Maritime bluffs, on the other hand, are nearly vertical morainal cliffs made up of semiconsolidated sand, stone, gravel, and clay. They are only sparsely vegetated.

Characteristic Species

Shrubs 0.5-2m
Northern Bayberry (*Myrica pensylvanica*)

Herbs
American Beachgrass (*Ammophila breviligulata ssp. breviligulata*)
Japanese Daisy (*Leucanthemum nipponicum*)
Common Reed (*Phragmites australis*)
Seaside Goldenrod (*Solidago sempervirens*)
Rough Cockleburr (*Xanthium strumarium*)



This figure helps visualize the structure and "look" or "feel" of a typical maritime bluff. Each bar represents the amount of "coverage" for all the species growing at that height. Because layers overlap (shrubs may grow under trees, for example), the shaded regions can add up to more than 100%.

Additional Resources

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New York Natural Heritage Program
625 Broadway, 5th Floor,
Albany, NY 12233-4757
Phone: (518) 402-8935
acris@nynhp.org

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This guide was authored by

Maritime Dunes

Maritime dunes at Fort Tilden, Gateway National Recreation Area

Photo credits: *Gregory J. Edinger*

System Terrestrial

Subsystem Open Uplands

Did you know?
Unlike most terrestrial systems, maritime dune systems move over the landscape and even across property boundaries. Consequently, this migrating dune system is difficult to preserve. However, it needs to be protected and restored. A healthy dune system protects property by reducing the energy of storm waves. It is the best defense against coastal flooding, erosion, and sea-level rise. It provides tremendous economic benefit to the local economy. A healthy coastal sand dune system is also the least costly way to maintain a recreational beach for future generations. (http://www.maine.gov/dep/blwq/topic/dunes/)

Summary

Protection Not listed in New York State, not listed federally.

Rarity G4, S3

A global rarity rank of G4 means: Apparently secure globally, though it may be quite rare in parts of its range, especially at the periphery.
A state rarity rank of S3 means: Typically 21 to 100 occurrences, limited acreage, or miles of stream in New York State.

Conservation Status in New York

There are an estimated 130 miles of maritime dunes on Long Island (about 100 miles on the south shore) covering about 4,700 to 14,000 acres; there may be as many as 30 to 50 extant occurrences statewide. The several documented occurrences have good viability and most are protected on public or private conservation land. This community is restricted to the ocean shoreline of southern and eastern Long Island and includes some high quality examples. The trend for the community is declining due to threats related to alteration of dune/swale dynamics, including management practices that alter natural hydrologic processes (such as breach contingency plans), dune fragmentation, loss of connectivity between the open ocean and the uplands, ORV use, and coastal development.

Short-term Trends

Although the number of maritime dunes may have increased slightly when formerly long, continuous examples were fragmented by development, the acreage of maritime dunes in New York has probably declined in recent decades as a result of coastal development and recreational overuse. Community viability/ecological integrity is suspected to be slowly declining, primarily due to anthropogenic alterations (both physical and hydrological) to dune and swale dynamics and coastal development (e.g., fragmentation, shoreline hardening, filling, road construction, and community destruction).

Long-term Trends

Although the number of maritime dunes in New York may have increased substantially from historical numbers when formerly long, continuous examples were fragmented by development into numerous large and small stretches of dunes, their aerial extent and viability are suspected to have declined substantially over the long-term. These declines are likely correlated with coastal development and associated changes in connectivity, hydrology, water quality, and natural processes.

Conservation and Management

Threats

Breach contingency plans for public lands that include dune stabilization and repair, draining overwash water, and other hydrologic alterations threaten processes that create and maintain the community. Additional threats include fragmentation of dunes by development, barriers to connectivity between the open ocean and the dunes, driving on the dunes (off-road and four-wheel drive vehicles), trampling, and invasion by exotic species (Elaeagnus umbellata, Celastrus orbiculata, Pinus thunbergii, Rosa rugosa, and Phragmites australis).

Conservation Strategies and Management Practices

Maintain dynamic beach and dune processes, including allowing dunes to be breached and overwashed by storm events. Minimize breach closure, groundwater pollution, and road fill. Prevent recreational overuse (e.g., driving and trampling) and encourage the public to stay on marked trails. Undertake dune restoration using native species as needed and avoid planting potential invasives, like Rosa rugosa. Prevent the spread of invasive exotic species into the dunes through appropriate direct management and by minimizing potential dispersal corridors, such as beach access trails and roads. Monitor the nesting use of dunes by species such as the diamondback terrapin and take measures (e.g., install predator exclosures) to prevent nest predation by raccoons, skunks, and foxes. Ensure connectivity between maritime dunes, low salt marsh, and the open ocean to allow species to freely move between habitats during nesting season.

Development and Mitigation Considerations

Any development effort that disrupts connectivity between the open ocean and the maritime dune system should be avoided (e.g., a road running parallel to the beach between the beach and dunes). This community is best protected as part of a large beach, dune, salt marsh complex. Development should avoid fragmentation of such systems to

allow dynamic ecological processes (overwash, erosion, and migration) to continue. Connectivity to brackish and freshwater tidal communities, upland beaches and dunes, and to shallow offshore communities should be maintained. Connectivity between these habitats is important not only for nutrient flow and seed dispersal, but also for animals that move between them seasonally. Similarly, fragmentation of linear dune systems should be avoided. Bisecting trails, roads, and developments allow exotic species to invade, potentially increase 'edge species' (such as raccoons, skunks, and foxes), and disrupt physical dune processes.

Inventory Needs

Surveys and documentation of additional occurrences are needed, as are data on rare and characteristic animals.

Research Needs

An investigation into the taxonomic distinction between the stabilized maritime dune variant, maritime heathland, and maritime grassland is needed, as these communities can be essentially identical in species composition, structure, and function. They need further documentation, analysis, and clarification. More research could focus on site specific habitat suitability and use for nesting by terrapins, seabirds, and other species.

Rare Species

Dune Sandspur (*Cenchrus tribuloides*)
Bridgham's Brocade (*Oligia bridghami*)
Marsh Straw Sedge (*Carex hormathodes*)
Fringed Boneset (*Eupatorium torreyanum*)
Yellow-crowned Night-Heron (*Nyctanassa violacea*)
Northern Gamma Grass (*Tripsacum dactyloides*)
Great Egret (*Ardea alba*)
Sandplain Wild Flax (*Linum intercursum*)
Blunt Mountain-mint (*Pycnanthemum muticum*)
Schweinitz's Flatsedge (*Cyperus schweinitzii*)
Southern Arrowwood (*Viburnum dentatum var. venosum*)
Piping Plover (*Charadrius melodus*)
Gull-billed Tern (*Gelochelidon nilotica*)
Oakes' Evening-primrose (*Oenothera oakesiana*)
Seaside Plantain (*Plantago maritima var. juncoides*)
Crested Fringed Orchis (*Platanthera cristata*)
Least Tern (*Sternula antillarum*)
Common Tern (*Sterna hirundo*)
Roseate Tern (*Sterna dougallii*)
Seabeach Knotweed (*Polygonum glaucum*)
Small's Knotweed (*Polygonum aviculare ssp. buxiforme*)
A Noctuid Moth (*Apamea inordinata*)
A Noctuid Moth (*Apamea burgessi*)
Violet Dart (*Euxoa violaris*)
A Noctuid Moth (*Oncocnemis riparia*)
Fawn Brown Dart (*Euxoa pleuritica*)

Identification Comments

A community dominated by grasses and low shrubs that occurs on active and stabilized dunes along the Atlantic coast. This community consists of a mosaic of vegetation patches. This mosaic reflects past natural disturbances such as sand deposition, erosion, and dune migration. The composition and structure of the vegetation is variable depending on stability of the dunes, amounts of sand deposition and erosion, and distance from the ocean.

The Best Time to See

The best time to visit maritime dunes is in the mid- to late summer when dune plants are flowering and the water of the Atlantic ocean has warmed to a comfortable temperature for swimming.

Characteristics Most Useful for Identification

Characteristic species of the active dunes, where sand movement is greastest, include American beachgrass (Ammophila breviligulata), dusty-miller (Artemisia stelleriana), beach pea (Lathyrus japonicus), sedge (Carex silicea), seaside goldenrod (Solidago sempervirens), and sand-rose (Rosa rugosa).

Characteristic species of stabilized dunes include beach heather (Hudsonia tomentosa), bearberry (Arctostaphylos uva-ursi), beachgrass (Ammophila breviligulata), cyperus (Cyperus polystachyos var. macrostachyus), seaside goldenrod, beach pinweed (Lechea maritima), jointweed (Polygonella articulata), common evening-primrose (Oenothera biennis), sand-rose (Rosa rugosa), bayberry (Myrica pensylvanica), beach-plum (Prunus maritima), poison ivy (Toxicodendron radicans), and the lichens Cladonia submitis and Cetraria arenaria.

Seabeach amaranth (Amaranthus pumilus) is a federally threatened plant that is found on open sand at the base of the foredune of some maritime dunes. A few stunted pitch pines (Pinus rigida) or post oaks (Quercus stellata) may be present in the dunes.

Elevation Range

Known examples of this community have been found at elevations between 0 feet and 50 feet.

Similar Ecological Communities

Great Lakes dunes: Great Lakes dunes and martime dunes share many plant species and experience similar disturbance regimes, but Great Lakes dunes are located on the shores of Lake Erie and Lake Ontario. Maritime dunes are typically much larger due to the strength and duration of ocean winds.

Maritime grassland: Maritime dunes occur on active and stabilized sand dunes along the Atlantic coast. Active dunes are characterized by a near monoculture of beachgrass (Ammophila breviligulata) and more stable areas can support a variety of species, some of which (like little bluestem) can also be found in maritime grasslands. Maritime grasslands

are located on the deeper soils of rolling outwash plains (not on sandy dunes) further from the ocean but still within the range of offshore winds and salt spray. They are characterized by the grasses little bluestem, common hairgrass, and poverty-grass.

Characteristic Species

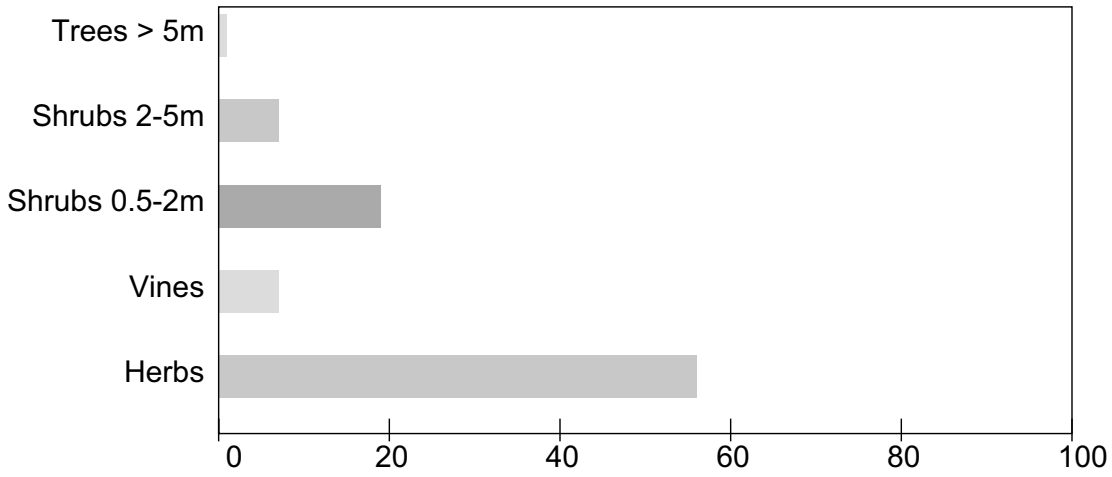
Trees > 5m
Japanese Black Pine (*Pinus thunbergiana*)

Shrubs 2-5m
Northern Bayberry (*Myrica pensylvanica*)
Wild Black Cherry (*Prunus serotina*)

Shrubs 0.5-2m
Sand-heather (*Hudsonia tomentosa*)
Marsh Elder (*Iva frutescens*)
Northern Bayberry (*Myrica pensylvanica*)
Beach Plum (*Prunus maritima*)
Rugosa Rose (*Rosa rugosa*)
Allegheny Blackberry (*Rubus allegheniensis*)
Northern Dewberry (*Rubus flagellaris*)

Vines
Virginia Creeper (*Parthenocissus quinquefolia*)
Eastern Poison Ivy (*Toxicodendron radicans*)

Herbs
American Beachgrass (*Ammophila breviligulata ssp. breviligulata*)
American Sea-rocket (*Cakile edentula*)
Seaside Spurge (*Chamaesyce polygonifolia*)
Maryland Golden Aster (*Chrysopsis mariana*)
Manyspike Flatsedge (*Cyperus polystachyos*)
Purple Lovegrass (*Eragrostis spectabilis*)
Beach Pea (*Lathyrus japonicus*)
Switchgrass (*Panicum virgatum*)
Coastal Jointweed (*Polygonella articulata*)
Little Bluestem (*Schizachyrium scoparium*)
Seaside Goldenrod (*Solidago sempervirens*)



This figure helps visualize the structure and "look" or "feel" of a typical maritime dunes. Each bar represents the amount of "coverage" for all the species growing at that height. Because layers overlap (shrubs may grow under trees, for example), the shaded regions can add up to more than 100%.

International Vegetation Classification System Associations

This New York natural community encompasses all or part of the concept of the following International Vegetation Classification (IVC) natural community associations. These are often described at finer resolution than New York's natural communities. The IVC is developed and maintained by NatureServe.

North Atlantic Coastal Plain Vine Dune (CEGL003886)

Overwash Dune Grassland (CEGL004097)

Northern Beach Heather Dune Shrubland (CEGL006143)

North Atlantic Coast Backdune Grassland (CEGL006161)

Northern Beachgrass Dune (CEGL006274)

NatureServe Ecological System Associations

This New York natural community falls into the following ecological system(s). Ecological systems are often described at a coarser resolution than New York's natural communities and tend to represent clusters of associations found in similar environments. The ecological systems project is developed and maintained by NatureServe.

Atlantic Coastal Plain Northern Dune and Maritime Grassland (CES203.264)

Additional Resources

Links

Terrapin Conservation at the Wetlands Institute
http://www.terrapinconservation.org/

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New York Natural Heritage Program
625 Broadway, 5th Floor,
Albany, NY 12233-4757
Phone: (518) 402-8935
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This guide was authored by

Deep Emergent Marsh

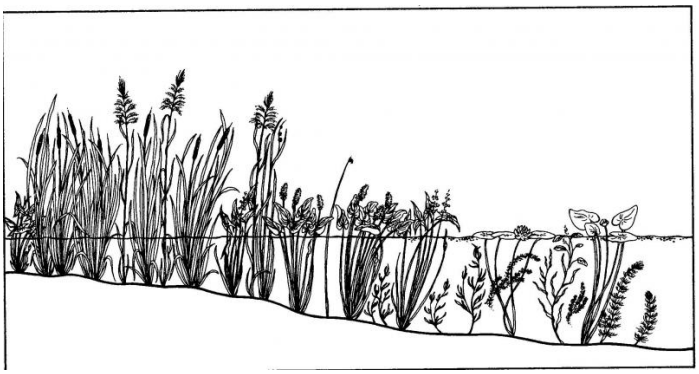


Photo credits: *Illustration by Darcy P. May*

System Palustrine

Subsystem Open Mineral Soil Wetlands

Did you know?
A characteristic species found in deep emergent marshes is wild rice (Zizania aquatica and Z. palustris). In addition to providing habitat and food for marsh fish and waterfowl, wild rice has been an important food staple for Native Americans for thousands of years. The ancestral grain of wild rice has even been found in layers of earth dating back 12,000 years! Today, about 23 million pounds of "wild" wild rice varieties as well as "cultivated" wild rice varieties are produced each year around the world, 4 million of which is considered "wild" grown.

Summary

Protection Not listed in New York State, not listed federally.

Rarity G5, S5

A global rarity rank of G5 means: Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.
A state rarity rank of S5 means: Demonstrably secure in New York State.

Conservation Status in New York

There are several thousand occurrences statewide. Some documented occurrences have good viability and many are protected on public land or private conservation land. This community has statewide distribution, and includes a few large, high quality examples. The current trend of this community is probably stable for occurrences on public land, or declining slightly elsewhere due to moderate threats that include alteration of the natural hydrology and invasive species.

Short-term Trends

The number and acreage of deep emergent marshes in New York have probably remained stable in recent decades as a result of wetland protection regulations. There may be a few cases where this community has increased as a result of flooding from impoundments.

Long-term Trends

The number and acreage of deep emergent marshes in New York has substantially declined (50-75%) from historical numbers likely correlated to the alteration of the natural hydrology and/or direct destruction.

Larger occurrences of this natural community (>12.5 acres) are protected under NY State wetland laws.

Conservation and Management

Threats

Deep emergent marshes are threatened by development and its associated run-off (e.g., agriculture, residential, commercial, roads/bridges), habitat alteration (e.g., pollution, dumping, utility ROWs), and recreational overuse (e.g., motor boating, canoeing, fishing). Alteration to the natural hydrological regime is also a threat to this community (e.g., impoundments, dredging, blocked culverts, beaver). Several deep emergent marshes are threatened by invasive species, such as purple loosestrife (Lythrum salicaria), water chestnut (Trapa natans), Eurasian watermilfoil (Myriophyllum spicatum), reedgrass (Phragmites australis), and frog-bit (Hydrocharis morsus-ranae).

Conservation Strategies and Management Practices

Where practical, establish and maintain a natural wetland buffer to reduce storm-water, pollution, and nutrient run-off, while simultaneously capturing sediments before they reach the wetland. Buffer width should take into account the erodibility of the surrounding soils, slope steepness, and current land use. Wetlands protected under Article 24 are known as New York State "regulated" wetlands. The regulated area includes the wetlands themselves, as well as a protective buffer or "adjacent area" extending 100 feet landward of the wetland boundary (NYS DEC 1995). If possible, minimize the number and size of impervious surfaces in the surrounding landscape. Avoid habitat alteration within the wetland and surrounding landscape. For example, roads and trails should be routed around wetlands, and ideally not pass through the buffer area. If the wetland must be crossed, then bridges and boardwalks are preferred over filling. Restore past impacts, such as removing obsolete impoundments and ditches in order to restore the natural hydrology. Prevent the spread of invasive exotic species into the wetland through appropriate direct management, and by minimizing potential dispersal corridors, such as roads.

Development and Mitigation Considerations

When considering road construction and other development activities minimize actions that will change what water carries and how water travels to this community, both on the surface and underground. Water traveling over-the-ground as run-off usually carries an abundance of silt, clay, and other particulates during (and often after) a construction project. While still suspended in the water, these particulates make it difficult for aquatic animals to find food; after settling to the bottom of the wetland, these particulates bury small plants and animals and alter the natural functions of the community in many other ways. Thus, road construction and development activities near this community type should strive to minimize particulate-laden run-off into this community. Water traveling on the ground or seeping through the ground also carries dissolved minerals and chemicals. Road salt, for example, is becoming an increasing problem both to natural communities and as a

contaminant in household wells. Fertilizers, detergents, and other chemicals that increase the nutrient levels in wetlands cause algae blooms and eventually an oxygen-depleted environment where few animals can live. Herbicides and pesticides often travel far from where they are applied and have lasting effects on the quality of the natural community. So, road construction and other development activities should strive to consider: 1. how water moves through the ground, 2. the types of dissolved substances these development activities may release, and 3. how to minimize the potential for these dissolved substances to reach this natural community.

Inventory Needs

Survey for occurrences statewide to advance documentation and classification of deep emergent marshes. A statewide review of deep emergent marshes is desirable. Continue searching for large sites in excellent to good condition (A- to AB-ranked).

Research Needs

Research the influence that artificial lake level control has on the structure and composition of deep emergent marshes. Research is needed to determine the distribution and invasiveness of Typha spp. in deep emergent marshes, including the presence of the hybrid cattail (Typha x glauca) in all examples. Research composition of deep emergent marshes statewide in order to characterize variations. Collect sufficient plot data to support the recognition of several distinct deep emergent marsh types based on composition and by ecoregion (e.g., Zizania spp. dominant, Typha spp. dominant, Sparganium spp. dominant, and broad-leaved aquatics dominant).

Rare Species

Hill's Pondweed (*Potamogeton hillii*)
Ogden's Pondweed (*Potamogeton ogdenii*)
Spotted Pondweed (*Potamogeton pulcher*)
False Hop Sedge (*Carex lupuliformis*)
Marsh Fern Moth (*Fagitana littera*)
Pied-billed Grebe (*Podilymbus podiceps*)
Blanding's Turtle (*Emydoidea blandingii*)
Northern Harrier (*Circus cyaneus*)
Least Bittern (*Ixobrychus exilis*)
Indiana Bat (*Myotis sodalis*)
Southern Leopard Frog (*Rana sphenocephala*)
Water-thread Pondweed (*Potamogeton diversifolius*)
Button-bush Dodder (*Cuscuta cephalanthi*)
Marsh Horsetail (*Equisetum palustre*)
Featherfoil (*Hottonia inflata*)
Black Tern (*Chlidonias niger*)
Awned Sedge (*Carex atherodes*)
Slender Bulrush (*Schoenoplectus heterochaetus*)

Identification Comments

A marsh community that occurs on mineral soils or fine-grained organic soils; the substrate is flooded by waters that are not subject to violent wave action. Water depths can range

from 15 cm to 2 m (6 inches to 6.6 feet); water levels may fluctuate seasonally, but the substrate is rarely dry, and there is usually standing water in the fall. Deep emergent marshes are quite variable. They may be codominated by a mixture of species or have a single dominant species.

The Best Time to See

An exciting time to visit this type of marsh is in spring (end of April and on) when the red-winged blackbirds have returned to nest. The males perch on the tallest emergent vegetation and call to attract mates and defend their territories.

Characteristics Most Useful for Identification

A community of non-woody plants growing out of water, where the water remains year-round. Typical examples of deep emergent marshes are dominated by cattail (Typha spp.). They tend not to be very floristically diverse and are continuously flooded throughout the year.

Elevation Range

Known examples of this community have been found at elevations between 90 feet and 1716 feet.

Similar Ecological Communities

Shallow emergent marsh: Shallow emergent marsh is better drained than a deep emergent marsh; water depths may range from 15 cm to 1 m (6 inches to 3.3 feet) during flood stages, but the water level usually drops by mid to late summer and the substrate is exposed during an average year.

Characteristic Species

Emergent aquatics

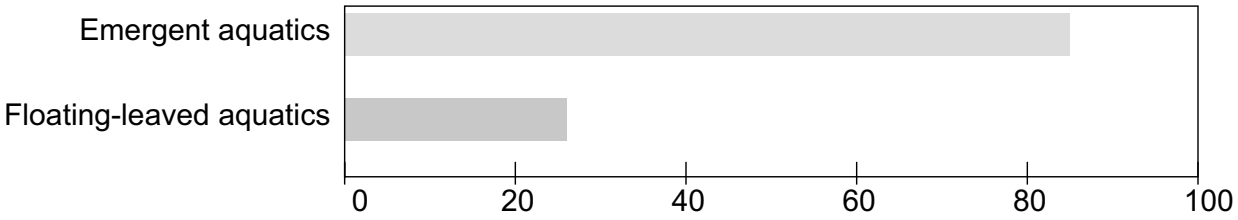
Water Horsetail (*Equisetum fluviatile*)
Green Arrow-arum (*Peltandra virginica*)
Pickerelweed (*Pontederia cordata*)
Broadleaf Arrowhead (*Sagittaria latifolia*)
Scirpus americanus
Scirpus tabernaemontani
Large Bur-reed (*Sparganium eurycarpum*)
Typha angustifola
Broad-leaf Cattail (*Typha latifolia*)
Eastern Wild Rice (*Zizania aquatica*)

Floating-leaved aquatics

Lesser Duckweed (*Lemna minor*)
American White Waterlily (*Nymphaea odorata*)
Floating Pondweed (*Potamogeton natans*)

Submerged aquatics

Common Hornwort (*Ceratophyllum demersum*)
Water Lobelia (*Lobelia dortmanna*)
Utricularia vulgaris



This figure helps visualize the structure and "look" or "feel" of a typical deep emergent marsh. Each bar represents the amount of "coverage" for all the species growing at that height. Because layers overlap (shrubs may grow under trees, for example), the shaded regions can add up to more than 100%.

International Vegetation Classification System Associations

This New York natural community encompasses all or part of the concept of the following International Vegetation Classification (IVC) natural community associations. These are often described at finer resolution than New York's natural communities. The IVC is developed and maintained by NatureServe.

Water-lily Aquatic Wetland (CEGL002386)

Southern Great Lakes Shore Emergent Marsh (CEGL005112)

Eastern Cattail Marsh (CEGL006153)

Bulrush Deepwater Marsh (CEGL006275)

Bayonet Rush Herbaceous Vegetation (CEGL006345)

NatureServe Ecological System Associations

This New York natural community falls into the following ecological system(s). Ecological systems are often described at a coarser resolution than New York's natural communities and tend to represent clusters of associations found in similar environments. The ecological systems project is developed and maintained by NatureServe.

Laurentian-Acadian Wet Meadow-Shrub Swamp and Marsh (CES201.577)

Additional Resources

Links

NatureServe Explorer (System)
http://www.natureserve.org/explorer/servlet/NatureServe?searchSystemUid=ELEMENT_GLOBAL.2.723028
NatureServe Explorer (5th association)
http://www.natureserve.org/explorer/servlet/NatureServe?searchCommunityUid=ELEMENT_GLOBAL.2.683324
NatureServe Explorer (4th association)

http://www.natureserve.org/explorer/servlet/NatureServe?searchCommunityUid=ELEMENT_GLOBAL.2.683450

NatureServe Explorer (3rd association)
http://www.natureserve.org/explorer/servlet/NatureServe?searchCommunityUid=ELEMENT_GLOBAL.2.685511

NatureServe Explorer (2nd association)
http://www.natureserve.org/explorer/servlet/NatureServe?searchCommunityUid=ELEMENT_GLOBAL.2.689103

NatureServe Explorer (1st association)
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New York Natural Heritage Program
625 Broadway, 5th Floor,
Albany, NY 12233-4757
Phone: (518) 402-8935
acris@nynhp.org

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This guide was authored by

Highbush Blueberry Bog Thicket

Highbush blueberry bog thicket

Photo credits: *Troy Weldy*

System Palustrine

Subsystem Open Peatlands

Did you know?
Of the temperate fruits, highbush blueberries have one of the highest concentrations of iron. Medicinal research suggests blueberries can relieve fevers, prevent cataracts, improve short term memory loss, reverse loss of balance and coordination, and treat varicose veins, hemorrhoids, and peptic ulcers. They are also known to benefit eyesight, be good blood cleansers, and improve circulation.

Summary

Protection Not listed in New York State, not listed federally.

Rarity G4, S3

A global rarity rank of G4 means: Apparently secure globally, though it may be quite rare in parts of its range, especially at the periphery.
A state rarity rank of S3 means: Typically 21 to 100 occurrences, limited acreage, or miles of stream in New York State.

Conservation Status in New York

There are several hundred occurrences statewide. There are some documented occurrences that have good viability and several are protected on public land or private conservation land. This community has statewide distribution, and includes a few, large, high quality examples. The current trend of this community is probably stable for occurrences on public land, or declining slightly elsewhere due to moderate threats related to development pressure or alteration to the natural hydrology.

Short-term Trends

The numbers and acreage of highush blueberry bog thickets in New York have probably remained stable in recent decades as a result of wetland protection regulations.

Long-term Trends

The numbers and acreage of highush blueberry bog thickets in New York probably declined moderately from historical numbers likely correlated with the onset of agricultural and residential development.

Larger occurrences of this natural community (>12.5 acres) are protected under NY State wetland laws.

Conservation and Management

Threats

Highbush blueberry bog thickets are threatened by development and its associated run-off (e.g., agriculture, residential, roads), recreational overuse (e.g., hiking trails, campgrounds) and habitat alteration in the adjacent landscape (e.g., mining, logging, utility ROWs, pollution). Alteration to the natural hydrology is also a threat to this community (e.g., ditching, blocked culverts, beaver). Trash dumping is a threat to a few bog thickets. Several examples of highbush blueberry bog thicket are threatened by invasive species, such as reedgrass (Phragmites australis ssp. australis) and purple loosestrife (Lythrum salicaria).

Conservation Strategies and Management Practices

Because highbush blueberry bog thickets are relatively acidic and low in nutients, they are susceptible to alteration by elevated nutrient inputs. Bog thickets may require larger buffers than other wetland types because of their high suceptibility to changes in nutrient concentrations.

Where practical, establish and maintain a natural wetland buffer to reduce storm-water, pollution, and nutrient run-off, while simultaneously capturing sediments before they reach the wetland. Buffer width should take into account the erodibility of the surrounding soils, slope steepness, and current land use. Wetlands protected under Article 24 are known as New York State "regulated" wetlands. The regulated area includes the wetlands themselves, as well as a protective buffer or "adjacent area" extending 100 feet landward of the wetland boundary (NYS DEC 1995). If possible, minimize the number and size of impervious surfaces in the surrounding landscape. Avoid habitat alteration within the wetland and surrounding landscape. For example, roads and trails should be routed around wetlands, and ideally should not pass through the buffer area. If the wetland must be crossed, then bridges and boardwalks are preferred over filling. Restore highbush blueberry bog thickets that have been unnaturally disturbed (e.g., remove obsolete impoundments and ditches in order to restore the natural hydrology). Prevent the spread of invasive exotic species into the wetland through appropriate direct management, and by minimizing potential dispersal corridors, such as roads.

Development and Mitigation Considerations

When considering road construction and other development activities minimize actions that will change what water carries and how water travels to this community, both on the surface and underground. Water traveling over-the-ground as run-off usually carries an abundance of silt, clay, and other particulates during (and often after) a construction project. While still suspended in the water, these particulates make it difficult for aquatic animals to find food; after settling to the bottom of the wetland, these particulates bury

small plants and animals and alter the natural functions of the community in many other ways. Thus, road construction and development activities near this community type should strive to minimize particulate-laden run-off into this community. Water traveling on the ground or seeping through the ground also carries dissolved minerals and chemicals. Road salt, for example, is becoming an increasing problem both to natural communities and as a contaminant in household wells. Fertilizers, detergents, and other chemicals that increase the nutrient levels in wetlands cause algae blooms and eventually an oxygen-depleted environment where few animals can live. Herbicides and pesticides often travel far from where they are applied and have lasting effects on the quality of the natural community. So, road construction and other development activities should strive to consider: 1. how water moves through the ground, 2. the types of dissolved substances these development activities may release, and 3. how to minimize the potential for these dissolved substances to reach this natural community.

Inventory Needs

Survey more occurrences and collect plot data that may support splitting this community into inland and Coastal Plain types. Inventory examples with little to no highbush blueberry (Vaccinium corymbosum) and resolve the classification of those types.

Research Needs

Future research on highbush blueberry bog thickets should explore the role of fire, frost, and coastal storms on the vegetation composition. Plot data and regional studies suggest basins supporting shrub swamps may be tightly related to Atlantic white cedar-dominated wetlands (Motzkin 1991). Highbush blueberry bog thickets may have previously been cedar-dominated wetlands, and may shift to cedar-dominated wetlands in the future. Understanding the role of disturbance in forming this community may help long-term planning and conservation of the variety of vegetation expressed within these sites. Lastly, it may be desirable to critically compare statewide plot data for highbush blueberry bog thicket to justify the creation of a new state community type (MacDonald and Edinger 2000).

Rare Species

Subarctic Darner (*Aeshna subarctica*)
Southern Twayblade (*Listera australis*)
Mottled Darner (*Aeshna clepsydra*)
Dark-green sedge (*Carex venusta*)
Balsam Willow (*Salix pyrifolia*)
Orange Fringed Orchid (*Platanthera ciliaris*)
Wiegand's Sedge (*Carex wiegandii*)
Collins' Sedge (*Carex collinsii*)
Button-bush Dodder (*Cuscuta cephalanthi*)

Identification Comments

An ombrotrophic or weakly minerotrophic peatland dominated by tall, deciduous, ericaceous shrubs and peat mosses; the water is usually nutrient-poor and acidic. The dominant shrub is usually highbush blueberry. At least three regional variants are recognized in New York. The first is found throughout central and western New York, the

second is primarily a northern variant, and the third is a southern variant with coastal plain species.

The Best Time to See

Summer and fall are great times to visit these thickets. Beginning in late June, highbush blueberries produce many large and delicious berries. In the fall their foliage turns from the green tones of summer to brillant shades of red and orange.

Characteristics Most Useful for Identification

A peatland that is dominated by tall (2 m) highbush blueberry (Vaccinium corymbosum) shrubs.

Elevation Range

Known examples of this community have been found at elevations between 5 feet and 1870 feet.

Similar Ecological Communities

Pitch pine-blueberry peat swamp: An open canopy conifer swamp occurring in shallow depressions in sandplains that is dominated by pitch pine, grey birch, and red maple with a dense shrub layer dominated by highbush blueberry. Pitch pine-blueberry peat swamps have a canopy layer that is dominated by pitch pine and associated hardwoods; highbush blueberry bog thicket is a shrub-dominated community.

Pine barrens shrub swamp: Tall-shrub-dominated communities on Long Island with shallow peat deposits (<20 cm) are treated as pine barrens shrub swamps. The two natural communities are separated by the fact that highbush blueberry bog thicket maintains a persistent hydrological regime, supports peat development, and often lacks "edge species" that are found in pine barrens shrub swamp, such as staggerbush (Lyonia mariana), gallberry (Ilex glabra), and bayberry (Myrica pensylvanica).

Shrub swamp: Shrub swamps are mineral soil wetlands that are dominated by shrub species other than highbush blueberry.

Rich shrub fen: Rich shrub fens are dominated by shrub species other than highbush blueberry. These fens are fed by mineral rich water with higher pH values (generally from 6.0 to 7.8) than those of highbush blueberry bog thickets.

Characteristic Species

Trees > 5m
Red Maple (*Acer rubrum*)
Eastern White Pine (*Pinus strobus*)

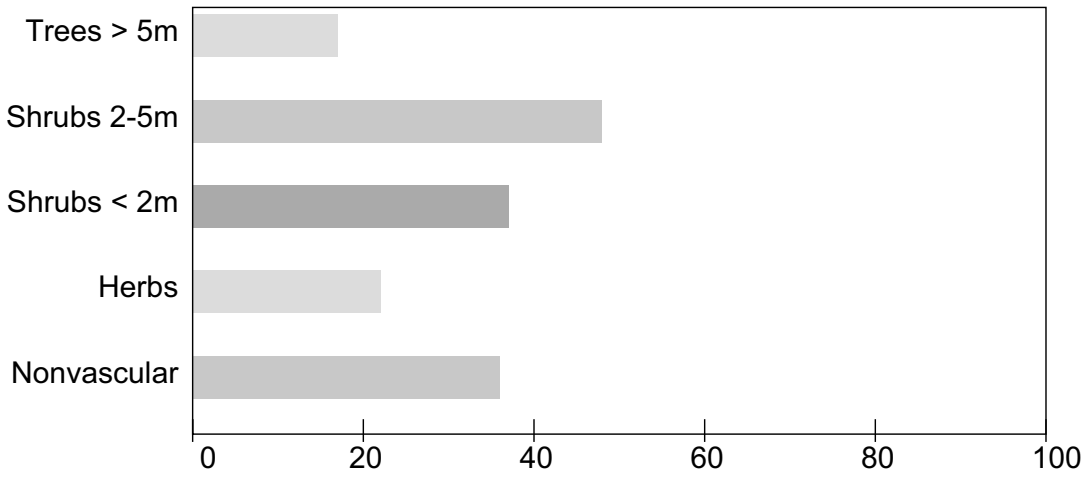
Shrubs 2-5m
Common Winterberry (*Ilex verticillata*)
Mountain Holly (*Nemopanthus mucronatus*)

Highbush Blueberry (*Vaccinium corymbosum*)

Shrubs < 2m
Leatherleaf (*Chamaedaphne calyculata*)
Sheep-laurel (*Kalmia angustifolia*)
Red Chokeberry (*Photinia pyrifolia*)
Swamp Azalea (*Rhododendron viscosum*)

Herbs
Billings' Sedge (*Carex trisperma*)
Three-leaf Solomon's-plume (*Maianthemum trifolium*)
Cinnamon Fern (*Osmunda cinnamomea*)
Pitcher-plant (*Sarracenia purpurea*)
Marsh Fern (*Thelypteris palustris*)
Marsh St. John's Wort (*Triadenum virginicum*)

Nonvascular
Sphagnum spp.



This figure helps visualize the structure and "look" or "feel" of a typical highbush blueberry bog thicket. Each bar represents the amount of "coverage" for all the species growing at that height. Because layers overlap (shrubs may grow under trees, for example), the shaded regions can add up to more than 100%.

International Vegetation Classification System Associations

This New York natural community encompasses all or part of the concept of the following International Vegetation Classification (IVC) natural community associations. These are often described at finer resolution than New York's natural communities. The IVC is developed and maintained by NatureServe.

Highbush Blueberry Poor Fen (CEGL005085)

Highbush Blueberry Bog Thicket (CEGL006190)

NatureServe Ecological System Associations

This New York natural community falls into the following ecological system(s). Ecological systems are often described at a coarser resolution than New York's natural communities and tend to represent clusters of associations found in similar environments. The ecological systems project is developed and maintained by NatureServe.

Laurentian-Acadian Acidic Basin Fen (CES201.583)

North-Central Interior and Appalachian Acid Peatland (CES202.606)

Additional Resources

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New York Natural Heritage Program
625 Broadway, 5th Floor,
Albany, NY 12233-4757
Phone: (518) 402-8935
acris@nynhp.org

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This guide was authored by

Marine Eelgrass Meadow

Marine eelgrass meadow

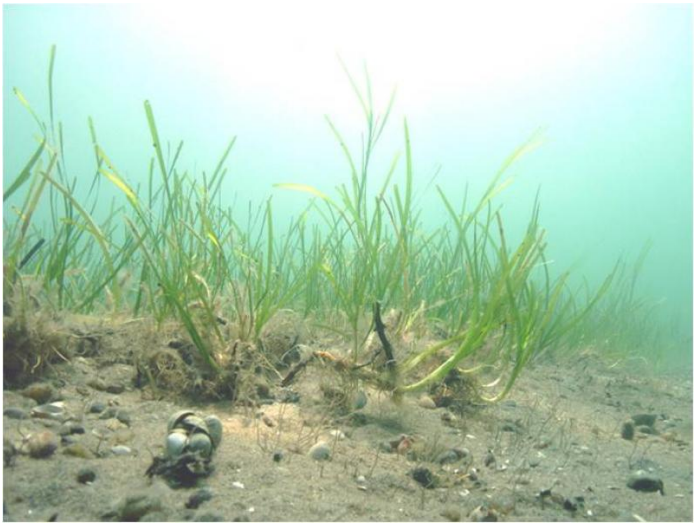


Photo credits: *Cornell Cooperative Extension of Suffolk County*

System Marine

Subsystem Marine Subtidal

Did you know?
Seagrass beds are some of the most productive communities on earth. In New York, eelgrass provides critical habitat for a surprising variety of fascinating marine creatures. Seahorses, puffer fish, bay scallops, hard clams, lobster, starfish, flounder, shrimp, hermit crabs, spider crabs, skates, squid, horseshoe crabs, sea turtles, and many more species spend at least part of their lives within these protective marine eelgrass meadows (NYS Seagrass Task Force 2009, Orth 2006).

Summary

Protection Not listed in New York State, not listed federally.

Rarity G5, S3

A global rarity rank of G5 means: Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.
A state rarity rank of S3 means: Typically 21 to 100 occurrences, limited acreage, or miles of stream in New York State.

Conservation Status in New York

There are estimated to be over 21,000 acres of eelgrass in New York; there may be as many as 30 extant occurrences of marine eelgrass meadow statewide. The few documented occurrences of this community have good viability and are somewhat protected in the waters adjacent to public or private conservation land. The community is restricted to the ocean surrounding Long Island in the North Atlantic Coast ecoregion; it is found in the Peconic Estuary, Long Island Sound, and the South Shore Estuary. The aerial extent and ecological integrity of this community is very rapidly to severely declining; an estimated 90% of New York's eelgrass meadows have been lost between 1930 and the present. Threats to the community include decreased water quality, increased nutrient inputs, physical disturbance from fishing and shellfishing gear, and harmful algal blooms.

Short-term Trends

The aerial extent and ecological integrity of this community is very rapidly to severely declining. While historical seagrass acreage in New York has not been documented, historical photography and records indicate that there may have been 200,000 acres in 1930; today, only 21,803 acres remain. This is due, in part, to effects from historical seagrass wasting disease and current increased nutrient loading, decreased water quality and clarity, harmful phytoplankton blooms, habitat degradation, and fishing and boating disturbances (New York State Seagrass Task Force 2009).

Long-term Trends

Prior to the 1930s, marine eelgrass meadows in the waters surrounding New York are assumed to have been relatively extensive (>200,000 acres) and stable (New York State Seagrass Task Force 2009).

Conservation and Management

Threats

The greatest threats to marine eelgrass meadows in New York are decreased water quality from excess nitrogen, harmful algal blooms, increased turbidity from sedimentation, and damage from fishing/shellfishing gear and boating activities. These threats vary by estuarine system: "Long Island Sound seagrass is most threatened by excess nitrogen. Peconic Estuary seagrass is most affected by fishing and shellfishing gear and boating activities. . . . Long Island's South Shore Estuary is most threatened by harmful algal blooms" (New York State Seagrass Task Force 2009). Additional existing or expected threats include continued decline in water quality and clarity from development, hardened shorelines, polluted run-off, and potentially from a loss of filter feeders; physical disturbances from construction of marinas and docks, navigational channel dredging (which potentially destroys eelgrass beds, increases turbidity, and alters habitat suitability), storm surges, and wind/wave action (which may be exacerbated by climate change); seagrass wasting disease; bioturbation and overgrazing; increased water temperatures from climate change; and sea level rise. Some invasive exotic species, including tunicate colonies (Didemnum spp.) and macroalgae (Codium fragile), are also threatening this community (New York State Seagrass Task Force 2009, Pickerell and Schott 2004, Stephenson 2009).

Conservation Strategies and Management Practices

Improve water quality by reducing or eliminating sewer and stormwater discharge and pesticide/herbicide application. Set guidelines and gear restrictions to minimize disturbances from shellfishing, boating, and dredging. Reduce or mitigate shoreline development and armoring as much as possible. Monitor the spread of invasive exotic species in this community, particularly tunicate colonies (Didemnum spp.) and macroalgae (Codium fragile) and, as needed, control their encroachment. Include marine eelgrass meadow restoration and long term monitoring in Harbor Management Plans, as appropriate. A comprehensive management plan for the Peconic Estuary is available as a model (Stephenson 2009).

Development and Mitigation Considerations

Strive to minimize or eliminate hardened shorelines and maintain low-sloped shorelines within the tidal zone; healthy marine eelgrass meadows will slow ocean currents and reduce shoreline erosion. Maintain functional connectivity between the open ocean and bays with marine eelgrass meadows to enable full tidal flushing during each tidal cycle. For example, barriers such as railway causeways should have numerous culverts to allow sufficient hydrologic connectivity. If flow restriction devices are needed, those that are calibrated for local tidal hydrology can be used. This community is best protected as part of a large complex. Protected areas should encompass coastal, nearshore, and deepwater marine habitats to ensure connectivity and allow dynamic ecological processes to continue. Connectivity to brackish and freshwater tidal communities, upland beaches and dunes, and to shallow offshore communities should also be maintained. Connectivity between these habitats is important not only for nutrient flow and seed dispersal, but also for animals that move between them seasonally. Development of site conservation plans that identify local threats and their sources and provide management and protection recommendations would ensure their long-term viability. Address seagrass protection in Local Waterfront Revitalization Programs where appropriate (NYS Seagrass Task Force 2009).

Inventory Needs

Extensive inventory is needed, with focus on the Peconic Estuary, Long Island Sound, and the South Shore Estuary. Existing digital maps of the three estuaries (Long Island Sound and South Shore Estuary circa 2002 and Peconic Estuary circa 2000) should be used as leads. The New York State Seagrass Task Force recommends that inventories be repeated every three years.

Research Needs

A significant amount of research on marine eelgrass meadow threats and stressors, recolonization, disturbance, restoration, genetics, and ecology has been suggested (from New York State Seagrass Task Force 2009). Studies are needed to determine impacts from channel dredging operations, specifically whether local operations actually improve water quality through increased tidal flushing. The ability of eelgrass beds to migrate in response to sea level rise, particularly in areas with hardened shorelines, should be investigated, as should their carbon dioxide uptake potential. Potential impacts of recently-arrived exotic species, like Didemnum spp. (a filter-feeding, colonial tunicate that forms dense, smothering mats), need to be explored. Research should be conducted to determine the effects of multiple stressors on eelgrass, to determine the genetic diversity of eelgrass in and between estuarine systems, and to determine the causes of exacerbated wasting disease or other potential diseases affecting eelgrass. The concentration at which pesticides and herbicides become toxic to eelgrass should be determined. Relationships, (positive, negative, and neutral) between biota (including epiphytes, grazers, and bioturbators) and eelgrass should be established. Ground- and surface-water monitoring should be conducted to determine whether inputs are negatively affecting eelgrass meadows, either directly or indirectly. Causes of eelgrass disappearance from seemingly suitable sites in the Peconic Estuary (Southold Bay, Three Mile Harbor, and Northwest Harbor) should be conclusively determined (Pickerell and Schott 2008). More data on other marine shallow water communities with very little or no eelgrass (e.g., marine macroalgae beds) are needed (Edinger et al. 2002).

Identification Comments

A community of subtidal aquatic beds typically occurring in quiet, shallow (2 to 30 feet deep), polyhaline (18 to 30 ppt salinity) waters of temperate tidal embayments below the lowest tide level, where fluctuations in salinity are minor.

Plant species composition is known to vary with different rates of exchange with marine waters. As salinity decreases, eelgrass beds may grade into brackish subtidal aquatic beds dominated by widgeon grass (Ruppia maritima) (Macomber et al. 1979). Eelgrass meadows are highly productive, provide habitat for a rich variety of marine organisms, and enhance sediment stability. They typically occur on sands to sandy loam soils at 0.6-4.5 m (2 to 15 ft) below mean sea level.

The Best Time to See

Marine eelgrass meadows can be explored year-round. Snorkel through the meadows in mid- to late summer to observe associated species like hermit crabs foraging and hiding amongst the blades of grass. Flowering eelgrass can also be seen in mid- to late summer.

Characteristics Most Useful for Identification

This community is characteristically dominated or codominated by eelgrass (Zostera marina). Characteristic associated plants include a diverse array of attached (rooted and epiphytic) and unattached (suspended) marine algae. Rooted red algae are especially common, including graceful red weed (Gracilaria tikvahiae), tubed weed (Polysiphonia denudata), Grinnell's pink leaf (Grinnellia americana), Agardh's red weed (Agardhiella subulata), Rhodomela confervoides, pod weed (Chondria baileyana), Spyridia filamentosa, banded weed (Ceramium spp.), and rough tangle weed (Stilophora rhizoides). Abundant and characteristic epiphytic marine algae include barrel weed (Champia parvula), tubed weed (Polysiphonia stricta), Cladophora sericea, and Pneophyllum fragile. Other associated marine algae include the green algae sea lettuce (Ulva lactuca), hollow green weed (Enteromorpha spp.), Cladophora gracilis, and the brown algae gulfweed (Sargassum filipendula). A common exotic species is the marine green algae, green fleece (Codium fragile).

Characteristic fauna include fish such as fourspine stickleback (Apeltes quadracus), mummichog (Fundulus heteroclitus), northern pipefish (Syngnathus fuscus), threespine stickleback (Gasterosteus aculeatus), silversides (Menidia spp.), naked goby (Gobiosoma bosci), menhaden (Brevoortia tyrannus), winter flounder (Pseudopleuronectes americanus), and northern puffer (Sphoeroides maculatus); marine mollusks such as bay scallop (Aequipecten irradians), common Atlantic slippershell (Crepidula fornicata), and northern quahog (Mercenaria mercenaria); crustaceans such as nine-spine spider crab (Libinia emarginata), mud crabs (e.g., Dyspanopeus sayi, Panopeus herbstii and Rithropanopeus harrisii), broken-back shrimp (Hippolyte pleurocantha); and other marine invertebrates, such as short-spine brittle star (Ophioderma brevispina), bamboo worms (Polychaeta), and counterclockwise coiled worm (Spirobis spirillum). Comb jellies (Beroe spp., Mnemiopsis leidyi) are common plankton species. Waterfowl known to extensively feed on eelgrass include brant (Branta bernicla) and American black duck (Anas rubripes) (Good et al. 1978).

Elevation Range

Known examples of this community have been found at elevations between -12 feet and -2 feet.

Similar Ecological Communities

Marine intertidal gravel/sand beach: Marine intertidal gravel/sand beaches, unlike marine eelgrass meadows, are periodically exposed and flooded by semidiurnal tides. They are washed by rough, high-energy waves and have sand or gravel substrates that are well-drained at low tide. They are largely unvegetated.

Freshwater subtidal aquatic bed: Like marine eelgrass meadows, freshwater subtidal aquatic beds are continuously flooded communities dominated by rooted vegetation. The freshwater system is primarily found along the Hudson River and possibly on small tidal rivers of Long Island, and is dominated by tapegrass (Vallisneria americana), whereas the marine system is found in the ocean off of Long Island and is dominated by eelgrass.

Brackish subtidal aquatic bed: Brackish subtidal aquatic beds are dominated by widgeon grass (Ruppia maritima), a submerged, rooted vascular plant that grows in slightly shallower water than eelgrass. The brackish water of these subtidal aquatic beds has salinity values that range from 0.5 to 18 parts per thousand (ppt) in contrast to marine eelgrass meadows, which are saline at 18-30 ppt.

Marine intertidal mudflats: Marine intertidal mudflats, unlike marine eelgrass meadows, are periodically exposed and flooded by semidiurnal tides. They may be covered with marine algae, such as sea lettuce, but would not support submerged eelgrass.

Saltwater tidal creek: Saltwater tidal creeks are permanently flooded, like marine eelgrass meadows, but they tend to be shallower. Their submerged areas average less than 2 m deep at low tide, but they can be deeper in main channel reaches. They are also dominated by species like widgeon grass, not eelgrass.

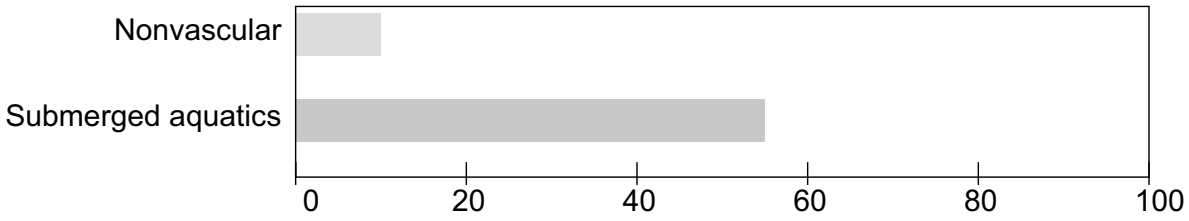
Marine rocky intertidal: Unlike marine eelgrass meadows, which are charaterized by quiet waters and unconsolidated sandy to sandy loam soils, marine rocky intertidal communities have high-energy wave action, occur on rocky substrates, and are dominated by marine algae, not eelgrass.

Characteristic Species

Nonvascular
Agardhiella subulata
Ceramium spp.
Champia parvula
Chondria baileyana
Cladophora sericea
Codium fragile
Gracilaria tikvahiae
Grinnellia americana
Pneophyllum fragile

Polysiphonia denudata
Polysiphonia stricta
Rhodomela confervoides
Sargassum filipendula
Spyridia filamentosa
Stylophora rhizoides

Submerged aquatics
Eelgrass (*Zostera marina*)



This figure helps visualize the structure and "look" or "feel" of a typical marine eelgrass meadow. Each bar represents the amount of "coverage" for all the species growing at that height. Because layers overlap (shrubs may grow under trees, for example), the shaded regions can add up to more than 100%.

International Vegetation Classification System Associations

This New York natural community encompasses all or part of the concept of the following International Vegetation Classification (IVC) natural community associations. These are often described at finer resolution than New York's natural communities. The IVC is developed and maintained by NatureServe.

Eel-grass Meadow (CEGL004336)

NatureServe Ecological System Associations

This New York natural community falls into the following ecological system(s). Ecological systems are often described at a coarser resolution than New York's natural communities and tend to represent clusters of associations found in similar environments. The ecological systems project is developed and maintained by NatureServe.

Atlantic Coastal Plain Northern Seagrass Bed (CES203.246)

Additional Resources

Links

Long Island Sound Study
http://www.longislandsoundstudy.net/
South Shore Estuary Reserve Council
http://www.estuary.cog.ny.us/
Peconic Estuary Program - Habitat and Living Resources
http://www.peconicestuary.org/HLR.html
Seagrass LI

http://counties.cce.cornell.edu/suffolk/habitat_restoration/seagrassli/index.html

World Atlas of Seagrasses

http://www.unep-wcmc.org/marine/seagrassatlas/index.htm

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New York Natural Heritage Program
625 Broadway, 5th Floor,
Albany, NY 12233-4757
Phone: (518) 402-8935
acris@nynhp.org

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Maritime Freshwater Interdunal Swales

Maritime freshwater interdunal swale at Napeague State Park

Photo credits: *Stephen M. Young*

System Palustrine

Subsystem Open Mineral Soil Wetlands

Did you know?
The large cranberry (Vaccinium marcrocarpon) found in maritime freshwater interdunal swales is more commonly associated with bogs in New York. It is the same cranberry that is commerically produced for fruit and juice and is used in medical research. The plant is considered a shrub but creeps along the ground, seeming more like a small vine, and has small evergreen leaves. Commercial cranberry beds and maritime interdunal swales are both flooded seasonally, though swales are flooded more irregularly and unpredictably.

Summary

Protection Not listed in New York State, not listed federally.

Rarity G3G4, S2

A global rarity rank of G3G4 means: Vulnerable globally, or Apparently Secure -- At moderate risk of extinction, with relatively few populations or locations in the world, few individuals, and/or restricted range; or uncommon but not rare globally; may be rare in some parts of its range; possibly some cause for long-term concern due to declines or other factors. More information is needed to assign a single conservation status.
A state rarity rank of S2 means: Typically 6 to 20 occurrences, few remaining individuals, acres, or miles of stream, or factors demonstrably make it very vulnerable in New York State.

Conservation Status in New York

There are approximately 20 extant occurrences statewide. The several documented occurrences are small and geographically restricted, but they have good viability and are protected on public or private conservation land. The community is restricted to the Coastal Lowlands ecozone in Suffolk County. The community's trend is declining due to threats related to invasive species, such as common reed (Phragmites australis); groundwater contamination; off-road vehicle abuse; and management practices that alter natural hydrologic processes, such as breach contingency plans. The surrounding landscape is

vulnerable to exotic flora invasion and urban development.

Short-term Trends

Community viability/ecological integrity and area of occupancy is suspected to be slowly declining, primarily due to community conversion (from maritime freshwater interdunal swales to common reed marsh) after invasive species encroachment. Other factors in the decline include anthropogenic alterations (both physical and hydrological) to dune and swale dynamics (e.g., ATV use, beach replenishment, dune stabilization) and coastal development (e.g., groundwater contamination, filling, road construction, and community destruction).

Long-term Trends

The number, extent, and viability of maritime freshwater interdunal swales in New York are suspected to have declined substantially over the long-term. These declines are likely correlated with coastal development and associated changes in hydrology, water quality, and natural processes.

Larger occurrences of this natural community (>12.5 acres) are protected under NY State wetland laws.

Conservation and Management

Threats

The main threats to maritime freshwater interdunal swales include common reed (Phragmites australis) invasion, ORV abuse, groundwater contamination, and development activities. Deregulation of isolated wetlands, which include maritime freshwater interdunal swales, is another recent threat. In 2001, the United States Supreme Court ruled that Section 404 of the Clean Water Act did not grant the U.S. Army Corps of Engineers (US ACoE) the authority to regulate the filling of isolated wetlands. This decision led U.S. Enironmental Protection Agency and US ACoE officials to issue guidance in January 2003 that made it more difficult for regulators to protect isolated wetlands (Comer et al. 2005).

Conservation Strategies and Management Practices

Monitor the abundance of common reed (Phragmites australis) in this community and, as needed, control its encroachment. Maintain dynamic beach and dune processes, including allowing dunes to be breached and overwashed by storm events. Minimize breach closure, groundwater pollution, and road fill. Where practical, establish and maintain a natural wetland buffer to reduce stormwater, pollution, and nutrient run-off, while simultaneously capturing sediments before they reach the wetland. Buffer width should take into account the erodibility of the surrounding soils, slope steepness, and current land use. Wetlands protected under the Freshwater Wetlands Act (Article 24 of the Environmental Conservation Law) are known as New York State "regulated" wetlands. The regulated area includes the wetlands themselves as well as a protective buffer or "adjacent area" extending 100 feet landward of the wetland boundary (NYS DEC 1995). If possible, minimize the number and size of impervious surfaces in the surrounding landscape. Avoid habitat alteration within the wetland and surrounding landscape. For example, roads and trails should be routed around wetlands, and ideally not pass through the buffer area. If the wetland must be crossed, then bridges and boardwalks are preferred over filling. Restore

past impacts, such as removing obsolete impoundments and ditches in order to restore the natural hydrology. Prevent the spread of invasive exotic species into the wetland through appropriate direct management and by minimizing potential dispersal corridors, such as roads.

Development and Mitigation Considerations

This community is best protected as part of a large beach, dune, salt marsh complex. Development should avoid fragmentation of such systems to allow dynamic ecological processes (overwash, erosion, and migration) to continue. Connectivity to brackish and freshwater tidal communities, upland beaches and dunes, and to shallow offshore communities should be maintained. Connectivity between these habitats is important not only for nutrient flow and seed dispersal, but also for animals that move between them seasonally. Care should be taken to avoid groundwater contamination and to minimize hydrologic alterations during road construction. Development of site conservation plans that identify wetland threats and their sources and provide management and protection recommendations would ensure their long-term viability.

Inventory Needs

Survey and compile existing data on the Fire Island occurrences. Searches for additional occurrences and data on characteristic animals are also needed.

Research Needs

Establish predictive models of dune dynamics and groundwater hydrology to determine where additional patches of this community may arise spontaneously.

Rare Species

Black Sedge (*Carex nigra*)
Carolina Clubmoss (*Pseudolycopodiella caroliniana*)
Whorled Mountain-mint (*Pycnanthemum verticillatum var. verticillatum*)
Screw-stem (*Bartonia paniculata ssp. paniculata*)
Piping Plover (*Charadrius melodus*)
Crested Fringed Orchis (*Platanthera cristata*)
Curlygrass Fern (*Schizaea pusilla*)
Narrow-leaf Sea-blite (*Suaeda linearis*)

Identification Comments

A mosaic of wetlands that occur in low areas between dunes along the Atlantic coast; the low areas or swales are formed either by blowouts in the dunes that lower the soil surface to groundwater level, or by the seaward extension of dune fields. Soils are either sand or peaty sand; water levels fluctuate seasonally and annually, reflecting changes in groundwater levels. The dominant species are sedges and herbs; low shrubs are usually present, but they are never dominant. These wetlands may be quite small (less than 0.25 acre or 0.1 ha); species diversity is usually low. The composition may be quite variable between different interdunal swales.

The Best Time to See

The grasses, sedges, and rushes that characterize the flora of this community bloom in mid- to late summer. Some of the showy associated species (the carnivorous sundews and bladderworts, cranberries and yellow-eyed grass) come into flower earlier, but a late-season visitor may be rewarded with a crop of ripe cranberries.

Characteristics Most Useful for Identification

Characteristic species with relatively high percent cover include large cranberry (Vaccinium macrocarpon), twig-rush (Cladium mariscoides), marsh fern (Thelypteris palustris), three-square (Schoenoplectus americanus), royal fern (Osmunda regalis), and Sphagnum spp. Characteristic plants with low percent cover include Canada rush (Juncus canadensis), and marsh St. John?s-wort (Triadenum virginicum), woolgrass (Scirpus cyperinus), highbush blueberry (Vaccinium corymbosum), mermaid-weed (Proserpinaca pectinata), and grass-leaved goldenrod (Euthamia graminifolia).

Other less frequently occurring plants with variable cover include poison ivy (Toxicodendron radicans), black chokeberry (Photinia melanocarpa), three-way sedge (Dulichium arundinaceum), swamp rose (Rosa palustris), bayberry (Myrica pensylvanica), sweet gale (M. gale), rose-mallow (Hibiscus moscheutos), bladderwort (Utricularia subulata), switch grass (Panicum virgatum), beakrushes (Rhynchospora alba, R. capitellata), hardhack (Spiraea tomentosa), cube-seeded iris (Iris prismatica), St. John's-wort (Hypericum sp.), swamp loosestrife (Lysimachia terrestris), cinnamon fern (Osmunda cinnamomea), sundews (Drosera intermedia, D. rotundifolia D. filiformis), flat sedges (Cyperus spp.), stiff yellow flax (Linum striatum), and slender yellow-eyed grass (Xyris torta). The invasion of common reed (Phragmites australis) is a serious threat to this community.

Elevation Range

Known examples of this community have been found at elevations between 5 feet and 15 feet.

Similar Ecological Communities

Brackish interdunal swales: Brackish interdunal swales are dominated by halophytic wetland species and are more likely to be inundated by tidewaters. Maritime freshwater interdunal swales have a stronger groundwater influence, are unlikely to be flooded by extreme tides, and are dominated by freshwater wetland species, including twig-rush, flat sedges, and beakrush.

Characteristic Species

Shrubs 2-5m
Highbush Blueberry (*Vaccinium corymbosum*)

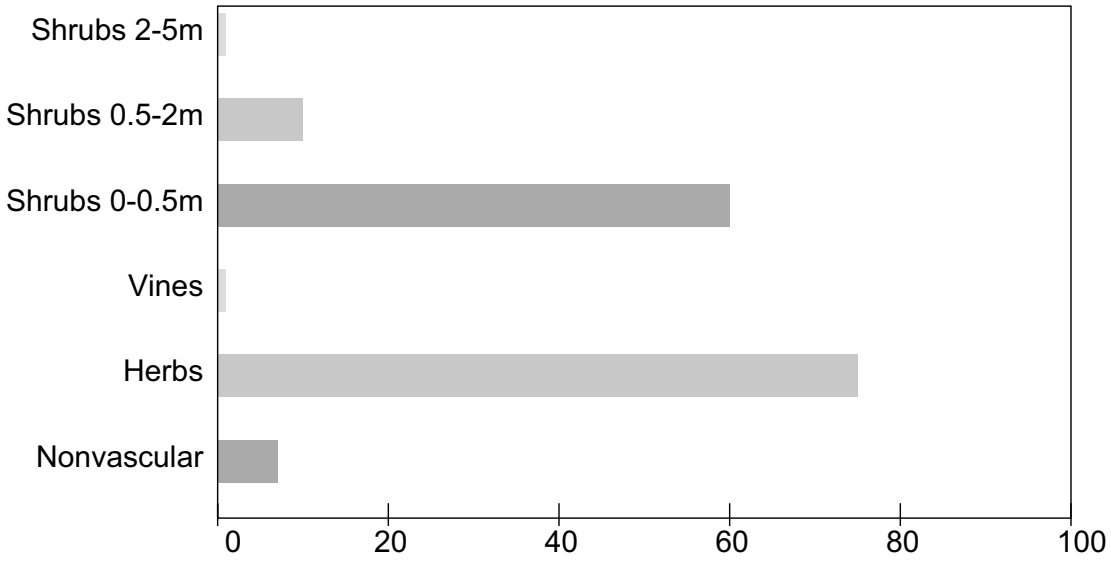
Shrubs 0.5-2m
Northern Bayberry (*Myrica pensylvanica*)
Hardhack Spiraea (*Spiraea tomentosa*)

Shrubs 0-0.5m
Large Cranberry (*Vaccinium macrocarpon*)

Vines
Eastern Poison Ivy (*Toxicodendron radicans*)

Herbs
Twig Rush (*Cladium mariscoides*)
Roundleaf Sundew (*Drosera rotundifolia*)
Flat-top Fragrant Goldenrod (*Euthamia graminifolia*)
Canada Rush (*Juncus canadensis*)
Royal Fern (*Osmunda regalis*)
Common Reed (*Phragmites australis*)
Brownish Beakrush (*Rhynchospora capitellata*)
Three-square Bulrush (*Schoenoplectus americanus*)
Cottongrass Bulrush (*Scirpus cyperinus*)
Marsh Fern (*Thelypteris palustris*)
Marsh St. John's Wort (*Triadenum virginicum*)

Nonvascular
Sphagnum cuspidatum



This figure helps visualize the structure and "look" or "feel" of a typical maritime freshwater interdunal swales. Each bar represents the amount of "coverage" for all the species growing at that height. Because layers overlap (shrubs may grow under trees, for example), the shaded regions can add up to more than 100%.

International Vegetation Classification System Associations

This New York natural community encompasses all or part of the concept of the following International Vegetation Classification (IVC) natural community associations. These are often described at finer resolution than New York's natural communities. The IVC is developed and maintained by NatureServe.

Northern Interdunal Cranberry Swale (CEGL006141)

NatureServe Ecological System Associations

This New York natural community falls into the following ecological system(s). Ecological systems are often described at a coarser resolution than New York's natural communities and tend to represent clusters of associations found in similar environments. The ecological systems project is developed and maintained by NatureServe.

Atlantic Coastal Plain Northern Dune and Maritime Grassland (CES203.264)

Additional Resources

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New York Natural Heritage Program
625 Broadway, 5th Floor,
Albany, NY 12233-4757
Phone: (518) 402-8935
acris@nynhp.org

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Maritime Grassland

Maritime grassland at Shadmoor State Park

Photo credits: *Aissa L. Feldmann*

System Terrestrial

Subsystem Open Uplands

Did you know?
From Stack (1989): "Early 19th century maps and photos show that nearly the entire eastern end of Long Island was once covered with tallgrass prairie-like vegetation. The grasslands supported large herds of grazing animals driven there from as far away as East Hampton to summer on the rich pasture. Annual burning in addition to cattle and sheep grazing kept woody species like bayberry, sumac, cherry, and locust from establising in the community. There are records that suggest that this (burning) was a practice learned from the previous inhabitants of the area, the Montauk Indians."

Summary

Protection Not listed in New York State, not listed federally.

Rarity G2G3, S1

A global rarity rank of G2G3 means: Imperiled or Vulnerable globally - At high or moderate risk of extinction due to rarity or other factors; typically 80 or fewer populations or locations in the world, few individuals, restricted range, few remaining acres (or miles of stream), and/or recent and widespread declines. More information is needed to assign a single conservation status.
A state rarity rank of S1 means: Typically 5 or fewer occurrences, very few remaining individuals, acres, or miles of stream, or some factor of its biology makes it especially vulnerable in New York State.

Conservation Status in New York

Some of the documented occurrences of this community have good viability and several are protected on public or private conservation land. The community is restricted to the Coastal Lowlands ecozone of eastern Long Island in Suffolk County and is found primarily on the South Fork. The trend for the community is declining due to significant threats from development, fire suppression, and trampling.

Short-term Trends

The number, extent, and viability of maritime grasslands is suspected to have decreased in the recent past, primarily due to fire suppression, woody species proliferation, and exotic species invasion. Some patches do still undergo prescribed burning and an effort has been made to add fire to managment regimes, but the efforts may not be sufficient to maintain stable acreage. Continued development pressures have contributed to additional declines.

Long-term Trends

The number, extent, and viability of maritime grassland in New York are suspected to have declined substantially over the long-term. These declines are likely correlated with fire suppression and decreased grazing, which historically kept woody species at bay. Declines are also due to coastal development and associated changes in landscape connectivity and natural processes.

Conservation and Management

Threats

Maritime grassland is threatened by increasing development pressure, fire suppression leading to woody species success, and trampling. Establishment and spread of invasive exotic species (Anthoxanthum odoratum, Celastrus orbiculatus, Lonicera morrowii, Setaria sp., Pinus thunbergii, and Agrostis sp.) is also a threat to this community. Some occurrences are threatened by ORV damage and herbicide use along railroad lines.

Conservation Strategies and Management Practices

Restore and replicate the natural fire regime, as appropriate. Monitor for trampling damage. Monitor the abundance of invasive species in this community and, as needed, control their encroachment using non-chemical protocols; in particular, restrict herbicide spraying along railroad tracks.

Development and Mitigation Considerations

This community is best protected as part of a large maritime system, encompassing grasslands, shrublands, bluffs, heathland, forests, barrens, and dunes. Development should avoid fragmentation of such systems to allow for nutrient flow, seed dispersal, and seasonal animal migrations within them. Bisecting trails, roads, and developments can also allow exotic plant and animal species to invade and potentially increase 'edge species' (such as raccoons, skunks, and foxes). Connectivity to brackish and freshwater tidal communities and to shallow offshore communities should also be maintained as much as possible to maintain "maritime" conditions, which imply deposition of salt spray and shearing from offshore winds.

Inventory Needs

The community has been well-inventoried, but additional occurrences may be found using aerial surveys. More compositional data, including plot data collection, is needed, as is data on rare and characteristic animals.

Research Needs

Documentation of the natural fire regime of this community is needed, possibly using the sources referred to in Stack (1989). Early records (from the 1650's) show that the grasslands were burned frequently (at times annually) by the Montauk Indians and subsequently by early settlers (Stack 1989). An investigation into the taxonomic distinction between maritime grassland and the stabilized, graminoid-dominated maritime dune variant is needed, as these communities can be essentially identical in species composition, structure, and function. They need further documentation, analysis, and clarification.

Rare Species

Henslow's Sparrow (*Ammodramus henslowii*)
Dune Sandspur (*Cenchrus tribuloides*)
Green Milkweed (*Asclepias viridiflora*)
Northern Harrier (*Circus cyaneus*)
Stargrass (*Aletris farinosa*)
Midland Sedge (*Carex mesochorea*)
Fringed Boneset (*Eupatorium torreyanum*)
Edwards' Hairstreak (*Satyrium edwardsii*)
Barn Owl (*Tyto alba*)
Michaux's Blue-eyed-grass (*Sisyrinchium mucronatum*)
Stiff Tick-trefoil (*Desmodium obtusum*)
Black Crowberry (*Empetrum nigrum ssp. hermaphroditum*)
Showy Aster (*Eurybia spectabilis*)
Sandplain Wild Flax (*Linum intercursum*)
Northern Blazing-star (*Liatris scariosa var. novae-angliae*)
Virginia False Gromwell (*Onosmodium virginianum*)
Blunt Mountain-mint (*Pycnanthemum muticum*)
Whorled Mountain-mint (*Pycnanthemum verticillatum var. verticillatum*)
Southern Arrowwood (*Viburnum dentatum var. venosum*)
Sandplain Gerardia (*Agalinis acuta*)
Nantucket Juneberry (*Amelanchier nantucketensis*)
Bushy Rockrose (*Crocanthemum dumosum*)
Field Beadgrass (*Paspalum laeve*)
Willow Oak (*Quercus phellos*)
Wild Pink (*Silene caroliniana ssp. pensylvanica*)
Packard's Lichen Moth (*Cisthene packardii*)
A Noctuid Moth (*Apamea burgessi*)
Violet Dart (*Euxoa violaris*)
A Noctuid Moth (*Oncocnemis riparia*)
Fringed Dart (*Eucoptocnemis fimbriaris*)
Fawn Brown Dart (*Euxoa pleuritica*)
The Pink Streak (*Faronta rubripennis*)

Identification Comments

A grassland community that occurs on rolling outwash plains of the glaciated portion of the Atlantic coastal plain, near the ocean, and within the influence of offshore winds and salt spray. This community is dominated by grasses that usually form a turf; the grasses

collectively have greater than 50% cover. Low heath shrubs may be present, with less than 50% cover.

The Best Time to See

One of the best times to see maritime grasslands is in the fall after the first frost, when the grasses have turned from green to their distinct late season reds and purples. Early fall is also a good time to enjoy asters and goldenrods in bloom.

Characteristics Most Useful for Identification

The dominant grasses are little bluestem (Schizachyrium scoparium), common hairgrass (Deschampsia flexuosa), and poverty-grass (Danthonia spicata).

Other characteristic species include Pennsylvania sedge (Carex pensylvanica), rush (Juncus greenei), Indian grass (Sorghastrum nutans), Atlantic golden aster (Pityopsis falcata), bushy rockrose (Helianthemum dumosum), hoary frostweed (H. propinquum), grass-leaved goldenrod (Euthamia graminifolia), white-topped aster (Sericocarpus asteroides), pussy's-toes (Antennaria plantaginifolia), bitter milkwort (Polygala polygama), hyssop-leaved boneset (Eupatorium hyssopifolium), bayberry (Myrica pensylvanica), shining sumac (Rhus copallinum), and northern dewberry (Rubus flagellaris). Rare plants occuring in some maritime grasslands are (Agalinis acuta) and New England blazing star (Liatris scariosa var. novae-angliae). A characteristic lichen is reindeer lichen (Cladonia rangiferina).

Elevation Range

Known examples of this community have been found at elevations between 10 feet and 90 feet.

Similar Ecological Communities

Hempstead Plains grassland: Hempstead Plains grassland occurs inland, beyond the influence of offshore winds and salt spray, and is dominated by species characteristic of midwestern tallgrass prairies: big bluestem (Andropogon gerardii), little bluestem, Indian grass, and switchgrass (Panicum virgatum). Maritime grassland occurs near the ocean within the range of offshore winds and salt spray and is dominated by little bluestem, common hairgrass, and poverty-grass.

Maritime dunes: Maritime dunes occur on active and stabilized sand dunes along the Atlantic coast. Active dunes are characterized by a near monoculture of beachgrass (Ammophila breviligulata) and more stable areas can support a variety of species, some of which (like little bluestem) can also be found in maritime grasslands. Maritime grasslands are located on the deeper soils of rolling outwash plains (not on sandy dunes) further from the ocean but still within the range of offshore winds and salt spray. They are characterized by the grasses little bluestem, common hairgrass, and poverty-grass.

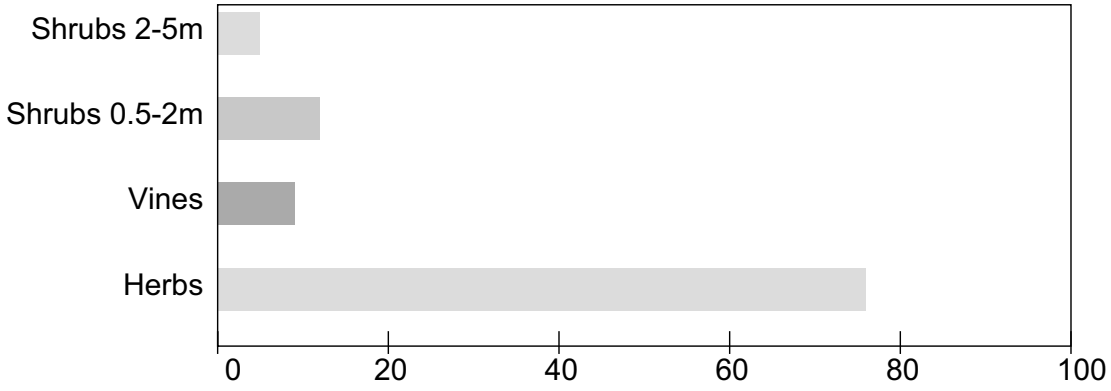
Characteristic Species

Shrubs 2-5m
Wild Black Cherry (*Prunus serotina*)

Shrubs 0.5-2m
Northern Bayberry (*Myrica pensylvanica*)
Wild Black Cherry (*Prunus serotina*)
Winged Sumac (*Rhus copallinum*)

Vines
Northern Dewberry (*Rubus flagellaris*)

Herbs
Common Wormwood (*Artemisia vulgaris*)
Yellow Wild-indigo (*Baptisia tinctoria*)
Poverty Oatgrass (*Danthonia spicata*)
Wavy Hair Grass (*Deschampsia flexuosa*)
Purple Lovegrass (*Eragrostis spectabilis*)
Flat-top Fragrant Goldenrod (*Euthamia graminifolia*)
Sickle-leaf Golden-aster (*Pityopsis falcata*)
Little Bluestem (*Schizachyrium scoparium*)
Rough-leaf Goldenrod (*Solidago rugosa*)
Yellow Indiangrass (*Sorghastrum nutans*)



This figure helps visualize the structure and "look" or "feel" of a typical maritime grassland. Each bar represents the amount of "coverage" for all the species growing at that height. Because layers overlap (shrubs may grow under trees, for example), the shaded regions can add up to more than 100%.

International Vegetation Classification System Associations

This New York natural community encompasses all or part of the concept of the following International Vegetation Classification (IVC) natural community associations. These are often described at finer resolution than New York's natural communities. The IVC is developed and maintained by NatureServe.

Northern Sandplain Grassland (CEGL006067)

NatureServe Ecological System Associations

This New York natural community falls into the following ecological system(s). Ecological systems are often described at a coarser resolution than New York's natural communities and tend to represent clusters of associations found in similar environments. The ecological systems project is developed and maintained by NatureServe.

Northern Atlantic Coastal Plain Heathland and Grassland (CES203.895)

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New York Natural Heritage Program
625 Broadway, 5th Floor,
Albany, NY 12233-4757
Phone: (518) 402-8935
acris@nynhp.org

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Maritime Shrubland

Maritime shrubland at Breezy Point, Gateway National Recreation Area

Photo credits: *Aissa L. Feldmann*

System Terrestrial

Subsystem Open Uplands

Did you know?
Maritime shrublands generally contain scattered stunted "salt pruned" trees with contorted branches and wilted leaves. When salt spray is blown ashore by strong offshore winds, it blasts against the trees and shrubs that are close to the sea. Their leaves and branches are slowly degraded over time, resulting in a thinned, asymmetrical growth form that appears to lean back away from the ocean.

Summary

Protection Not listed in New York State, not listed federally.

Rarity G4, S4

A global rarity rank of G4 means: Apparently secure globally, though it may be quite rare in parts of its range, especially at the periphery.
A state rarity rank of S4 means: Apparently secure in New York State.

Conservation Status in New York

The several documented occurrences have good viability and are protected on public conservation land. The community is restricted to the seacoast of the Coastal Lowlands ecozone in New York in Suffolk, Nassau, Richmond, Queens, and Kings Counties and is concentrated on dry seaside bluffs and headlands that are exposed to offshore winds and salt spray. The trend for the community is declining due primarily to threats from invasive species encroachment and coastal development that fragments maritime systems.

Short-term Trends

Community viability/ecological integrity and area of occupancy is suspected to be slowly declining, primarily due to invasive species proliferation. Coastal development and associated filling, road construction, and community destruction are additional contributing factors.

Long-term Trends

The number, extent, and viability of maritime shrubland in New York are suspected to have declined substantially over the long-term. These declines are likely correlated with coastal development and associated changes in landscape connectivity and natural processes.

Conservation and Management

Threats

Maritime shrubland is threatened by the proliferation of invasive exotic vines; Oriental bittersweet (Celastrus orbiculatus) and Japanese honeysuckle (Lonicera japonica) are the two most aggressive species and threaten to convert the community to a 'vineland.' Additional exotic species (including Rosa rugosa, Pinus thunbergii, and Elaeagnus umbellata) also threaten community integrity. The community is also vulnerable to fragmentation, degradation, and extirpation from further coastal development, particularly development that separates these shrublands from the maritime influences of offshore winds and salt spray. The spread of hiking and horse trails also fragments the system and threatens community integrity.

Conservation Strategies and Management Practices

Monitor the abundance of invasive species, particularly Oriental bittersweet and Japanese honeysuckle, in this community and, as needed, control their encroachment.

Development and Mitigation Considerations

This community is best protected as part of a large maritime system, encompassing grasslands, shrublands, bluffs, heathland, forests, barrens, and dunes. Development should avoid fragmentation of such systems to allow for nutrient flow, seed dispersal, and seasonal animal migrations within them. Bisecting trails, roads, and developments can also allow exotic plant and animal species to invade and potentially increase 'edge species' (such as raccoons, skunks, and foxes). Connectivity to brackish and freshwater tidal communities and to shallow offshore communities should also be maintained as much as possible to maintain "maritime" conditions, which imply deposition of salt spray and shearing from offshore winds.

Inventory Needs

Surveys and documentation of additional occurrences are needed, as are data on rare and characteristic animals. Plot data collection from known sites is also needed.

Research Needs

A critical assessment of the long-term effects of Oriental bittersweet and Japanese honeysuckle invasion is needed, particularly addressing whether the community is eventually converted to a "vineland" or whether shrub canopy species are still able to survive and recruit. More research and classification work within possible landscape variants is needed (e.g., maritime shrublands on morainal headland vs. outwash barrier dune) and to possibly recognize "tall" (>2 m) and "short" (<2 m) maritime shrubland variants.

Rare Species

Slender Blue Flag (*Iris prismatica*)
Northern Harrier (*Circus cyaneus*)
Dragon's Mouth Orchid (*Arethusa bulbosa*)
Snowy Egret (*Egretta thula*)
Yellow-crowned Night-Heron (*Nyctanassa violacea*)
Sandplain Wild Flax (*Linum intercursum*)
Blunt Mountain-mint (*Pycnanthemum muticum*)
Southern Arrowwood (*Viburnum dentatum var. venosum*)
Sandplain Gerardia (*Agalinis acuta*)
Nantucket Juneberry (*Amelanchier nantucketensis*)
Bushy Rockrose (*Crocanthemum dumosum*)

Identification Comments

A shrubland community that occurs on dry seaside bluffs and headlands that are exposed to onshore winds and salt spray. This community typically occurs as a tall shrubland (2-3 m), but may include areas under 1m shrub height, to areas with shrubs up to 4 m tall forming a shrub canopy in shallow depressions. These low areas may imperceptibly grade into shrub swamp if soils are sufficiently wet. Trees are usually sparse or absent (ideally less than 25% cover).

Maritime shublands may form a patchy mosaic and grade into other maritime communities. For example, if trees become more prevalent it may grade into one of the maritime forest communities, such as successional maritime forest. If a severe storm reduces shrub cover and deposits sand into the community it may be converted to a maritime dune. This community shares many shrub species with maritime dunes, but typically lacks the maritime dune herb species.

The Best Time to See

During the growing season, a characteristic shrub of maritime shrublands, bayberry, produces spicy-smelling fruit. These berries persist on the branches, and can be observed throughout much of the year.

Characteristics Most Useful for Identification

Characteristic shrubs and sapling trees include serviceberry (Amelanchier canadensis), bayberry (Myrica pensylvanica), black cherry (Prunus serotina), southern arrowwood (Viburnum dentatum var. venosum), and shining sumac (Rhus copallinum). Other shrubs and stunted trees include beach-plum (Prunus maritima), sand-rose (Rosa rugosa), wild rose (R. virginiana), eastern red cedar (Juniperus virginiana), American holly (Ilex opaca), black oak (Quercus velutina), and sassafras (Sassafras albidum). Small amounts of highbush blueberry (Vaccinium corymbosum), sweet pepperbush (Clethra alnifolia), red maple (Acer rubrum), and black chokeberry (Photinia melanocarpa) are found in moister low areas, often grading to small patches of shrub swamp. Morrow?s honeysuckle (Lonicera morrowii) is a common invasive shrub in this community.

Characteristic vines include poison ivy (Toxicodendron radicans), Virginia creeper (Parthenocissus quiquefolia), and common greenbrier (Smilax rotundifolia). Oriental

bittersweet (Celastrus orbiculatus) and Japanese honeysuckle (Lonicera japonica) are common invasive vines in this community.

The herb layer is very sparse and may contain a few scattered grass-leaved goldenrod (Euthamia graminifolia), wild indigo (Baptisia tinctoria), white-topped aster (Sericocarpus asteroides), and little bluestem (Schizachyrium scoparium).

Birds that may be found in maritime shrublands include black-crowned night-heron (Nycticorax nycticorax), fish crow (Corvus ossifragus), yellow-breasted chat (Icteria virens), and migratory songbirds (especially in fall) (Levine 1998).

Elevation Range

Known examples of this community have been found at elevations between 5 feet and 90 feet.

Similar Ecological Communities

Maritime dunes: If a severe storm reduces shrub cover and deposits sand into the community it may be converted to a maritime dune. This community shares many shrub species with maritime dunes, but typically lacks the maritime dune herb species.

Successional maritime forest: If the tree species that are associated with maritime shrublands (shadbush, black cherry) become prevalent, a maritime shrubland may grade into a successional maritime forest.

Salt shrub: Salt shrub is an estuarine community, dominated by groundsel-tree and saltmarsh-elder, that occurs at the upper limit of high spring and storm tides. Maritime shrublands, terrestrial communities, are located beyond the range of tidal influence but are exposed to offshore winds and salt spray. Groundsel-tree and saltmarsh-elder would only appear at very low abundance in maritime shrublands.

Maritime heathland: Maritime heathland, unlike maritime shrubland, is characterized by dwarf shrubs, including beach heather, bearberry, blueberry, and black huckleberry. Maritime shrublands are dominated by tall expanses of bayberry, arrowwood, and shadbush shrubs. The two communities grade into each other and are distinguished primarily based on shrub height.

Shrub swamp: Shrub swamp is a palustrine (wetland) community and low areas of maritime shrubland may imperceptibly grade into shrub swamp if their soils are sufficiently wet.

Characteristic Species

Trees > 5m
Red Cedar (*Juniperus virginiana*)
Japanese Black Pine (*Pinus thunbergiana*)
Wild Black Cherry (*Prunus serotina*)

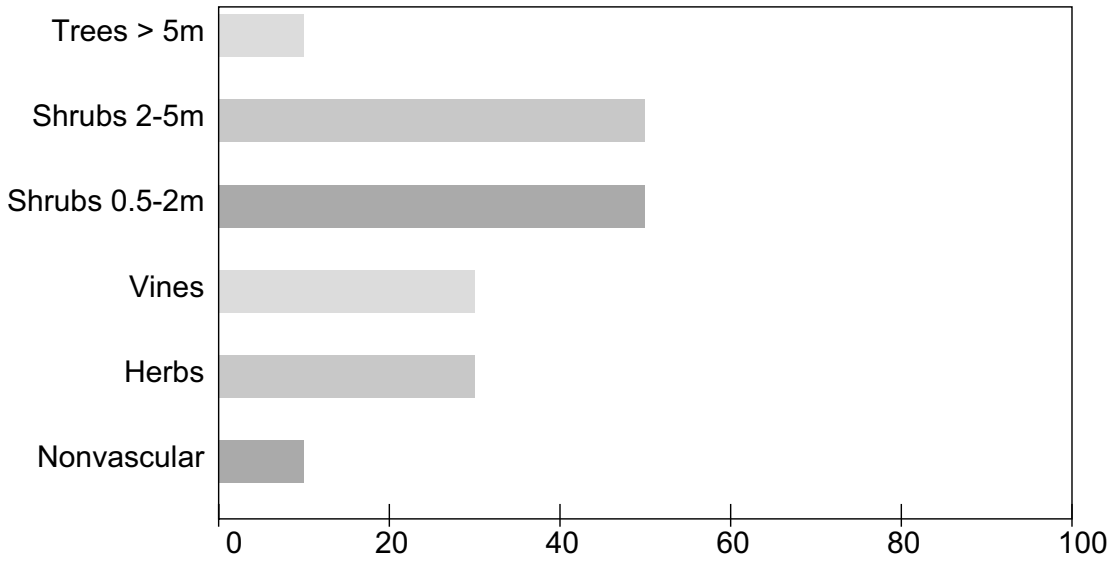
Shrubs 2-5m

American Holly (*Ilex opaca*)
Red Cedar (*Juniperus virginiana*)
Northern Bayberry (*Myrica pensylvanica*)
Black Chokeberry (*Photinia melanocarpa*)
Beach Plum (*Prunus maritima*)
Wild Black Cherry (*Prunus serotina*)
Winged Sumac (*Rhus copallinum*)
Southern Arrowwood (*Viburnum dentatum*)

Shrubs 0.5-2m
Red Cedar (*Juniperus virginiana*)
Northern Bayberry (*Myrica pensylvanica*)
Black Chokeberry (*Photinia melanocarpa*)
Beach Plum (*Prunus maritima*)
Wild Black Cherry (*Prunus serotina*)
Winged Sumac (*Rhus copallinum*)
Rugosa Rose (*Rosa rugosa*)
Allegheny Blackberry (*Rubus allegheniensis*)
Southern Arrowwood (*Viburnum dentatum*)

Vines
Oriental Bitter-sweet (*Celastrus orbiculata*)
Japanese Honeysuckle (*Lonicera japonica*)
Virginia Creeper (*Parthenocissus quinquefolia*)
Roundleaf Greenbrier (*Smilax rotundifolia*)
Eastern Poison Ivy (*Toxicodendron radicans*)
Northern Fox Grape (*Vitis labrusca*)

Herbs
Common Yarrow (*Achillea millefolium*)
Flat-top Fragrant Goldenrod (*Euthamia graminifolia*)
Common Reed (*Phragmites australis*)
Little Bluestem (*Schizachyrium scoparium*)
Rough-leaf Goldenrod (*Solidago rugosa*)
Seaside Goldenrod (*Solidago sempervirens*)



This figure helps visualize the structure and "look" or "feel" of a typical maritime shrubland. Each bar represents the amount of "coverage" for all the species growing at that height. Because layers overlap (shrubs may grow under trees, for example), the shaded regions can add up to more than 100%.

International Vegetation Classification System Associations

This New York natural community encompasses all or part of the concept of the following International Vegetation Classification (IVC) natural community associations. These are often described at finer resolution than New York's natural communities. The IVC is developed and maintained by NatureServe.

Northern Bayberry Dune Shrubland (CEGL006295)

Successional Maritime Forest (CEGL006379)

NatureServe Ecological System Associations

This New York natural community falls into the following ecological system(s). Ecological systems are often described at a coarser resolution than New York's natural communities and tend to represent clusters of associations found in similar environments. The ecological systems project is developed and maintained by NatureServe.

Atlantic Coastal Plain Northern Dune and Maritime Grassland (CES203.264)

Additional Resources

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This guide was authored by

Red Maple-Blackgum Swamp

Red maple-blackgum swamp

Photo credits: *Shane Gebauer*

System Palustrine

Subsystem Forested Mineral Soil Wetlands

Did you know?
Ever wonder how tupelo honey received its name? Tupelo honey is a special type of light golden honey that never granulates. It is produced by using bees to pollinate the blackgum tree (Nyssa sylvatica), also called tupelo, by applying an unusual method. Bees are placed on elevated platforms in swamps during April and May. They travel only to the nearby blackgum blossoms, pollinate the trees, and return to the hive to produce tupelo honey.

Summary

Protection Not listed in New York State, not listed federally.

Rarity G3G4, S2

A global rarity rank of G3G4 means: Vulnerable globally, or Apparently Secure -- At moderate risk of extinction, with relatively few populations or locations in the world, few individuals, and/or restricted range; or uncommon but not rare globally; may be rare in some parts of its range; possibly some cause for long-term concern due to declines or other factors. More information is needed to assign a single conservation status.
A state rarity rank of S2 means: Typically 6 to 20 occurrences, few remaining individuals, acres, or miles of stream, or factors demonstrably make it very vulnerable in New York State.

Conservation Status in New York

There are an estimated 20 to 30 extant occurrences statewide. A few documented occurrences have good viability and few are protected on public land or private conservation land. This community has a somewhat limited statewide distribution that is primarily concentrated on the coastal plain where there are a several small, good quality examples. The current trend of this community is probably stable for occurrences on public land, or declining slightly elsewhere due to moderate threats that include alteration of the natural hydrology and introduction of invasive species.

Short-term Trends

The number and acreage of red maple-blackgum swamps in New York have probably declined slightly, or remained stable, in recent decades as a result of wetland protection regulations. Since World War II, urbanization has emerged as the predominant force impacting wetlands in most parts of the region (Golet et al. 1993).

Long-term Trends

The number and acreage of red maple-blackgum swamps in New York have probably declined substantially from historical numbers likely correlated with agricultural and other development. The principal causes of wetland loss in the Northeast prior to mid-1800s include conversion of wetlands to agriculture, the construction of impoundments for hydropower and water supply, and the cutting of swamp timber for lumber, fence posts, and fuel wood (Golet et al. 1993).

Larger occurrences of this natural community (>12.5 acres) are protected under NY State wetland laws.

Conservation and Management

Threats

Red maple-blackgum swamps are threatened by development in the surrounding landscape and its assocaited run-off (e.g., residential and commercial development, mining, roads, bridges, utility ROWs, etc.), habitat alteration (e.g., excessive logging, filling, pollution), and recreational overuse (e.g., hiking, ATVs, trash dumping). Alteration to the natural hydrological regime is also a threat to this community (e.g., impoundments, blocked culverts, lowering water table). Deer over-browsing may be a threat at a few sites. Several red maple-blackgum swamps are threatened by invasive species, such as reedgrass (Phragmites australis ssp. australis), multiflora rose (Rosa multiflora), Asiatic bittersweet (Celastrus orbiculatus), and Norway spruce (Picea abies).Conversion of wetlands for agriculture was a major cause of inland wetland loss in many areas of the Northeast historically, and it is still an important factor today, most notably in New York (Golet et al. 1993).

Conservation Strategies and Management Practices

Where practical, establish and maintain a natural wetland buffer to reduce storm-water, pollution, and nutrient run-off, while simultaneously capturing sediments before they reach the wetland. Buffer width should take into account the erodibility of the surrounding soils, slope steepness, and current land use. Wetlands protected under Article 24 are known as New York State "regulated" wetlands. The regulated area includes the wetlands themselves, as well as a protective buffer or "adjacent area" extending 100 feet landward of the wetland boundary (NYS DEC 1995). If possible, minimize the number and size of impervious surfaces in the surrounding landscape. Avoid habitat alteration within the wetland and surrounding landscape. For example, roads and trails should be routed around wetlands, and should not pass through the buffer area. If the wetland must be crossed, then bridges and boardwalks are preferred over filling. Restore past impacts, such as removing obsolete impoundments and ditches in order to restore the natural hydrology. Prevent the spread of invasive exotic species into the wetland through appropriate direct management, and by minimizing potential dispersal corridors, such as roads.

Development and Mitigation Considerations

When considering road construction and other development activities minimize actions that will change what water carries and how water travels to this community, both on the surface and underground. Water traveling over-the-ground as run-off usually carries an abundance of silt, clay, and other particulates during (and often after) a construction project. While still suspended in the water, these particulates make it difficult for aquatic animals to find food; after settling to the bottom of the wetland, these particulates bury small plants and animals and alter the natural functions of the community in many other ways. Thus, road construction and development activities near this community type should strive to minimize particulate-laden run-off into this community. Water traveling on the ground or seeping through the ground also carries dissolved minerals and chemicals. Road salt, for example, is becoming an increasing problem both to natural communities and as a contaminant in household wells. Fertilizers, detergents, and other chemicals that increase the nutrient levels in wetlands cause algal blooms and eventually an oxygen-depleted environment where few animals can live. Herbicides and pesticides often travel far from where they are applied and have lasting effects on the quality of the natural community. So, road construction and other development activities should strive to consider: 1. how water moves through the ground, 2. the types of dissolved substances these development activities may release, and 3. how to minimize the potential for these dissolved substances to reach this natural community.

Inventory Needs

Survey for occurrences statewide to advance documentation and classification of red maple-blackgum swamps. A statewide review of red maple-blackgum swamps is desirable. Continue searching for large sites in good condition (A- to AB-ranked).

Research Needs

Research composition of red maple-blackgum swamps statewide in order to characterize and describe inland and coastal plain variants. Collect sufficient plot data to support the recognition of at least two distinct red maple-blackgum swamp types based on composition and by ecoregion (e.g., "inland red maple-blackgum swamp" and "coastal plain red maple-blackgum swamp").

Rare Species

Great Blue Heron (*Ardea herodias*)
Swamp Cottonwood (*Populus heterophylla*)
Southern Twayblade (*Listera australis*)
Prothonotary Warbler (*Protonotaria citrea*)
Dark-green sedge (*Carex venusta*)
Blunt-lobe Grape Fern (*Botrychium oneidense*)
Orange Fringed Orchid (*Platanthera ciliaris*)
Mitchell's Sedge (*Carex mitchelliana*)
Collins' Sedge (*Carex collinsii*)
Atlantic White Cedar (*Chamaecyparis thyoides*)

Identification Comments

A hardwood swamp dominated by red maple (Acer rubrum) and blackgum (Nyssa sylvatica), that occurs in maritime, coastal, and inland areas, within poorly-drained depressions. The soil is typically made up of a thin layer of acidic, well-decomposed peat over sandy loam or loamy sand. The understory vegetation composition may vary between swamps on the coastal plain and those inland. For example, coastal plain swamps may include inkberry (Ilex glabra) and netted chain fern (Woodwardia areolata), whereas more northern, inland swamps may have mountain holly (Nemopanthus mucronatus) (Edinger et al. 2002).

The Best Time to See

The community vegetation is at its peak during midsummer; at this time ferns, sedges, and herbs can be readily observed and identified. Striking seasonal leaf color can be enjoyed in the fall.

Characteristics Most Useful for Identification

Red maple-blackgum swamps are poorly-drained depression wetlands featuring a canopy dominated by red maple and blackgum. Often there are hummock islands and hollows with standing water. The canopy can include low densities of other species such as swamp white oak (Quercus bicolor), red oak (Q. rubra), and black ash (Fraxinus nigra). The understory is moderate to dense with a well-developed shrub layer made up any of a variety of species such as highbush blueberry (Vaccinium corymbosum), winterberry (Ilex verticillata), sweet pepperbush (Clethra alnifolia), and swamp azalea (Rhododendron viscosum). Characteristic herbs include cinnamon fern (Osmunda cinnamomea), royal fern (O. regalis), skunk cabbage (Symplocarpus foetidus), and tussock sedge (Carex stricta).

Elevation Range

Known examples of this community have been found at elevations between 0 feet and 863 feet.

Similar Ecological Communities

Hemlock-hardwood swamp: Hemlock hardwood swamps have a high density of eastern hemlock (Tsuga canadensis) in the canopy. Blackgum may be in the canopy, but it is not a codominant.

Perched swamp white oak swamp: Perched swamp white oak swamps occur on hillsides in shallow depressions where the local water table is perched above the surrounding groundwater level. Swamp white oak is a canopy dominant in this community, whereas it is present in relatively low densities in red maple-blackgum swamps.

Silver maple-ash swamp: Silver maple-ash swamps are dominated by silver maple (Acer saccharinum) and green ash (Acer pennsylvanica); blackgum is not typically abundant in this community.

Red maple-hardwood swamp: Red maple-hardwood swamps have a canopy composition that ranges from nearly pure red maple, to a variety of species; but blackgum, if present, is uncommon in the canopy. Blackgum is abundant and codominant in red maple-blackgum

swamps.

Red maple-sweetgum swamp: Red maple-sweetgum swamps have red maple and sweet gum (Liquidambar styraciflua) as canopy codominants. Blackgum may be present, but it occurs in low densities. Red maple-sweetgum swamps often occur on somewhat poorly-drained flats, rather than in basins.

Characteristic Species

Trees > 5m
Red Maple (*Acer rubrum*)
Yellow Birch (*Betula alleghaniensis*)
American Hornbeam (*Carpinus caroliniana*)
Black Ash (*Fraxinus nigra*)
Green Ash (*Fraxinus pennsylvanica*)
Blackgum (*Nyssa sylvatica*)
Eastern Hemlock (*Tsuga canadensis*)

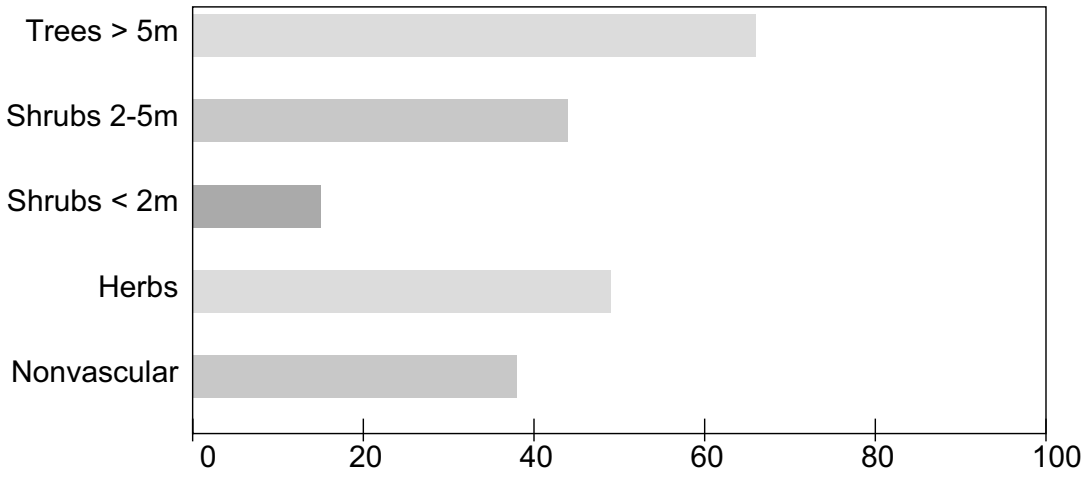
Shrubs 2-5m
Coast Pepper-bush (*Clethra alnifolia*)
Common Winterberry (*Ilex verticillata*)
Mountain Holly (*Nemopanthus mucronatus*)
Poison Sumac (*Toxicodendron vernix*)
Highbush Blueberry (*Vaccinium corymbosum*)
Southern Arrowwood (*Viburnum dentatum*)
Northern Wild Raisin (*Viburnum nudum var. cassinoides*)

Shrubs < 2m
Coast Pepper-bush (*Clethra alnifolia*)
Pale Dogwood (*Cornus amomum*)

Vines
Eastern Poison Ivy (*Toxicodendron radicans*)

Herbs
Purple-stem Swamp Beggar-ticks (*Bidens connata*)
Wild Calla (*Calla palustris*)
Bristly Sedge (*Carex comosa*)
Tussock Sedge (*Carex stricta*)
Spotted Jewelweed (*Impatiens capensis*)
Cinnamon Fern (*Osmunda cinnamomea*)
Royal Fern (*Osmunda regalis*)
Netted Chainfern (*Woodwardia areolata*)

Nonvascular
Bazzania trilobata
Calliergon spp.
Sphagnum centrale
Sphagnum fimbriatum



This figure helps visualize the structure and "look" or "feel" of a typical red maple-blackgum swamp. Each bar represents the amount of "coverage" for all the species growing at that height. Because layers overlap (shrubs may grow under trees, for example), the shaded regions can add up to more than 100%.

International Vegetation Classification System Associations

This New York natural community encompasses all or part of the concept of the following International Vegetation Classification (IVC) natural community associations. These are often described at finer resolution than New York's natural communities. The IVC is developed and maintained by NatureServe.

Red Maple - Black Gum Basin Swamp (CEGL006014)

NatureServe Ecological System Associations

This New York natural community falls into the following ecological system(s). Ecological systems are often described at a coarser resolution than New York's natural communities and tend to represent clusters of associations found in similar environments. The ecological systems project is developed and maintained by NatureServe.

Laurentian-Acadian Pine-Hemlock-Hardwood Forest (CES201.563)

Northeastern Interior Dry Oak Forest (CES202.592)

Appalachian Hemlock-Hardwood Forest (CES202.593)

North-Central Appalachian Acidic Swamp (CES202.604)

Additional Resources

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New York Natural Heritage Program
625 Broadway, 5th Floor,
Albany, NY 12233-4757
Phone: (518) 402-8935
acris@nynhp.org

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- New York State Office of Parks, Recreation and Historic Preservation

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This guide was authored by

Salt Shrub

Salt shrub at Canarsie Pier, Gateway National Recreation Area

Photo credits: *Gregory J. Edinger*

System Estuarine

Subsystem Estuarine Intertidal

Did you know?
Salt shrub is perhaps one of the best communities to see the interaction of the landscape and tidal range. Large areas of salt shrub can be found where there are broad, gentle slopes intersecting the upper range of spring and storm tides. Where slopes of the marsh basin are steep and the intersection with the tidal range is narrow, salt shrub is condensed into a thin band (MacDonald and Edinger 2000).

Summary

Protection Not listed in New York State, not listed federally.

Rarity G5, S4

A global rarity rank of G5 means: Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.
A state rarity rank of S4 means: Apparently secure in New York State.

Conservation Status in New York

There are estimated to be between 20 and 50 occurrences statewide. The very few documented occurrences have good viability and are protected on public land. The community is restricted to sheltered areas of the seacoast in the Coastal Lowlands and Manhattan Hills ecozones. The current trend of the community is declining and the primary threat to this community is invasion by common reed (Phragmites australis). Secondary threats, common to all salt marsh complexes, include ditching and draining, dredging and filling, poor water quality, diking and impoundment, inlet stabilization, shoreline hardening, wrack accumulation, altered sediment budget, subsidence, changes in water circulation patterns, restricted tidal connection, and altered tidal hydrodynamics.

Short-term Trends

In recent decades, the number, aerial extent, and quality of salt shrub (and salt marsh complexes) in New York has declined significantly. These losses are primarily due to invasion by common reed (Phragmites australis), dredging and filling for urban development, and to pollution, including airborne particulates, pesticides, and sewage and stormwater discharge. It is suspected that losses will continue, resulting from ongoing

invasive species encroachment, shoreline development, declining water quality, and hydrologic alterations. The degradation and loss of salt shrub, which forms an upland buffer for lower elevation salt marsh communities, may have profound adverse effects on those tidal wetlands, causing increased sediment flow, altered ground water elevations and flow, loss of nutrient filtering vegetation, and loss of wildlife habitat for wetland edge species (MacDonald and Edinger 2000).

Long-term Trends

The number, aerial extent, and integrity of salt marsh complexes and associated salt shrub communities in New York are suspected to have declined substantially from their historical state. These declines are likely correlated with coastal development; dredging, ditching, and filling; and changes in hydrology, water quality, and natural processes.

Larger occurrences of this natural community (>12.5 acres) are protected under NY State wetland laws.

Conservation and Management

Threats

The primary threat to this community is invasion by common reed (Phragmites australis). Additional threats to this community and to salt marsh complexes generally include dredging and filling for development, ditching and draining for mosquito control, poor water quality (from sewage and stormwater discharge; nonpoint source runoff; landfill leachate; boat traffic; particulate aircraft, vehicular, and power plant emissions; jet fuel; ethylene glycol from aircraft deicing; and pesticides used in mosquito management), diking and impoundment, inlet stabilization, shoreline hardening, wrack accumulation, altered sediment budget (decreased sediment input to marshes), subsidence, changes in water circulation patterns because of changes in shoreline and benthic topography, restricted tidal connection, and altered tidal hydrodynamics resulting from changes to hydrology (including groundwater levels, overland flow, and in-channel volume) in the surrounding watershed, road construction, and urbanization (GNRA and JBWPPAC 2007, Niedowski 2000, New York State Department of Environmental Conservation 2009b, 2009c, 2009d). Response to sea level rise is uncertain.

Conservation Strategies and Management Practices

Monitor the abundance of invasive species, particularly common reed (Phragmites australis), in this community and, as needed, control their encroachment. Remove excessive wrack accumulation. Remove shoreline armoring to increase overland sediment input; improve water quality by reducing or eliminating sewer and stormwater discharge and pesticide application; restore tidal regime by removing culverts, dikes, and impoundments, plugging ditches, and replacing static flow restriction devices with those that are calibrated for local tidal hydrology. Restoration and monitoring protocols are available (Niedowski 2000).

Development and Mitigation Considerations

Strive to minimize or eliminate hardened shorelines and maintain low-sloped shorelines within the tidal zone to increase overland sediment input. Maintain functional connectivity between the open ocean and bays with salt marsh complexes to enable full tidal flushing during each tidal cycle. For example, barriers such as railway causeways should have numerous culverts to allow sufficient hydrologic connectivity. If flow restriction devices are needed, those that are calibrated for local tidal hydrology can be used. Avoid dumping dredge spoil onto salt shrub communities. This community is best protected as part of a large salt marsh complex. Protected areas should encompass the full mosaic of low salt marsh, high salt marsh, marine intertidal mudflats, saltwater tidal creek, salt panne, and salt shrub communities to allow dynamic ecological processes (sedimentation, erosion, tidal flushing, and nutrient cycling) to continue. Connectivity to brackish and freshwater tidal communities, upland beaches and dunes, and to shallow offshore communities should be maintained. Connectivity between these habitats is important not only for nutrient flow and seed dispersal, but also for animals that move between them seasonally. Development of site conservation plans that identify wetland threats and their sources and provide management and protection recommendations would ensure their long-term viability.

Inventory Needs

Additional inventory is needed on the north and south shore of Long Island and in Peconic Bay. Leads include the sixteen sites that were not selected as reference wetlands by MacDonald and Edinger (2000). North shore leads include Lloyd Neck Marsh, Flax Pond, and Crab Meadow Marsh. Peconic Bay leads include Orient Point Marsh, Accabonac Harbor Marsh, Cow Neck Marsh, Mashomack Point Marsh, Downs Creek, West Creek, and Northwest Creek. South shore leads include Moriches Inlet Backbarrier Beach, West Beach-Tiana Beach, Floyd Point Marsh, Gilgo Beach Back Barrier Marsh, Hempstead Bay Wetlands, and Apple Tree Neck Wetlands.

Research Needs

Research on salt shrub should include monitoring common reed (Phragmites australis) encroachment in conjunction with indicators of community health to determine whether healthy communities are more resistant to invasion. Additional work could investigate community response to rising sea level (MacDonald and Edinger 2000).

Rare Species

Marsh Fimbry (*Fimbristylis castanea*)
Northern Harrier (*Circus cyaneus*)
Saltmarsh Aster (*Symphyotrichum subulatum var. subulatum*)
Thickleaf Orach (*Atriplex dioica*)
Dwarf Glasswort (*Salicornia bigelovii*)

Identification Comments

A shrubland community that forms the ecotone between salt marsh and upland vegetation. Salinity levels are generally lower here than in the salt marsh (soil pore salinity ranges 7 ppt to 27 ppt) and thus technically brackish. Salt shrub areas are slightly higher in elevation than the salt marsh. Salt shrub does not usually develop on deep peat. More often, it

occurs on a thin (0-10 cm) layer of peat, and soils share characteristics of both estuarine and maritime terrestrial settings. Periodic disturbance associated with storms causes die-back of shrubs.

Salt shrub is usually present as a linear feature at the upper edge of a salt marsh marking the limit of the highest spring and storm tides within a given estuarine basin. In areas where the local topography is nearly level an extensive shrubland, or brackish meadow may occur. This community is often invaded by common reed (Phragmites australis).

The Best Time to See

In late summer and early fall, the two characteristic shrubs of this community, groundsel-tree and saltmarsh-elder, come into flower.

Characteristics Most Useful for Identification

Salt shrub forms the ecotone between salt marsh and upland vegetation. Characteristic shrubs are groundsel-tree (Baccharis halimifolia), saltmarsh-elder (Iva frutescens), and pasture rose (Rosa carolina); salt-meadow grass (Spartina patens), black-grass (Juncus gerardii), and switchgrass (Panicum virgatum) are typical herbs. Salt shrub is almost always dominated by a stunted leading edge of Iva frutescens on the marshward side of the community. Baccharis halimifolia becomes more dominant only in the older, more developed, landward side. The landward side of salt shrub is usually the most diverse.

Elevation Range

Known examples of this community have been found at elevations between 0 feet and 4 feet.

Similar Ecological Communities

Maritime shrubland: Maritime shrublands are upland communities dominated by bayberry (Myrica pensylvanica) with shadbush (Amelanchier canadensis), black cherry (Prunus serotina), arrowwood (Viburnum dentatum), and shining sumac (Rhus copallinum). Salt shrub communities form an ecotone between salt marsh and the uplands. They are dominated by groundsel-tree and saltmarsh-elder. Bayberry can be present, but in low abundance.

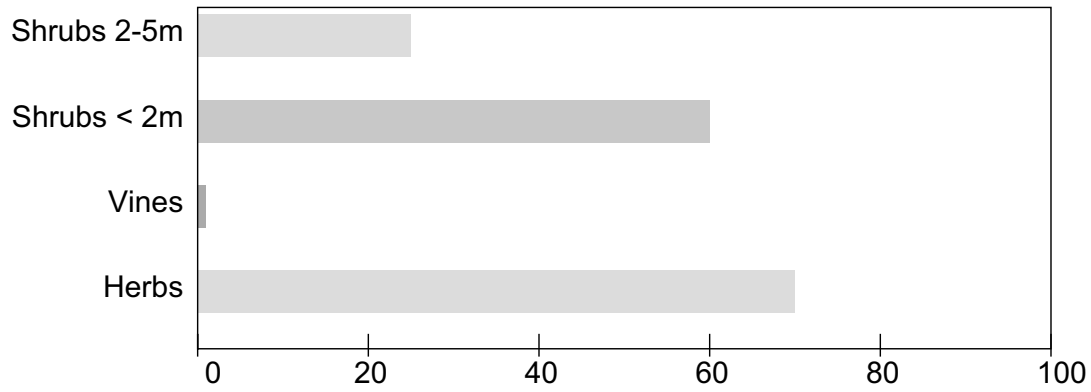
Characteristic Species

Shrubs 2-5m
Eastern Baccharis (*Baccharis halimifolia*)
Marsh Elder (*Iva frutescens*)

Shrubs 0.5-2m
Eastern Baccharis (*Baccharis halimifolia*)
Marsh Elder (*Iva frutescens*)
Northern Bayberry (*Myrica pensylvanica*)
Dwarf Red Blackberry (*Rubus pubescens*)

Vines
Eastern Poison Ivy (*Toxicodendron radicans*)

Herbs
Purple-stem Swamp Beggar-ticks (*Bidens connata*)
Marsh Straw Sedge (*Carex hormathodes*)
Inland Saltgrass (*Distichlis spicata*)
Common Boneset (*Eupatorium perfoliatum*)
Crimsoneyed Rosemallow (*Hibiscus moscheutos*)
Canada Rush (*Juncus canadensis*)
Black-grass Rush (*Juncus gerardii*)
Sea-lavender (*Limonium carolinianum*)
Northern Bugleweed (*Lycopus uniflorus*)
Switchgrass (*Panicum virgatum*)
Common Reed (*Phragmites australis*)
Saltmarsh Fleabane (*Pluchea odorata*)
Three-square Bulrush (*Schoenoplectus americanus*)
Saltmeadow Cordgrass (*Spartina patens*)



This figure helps visualize the structure and "look" or "feel" of a typical salt shrub. Each bar represents the amount of "coverage" for all the species growing at that height. Because layers overlap (shrubs may grow under trees, for example), the shaded regions can add up to more than 100%.

International Vegetation Classification System Associations

This New York natural community encompasses all or part of the concept of the following International Vegetation Classification (IVC) natural community associations. These are often described at finer resolution than New York's natural communities. The IVC is developed and maintained by NatureServe.

Mid-Atlantic Maritime Salt Shrub (CEGL003921)

NatureServe Ecological System Associations

This New York natural community falls into the following ecological system(s). Ecological systems are often described at a coarser resolution than New York's natural communities and tend to represent clusters of associations found in similar environments. The ecological systems project is developed and maintained by NatureServe.

Additional Resources

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New York Natural Heritage Program
625 Broadway, 5th Floor,
Albany, NY 12233-4757
Phone: (518) 402-8935
acris@nynhp.org

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This guide was authored by

Shallow Emergent Marsh

Shallow emergent marsh

Photo credits: *Andrew D. Finton*

System Palustrine

Subsystem Open Mineral Soil Wetlands

Did you know?
One characteristic plant of shallow emergent marshes is the cardinal flower. The bright, scarlet red flower attracts its pollinator, the ruby-throated hummingbird. This hummingbird is the only hummingbird that breeds in eastern North America. It winters in Central America and the cardinal flower has timed its blooming season to correspond to the hummingbird's migration south. According to legend, the flower was named for the red robes worn by cardinals in the Catholic Church.

Summary

Protection Not listed in New York State, not listed federally.

Rarity G5, S5

A global rarity rank of G5 means: Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.
A state rarity rank of S5 means: Demonstrably secure in New York State.

Conservation Status in New York

There are several thousand occurrences statewide. Some documented occurrences have good viability and several are protected on public land or private conservation land. This community has statewide distribution, and includes a few large, high quality examples. The current trend of this community is probably stable for occurrences on public land, or declining slightly elsewhere due to moderate threats that include alteration of the natural hydrology and invasive species.

Short-term Trends

The number and acreage of shallow emergent marshes in New York have probably remained stable in recent decades as a result of wetland protection regulations. There may be a few cases where this community has increased as a result of abandoned agriculture land.

Long-term Trends

The number and acreage of shallow emergent marshes in New York have substantially declined (50-75%) from historical numbers likely correlated to the alteration to the natural hydrology and to direct destruction, especially near urban areas.

Larger occurrences of this natural community (>12.5 acres) are protected under NY State wetland laws.

Conservation and Management

Threats

Shallow emergent marshes are threatened by development and its associated run-off (e.g., agriculture, residential, roads/bridges, mining operations), habitat alteration (e.g., pollution, nutrient loading, mowing, utility ROWs), and recreational overuse (e.g., motor boating, canoeing, fishing, trampling). Alteration to the natural hydrological regime is also a threat to this community (e.g., impoundments, dredging, blocked culverts, beaver). Several shallow emergent marshes are threatened by invasive species, such as purple loosestrife (Lythrum salicaria), reedgrass (Phragmites australis), and frog-bit (Hydrocharis morsus-ranae).

Conservation Strategies and Management Practices

Where practical, establish and maintain a natural wetland buffer to reduce storm-water, pollution, and nutrient run-off, while simultaneously capturing sediments before they reach the wetland. Buffer width should take into account the erodibility of the surrounding soils, slope steepness, and current land use. Wetlands protected under Article 24 are known as New York State "regulated" wetlands. The regulated area includes the wetlands themselves, as well as a protective buffer or "adjacent area" extending 100 feet landward of the wetland boundary (NYS DEC 1995). If possible, minimize the number and size of impervious surfaces in the surrounding landscape. Avoid habitat alteration within the wetland and surrounding landscape. For example, roads and trails should be routed around wetlands, and ideally not pass through the buffer area. If the wetland must be crossed, then bridges and boardwalks are preferred over filling. Restore past impacts, such as removing obsolete impoundments and ditches in order to restore the natural hydrology. Prevent the spread of invasive exotic species into the wetland through appropriate direct management, and by minimizing potential dispersal corridors, such as roads.

Development and Mitigation Considerations

When considering road construction and other development activities, minimize actions that will change what water carries and how water travels to this community, both on the surface and underground. Water traveling over-the-ground as runoff usually carries an abundance of silt, clay, and other particulates during (and often after) a construction project. While still suspended in the water, these particulates make it difficult for aquatic animals to find food; after settling to the bottom of the system, they bury small plants and animals and alter the natural functions of the community in many other ways. Thus, road construction and development activities near this community type should strive to minimize particulate-laden run-off into this community. Water traveling on the ground or seeping through the ground also carries dissolved minerals and chemicals. Road salt, for example, is becoming an increasing problem both to natural communities and as a contaminant in household wells. Fertilizers, detergents, and other chemicals that increase the nutrient

levels in wetlands cause algal blooms and eventually an oxygen-depleted environment in which few animals can live. Herbicides and pesticides often travel far from where they are applied and have lasting effects on the quality of the natural community. So, road construction and other development activities should strive to consider: 1. how water moves through the ground, 2. the types of dissolved substances these development activities may release, and 3. how to minimize the potential for these dissolved substances to reach this natural community.

Inventory Needs

Survey for occurrences statewide to advance documentation and classification of shallow emergent marshes. A statewide review of shallow emergent marshes is desirable. Continue searching for large sites in good condition (A- to AB-ranked).

Research Needs

Research composition of shallow emergent marshes statewide in order to characterize variations. Collect sufficient plot data to support the recognition of several distinct shallow emergent marsh types based on composition and by ecoregion (e.g., Typha spp. dominant, Phalaris arundinacea dominant, Scirpus cyperinus dominant, Carex spp. dominant, etc.).

Rare Species

Swamp Cottonwood (*Populus heterophylla*)
Northern Clustered Sedge (*Carex arcta*)
False Hop Sedge (*Carex lupuliformis*)
Soft Fox Sedge (*Carex conjuncta*)
Davis' Sedge (*Carex davisii*)
Frank's Sedge (*Carex frankii*)
Short's Sedge (*Carex shortiana*)
Marsh Fern Moth (*Fagitana littera*)
Pied-billed Grebe (*Podilymbus podiceps*)
Timber Rattlesnake (*Crotalus horridus*)
Mountain Watercress (*Cardamine rotundifolia*)
Blanding's Turtle (*Emydoidea blandingii*)
Northern Harrier (*Circus cyaneus*)
Least Bittern (*Ixobrychus exilis*)
New England Cottontail (*Sylvilagus transitionalis*)
Jacob's-ladder (*Polemonium vanbruntiae*)
Bent Sedge (*Carex styloflexa*)
Cat-tail Sedge (*Carex typhina*)
Cloud Sedge (*Carex haydenii*)
Mitchell's Sedge (*Carex mitchelliana*)
Black Sedge (*Carex nigra*)
Schweinitz's Sedge (*Carex schweinitzii*)
Straw Sedge (*Carex straminea*)
Sedge Wren (*Cistothorus platensis*)
King Rail (*Rallus elegans*)
Southern Leopard Frog (*Rana sphenocephala*)
Georgia Bulrush (*Scirpus georgianus*)

Smooth Bur-marigold (*Bidens laevis*)
Rough Avens (*Geum virginianum*)
Featherfoil (*Hottonia inflata*)
Weak Rush (*Juncus debilis*)
Woodland Rush (*Juncus subcaudatus*)
Gypsy-wort (*Lycopus rubellus*)
Swamp Buttercup (*Ranunculus hispidus var. nitidus*)
Black Tern (*Chlidonias niger*)
Green Parrot's-feather (*Myriophyllum pinnatum*)
Awned Sedge (*Carex atherodes*)
Slender Bulrush (*Schoenoplectus heterochaetus*)
Common Tern (*Sterna hirundo*)
A Noctuid Moth (*Amphipoea erepta ryensis*)

Identification Comments

A marsh meadow community that occurs on mineral soil or muck soils that are permanently saturated and seasonally flooded. This marsh is better drained than a deep emergent marsh; water depths may range from 6 inches to 3.3 feet (15 cm to 1 m) during flood stages, but the water level usually drops by mid to late summer and the substrate is exposed. Shallow emergent marshes typically occur in lake basins and along streams. Deep and shallow emergent marshes often intergrade, and they may occur together in a complex mosaic in a large wetland (Edinger et al. 2002).

The Best Time to See

The best time to view the diversity of plants in a shallow emergent marsh is in the summer, from June to early August.

Characteristics Most Useful for Identification

Shallow emergent marshes have a very diverse assemblage of herbaceous plants that include grasses, sedges, cattails, wetland ferns, and a variety of forbs. These marshes often have a number of different types of sedges, bulrushes, and rushes, but have less than 50% cover of the tussocks-forming sedges (Carex stricta, Carex aquatilis).

Elevation Range

Known examples of this community have been found at elevations between 98 feet and 1930 feet.

Similar Ecological Communities

Sedge meadow: Sedge meadows typically have peat accumulation in the substrate and this peat is usually underlain by deep muck. The dominant plants in sedge meadows are members of the sedge family (Cyperaceae), typically the genus Carex. There is no peat accumulation in a shallow emergent marsh. Shallow emergent marshes are found on deep mineral soil or sometimes deep muck soils. Sedges may be abundant in shallow emrgent marshes but are not dominant.

Deep emergent marsh: Deep emergent marshes are also on mineral soils but are usually

flooded for most of the year. The most abundant plants in a deep emergent marsh are cattails (Typha spp.), bulrushes (Scirpus spp.), bur-weeds (Sparganium spp.), and other emergent aquatic plants. Shallow emergent marshes are found on permanently saturated soils that are seasonally flooded, but the water levels usually drop by mid to late summer to expose the substrate.

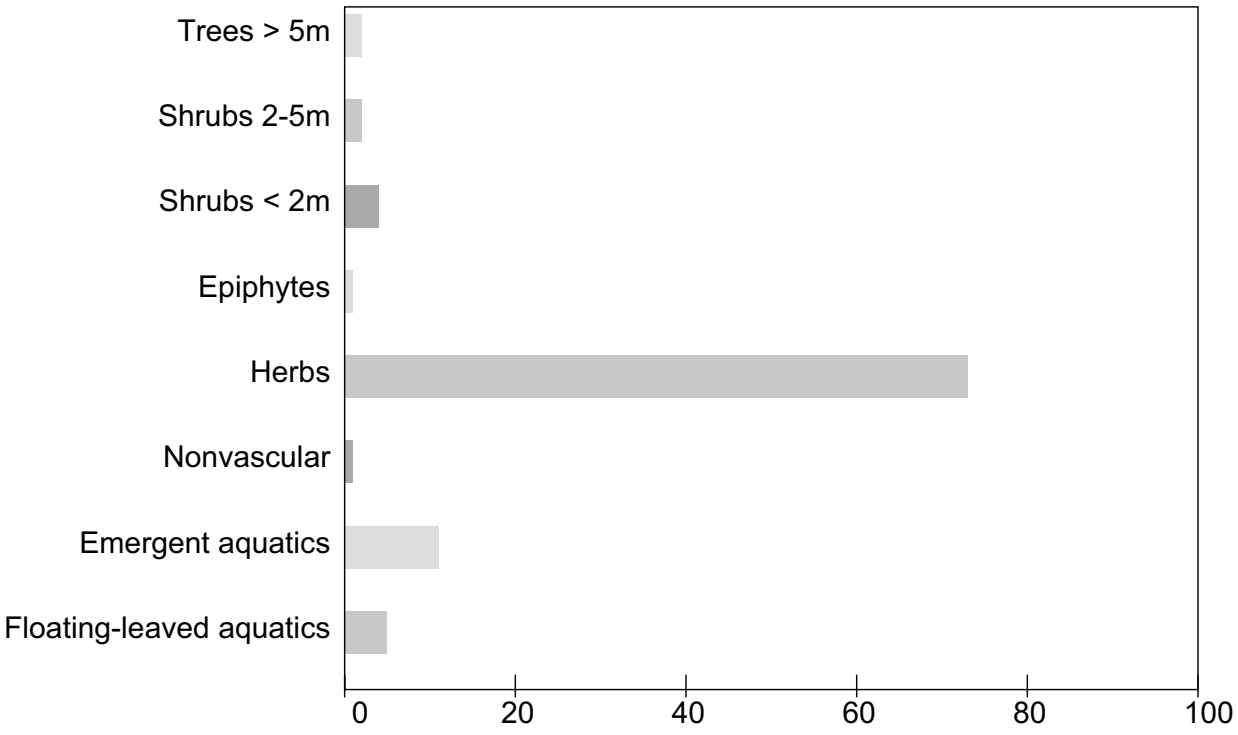
Characteristic Species

Trees > 5m
Red Maple (*Acer rubrum*)

Shrubs < 2m
Hardhack Spiraea (*Spiraea tomentosa*)

Herbs
False Nettle (*Boehmeria cylindrica*)
Bluejoint (*Calamagrostis canadensis*)
Lake-bank Sedge (*Carex lacustris*)
Tussock Sedge (*Carex stricta*)
Canada Manna-grass (*Glyceria canadensis*)
Spotted Jewelweed (*Impatiens capensis*)
Common Rush (*Juncus effusus*)
Rice Cutgrass (*Leersia oryzoides*)
Sensitive Fern (*Onoclea sensibilis*)
Arrow-leaf Tearthumb (*Persicaria sagittata*)
Reed Canary Grass (*Phalaris arundinacea*)
Scribner Bluegrass (*Poa trivialis*)
Woolgrass Bulrush (*Scirpus atrovirens*)
Cottongrass Bulrush (*Scirpus cyperinus*)
Giant Goldenrod (*Solidago gigantea*)
Marsh Fern (*Thelypteris palustris*)
Broad-leaf Cattail (*Typha latifolia*)

Floating-leaved aquatics
Common Frogbit (*Hydrocharis morsus-ranae*)



This figure helps visualize the structure and "look" or "feel" of a typical shallow emergent marsh. Each bar represents the amount of "coverage" for all the species growing at that height. Because layers overlap (shrubs may grow under trees, for example), the shaded regions can add up to more than 100%.

International Vegetation Classification System Associations

This New York natural community encompasses all or part of the concept of the following International Vegetation Classification (IVC) natural community associations. These are often described at finer resolution than New York's natural communities. The IVC is developed and maintained by NatureServe.

Bluejoint Wet Meadow (CEGL005174)

Reed Canary Grass Eastern Marsh (CEGL006044)

Woolgrass Bulrush Seasonally Flooded Herbaceous Vegetation (CEGL006349)

Seasonally Flooded Mixed Graminoid Meadow (CEGL006519)

NatureServe Ecological System Associations

This New York natural community falls into the following ecological system(s). Ecological systems are often described at a coarser resolution than New York's natural communities and tend to represent clusters of associations found in similar environments. The ecological systems project is developed and maintained by NatureServe.

Laurentian-Acadian Wet Meadow-Shrub Swamp and Marsh (CES201.577)

Laurentian-Acadian Floodplain Forest (CES201.587)

Additional Resources

Links

NatureServe Explorer (2nd system)
http://www.natureserve.org/explorer/servlet/NatureServe?searchSystemUid=ELEMENT_GLOBAL.2.723028

NatureServe Explorer (1st system)
http://www.natureserve.org/explorer/servlet/NatureServe?searchSystemUid=ELEMENT_GLOBAL.2.723019

NatureServe Explorer (4th association)
http://www.natureserve.org/explorer/servlet/NatureServe?searchCommunityUid=ELEMENT_GLOBAL.2.687973

NatureServe Explorer (3rd association)
http://www.natureserve.org/explorer/servlet/NatureServe?menuselect=none&sourceTemplate=tabular_report.wmt&loadTemplate=systems_RptComprehensive.wmt&selectedReport=RptComprehensive.wmt&summaryView=tabular_report.wmt&elKey=731538&paging=home&save=true&startIndex=1&nextStartIndex=1&reset=false&offPageSelectedElKey=722959&offPageSelectedElType=systems&offPageYesNo=true&post_processes=&radiobutton=radiobutton&selectedIndexes=722959&selectedIndexes=722972&selectedIndexes=731538&selectedIndexes=722861&selectedIndexes=722707&selectedIndexes=722802&menuselectfooter=none

NatureServe Explorer (2nd association)
http://www.natureserve.org/explorer/servlet/NatureServe?searchCommunityUid=ELEMENT_GLOBAL.2.687162

NatureServe Explorer (1st association)
http://www.natureserve.org/explorer/servlet/NatureServe?searchCommunityUid=ELEMENT_GLOBAL.2.685540

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New York Natural Heritage Program
625 Broadway, 5th Floor,
Albany, NY 12233-4757
Phone: (518) 402-8935
acris@nynhp.org

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This guide was authored by

Shrub Swamp

Shrub swamp at Ludlow Creek Marsh

Photo credits: *Stephen M. Young*

System Palustrine

Subsystem Open Mineral Soil Wetlands

Did you know?
Speckled alder (Alnus incana ssp. rugosa) is a nitrogen-fixing shrub that has been found to increase the concentration of inorganic nitrogen in the surface waters of the Adirondacks. Native Americans used speckled alder in combination with bloodroot, wild plum, and red osier dogwood (Cornus sericea) to make a scarlet dye for porcupine quill embroidery. Inuit people and settlers extracted a dark dye from the bark for tanning and staining hides. The bark was boiled to make medicinal teas for treating rheumatism and was also applied to wounds as a poultice to reducing bleeding and swelling.

Summary

Protection Not listed in New York State, not listed federally.

Rarity G5, S5

A global rarity rank of G5 means: Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.
A state rarity rank of S5 means: Demonstrably secure in New York State.

Conservation Status in New York

There are several thousand shrub swamps statewide. Some documented occurrences have good viability and many are protected on public land or private conservation land. This community has statewide distribution, and includes a few large, high quality examples. The current trend of this community is probably stable for occurrences on public land and private conservation land, or declining slightly elsewhere due to moderate threats that include alteration of the natural hydrology and invasive species.

Short-term Trends

The number and acreage of shrub swamps in New York have probably remained stable in recent decades as a result of wetland protection regulations. There may be a few cases where this community has increased as a result of abandoned agriculture land.

Long-term Trends

The number and acreage of shrub swamps in New York have substantially declined (50-75%) from historical numbers likely correlated to the alteration to the natural hydrology and to direct destruction, especially near urban areas.

Larger occurrences of this natural community (>12.5 acres) are protected under NY State wetland laws.

Conservation and Management

Threats

Shrub swamps are threatened by development and its associated run-off (e.g., agriculture, residential, roads/bridges), habitat alteration (e.g., pollution, nutrient loading, excessive logging in adjacent uplands), and recreational overuse (e.g., trash dumping, motor boating). Alteration to the natural hydrological regime is also a threat to this community (e.g., impoundments, blocked culverts, beaver). Several shrub swamps are threatened by invasive species, such as purple loosestrife (Lythrum salicaria), reedgrass (Phragmites australis), and frog-bit (Hydrocharis morsus-ranae).

Conservation Strategies and Management Practices

Where practical, establish and maintain a natural wetland buffer to reduce storm-water, pollution, and nutrient run-off, while simultaneously capturing sediments before they reach the wetland. Buffer width should take into account the erodibility of the surrounding soils, slope steepness, and current land use. Wetlands protected under Article 24 are known as New York State "regulated" wetlands. The regulated area includes the wetlands themselves, as well as a protective buffer or "adjacent area" extending 100 feet landward of the wetland boundary (NYS DEC 1995). If possible, minimize the number and size of impervious surfaces in the surrounding landscape. Avoid habitat alteration within the wetland and surrounding landscape. For example, roads and trails should be routed around wetlands, and ideally not pass through the buffer area. If the wetland must be crossed, then bridges and boardwalks are preferred over filling. Restore past impacts, such as removing obsolete impoundments and ditches in order to restore the natural hydrology. Prevent the spread of invasive exotic species into the wetland through appropriate direct management, and by minimizing potential dispersal corridors, such as roads.

Development and Mitigation Considerations

When considering road construction and other development activities, minimize actions that will change what water carries and how water travels to this community, both on the surface and underground. Water traveling over-the-ground as runoff usually carries an abundance of silt, clay, and other particulates during (and often after) a construction project. While still suspended in the water, these particulates make it difficult for aquatic animals to find food; after settling to the bottom of the system, they bury small plants and animals and alter the natural functions of the community in many other ways. Thus, road construction and development activities near this community type should strive to minimize particulate-laden run-off into this community. Water traveling on the ground or seeping through the ground also carries dissolved minerals and chemicals. Road salt, for example, is becoming an increasing problem both to natural communities and as a contaminant in household wells. Fertilizers, detergents, and other chemicals that increase the nutrient

levels in wetlands cause algal blooms and eventually an oxygen-depleted environment in which few animals can live. Herbicides and pesticides often travel far from where they are applied and have lasting effects on the quality of the natural community. So, road construction and other development activities should strive to consider: 1. how water moves through the ground, 2. the types of dissolved substances these development activities may release, and 3. how to minimize the potential for these dissolved substances to reach this natural community.

Inventory Needs

Survey for occurrences statewide to advance documentation and classification of shrub swamps. A statewide review of shrub swamps is desirable. Continue searching for large sites in good condition (A- to AB-ranked).

Research Needs

Research composition of shrub swamps statewide in order to characterize variations. Collect sufficient plot data to support the recognition of several distinct shrub swamp types based on composition and by ecoregion (e.g., Alnus spp. dominant, Cephalanthus occidentalis dominant, Cornus spp. dominant, Salix spp. dominant, etc.).

Rare Species

Clustered Sedge (*Carex cumulata*)
Swamp Birch (*Betula pumila*)
False Hop Sedge (*Carex lupuliformis*)
Soft Fox Sedge (*Carex conjuncta*)
Marsh Fern Moth (*Fagitana littera*)
Pied-billed Grebe (*Podilymbus podiceps*)
Timber Rattlesnake (*Crotalus horridus*)
Mountain Watercress (*Cardamine rotundifolia*)
Blanding's Turtle (*Emydoidea blandingii*)
Northern Harrier (*Circus cyaneus*)
Rhodora (*Rhododendron canadense*)
Jacob's-ladder (*Polemonium vanbruntiae*)
Auricled Twayblade (*Listera auriculata*)
Balsam Willow (*Salix pyrifolia*)
Mitchell's Sedge (*Carex mitchelliana*)
Straw Sedge (*Carex straminea*)
Cypress-knee Sedge (*Carex decomposita*)
Swamp Lousewort (*Pedicularis lanceolata*)
Henry's Elfin (*Callophrys henrici*)
Southern Leopard Frog (*Rana sphenocephala*)
Large Twayblade (*Liparis liliifolia*)
Button-bush Dodder (*Cuscuta cephalanthi*)
Featherfoil (*Hottonia inflata*)
Sparse-flowered Sedge (*Carex tenuiflora*)
Wild Sweet-william (*Phlox maculata ssp. maculata*)
Awned Sedge (*Carex atherodes*)
Lake-cress (*Rorippa aquatica*)

Small Bur-reed (*Sparganium natans*)

Identification Comments

A shrub swamp is an inland wetland dominated by tall shrubs that occurs along the shore of a lake or river; in a wet depression or valley not associated with lakes; or as a transition zone between a marsh, fen, or bog and a swamp or upland community. The substrate is usually mineral soil or muck. This is a very broadly defined type that includes several distinct communities and many intermediates.

In northern New York many shrub swamps are dominated by alder (Alnus incana ssp. rugosa); these swamps are sometimes called alder thickets. A swamp dominated by red osier dogwood (Cornus sericea), silky dogwood (C. amomum), and willows (Salix spp.) may be called a shrub carr. Along the shores of some lakes and ponds there is a distinct zone dominated by waterwillows (Decodon verticillatus) and/or buttonbush (Cephalanthus occidentalis) which can sometimes fill a shallow basin.

Birds that may be found in shrub swamps include both common species such as common yellowthroat (Geothlypis trichas) and swamp sparrow (Melospiza georgiana) and rare species such as the American bittern (Botaurus lentiginosus).

The Best Time to See

The best time to view the diversity of plants in a shrub swamp is in the summer, from June to August. Many dogwood species (Cornus spp.) begin to bloom as early as May, but most other characteristic shrubs, including meadowsweet (Spiraea alba), buttonbush (Cephalanthus occidentalis), and sweet pepperbush (Clethra alnifolia) bloom from June or July through August.

Characteristics Most Useful for Identification

Shrub swamps are very common and quite variable. They may be codominated by a mixture of species or be a near-monoculture of a single dominant shrub species. Characteristic shrubs include meadowsweet (Spiraea alba var. latifolia), steeplebush (Spiraea tomentosa), gray dogwood (Cornus racemosa), swamp azalea (Rhododendron viscosum), highbush blueberry (Vaccinium corymbosum), maleberry (Lyonia ligustrina), smooth alder (Alnus serrulata), spicebush (Lindera benzoin), willows (Salix bebbiana, S. discolor, S. lucida, S. petiolaris), wild raisin (Viburnum nudum var. cassinoides), and arrowwood (Viburnum dentatum var. lucidum).

Elevation Range

Known examples of this community have been found at elevations between 95 feet and 1900 feet.

Similar Ecological Communities

Highbush blueberry bog thicket: Highbush blueberry bog thicket are underlain by a layer of peat that is typically deeper than 20 cm; shrub swamps have only shallow peat or, more commonly, mineral soils.

Pine barrens shrub swamp: A pine barrens shrub swamp occurs in shallow depressions on the Coastal Plain, often as a linear transition zone between a coastal plain pondshore and an upland pitch pine-dominated community. They are embedded within fire-prone communities.

Shallow emergent marsh: Shallow emergent marshes are dominated by herbaceous species; shrubs are typically present at significantly less than 50% cover.

Dwarf shrub bog: Dwarf shrub bogs are underlain by a layer of peat that is typically deeper than 20 cm; shrub swamps have only shallow peat or, more commonly, mineral soils.

Characteristic Species

Trees > 5m
Brook-side Alder (*Alnus serrulata*)
Salix spp.

Shrubs 2-5m
Speckled Alder (*Alnus incana ssp. rugosa*)
Common Buttonbush (*Cephalanthus occidentalis*)
Coast Pepper-bush (*Clethra alnifolia*)
Red Osier Dogwood (*Cornus sericea*)
Northern Meadow-sweet (*Spiraea alba*)

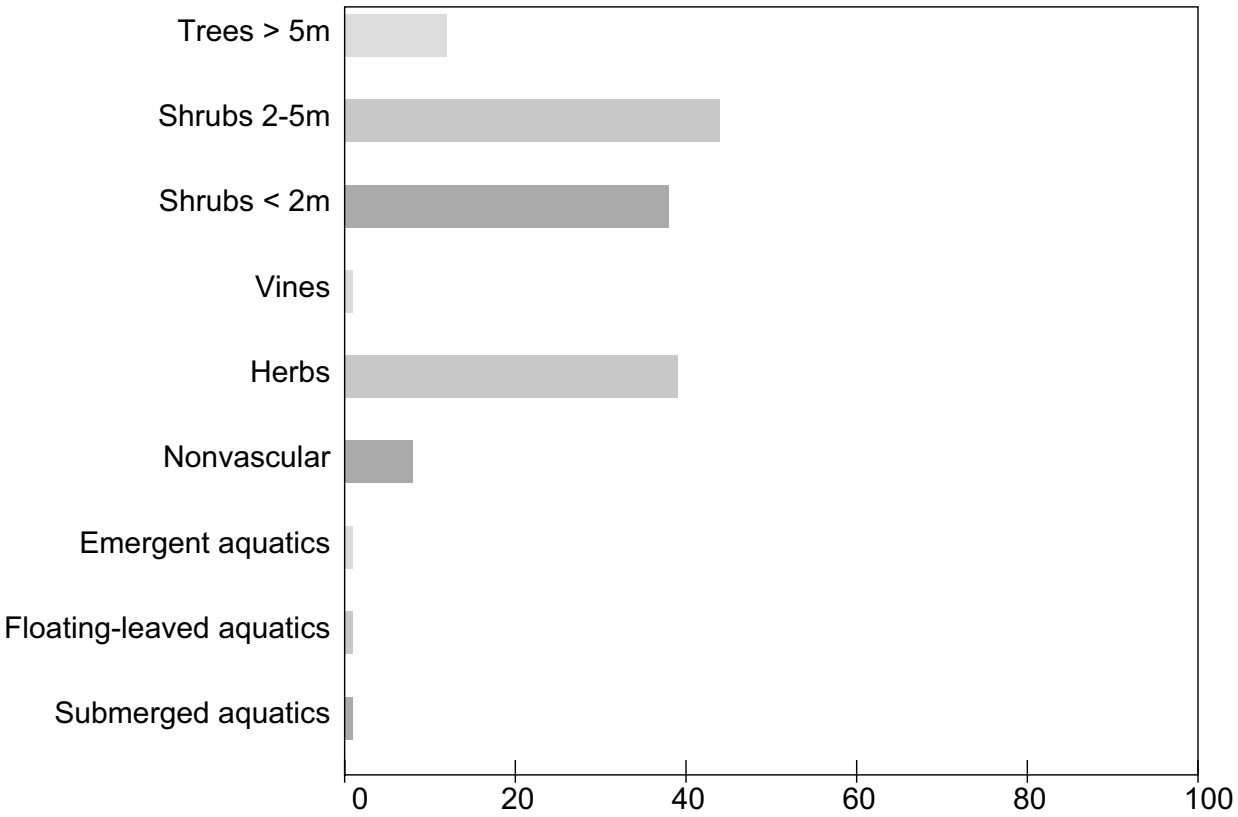
Shrubs < 2m
Speckled Alder (*Alnus incana ssp. rugosa*)
Common Buttonbush (*Cephalanthus occidentalis*)
Smooth Winterberry Holly (*Ilex laevigata*)
Salix spp.

Vines
Summer Grape (*Vitis aestivalis*)

Herbs
Nodding Beggar-ticks (*Bidens cernua*)
Twisted Sedge (*Carex torta*)
Hairy Swamp Loosestrife (*Decodon verticillatus*)
Cinnamon Fern (*Osmunda cinnamomea*)
Water Smartweed (*Persicaria amphibia*)
Halberd-leaf Tearthumb (*Persicaria arifolia*)
Reed Canary Grass (*Phalaris arundinacea*)
Narrow-leaved Cattail (*Typha angustifolia*)

Nonvascular
Sphagnum spp.

Floating-leaved aquatics
Lesser Duckweed (*Lemna minor*)



This figure helps visualize the structure and "look" or "feel" of a typical shrub swamp. Each bar represents the amount of "coverage" for all the species growing at that height. Because layers overlap (shrubs may grow under trees, for example), the shaded regions can add up to more than 100%.

International Vegetation Classification System Associations

This New York natural community encompasses all or part of the concept of the following International Vegetation Classification (IVC) natural community associations. These are often described at finer resolution than New York's natural communities. The IVC is developed and maintained by NatureServe.

Dogwood - Willow Swamp (CEGL002186)

Northern Buttonbush Swamp (CEGL002190)

Speckled Alder Swamp (CEGL002381)

Birch - Willow Riverbank Shrubland (CEGL003896)

Water-willow Shrub Swamp (CEGL005089)

Alluvial Alder Thicket (CEGL006062)

Buttonbush Shrub Swamp (CEGL006069)

Northern Peatland Shrub Swamp (CEGL006158)

Peatland Lagg (CEGL006164)

Freshwater Interdunal Swale/Shrub Swamp (CEGL006339)

NatureServe Ecological System Associations

This New York natural community falls into the following ecological system(s). Ecological systems are often described at a coarser resolution than New York's natural communities and tend to represent clusters of associations found in similar environments. The ecological systems project is developed and maintained by NatureServe.

Laurentian-Acadian Wet Meadow-Shrub Swamp (CES201.582)

Laurentian-Acadian Floodplain Forest (CES201.587)

Central Appalachian Floodplain (CES202.608)

Central Appalachian Riparian (CES202.609)

Atlantic Coastal Plain Northern Dune and Maritime Grassland (CES203.264)

Atlantic Coastal Plain Northern Pondshore (CES203.518)

Additional Resources

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New York Natural Heritage Program
625 Broadway, 5th Floor,
Albany, NY 12233-4757
Phone: (518) 402-8935
acris@nynhp.org

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Successional Maritime Forest

Fisher's Island

Photo credits: *Gregory J. Edinger*

System Terrestrial

Subsystem Forested Uplands

Did you know?
How does salt spray affect plant growth? Salt water is hypertonic for most plant cells. The salt in the salt spray will cause water to be drawn out of the plant cells causing the cells to shrink and die. The higher the concentration of salt, the faster the plant dies. This could cause the tree to be stunted as their canopy dies back from the salt spray or they could grow asymmetrically with the oceanside of the trees dying back and the side furthest from the ocean continuing to grow. Some plants growing near the ocean are actually adapted to the salt spray and can tolerate these conditions better than other plants. Bayberry is an example of this type of plant.

Summary

Protection Not listed in New York State, not listed federally.

Rarity G4, S3

A global rarity rank of G4 means: Apparently secure globally, though it may be quite rare in parts of its range, especially at the periphery.
A state rarity rank of S3 means: Typically 21 to 100 occurrences, limited acreage, or miles of stream in New York State.

Conservation Status in New York

There are less than 3 documented occurrences of this natural community type in New York State. It is predicted that there is the potential for possibly less than 100 total occurrences many of which would be very small in size (acreage) with the total acreage predicted to be less than 400. This maritime forest community is restricted in range to the coastal area of New York on Long Island. The potential habitat of this community is also restricted to areas directly affected by maritime processes, e.g., salt spray and winds. These areas in New York continue to be under significant threat from housing development.

Short-term Trends

The acreage, extent, and condition of successional maritime forests in New York is probably stable due to the dynamic nature of successional forests in general. As farmland is abandoned or after a mature forest is burned, there will be an increase in the acreage of these successional forest types. Succession would lead to other types of maritime forests however the natural process of salt spray would maintain the community as it is. Large catastrophic events such as storms or human disturbance such as burning or clearing would revert the area back to an earlier successional type. This is a large, intact, slowly succeeding forest, recovering well from historical clearings and with good diversity of successional stages and only minor disturbances. The community is in a landscape relatively large and intact for the coastal region.

Long-term Trends

The numbers and acreage of successional maritime forests in New York has probably declined over the long-term. These declines were due to the settlement of the area and the subsequent loss of forests due to agricultural, residential and commercial development.

Conservation and Management

Threats

The threats to successional maritime forests include development pressure, invasive species, and deer browse. An increase in residential and commercial development causes fragmentation of the natural forest and a decrease in the size of the forest block into smaller and smaller units. Development and new roads also increase the potential for the invasion of exotic species that will out compete the native ones. These forests can also experience excessive deer browse on seedlings and saplings that can prevent the regeneration and establishment of mature forest trees.

Conservation Strategies and Management Practices

To promote a dynamic forest mosaic, allow natural processes, including gap formation from blowdowns and tree mortality as well as in-place decomposition of fallen coarse woody debris and standing snags, to operate (Spies and Turner 1999). Generally, management should focus on activities that help maintain regeneration of the species associated with this community. The natural maritime influence should be maintained including salt spray. Management efforts should focus on the control or local eradication of invasive exotic plants and the reduction of white-tailed deer densities. Consider deer exclosures or population management, particularly if studies confirm that canopy species recruitment is being affected by heavy browse. Deer have been shown to have negative effects on forest understories (Miller et al. 1992, Augustine and French 1998, Knight 2003) and management efforts should strive to ensure that tree and shrub seedlings are not so heavily browsed that they cannot replace overstory trees.

Development and Mitigation Considerations

Fragmentation of coastal forests should be avoided. It is also important to maintain connectivity with adjacent natural communities not only to allow nutrient flow and seed dispersal, but to allow animals to move between them seasonally. Strive to minimize fragmentation of large forest blocks by focusing development on forest edges, minimizing the width of roads and road corridors extending into forests, and designing cluster developments that minimize the spatial extent of the development. Development projects with the least impact on large forests and all the plants and animals living within these forests are those built on brownfields or other previously developed land. These projects have the added benefit of matching sustainable development practices (for example, see: The President's Council on Sustainable Development 1999 final report, US Green Building Council's Leadership in Energy and Environmental Design certification process at http://www.usgbc.org/).

Inventory Needs

Additional inventory is needed to confirm the extent of this community type and to map the least disturbed cores. It would also be useful to map and identify salt spray areas. Inventory and plots are also needed to improve the species lists (both plant and animal) and to better document the natural community.The spread of invasive species also needs to be monitored.

Research Needs

Research is needed to document the successional trend to a mature forest type and the impact of deer browse.

Rare Species

Black-edge Sedge (*Carex nigromarginata*)
Blunt Mountain-mint (*Pycnanthemum muticum*)
Southern Arrowwood (*Viburnum dentatum var. venosum*)
Willow Oak (*Quercus phellos*)

Identification Comments

This is a successional hardwood forest that occurs in low areas near the seacoast. This forest is a variable type that develops after vegetation has burned or land cleared (such as pastureland or farm fields). The trees may be somewhat stunted and flat-topped because the canopies are pruned by salt spray. The forest may be dominated by a single species, or there may be two or three codominants.This forest represents an earlier seral stage of other maritime forests, such as maritime post oak forest, maritime holly forest, maritime red cedar forest, and probably others. Soil and moisture regime will usually determine which forest type succeeds from this community. A few disturbance-climax examples occur, maintained by severe and constant salt spray.

The Best Time to See

The fall season brings migrating landbirds to this natural community, sometimes in great numbers and species following the passage of a northwest cold front, and the birds take advantage of the cover and food opportunities that remain due to the extended growing season of coastal habitats.

Characteristics Most Useful for Identification

Successional maritime forests are areas of abandoned farmland or occur after vegetation has been burned or land cleared. These forests are generally in immediate proximity to marine communities and will occur as narrow "strand" communities that may not be more than 50 meters wide. Species composition will vary based on site characteristics and land history. Characteristic canopy trees include black oak (Quercus velutina), post oak (Quercus stellata), serviceberry (Amelanchier canadensis), white oak (Quercus alba), black cherry (Prunus serotina), blackgum (Nyssa sylvatica), sassafras (Sassafras albidum), and red maple (Acer rubrum). A small number of eastern red cedar (Juniperus virginiana) may be present.

Elevation Range

Known examples of this community have been found at elevations between 5 feet and 105 feet.

Similar Ecological Communities

Maritime post oak forest: This is an oak-dominated forest that borders salt marshes or occurs on exposed bluffs and sand spits within about 200 meters of the seacoast. The trees may be somewhat stunted and flat-topped because the canopies are pruned by salt spray and exposed to winds. This forest is usually dominated by two or more species of oak.

Successional southern hardwoods: This is a hardwood or mixed forest that occurs on sites that have been cleared or otherwise disturbed. Southern indicator species found include American elm (Ulmus americana), white ash (Fraxinus americana), red maple (Acer rubrum), and box elder (Acer negundo). Certain exotic species are commonly found in successional forests, including black locust (Robinia pseudo-acacia), tree-of-heaven (Ailanthus altissima), and buckthorn (Rhamnus cathartica). Any of these may be dominant or codominant in a successional southern hardwood forest. This is a broadly defined community and several seral and regional variants are known.

Successional shrubland: This is a shrubland that occurs on sites that have been cleared (for farming, logging, development, etc.) or otherwise disturbed. This community has at least 50% cover of shrubs and can grade into successional forest types such as successional northern hardwoods, and successional southern hardwoods. This community is not typically influenced by maritime processes. Characteristic shrubs include gray dogwood (Cornus racemosa), eastern red cedar (Juniperus virginiana), raspberries (Rubus spp.), hawthorne (Crataegus spp.), shadbushes (Amelanchier spp.), choke-cherry (Prunus virginiana), wild plum (Prunus americana), sumac (Rhus glabra, R. typhina), nanny-berry (Viburnum lentago), arrowwood (Viburnum dentatum var. lucidum), and multiflora rose

(Rosa multiflora).

Successional red cedar woodland: This is a woodland community that commonly occurs on abandoned agricultural fields and pastures, usually at elevations less than 1,000 ft (305 m). The dominant tree is eastern red cedar (Juniperus virginiana), which may occur widely spaced in young stands and may be rather dense in more mature stands. This natural community is not influenced by maritime processes.

Maritime red cedar forest: This is a conifer forest that occurs on dry sites near the ocean. Eastern red cedar (Juniperus virginiana) is the dominant tree, often forming nearly pure stands. Red cedar is usually present in all tree and shrub layers. Other characteristic trees include post oak (Quercus stellata) and black cherry (Prunus serotina). Maritime red cedar forests differ from successional maritime forests in that they contain less successional and pioneer species, and are dominated by red cedar.

Maritime shrubland: This is a shrubland community that occurs on dry seaside bluffs and headlands that are exposed to onshore winds and salt spray. This community typically occurs as a tall shrubland (2-3 m), but may include areas under 1m shrub height, to areas with shrubs up to 4 m tall forming a shrub canopy in shallow depressions. These low areas may imperceptibly grade into shrub swamp if soils are sufficiently wet. Trees are usually sparse or absent (ideally less than 25% cover). Maritime shrublands differ from successional maritime forests in that they usually have much less than 25% cover of trees, but maritime shublands may form a patchy mosaic and grade into other maritime communities. For example, if trees become more prevalent it may grade into one of the maritime forest communities, such as successional maritime forest.

Characteristic Species

Trees > 5m
Red Maple (*Acer rubrum*)
Oblong-leaf Serviceberry (*Amelanchier canadensis*)
Red Cedar (*Juniperus virginiana*)
Blackgum (*Nyssa sylvatica*)
Wild Black Cherry (*Prunus serotina*)
White Oak (*Quercus alba*)
Post Oak (*Quercus stellata*)
Black Oak (*Quercus velutina*)
Sassafras (*Sassafras albidum*)

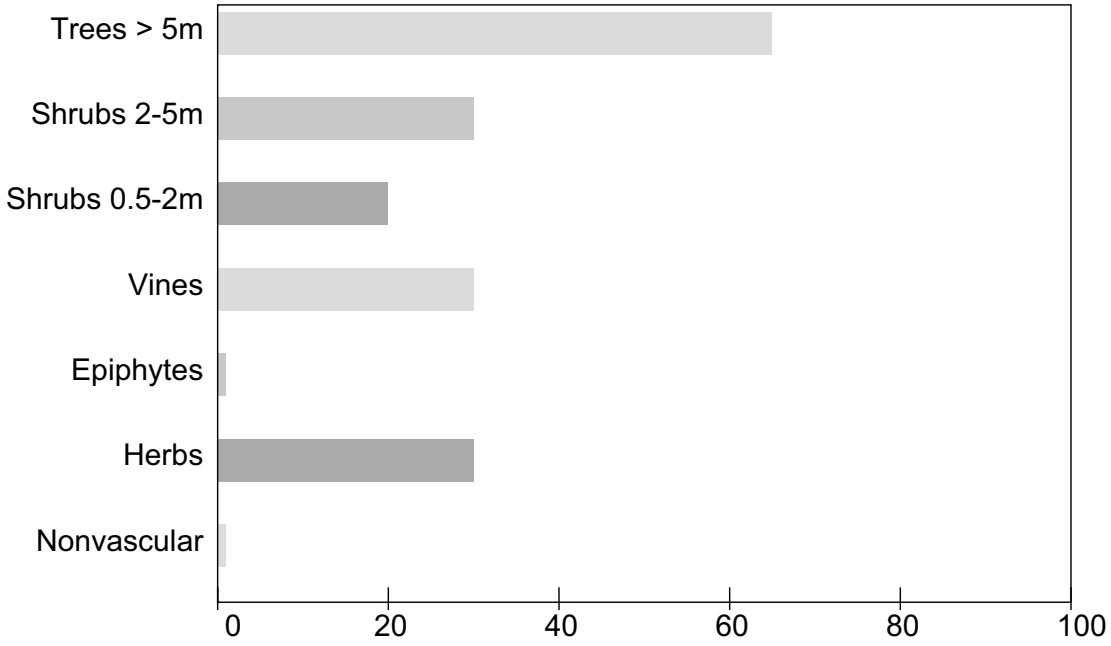
Shrubs 2-5m
Red Maple (*Acer rubrum*)
Oblong-leaf Serviceberry (*Amelanchier canadensis*)
Red Cedar (*Juniperus virginiana*)
Northern Bayberry (*Myrica pensylvanica*)
Wild Black Cherry (*Prunus serotina*)
Red Oak (*Quercus rubra*)
Black Oak (*Quercus velutina*)
Rambler Rose (*Rosa multiflora*)

Shrubs 0.5-2m

Southern Arrowwood (*Viburnum dentatum*)

Vines
Virginia Creeper (*Parthenocissus quinquefolia*)
Wild Sarsaparilla (*Smilax glauca*)
Roundleaf Greenbrier (*Smilax rotundifolia*)
Eastern Poison Ivy (*Toxicodendron radicans*)
Riverbank Grape (*Vitis riparia*)

Herbs
Poverty Oatgrass (*Danthonia spicata*)
Wavy Hair Grass (*Deschampsia flexuosa*)
Deer-tongue Witchgrass (*Dichanthelium clandestinum*)
American Burnweed (*Erechtites hieraciifolia*)
Canada May-flower (*Maianthemum canadense*)
Wineberry (*Rubus phoenicolasius*)
Rough-leaf Goldenrod (*Solidago rugosa*)



This figure helps visualize the structure and "look" or "feel" of a typical successional maritime forest. Each bar represents the amount of "coverage" for all the species growing at that height. Because layers overlap (shrubs may grow under trees, for example), the shaded regions can add up to more than 100%.

International Vegetation Classification System Associations

This New York natural community encompasses all or part of the concept of the following International Vegetation Classification (IVC) natural community associations. These are often described at finer resolution than New York's natural communities. The IVC is developed and maintained by NatureServe.

Successional Maritime Forest (CEGL006379)

NatureServe Ecological System Associations

This New York natural community falls into the following ecological system(s). Ecological systems are often described at a coarser resolution than New York's natural communities and tend to represent clusters of associations found in similar environments. The ecological systems project is developed and maintained by NatureServe.

Atlantic Coastal Plain Northern Maritime Forest (CES203.302)

Additional Resources

Links

Long Island Botanical Society
http://www.libotanical.org/
South Fork Natural History Museum and Nature Center
http://www.sofo.org/
The Nature Conservancy - Long Island
http://www.nature.org/wherewework/northamerica/states/newyork/preserves/art13653.html
NatureServe Explorer
http://www.natureserve.org/

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New York Natural Heritage Program
625 Broadway, 5th Floor,
Albany, NY 12233-4757
Phone: (518) 402-8935
acris@nynhp.org

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Conservation Guide

New York Natural Heritage Program

Hairy-necked Tiger Beetle

Cicindela hirticollis, Noblewood Park, Lake Champlain — Matthew D. Schlesinger

Scientific name *Cicindela hirticollis Say, 1817*

Family name Cicindelidae (Tiger Beetles)

Did you know?

The hairy-necked tiger beetle has declined in many parts of its range, mainly due to habitat alteration and recreational pressure on its sandy habitats.

Summary

Protection Unprotected in New York State, not listed federally.

Rarity G5, S1S2

A global rarity rank of G5 means: Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.

A state rarity rank of S1S2 means: Typically 5 or fewer occurrences, very few remaining individuals, acres, or miles of stream, or some factor of its biology makes it especially vulnerable in New York State.

State Ranking Justification

This species has a limited state distribution, narrow habitat requirements, and is declining in much of its range, including New York, due to beach front development and overuse of beaches. The rank was calculated using NatureServe's Element Rank Calculator, version 2.0.

What are the conservation issues?

Threats

The overall threat impact is considered Very High. Beach front development and overuse of beaches are major threats. In particular, vehicle traffic that crushes larval burrows is a chief cause of decline.

Management Considerations

The most critical management need for the hairy-necked tiger beetle is the control and/or elimination of vehicle and other recreational traffic on occupied beaches, which can crush larval burrows. Beach grooming and stablization measures also adversely affect larval and adult beetles.

Research Needs

A primary research need is further description of the morphology, habitat use, and distribution of C. h. hirticollis and C. h. rugifrons, which apparently overlap at several locations in New York (Schlesinger and Novak 2011). Research is needed on the reasons C. hiritcollis is able to persist on some beaches where C. dorsalis dorsalis is not. Research is also needed on microhabitat separation (niche partitioning) among C. hirticollis, C. repanda, and C. tranquebarica.

Short Term Trends

No information on short-term trends is available.

Long Term Trends

Approximately 7 of 40 historical occurrences on Long Island appear still to be occupied, with most having been surveyed recently. No historical information is available for New York's Great Lakes populations.

Where is it found?

Habitat description

This beetle occurs on sandy beaches associated with large lakes (Ontario and Champlain) and the ocean. Beaches can be narrow or wide, with varying amounts of dune vegetation, but usually with some associated dunes intact.

Some good places to see it

Jamaica Bay National Wildlife Refuge (Queens County)

Associated species

Bronzed Tiger Beetle

Oblique-lined Tiger Beetle

Associated ecological communities

Maritime beach

A community with extremely sparse vegetation that occurs on unstable sand, gravel, or cobble ocean shores above mean high tide, where the shore is modified by storm waves and wind erosion.

Great Lakes dunes

A community dominated by grasses and shrubs that occurs on active and stabilized sand dunes along the shores of the Great Lakes. Unstable dunes are sparsely vegetated, whereas the vegetation of stable dunes is more dense, and can eventually become forested.

Maritime dunes

A community dominated by grasses and low shrubs that occurs on active and stabilized dunes along the Atlantic coast. The composition and structure of the vegetation is variable depending on stability of the dunes, amounts of sand deposition and erosion, and distance from the ocean.

What is its range?

New York State Distribution

This species is primarily recorded from Long Island with some recent records from the shores of Lake Champlain and Lake Ontario. It is primarily a beach species.

Global Distribution

The hairy-necked tiger beetle is widely distributed throughout North America. The subspecies C. h. hirticollis ranges from the southeast US to northern New York, and west to the southern Midwest. The subspecies C. h. rugifrons occurs in New York, New England, and the upper Midwest (Pearson et al. 2006).

What does it look like?

Identifying Characteristics

Like other tiger beetles in the northeast, the hairy-necked tiger beetle is a small insect approximately 0.5 inches (12-14 mm) in length with long sickle-shaped mouthparts, long thin antennae with 11 segments, a long body form with head and eyes wider than the middle portion (thorax) of the body, long thin legs for running, and a pattern of white markings (maculations) on wing covers (elytra) located on top of the main portion of the body (abdomen). The elytra of the hairy-necked tiger beetle are brown or bronze; the anterior maculations are G- and reverse-G-shaped. As with other tiger beetles, the larvae live in burrows in the ground and are white and grublike in appearance. (Pearson et al. 2006, Leonard and Bell 1999)

Characters most useful for identification

The hairy-necked tiger beetle, true to its name, has a hairier "neck" (thorax) than other tiger beetles in similar habitats; however, this character can be challenging without other species in hand for comparison. The G shape at the front of the elytra, as opposed to a C shape in C. repanda, is the best character for distinguishing this beetle.

The best life stage for identifying this species

All tiger beetles are best identified as adults. Far fewer good diagnostic characters are available for identifying larvae, many species lack formal or complete larval descriptions, and there is no comprehensive key for those larvae that have been described (Pearson et al. 2006).

Behavior

Most adult tiger beetles are diurnal animals, spending the warmer parts of the day running along the surface of the ground hunting, eating, and mating. They pursue prey by running in short, fast spurts interspersed with brief stops. Tiger beetles are most active on warm, sunny days and will retreat to burrows or hiding places at sunset or when skies become overcast.

Diet

Tiger beetles are predatory on other insects. Little is known about specific diet items of the hairy-necked tiger beetle.

The best time to see

Phenology

Jan	1st half	L	May	1st half	A	Sept	1st half	A
Jan	2nd half	L	May	2nd half	A	Sept	2nd half	A
Feb	1st half	L	June	1st half	A	Oct	1st half	L
Feb	2nd half	L	June	2nd half	A	Oct	2nd half	L
Mar	1st half	L	July	1st half	A	Nov	1st half	L
Mar	2nd half	L	July	2nd half	A	Nov	2nd half	L
Apr	1st half	L	Aug	1st half	A	Dec	1st half	L
Apr	2nd half	L	Aug	2nd half	A	Dec	2nd half	L

Other species similar to this one

Bronzed Tiger Beetle (Cicindela repanda)

C. repanda has a C shape at the front of the elytra and less dense hairs on the thorax.

Additional Resources

Links

Google

NatureServe

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Northern Harrier

Northern Harrier (Circus cyaneus)

Photo credits: *Jeff Nadler*

Scientific Name *Circus cyaneus* (Linnaeus, 1766)

Family Name Accipitridae
Hawks and Eagles

Did you know?
Unlike most hawks, harriers can use their sense of hearing to help locate prey. Harriers have an owl-like facial disk to help with directional hearing and soft feathers for a quieter flight.

Summary

Protection Threatened Species in New York State, protected federally.

This level of state protection means: any species which meet one of the following criteria: 1) Any native species likely to become an endangered species within the foreseeable future in New York. 2) Any species listed as threatened by the U.S. Department of the Interior.

Rarity G5, S3B,S3N

A global rarity rank of G5 means: Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.
A state rarity rank of S3B,S3N means: Typically 21 to 100 breeding occurrences or limited breeding acreage and typically 20 to 100 non-breeding (usually winter residents) occurrences in New York State.

Conservation Status in New York

There were 354 probable and confirmed breeding blocks identified during the second Breeding Bird Atlas (McGowan and Corwin 2008) and 355 probable and confirmed breeding blocks identified during the first New York State Breeding Bird Atlas (1980-1985) (Andrle and Carroll 1988). However, these numbers could be deceptive since they are cumulative over several years and the birds occupy large breeding territories (i.e. individuals reported in more than one block). They are widespread in winter, but numbers are highly variable. There is concern about the status of Northern Harrier populations in New York because of the loss of farmland and wetlands throughout the state.

Short-term Trends

Northern Harrier populations vary with rodent populations, peaking about every five years. Breeding populations appear to be fairly stable when comparing the two breeding bird atlases of New York. During the first Breeding Bird Atlas (1980-1985), 355 probable or confirmed blocks were reported (Andrle and Carroll 1988). During the second Breeding Bird Atlas, probable or confirmed breeding was reported in 354 blocks (McGowan and Corwin 2008). Since Northern Harriers have a large home range, it is possible that individuals were reported in more than one block. Declines were noted by McGowan and Corwin (2008) in the Adirondacks, Coastal Lowlands, St. Lawrence Plains, and Tug Hill Plateau, while the number of reported blocks increased in the Champlain Valley to the northern Hudson Valley, Mohawk Valley, and Appalachian Plateau (McGowan and Corwin 2008). Breeding Bird Survey data show a possible decline of 3.8% per year between 1980 and 2006. Although, these findings were not found to be statistically significant (Sauer et al. 2007). Non-breeding populations appear to be their highest during spring and fall migration (Levine 1998). Wintering populations fluctuate with prey abundance and snow cover, but appear to be fairly stable.

Long-term Trends

Until about the 1950s, breeding Northern Harriers were considered common throughout the state. Between the 1950s and 1960s the population started to decline for unknown reasons (Andrle and Carroll 1988, Levine 1998). The downward trend may be attributed to habitat loss ranging from reforestation and filling of wetlands to urban and industrial development (Serretino 1992). Although it is not certain, pesticide use may have also played a role in the population decline (Levine 1998). Breeding Bird Survey data show a possible decline of 3.0% per year from 1966 to 2006. Although, these findings were not determined to be statistically significant (Sauer et al. 2007). Wintering populations appear to be fairly stable. Northern Harriers have been known to winter in areas where they are locally extirpated as breeders (Serrentino 1992).

This species is protected under the Migratory Bird Treaty Act. The Migratory Bird Treaty Act implements various treaties and conventions between the U. S. and Canada, Japan, Mexico and the former Soviet Union for the protection of migratory birds. Under this Act, taking, killing, or possessing migratory birds, including nests or eggs, is unlawful unless specifically permitted by other regulations.

Conservation and Management

Threats

One of the most significant threats to Northern Harrier populations in New York is the loss of suitable grassland habitat. Economic factors have affected the viability of farms in New York. Many farmers have intensified their farming practices, converted hayfields to row crops, or abandoned farming altogether (Andrle and Carroll 1988, Post 2005). Remaining hayfields are often mowed earlier and more frequently to increase production. As a result, the mortality rate of young in those fields is high and sometimes adults are killed during mowing. As farms are abandoned they are lost to development or the land reverts to shrublands and forests. Grasslands are becoming more scattered and isolated thereby reducing connectivity (Post 2005). Another significant threat to Northern Harriers is the loss of wetland habitat by draining, dredging, and filling marshes (Evers 1992 cited in NatureServe 2003). New York State has lost over half of its wetlands since colonization

(Tiner 1984 cited in NatureServe 2003). More recently, losses of wetlands in the Lake Plains portion of the state have been offset as agricultural lands revert back to wetlands, although net losses of wetlands in the Hudson Valley continue. Emergent marshes, which constitute only five percent of the state's 2.5 million acres, have declined overall. Equally important, the quality of remaining habitat is often degraded by fragmentation, exotic plants, and nutrient enrichment (Riexinger, personal communication, October 31, 2003). Ditching of salt marshes for mosquito control may have negative effects on breeding populations (Serrentino and England 1989).

Conservation Strategies and Management Practices

Large areas of open habitat in breeding and wintering areas need to be maintained in order to ensure the persistence of this species in New York. Potential management practices include burning, mowing, and plowing of fields after the breeding season. Use Landowner Incentive Program funds to conserve privately-owned grasslands. Coordinate conservation efforts with other agencies and organizations and initiate an outreach program (Post 2005). It may also be possible to design a management plan that would include other threatened species with similar habitat requirements, such as the Short-eared Owl.

Research Needs

Implement accurate and standardized survey methods to determine the population size in New York. Data should be collected on hunting habitat and roost site selection in various habitats such as salt marshes, freshwater wetlands, agricultural habitats, and maritime heaths. Determine the sizes of hunting ranges of birds during the breeding and non-breeding season at sites with varying densities and habitat types. Determine the causes of breeding failure and mortality in young and adults. Conduct studies on the techniques used to maintain early successional habitats. Comparisons between treatments and the cost-effectiveness of each treatment are especially needed. Determine the amount and type of disturbances that breeding Northern harriers will tolerate. In coastal areas, determine the effect of salt marsh ditching on populations and their major prey species.

Habitat

Northern Harriers use a wide range of open grasslands, shrubland, and salt and freshwater marshes (Andrle and Carroll 1988, McGowan and Corwin 2008). Nests are placed on the ground, usually in dense cover.

Associated Ecological Communities

Brackish Meadow
A moist, moderately well-drained brackish (salinity 0.5-18 ppt) perennial grassland with occasional isolated shrubs that is typically situated in a belt at the upper edge of salt marshes bordering sandy uplands, but may occupy large portions of interdunal basins. The community usually develops in areas with a unique combination of soils and hydrology, on deep deposits of periodically windblown or overwashed gleyed sands that are usually flooded only during spring tides and during major coastal storms, approximately two to three times per year.

Brackish Tidal Marsh
A marsh community that occurs where water salinity ranges from 0.5 to 18.0 ppt, and water

is less than 2 m (6 ft) deep at high tide. The vegetation in a brackish tidal marsh is dense and dominated by tall grass-like plants.

Deep Emergent Marsh
A marsh community flooded by waters that are not subject to violent wave action. Water depths can range from 6 in to 6.6 ft (15 cm to 2 m). Water levels may fluctuate seasonally, but the substrate is rarely dry, and there is usually standing water in the fall.

Dwarf Pine Plains
A woodland community dominated by dwarf individuals of pitch pine and scrub oak that occurs on nearly level outwash sand and gravel plains in eastern Long Island. The soils are infertile, coarse textured sands that are excessively well-drained.

Freshwater Tidal Marsh
A marsh community that occurs in shallow bays, shoals, and at the mouth of tributaries of large tidal river systems, where the water is usually fresh (salinity less than 0.5 ppt), and less than 2 m (6 ft) deep at high tide. Typically there are two zones in a freshwater tidal marsh: a low-elevation area dominated by short, broadleaf emergents bordering mudflats or open water, and a slightly higher-elevation area dominated by tall grass-like plants.

Hempstead Plains Grassland
A tall grassland community that occurs on rolling outwash plains in west-central Long Island. This community occurs inland, beyond the influence of offshore winds and salt spray.

High Salt Marsh
A coastal marsh community that occurs in sheltered areas of the seacoast, in a zone extending from mean high tide up to the limit of spring tides. It is periodically flooded by spring tides and flood tides. High salt marshes typically consist of a mosaic of patches that are mostly dominated by a single graminoid species.

Low Salt Marsh
A coastal marsh community that occurs in sheltered areas of the seacoast, in a zone extending from mean high tide down to mean sea level or to about 2 m (6 ft) below mean high tide. It is regularly flooded by semidiurnal tides. The mean tidal range of low salt marshes on Long Island is about 80 cm, and they often form in basins with a depth of 1.6 m or greater.

Maritime Grassland
A grassland community that occurs on rolling outwash plains of the glaciated portion of the Atlantic coastal plain, near the ocean and within the influence of offshore winds and salt spray.

Maritime Shrubland
A shrubland community that occurs on dry seaside bluffs and headlands that are exposed to offshore winds and salt spray.

Medium Fen
A wetland fed by water from springs and seeps. These waters are slightly acidic (pH values generally range from 4.5 to 6.5) and contain some dissolved minerals. Plant remains in

these fens do not decompose rapidly and thus the plants in these fens usually grow on older, undecomposed plant parts of woody material, grasses, and mosses.

Salt Panne
A shallow depression in a salt marsh where the marsh is poorly drained. Pannes occur in both low and high salt marshes. Pannes in low salt marshes usually lack vegetation, and the substrate is a soft, silty mud. Pannes in a high salt marsh are irregularly flooded by spring tides or flood tides, but the water does not drain into tidal creeks. After a panne has been flooded the standing water evaporates and the salinity of the soil water is raised well above the salinity of sea-water.

Shallow Emergent Marsh
A marsh meadow community that occurs on soils that are permanently saturated and seasonally flooded. This marsh is better drained than a deep emergent marsh; water depths may range from 6 in to 3.3 ft (15 cm to 1 m) during flood stages, but the water level usually drops by mid to late summer and the soil is exposed during an average year.

Shrub Swamp
An inland wetland dominated by tall shrubs that occurs along the shore of a lake or river, in a wet depression or valley not associated with lakes, or as a transition zone between a marsh, fen, or bog and a swamp or upland community. Shrub swamps are very common and quite variable.

Successional Old Field
A meadow dominated by forbs and grasses that occurs on sites that have been cleared and plowed (for farming or development), and then abandoned or only occasionally mowed.

Successional Shrubland
A shrubland that occurs on sites that have been cleared (for farming, logging, development, etc.) or otherwise disturbed. This community has at least 50% cover of shrubs.

Other Probable Associated Communities

Alvar grassland
Calcareous pavement barrens
Dwarf shrub bog
Inland salt marsh
Salt shrub
Successional northern sandplain grassland

Associated Species

Short-Eared Owl (*Asio flammeus*)

Identification Comments

Identifying Characteristics

The Northern Harrier is a slim, medium-sized hawk with long, broad wings and long legs and tail. There are two features that are useful in identifying this species: a facial ruff that gives them an owl-like appearance and a white rump that is visible when in flight. Northern Harriers are known to fly low over fields and to hover in flight over prey. Sexes are dimorphic. Adult females are dark brown above and buffy below. There is some streaking in the underparts. The tail is barred. Males differ in that they are gray above and white below. Underparts have reddish spots. Wingtips are black. Males have brown dorsal markings until three to four years of age. Immature harriers are similar in appearence to females except they have a cinnamon-colored breast and the back and wings are darker brown. Immature plumage is retained until the following spring or summer. When laid, eggs are pale blue, but turn white after a few days. Some eggs have brown markings. Nests are built of grasses and sticks on the ground in thick vegetation of grassland or marshes. Northern harriers have a few vocalizations that are used in various situations. In general, the call is a weak, nasal whistle ("pee, pee, pee"). A "wailing squeal" is used by females to males and young to adults when begging for food. The same call can be heard during courtship. Incubating females may use a "quip, quip, quip" call.

Behavior

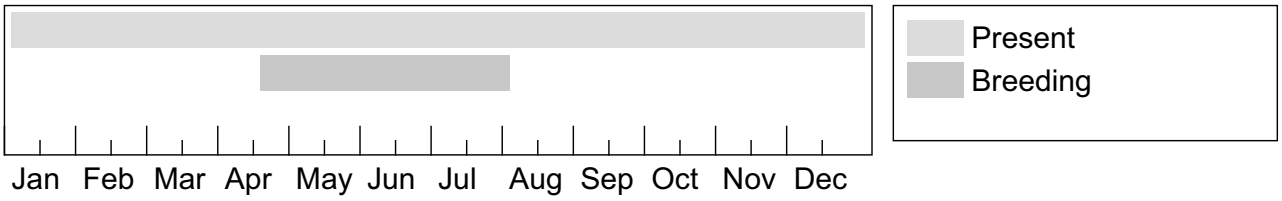
During the breeding season, males hunt farther away from the nest site than females. Northern Harriers are known to congregate during the winter months in open habitats with high rodent populations. They usually abandon wintering grounds with deep snow cover. They are known to share wintering grounds with other bird species, such as Short-eared Owls and Rough-legged Hawks.

Diet

Northern Harriers prey upon rodents and small birds.

The Best Time to See

Northern Harriers are found in New York throughout the year. During the breeding season, the best time to look for Northern Harriers is May through June. Concentrations of birds may be found in suitable habitat with abundant prey during the winter months.



The time of year you would expect to find Northern Harrier in New York.

Similar Species

Rough-Legged Hawk(Buteo lagopus): Northern Harriers and Rough-legged Hawks are found in similar habitats during the winter. Rough-legged Hawks are larger and have a white tail with dark bands. They lack the white rump patch that is present on Northern Harriers. Northern Harriers also have an owl-like facial ruff. Both species are known to hover in flight.

Short-Eared Owl(Asio flammeus): Northern Harriers have an owl-like facial disk which may cause some confusion when initially trying to distinguish them from Short-eared Owls. Short-eared Owls lack the distinctive white rump patch of Northern Harriers.

Taxonomy

Kingdom Animalia
└ **Phylum** Craniata
└ **Class** Birds (Aves)
└ **Order** Raptors (Falconiformes)
└ **Family** Accipitridae (Hawks and Eagles)

Additional Common Names

Marsh Hawk

Additional Resources

Links

NatureServe Explorer
http://natureserve.org/explorer/servlet/NatureServe?searchName=CIRCUS+CYANEUS
Google Images
http://images.google.com/images?q=CIRCUS+CYANEUS
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New York Natural Heritage Program
625 Broadway, 5th Floor,
Albany, NY 12233-4757
Phone: (518) 402-8935
acris@nynhp.org

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Piping Plover

Piping Plover (Charadrius melodus)

Photo credits: *Gene Nieminnen*

Scientific Name *Charadrius melodus* Ord, 1824

Family Name Charadriidae
Lapwings and Plovers

Did you know?
Piping Plovers nest on open sand beaches and are susceptible to human distrubance and mortality from beach driving. Young plover chicks typically move large distances to and from the nest soon after hatching to forage. They may hide in vehicle tracks along beaches and have trouble getting out of them. Because they are so well-camoflouged they are in danger of being run over.

Summary

Protection Endangered Species in New York State, listed as Endangered and as Threatened federally.

This level of state protection means: any species which meet one of the following criteria: 1) Any native species in imminent danger of extirpation or extinction in New York. 2) Any species listed as endangered by the United States Department of the Interior.

This level of federal protection means: this species is formally listed as endangered in portions of New York and as threatened in portions of New York.

Rarity G3, S3B

A global rarity rank of G3 means: Either rare and local throughout its range (21 to 100 occurrences), or found locally (even abundantly at some of its locations) in a restricted range (e.g. a physiographic region), or vulnerable to extinction throughout its range because of other factors.
A state rarity rank of S3B means: Typically 21 to 100 breeding occurrences or limited breeding acreage in New York State.

Conservation Status in New York

Piping Plovers are federally listed as endangered in the Great Lakes and as threatened on the Atlantic coast. New York State Department of Environmental Conservation has listed this species as endangered in the state. Without vigorous protection and management efforts, reproductive success of piping plovers in New York State would be very low. Protection of nests and eggs from predators and disturbance has been successful at stabilizing numbers. The population has gone from 187 pairs in 1992 to 437 pairs in 2009

(Gibbons pers. comm.). However, juvenile recruitment may be low, stemming from high predation rates on juveniles and poor food availability due to habitat loss and degradation. Predation coupled with limited habitat and human disturbance are major factors that would inhibit populations from rebounding without protection.

Short-term Trends

The distribution of Piping Plovers in New York remained largely unchanged from the first Breeding Bird Atlas to the second. Seventy-five atlas blocks were occupied during the first atlas effort in 1980-85 and 76 in the second effort in 2000-05; an increase of 1% (McGowan and Corwin 2008). New York State Department of Environmental Conservation's population counts show that numbers are on the rise, however, and stabilizing. There were only 114 breeding pairs in 1985, 294 in 1995, and 437 in 2009 (NYSDEC 2010).

Long-term Trends

The long-term trend is declining. Piping Plovers rebounded after hunting them was prohibited in 1913. Within modern times Wilcox (1959) estimated 500 breeding pairs on Long Island in 1939 and population numbers have been reduced to 190 estimated pairs annually from 1989-1995 (Levine 1998), a reduction of 62%.
This species is protected under the Migratory Bird Treaty Act. The Migratory Bird Treaty Act implements various treaties and conventions between the U. S. and Canada, Japan, Mexico and the former Soviet Union for the protection of migratory birds. Under this Act, taking, killing, or possessing migratory birds, including nests or eggs, is unlawful unless specifically permitted by other regulations.

Conservation and Management

Threats

Piping Plovers are subject to many significant threats including habitat loss, nest and chick predation, human disturbance, and low population numbers. Habitat loss has occurred over time as beaches have been converted for residential and recreational use. Natural succession and vegetative regrowth of the open sand beaches used for nesting decrease habitat quality for this species. Vegetation may restrict movements of the chicks from high quality foraging habitats and starvation in some areas has been a problem (Loegering and Fraser 1995). They are adapted to a fluctuating system where cycles of vegetative regrowth and set back occur due to weather systems creating sand deposits and washes. Habitat availability in some areas may be an issue if smaller habitat patches become vegetated without nearby expanses of sand scoured habitat for the birds to move into. Habitat availability for this species will only continue to decline with rising sea-levels and increased storms due to global climate change. Habitat fragmentation may also be a significant issue in some areas. Plover chicks are known to hide in or have difficulty crossing vehicle tracks in the sand and mortality from beach driving is a direct threat. Roads, residences, and high use areas fragment populations and limit travel to foraging areas. Beach management practices including raking and allowing ORV traffic may eliminate or reduce the wrack line left by the tide which is a prime foraging environment (Goldin 1993). Human activity not only limits habitat available to the plovers, but it is disruptive during the breeding season to adults and chicks (Goldin and Regosin 1998). Perhaps surprisingly, kite-flying near plover nesting areas is a threat as the adults are

highly disturbed, perhaps viewing the kites as aerial predators (U.S. Fish and Wildlife Service 2010). Adults may flush from nests exposing eggs to heat or cold and leaving eggs and chicks open to predation. Human presence near nesting habitats has likely increased nest predators such as raccoons, crows, and rats by providing them a food source, garbage.

Conservation Strategies and Management Practices

Management of habitat for Piping Plovers requires not only protection of nesting areas from both human disturbance and high predation, but also conservation of foraging areas and safe access for the highly mobile chicks to these areas. The U.S. Fish and Wildlife Service (2010) recommends the following: 1) Install a symbolic (string) fence with warning signs around Piping Plover courtship habitat at a minimum of 50 meters away from nest locations to prohibit human disturbance. 2) Ensure all human activities are kept outside the fenced area. 3) Keep pet cats indoors, keep dogs on a leash and prohibit feral cats. 4) Trash should not be left or buried on beaches since it attracts predators. 5) Consult with a biologist or plover monitor to determine areas of the beach that should not be raked. 6) Prohibit kite flying within 200 meters of fenced areas (Plovers are especially intolerant of them, perhaps perceiving them as aerial predators). 7) Prohibit fireworks on beaches with plovers. 8) Implement motor vehicle management and restrictions on occupied beaches, including closing all beaches with nesting plovers or foraging chicks according to the guidelines in The Fish and Wildlife Service Northeast Region Guidelines for Managing Recreational Activities in Piping Plover Breeding Habitat on the U.S. Atlantic Coast To Avoid Take Under Section 9 of the Endangered Species Act (available at http://www.fws.gov/northeast/pipingplover/pdf/recguide.pdf). Symbolic fencing should be erected at reliable nesting locations prior to the arrival of the birds in the spring and removed in the fall. Posting nesting areas from April 1st through August 31st habituates people to the seasonally off-limits area and protection efforts may be furthered by the presence of a steward on public beaches. Off-road vehicles, fireworks and off-leash pets should be restricted from beaches with nesting plovers from April 1st to August 31st as well. On beaches where driving is allowed it is recommended that all suitable Piping Plover habitat is fenced (Gibbons pers. comm.). Predator exclosures around nests have increased nesting success but are also controversial (Mabee and Estelle 2000, Murphy et al. 2003a, 2003b). Predators have learned to identify the wire exclosures and have actually increased nest predation in some areas. Chicks are precocial, or fully developed, once hatched and able to move large distances to and from the nest to forage in as little as one day after hatching. This means that nest exclosures do little to protect chicks from predation once they hatch. Electric or snow fencing may be used if predation is high and predator removal may be necessary and effective in some instances when a low number of raccoons, or rats are the issue.

Research Needs

The New York State Department of Environmental Conservation conducts annual population surveys of breeding sites and monitors productivity of many pairs, however, more comprehensive productivity data (on nesting success) are needed (Gibbons pers. comm.). This will determine if pairs are successful at producing offspring to ensure long-term population viability and will identify threats to specific sites such as human disturbance and predation so that management steps may be taken when needed. More information is especially needed on chick survivial and predation of chicks.

Habitat

Piping Plovers nest on open, sparsely-vegetated beaches and sandflats between the primary dune and high tide line (Elliott-Smith and Haig 2004, McIntyre et al. 2010). Vegetative cover is generally less than 20% (Haig 1986). Elias et al. (2000) found that beaches with ephemeral pools and bay tidal flats were higher quality habitat for brood-rearing in New York. Nest sites on Long Island, in one study, occured in less than 50% vegetative cover with most nests occured on bare ground (Cohen et al. 2008). Nests in vegetated cover occured more frequently than expected based on availability (Cohen et al. 2008). A small amount of vegetative cover may protect chicks from exposure to the sun and wind. During winter, Piping Plovers use both coastal and inland beaches, algal bay flats, mudflats, and sandflats, along the Gulf of Mexico, inland bays, and Atlantic coast (Elliott-Smith et al. 2004, Haig and Oring 1985, Johnson and Baldassarre 1988, Nicholls and Baldassarre 1990).

Associated Ecological Communities

Brackish Interdunal Swales

Temporarily tidally flooded temperate marshes in interdunal swales dominated by salt-tolerant graminoids. Individual swales occur as small patches positioned between fore-, primary and secondary dunes in a maritime dunes system, typically on barrier islands.

Brackish Meadow

A moist, moderately well-drained brackish (salinity 0.5-18 ppt) perennial grassland with occasional isolated shrubs that is typically situated in a belt at the upper edge of salt marshes bordering sandy uplands, but may occupy large portions of interdunal basins. The community usually develops in areas with a unique combination of soils and hydrology, on deep deposits of periodically windblown or overwashed gleyed sands that are usually flooded only during spring tides and during major coastal storms, approximately two to three times per year.

Coastal Salt Pond

A community inhabiting marine shoreline lakes or ponds formed by sandspits that close off a lagoon or bay. The water typically averages brackish or slightly brackish over long periods of time, but may range rapidly from fresh to saline.

High Salt Marsh

A coastal marsh community that occurs in sheltered areas of the seacoast, in a zone extending from mean high tide up to the limit of spring tides. It is periodically flooded by spring tides and flood tides. High salt marshes typically consist of a mosaic of patches that are mostly dominated by a single graminoid species.

Low Salt Marsh

A coastal marsh community that occurs in sheltered areas of the seacoast, in a zone extending from mean high tide down to mean sea level or to about 2 m (6 ft) below mean high tide. It is regularly flooded by semidiurnal tides. The mean tidal range of low salt marshes on Long Island is about 80 cm, and they often form in basins with a depth of 1.6 m or greater.

Marine Rocky Intertidal

A community inhabiting rocky shores that are washed by rough, high-energy ocean waves.

Characteristic organisms are attached marine algae, mussels, sea stars, urchins, and barnacles that can withstand the impact of the waves and periodic desiccation. Examples of this community in New York typically have gently sloping rocky shores comprised of boulders (0.25 to 3 m diameter) and/or cobbles (6.4 to 25 cm). Bedrock outcrops may be present in a few examples, but not to the extent or as steep as those described in other New England states, such as Maine. The community is typically rich in species. Attached organisms cover usually more than 60% of the substrate, especially at the lower intertidal zone.

Maritime Beach
A community with extremely sparse vegetation that occurs on unstable sand, gravel, or cobble ocean shores above mean high tide, where the shore is modified by storm waves and wind erosion.

Maritime Dunes
A community dominated by grasses and low shrubs that occurs on active and stabilized dunes along the Atlantic coast. The composition and structure of the vegetation is variable depending on stability of the dunes, amounts of sand deposition and erosion, and distance from the ocean.

Maritime Freshwater Interdunal Swales
A mosaic of wetlands that occur in low areas between dunes along the Atlantic coast; the low areas (swales) are formed either by blowouts in the dunes that lower the soil surface to groundwater level, or by the seaward extension of dune fields. Water levels fluctuate seasonally and annually. Sedges and herbs are usually the most abundant types of plants. These wetlands may be quite small (less than 0.25 acre).

Salt Panne
A shallow depression in a salt marsh where the marsh is poorly drained. Pannes occur in both low and high salt marshes. Pannes in low salt marshes usually lack vegetation, and the substrate is a soft, silty mud. Pannes in a high salt marsh are irregularly flooded by spring tides or flood tides, but the water does not drain into tidal creeks. After a panne has been flooded the standing water evaporates and the salinity of the soil water is raised well above the salinity of sea-water.

Associated Species

American Oystercatcher (*Haematopus palliatus*)
Black Skimmer (*Rynchops niger*)
Least Tern (*Sterna antillarum*)
Common Tern (*Sterna hirundo*)

Identification Comments

The Piping Plover is a small plover with orange legs, a white breast, sand-colored upperparts, and a short, stout bill. It is one of several plover species displaying a black neckband during the breeding season.

Identifying Characteristics

The Piping Plover is a small plover weighing 46-64 g (average 55 g). The length averages about 17-18 cm (NGS 1983). Adults in alternate (breeding) plumage have sand-colored upperparts (wings and back), a short stout bill that is orange at the base and black at the tip, and orange legs. They have a dark band across the front of the crown from eye-to-eye and a dark ring around their neck, or collar, that is more pronounced in males. The tail is grey and white at base, darkening towards the end and tipped with white. Nonbreeding birds loose identifying features such as the forehead stripe, neckband, and the bill becomes entirely black. Wintering birds are white underneath with a darker grey back and wings. Immature plumage resembles the adult nonbreeding plumage; juveniles acquire adult plumage the spring after they fledge. The Piping Plover's call has been described as a melodious organ-like two to four note whistle described as "peep-lo" (NYSDEC, Robbins et al. 1983). Nests generally consist of bare scrapes in the sand and are sometimes lined with pebbles or shells (NYSDEC). Eggs are pale buff-colored with splotches of black or dark brown or purple (Cairns 1982). Some clutches have more abundant larger, and darker splotching on the egg's broad end (Elliott-Smith and Haig 2004).

Characteristics Most Useful for Identification

Although no single trait is exclusive to this species, the combination of breeding season characteristics including a small plover with a stout orange bill with a black tip, orange legs, white underparts, pale grey upperparts, black neckband, and white rump that is conspicous in flight, distinguishes this species.

Best Life Stage for Identifying This Species

Adults during the breeding season are easiest to identify, although it is possible to also distinguish juveniles and wintering adults from other species.

Behavior

Piping Plovers raise one brood per year, although several nesting attempts may be made if previous attempts fail. Pairs are primaily monogamous but serial polygyny and polyandry have been reported (Haig and Oring 1988c, Elliott-Smith and Haig 2004). Piping Plovers frequently nest in the same areas as Least Terns, perhaps capitalizing on the extra protection afforded by the tern's fierce aerial defense of the nesting area and increased vigilance and alarm system. Piping Plovers tend to nest away from other Piping Plovers but don't seem to avoid placing their nests in proximity to terns. One study in New Jersey found average distances of Piping Plover nests were 85 to 99 meters to another Piping Plover nest and 5 to 36 meters to a Least Tern nest (Burger1987). Birds may thermoregulate by standing on driftwood on cold mornings, facing the sun, with their black neckbands exposed. On hot days, they may stand in the shade of a rock or log with their neckbands concealed (Elliott-Smith and Haig 2004). They do fly, but primarily walk or run; their sand-colored plumage providing excellent camoflouge. Territories, nests, and nestlings are defended against predators and territories may be defended against another Piping Plover or even a bird of a different species entering their territory (Elliott-Smith and Haig 2004). Defensive and aggressive behaviors include chasing, pecking, and biting. Defensive and territorial displays include assuming a display posture, puffing feathers and running long distances, sometimes over 100 meters parellel to another male along territrory boundaries

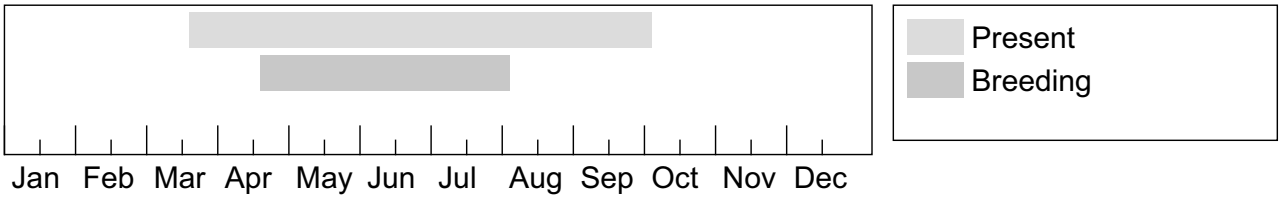
(Cairns 1982). When a predator approaches a nest one or both parents may perform a distraction display by feigning a broken wing and running along the ground with one wing raised and one lowered (Cairns 1982). When both parents are present one may lead the chicks to saftey while the other feigns injury (Cairns 1982).

Diet

Piping Plovers' primary food source is invertebrates including a wide array of terrestrial insects, marine worms and tiny crusteaceans (Cairns 1977). Primary food items in at least some parts of their range include beetles such as Carabids (ground beetles) and Dytiscids (predaceous diving beetles), true bugs such as Corixidae (water boatmen), Diptera (flies) such as Chironomids (midges) and Ephydridae (shore flies), and also hymenopts, molluscs, polychaetes and amphiopods. Invertebrate prey taken varies by the age of the bird, habitat, range and season (Elliott-Smith and Haig 2004).

The Best Time to See

Migrants may be observed on Long Island in March and late August and breeding individuals may be observed from April through July (Levine 1998). This specieis usually rare on Long Island before mid-March and after September. On very rare occasions individual birds are observed in winter on Long Island.



The time of year you would expect to find Piping Plover in New York.

Similar Species

Wilson's Plover(Charadrius wilsonia): The Wilson's Plover has an over-sized, longer and broader bill, grey to pinkish legs and darker upperparts. The Wilson's Plover does not typically occur in New York.

Killdeer(Charadrius vociferus): Killdeer appear similar to Piping Plovers but with a darker tawny brown back, thicker neck collar, and a second black band on the chest. They also have a longer bill that is all black.

Semipalmated Plover(Charadrius semipalmatus): The Semipalmated Plover appears similar to the Piping Plover but with much darker upperparts and a thicker black forehead band, lores and neck collar. The Semipalmated Plover passes through New York during migration.

Taxonomy

Kingdom Animalia

Phylum Craniata
└ **Class** Birds (Aves)
└ **Order** Gulls, Plovers, and Shorebirds (Charadriiformes)
└ **Family** Charadriidae (Lapwings and Plovers)

Additional Resources

Links

Google Images
http://images.google.com/images?q=CHARADRIUS+MELODUS
NatureServe Explorer
http://natureserve.org/explorer/servlet/NatureServe?searchName=CHARADRIUS+MELODUS

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New York Natural Heritage Program
625 Broadway, 5th Floor,
Albany, NY 12233-4757
Phone: (518) 402-8935
acris@nynhp.org

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- Division of Lands & Forests, Department of Environmental Conservation
- New York State Office of Parks, Recreation and Historic Preservation

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This guide was authored by

Snowy Egret

Photo credits: *Master, Larry*

Scientific Name *Egretta thula* (Molina, 1782)

Family Name Ardeidae
Herons, Bitterns, and Egrets

Did you know?
Snowy Egrets use their bright yellow feet to stir up sediments in the water and frighten prey out of hiding places (Willard 1977 and Hom 1983 cited in Parsons and Master 2000).

Summary

Protection Not listed in New York State, protected federally.

Rarity G5, S2

A global rarity rank of G5 means: Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.
A state rarity rank of S2 means: Typically 6 to 20 occurrences, few remaining individuals, acres, or miles of stream, or factors demonstrably make it very vulnerable in New York State.

Conservation Status in New York

The Snowy Egret is known to occur in nine counties in New York State including Bronx, Erie, Kings, Nassau, New York, Queens, Richmond, Suffolk, and Westchester counties (McGowan and Corwin InPress, New York Natural Heritage Program 2007). After the population reached its peak during a period of fluctuation in the mid-1970s, numbers appear to have declined slightly in recent years (Peterson cited in Andrle and Carroll 1988). In general, Snowy Egret populations are declining along the Atlantic Coast (Parsons and Master 2000) and nationwide (Kushlan et al. 2002 cited in McGowan and Corwin In Press).

Short-term Trends

Brown et al. (2001) discovered that there were approximately 904 nesting pairs of Snowy Egrets on Long Island between 1974 and 1995. The number of nesting pairs in Jamaica Bay Wildlife Refuge declined between 1976 and 1993 (Brown et al. 2001). The species is also found in the Niagara Basin (New York Breeding Bird Atlas 2000-2005, New York Natural Heritage Program 2007) and the statewide population of Snowy Egrets in recent years has undergone cycles of growth and decline (McGowan and Corwin In Press). The

first Breeding Bird Atlas in New York (1980-1985) reported Snowy Egrets in 34 probable or confirmed breeding blocks (Andrle and Carroll 1988), while the second Atlas (2000-2005) reported them in 29 probable or confirmed breeding blocks (McGowan and Corwin In Press). This represents a 15% decline over the two atlases in the number of confirmed or probable breeding blocks where Snowy Egrets were found.

Long-term Trends

The first records of Snowy Egret breeding in New York occurred in the 1880s, in limited numbers, on the coastal islands of Long Island (McGowan and Corwin In Press). During this time frame and the early 1900s, Snowy Egrets became extirpated from the state due to overhunting for their plumes, which were in high demand for the hat trade. They were listed as extirpated in the state in the 1920s (Peterson 1988 cited in Andrle and Carroll 1988). They were first seen breeding again in Suffolk County in 1949 following legislation which protected migratory birds (Bull 1974). In the mid-1970s, the population reached its peak, and after a period of fluctuation during the 1970s and 1980s, now averages 780 nesting pairs per season (McGowan and Corwin In Press).
This species is protected under the Migratory Bird Treaty Act. The Migratory Bird Treaty Act implements various treaties and conventions between the U. S. and Canada, Japan, Mexico and the former Soviet Union for the protection of migratory birds. Under this Act, taking, killing, or possessing migratory birds, including nests or eggs, is unlawful unless specifically permitted by other regulations.

Conservation and Management

Threats

Habitat loss has been noted as the greatest threat to this species. In addition, complete information on breeding and foraging habitat requirements is not currently available (McCrimmon 2006). On Long Island, threats include flooding, erosion, human activity, and predation. Human activities include boating and fishing, dredge spoil deposition, pedestrians, jet skiers, ORV and other vehicle use, development, oil spills, contaminants, vandalism, and invasive species. Known predators that currently pose a threat to populations are crows, gulls, raccoons, dogs, feral cats, rats, and others (New York Natural Heritage Program 2007).

Conservation Strategies and Management Practices

As habitat loss is the largest known threat to Snowy Egrets, continuing to protect lands such as the Jamaica Bay Wildlife Refuge and other managed areas is important to the conservation of this species and other colonial waterbirds (Brown et al. 2001). Limiting predation and human activity through the use of predator exclosures, visitor education, and by posting restricted signs in breeding and foraging areas would also be beneficial. Any habitat restoration efforts should consider increasing the availability of pool and open water habitat, as foraging habitat availability may be a limiting factor for egrets (Trocki and Paton 2006). Another consideration for the management of breeding Snowy Egrets is the use of buffers around colonies to reduce flushing responses to human disturbance (Peters and Otis 2006). Vehicle disturbances, especially in undeveloped areas, have been shown to cause a decline in foraging rates for this species, with seasonal differences in behavioral response (Stolen 2003, Traut and Hostetler 2003). This suggests that buffer zones could provide additional protection.

Research Needs

Further studies are needed to understand how this species is affected by habitat loss from human activity. While many existing and potential threats have been identified, further knowledge about how these threats interplay and affect Snowy Egret behavior and population viability would better inform management decisions (Peters and Otis 2006). More complete information on breeding and foraging habitat requirements, reproductive ecology, and life history is needed for this species as well (McCrimmon 2006).

Habitat

Snowy Egrets inhabit open edges of rivers, lakes, salt marshes, salt pannes, brackish interdunal swales, marine intertidal zones and maritime beaches and shrubland in New York (Budliger and Kennedy 2005, New York Natural Heritage Program 2007). They nest in dense scrub thickets on coastal sand dunes close to feeding areas, usually 3-10 feet off the ground (Bull 1974 in Andrle and Carroll 1988).

Associated Ecological Communities

Brackish Interdunal Swales
Temporarily tidally flooded temperate marshes in interdunal swales dominated by salt-tolerant graminoids. Individual swales occur as small patches positioned between fore-, primary and secondary dunes in a maritime dunes system, typically on barrier islands.

High Salt Marsh
A coastal marsh community that occurs in sheltered areas of the seacoast, in a zone extending from mean high tide up to the limit of spring tides. It is periodically flooded by spring tides and flood tides. High salt marshes typically consist of a mosaic of patches that are mostly dominated by a single graminoid species.

Low Salt Marsh
A coastal marsh community that occurs in sheltered areas of the seacoast, in a zone extending from mean high tide down to mean sea level or to about 2 m (6 ft) below mean high tide. It is regularly flooded by semidiurnal tides. The mean tidal range of low salt marshes on Long Island is about 80 cm, and they often form in basins with a depth of 1.6 m or greater.

Marine Rocky Intertidal
A community inhabiting rocky shores that are washed by rough, high-energy ocean waves. Characteristic organisms are attached marine algae, mussels, sea stars, urchins, and barnacles that can withstand the impact of the waves and periodic desiccation. Examples of this community in New York typically have gently sloping rocky shores comprised of boulders (0.25 to 3 m diameter) and/or cobbles (6.4 to 25 cm). Bedrock outcrops may be present in a few examples, but not to the extent or as steep as those described in other New England states, such as Maine. The community is typically rich in species. Attached organisms cover usually more than 60% of the substrate, especially at the lower intertidal zone.

Maritime Beach
A community with extremely sparse vegetation that occurs on unstable sand, gravel, or

cobble ocean shores above mean high tide, where the shore is modified by storm waves and wind erosion.

Maritime Shrubland
A shrubland community that occurs on dry seaside bluffs and headlands that are exposed to offshore winds and salt spray.

Salt Panne
A shallow depression in a salt marsh where the marsh is poorly drained. Pannes occur in both low and high salt marshes. Pannes in low salt marshes usually lack vegetation, and the substrate is a soft, silty mud. Pannes in a high salt marsh are irregularly flooded by spring tides or flood tides, but the water does not drain into tidal creeks. After a panne has been flooded the standing water evaporates and the salinity of the soil water is raised well above the salinity of sea-water.

Associated Species

Great Egret (*Ardea alba*)
Cattle Egret (*Bubulcus ibis*)
Piping Plover (*Charadrius melodus*)
Little Blue Heron (*Egretta caerulea*)
Tricolored Heron (*Egretta tricolor*)
American Oystercatcher (*Haematopus palliatus*)
Herring Gull (*Larus argentatus*)
Laughing Gull (*Larus atricilla*)
Great Black-Backed Gull (*Larus marinus*)
Yellow-Crowned Night-Heron (*Nyctanassa violacea*)
Black-Crowned Night-Heron (*Nycticorax nycticorax*)
Double-Crested Cormorant (*Phalacrocorax auritus*)
Glossy Ibis (*Plegadis falcinellus*)
Black Skimmer (*Rynchops niger*)
Least Tern (*Sterna antillarum*)
Roseate Tern (*Sterna dougallii*)
Forster's Tern (*Sterna forsteri*)
Common Tern (*Sterna hirundo*)

Identification Comments

Identifying Characteristics

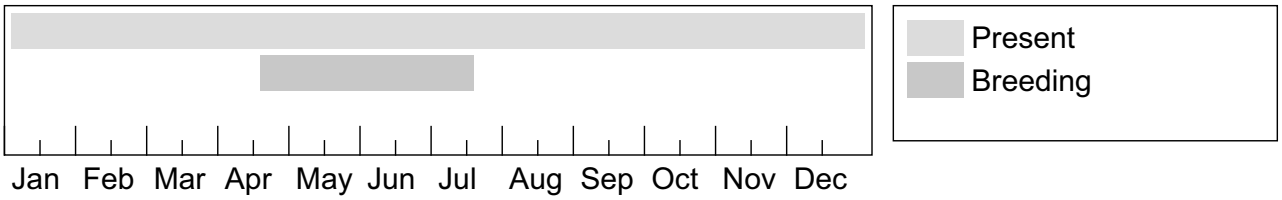
The Snowy Egret is a medium-sized, white heron that is 56-66 cm in length and has a wingspan of 100 cm and a body mass of 370 g. They have black legs with yellow feet and a black bill (Parsons and Master 2000). During breeding season, long, white plumes trail from the throat and the rump. They are known to nest in colonies with others of the same species or another heron species (Budliger and Kennedy 2005). They nest in trees or shrubs or, in some areas, on the ground or in marsh vegetation (Spendelow and Patton 1988 cited in Parsons and Master 2000). Clutch size is 3-5 pale blue-green eggs which are incubated for 20-24 days (Budliger and Kennedy 2005). Vocalizations include a raspy "raarr" or nasal "hraaa" (Sibley 2000) and low croaks and a bouncy "wulla-wulla-wulla" on breeding grounds (Budliger and Kennedy 2005).

Diet

Snowy Egrets eat small fishes, frogs, lizards, snakes, crustaceans, worms, snails, and insects (Palmer 1962 cited in Nature Serve 2007). One New Jersey study showed that this species seems to prefer to forage in wadeable, shallow pools with high prey densities (Master et al. 2005).

The Best Time to See

On the coast, this species is rare before late March and after November (New York Natural Heritage Program 2007).



The time of year you would expect to find Snowy Egret in New York.

Similar Species

Little Blue Heron(Egretta caerulea): The Little Blue Heron has a yellow-orange bill and legs instead of a black bill and legs with yellow feet like the Snowy Egret (Budliger and Kennedy 2005).

Great Egret(Ardea alba): The Great Egret is 38 cm longer than the Snowy Egret, so their greatest difference is size (Nature Serve 2007). In addition, the Snowy Egret has a black bill and yellow feet, while the Great Egret has a yellow bill and black feet (Budliger and Kennedy 2005).

Taxonomy

Kingdom Animalia
- **Phylum** Craniata
  - **Class** Birds (Aves)
    - **Order** herons, egrets, ibises, storks and spoonbills (Ciconiiformes)
      - **Family** Ardeidae (Herons, Bitterns, and Egrets)

Additional Resources

Links

The Birds of North America
http://bna.birds.cornell.edu/bna
NatureServe Explorer
http://natureserve.org/explorer/servlet/NatureServe?searchName=EGRETTA+THULA

Google Images

http://images.google.com/images?q=EGRETTA+THULA

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New York Natural Heritage Program
625 Broadway, 5th Floor,
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acris@nynhp.org

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This guide was authored by

Atlantic White Cedar

Chamaecyparis thyoides

Photo credits: *Gregory J. Edinger*

Scientific Name *Chamaecyparis thyoides* (L.) B.S.P.

Family Name Cupressaceae
Cypress Family

Did you know?
Atlantic white cedar trees grow slowly and may live for more than 1000 years. The wood is very resistant to decay. Trees buried in peat bogs for decades have been recovered still in excellent condition. One of the largest inland Atlantic white cedar wetland complexes in the world was located along the Wallkill River flood plain in southern Orange County. Originally over 50,000 acres the "Drowned Lands" swamp was almost completely converted to agriculture by the 1970s.

Summary

Protection Rare in New York State, not listed federally.

This level of state protection means: listed species have: 1) 20 to 35 extant sites, or 2) 3,000 to 5,000 individuals statewide.

Rarity G4, S2

A global rarity rank of G4 means: This species is apparently secure globally (typically with more than 100+ populations), though it may be quite rare in parts of its range, especially at the periphery.
A state rarity rank of S2 means: This plant is threatened/imperiled in New York because of rarity (typically 6-20 populations or few remaining individuals) or is vulnerable to extirpation from New York due to biological factors.

Conservation Status in New York

There are 16 existing populations and about half of them are large and protected. The remaining populations are small with usually under 100 trees but some of them are in protected areas. While some small occurrences may still be discovered it is not expected that additional large populations would be found. All of the historical populations have been checked.

Short-term Trends

Short-term trends are stable with no big changes in existing populations.

Long-term Trends

In the last 100 years there has been a decline in Atlantic white cedar swamps in western Long Island and the lower Hudson area including the destruction of some very large swamps in Nassau and Orange counties. Many of the remaining swamps are within developed landscapes without large natural buffers.

Conservation and Management

Threats

Some unprotected white cedar swamps are subject to habitat loss by logging and development. Beaver activity may cause high water levels to kill trees.

Conservation Strategies and Management Practices

Trees need to be protected within their wetlands by providing large enough natural buffers to preserve hydrologic r?gimes and to prevent direct destruction of the swamps and trees.

Habitat

Chamaecyparis thyoides is found in swamps and ponds, typically at sites with a high water table and deep organic soils. Unlike Northern-White Cedar (Thuja occidentalis), it is not associated with high pH sites or the influence of calcareous bedrock or groundwater. Historically Atlantic White-Cedar swamps covered large areas in the coastal plain and along floodplains.

Associated Ecological Communities

Coastal Plain Atlantic White Cedar Swamp
A swamp that occurs on organic soils along streams and in poorly drained depressions of the coastal plain. Atlantic white cedar makes up over 50% of the canopy cover. In mixed stands in New York, red maple is the codominant tree.

Coastal Plain Pond
The aquatic community of the permanently flooded portion of a coastal plain pond with seasonally, and annually fluctuating water levels. These are shallow, groundwater-fed ponds that occur in kettle-holes or shallow depressions in the outwash plains south of the terminal moraines of Long Island, and New England. A series of coastal plain ponds are often hydrologically connected, either by groundwater, or sometimes by surface flow in a small coastal plain stream.

Inland Atlantic White Cedar Swamp
A swamp that occurs on organic soils (usually peat) in poorly drained depressions and along pond edges in southeastern New York and northern New Jersey. The characteristic tree is Atlantic white cedar. In mixed stands the codominants are typically red maple, black gum, and eastern hemlock.

Other Probable Associated Communities

Pitch pine-blueberry peat swamp
Red maple-blackgum swamp

Associated Species

Red Maple (*Acer rubrum*)
Devil's Beggartick (*Bidens frondosa*)
Leatherleaf (*Chamaedaphne calyculata*)
Coast Pepper-bush (*Clethra alnifolia*)
Sweet Bayberry (*Myrica gale*)
Northern Bayberry (*Myrica pensylvanica*)
Blackgum (*Nyssa sylvatica*)
Swamp Azalea (*Rhododendron viscosum*)
Sphagnum
Highbush Blueberry (*Vaccinium corymbosum*)

Identification Comments

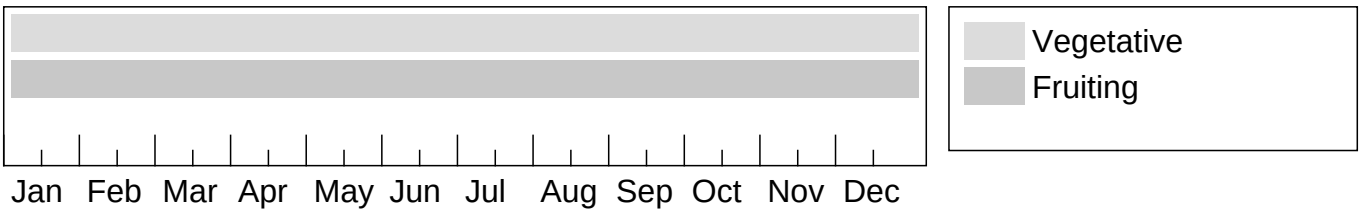
Atlantic White Cedar is an attractive, small to medium-sized evergreen tree, its crown generally forming a narrow spire or column shape. The dark, shiny green foliage is arranged into 2-ranked branchlets, and the tiny (2-4mm) scale-like leaves are imbricate (overlapping like shingles), ovate and usually glandular. The brownish-gray bark is divided into long, thin, tight strips. Thecones are glaucous purple or blue capsules, covered by 4 to 6 non-overlapping scales

Best Life Stage for Identifying This Species

This species may be identified from either the cones or sterile branches.

The Best Time to See

May be identified all year round.



The time of year you would expect to find Atlantic White Cedar in New York.

Similar Species

Thuja occidentalis has flattened branchlets, its cones have overlapping scales, and it is typically found further inland and north then Chamaecyparis thyoides. Juniperus virginiana has sharp, needle-like leaves, its fruits are fleshy "berries" rather than capsules, and it is usually found in drier habitats.

Taxonomy

Kingdom Plantae
└ **Phylum** Coniferophyta
└ **Class** Conifers (Pinopsida)
└ **Order** Pinales
└ **Family** Cupressaceae (Cypress Family)

Additional Common Names

Coast-cedar
Southern White Cedar
Swamp-cedar

Additional Resources

Links

Flora of North America
http://efloras.org/florataxon.aspx?flora_id=1&taxon_id=210000241
New York Flora Atlas
http://www.newyork.plantatlas.usf.edu/Plant.aspx?id=925
USDA Plants Database
http://plants.usda.gov/java/nameSearch?mode=sciname&keywordquery=CHAMAECYPARIS+THYOIDES
NatureServe Explorer
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New York Natural Heritage Program
625 Broadway, 5th Floor,
Albany, NY 12233-4757
Phone: (518) 402-8935
acris@nynhp.org

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Adjacent Canada. The New York Botanical Garden, Bronx, New York. 910 pp.

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New York Natural Heritage Program
625 Broadway, 5th Floor,
Albany, NY 12233-4757
Phone: (518) 402-8935
acris@nynhp.org

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This guide was authored by

Bushy Rockrose

Crocanthemum dumosum flower

Photo credits: *Stephen M. Young*

Scientific Name *Crocanthemum dumosum* Bickn.

Family Name Cistaceae
Rock-Rose Family

Did you know?
Robert Zaremba, botanist from Cape Cod, calls bushy rockrose the signature species of the maritime grasslands since its beautiful yellow flowers are always present in large healthy examples of this community. The genus name is derived from the Greek for sunflower and refers to the yellow flowers that open only once, when the sun is shining, before the petals fall off. The species name means bushy.

Summary

Protection Threatened Species in New York State, not listed federally.

This level of state protection means: listed species are those with: 1) 6 to fewer than 20 extant sites, or 2) 1,000 to fewer than 3,000 individuals, or 3) restricted to not less than 4 or more than 7 U.S.G.S. 7 ? minute topographical maps, or 4) listed as threatened by U.S. Department of the Interior.

Rarity G3, S2

A global rarity rank of G3 means: This species is either rare and local throughout its range (21 to 100 occurrences), or found locally (even abundantly at some of its locations) in a restricted range (e.g. a single physiographic region), or is vulnerable to extinction throughout its range because of other factors.
A state rarity rank of S2 means: This plant is threatened/imperiled in New York because of rarity (typically 6-20 populations or few remaining individuals) or is vulnerable to extirpation from New York due to biological factors.

Conservation Status in New York

There are 12 existing populations, but only 2 of them are large and extensive. The remainder occur in fairly small patches. There are nine historical occurrences, but 6 of them are considered extirpated.

Short-term Trends

Populations fluctuate, sometimes substantially, from year to year, but overall they seem stable as counts are done on most populations every year. One population from 1984 was subsequently destroyed by development. Three populations need recent counts.

Long-term Trends

Populations have been stable over the long term as new populations have been found to replace those that have been extirpated on western Long Island. The present populations seem large enough to remain stable for the foreseeable future.

Conservation and Management

Threats

The biggest threat to this species is succession of its maritime grassland habitat to woody species, although a seed bank can maintain the population for some time until disturbance returns. Some populations also occur along trails or roads where the open habitat is maintained, but the plants are still threatened by direct disturbance such as trampling, improper mowing, or bicycle use.

Conservation Strategies and Management Practices

This species needs disturbance to reduce competition from woody plants or more aggressive herbaceous plants, but too much direct disturbance to the plants will reduce the population. Its habitat could be disturbed in the non-growing season, especially with fire, to open it up for seed germination and colonization, but direct disturbance should be prevented during the growing season.

Research Needs

Some taxonomic work has been done on this species but results are inconclusive. More research is needed on how the characters of this plant change throughout the season.

Habitat

In New York State, Crocanthemum dumosum is known from a number of diverse habitats on Long Island, with dry sandy soils being the common factor. It has been found growing in maritime heathlands, shrublands and grasslands, in Hempstead Plains grasslands, in oak woodlands and openings within oak hickory, oak-pine, and oak-maple forests, and in disturbed areas within lawns, golf courses, and pipelines (New York Natural Heritage Program 2010). Dry, sandy soil and barrens (Gleason and Cronquist 1991). Open, dry, sandy slopes with less than 25% herb cover; plants seem to be intolerant of shade and moisture (Coddington 1978). Dry sands, barrens and open woods (Fernald 1970).

Associated Ecological Communities

Coastal Oak-hickory Forest
A hardwood forest with oaks and hickories codominant that occurs in dry, well-drained, loamy sand of knolls, upper slopes, or south-facing slopes of glacial moraines of the Atlantic Coastal Plain.

Hempstead Plains Grassland
A tall grassland community that occurs on rolling outwash plains in west-central Long Island. This community occurs inland, beyond the influence of offshore winds and salt spray.

Maritime Grassland
A grassland community that occurs on rolling outwash plains of the glaciated portion of the Atlantic coastal plain, near the ocean and within the influence of offshore winds and salt spray.

Maritime Heathland
A dwarf shrubland community that occurs on rolling outwash plains and moraine of the glaciated portion of the Atlantic coastal plain, near the ocean and within the influence of onshore winds and salt spray.

Maritime Shrubland
A shrubland community that occurs on dry seaside bluffs and headlands that are exposed to offshore winds and salt spray.

Mowed Lawn With Trees
Residential, recreational, or commercial land in which the groundcover is dominated by clipped grasses and forbs, and it is shaded by at least 30% cover of trees. Ornamental and/or native shrubs may be present, usually with less than 50% cover. The groundcover is maintained by mowing and broadleaf herbicide application.

Pitch Pine-oak Forest
A mixed forest that typically occurs on well-drained, sandy soils of glacial outwash plains or moraines; it also occurs on thin, rocky soils of ridgetops. The dominant trees are pitch pine mixed with one or more of the following oaks: scarlet oak, white oak, red oak, or black oak.

Pitch Pine-oak-heath Woodland
A pine barrens community that occurs on well-drained, infertile, sandy soils. The structure of this community is intermediate between a shrub-savanna and a woodland. Pitch pine and white oak are the most abundant trees.

Associated Species

Bearberry (*Arctostaphylos uva-ursi*)
Pennsylvania Sedge (*Carex pensylvanica*)
Maryland Golden Aster (*Chrysopsis mariana*)
Poverty Oatgrass (*Danthonia spicata*)
Longbranch Frostweed (*Helianthemum canadense*)
Low Frostweed (*Helianthemum propinquum*)

Sand-heather (*Hudsonia tomentosa*)
Flaxleaf Whitetop Aster (*Ionactis linariifolius*)
Beach Pinweed (*Lechea maritima*)
Southern Woodrush (*Luzula bulbosa*)
Stagger-bush (*Lyonia mariana*)
Northern Bayberry (*Myrica pensylvanica*)
Eastern Prickly-pear (*Opuntia humifusa*)
Polytrichum commune
White Oak (*Quercus alba*)
Post Oak (*Quercus stellata*)
Black Oak (*Quercus velutina*)
Little Bluestem (*Schizachyrium scoparium*)

Identification Comments

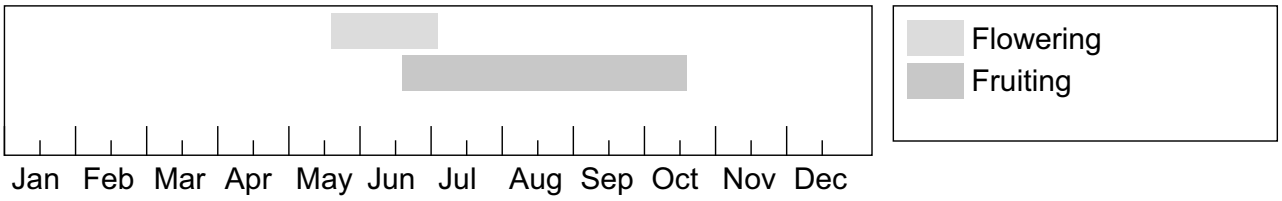
Bush Rockrose is a low-growing (up to 30 cm) perennial herb species with widely spreading branches. The leaves are alternate, 2 to 3 cm long, and densely hairy on their upper sides. It first bears open, solitary flowers with yellow petals 8 to 15 mm long, and later closed, cleistogamous flowers borne in the axils or tips of leafty branchlets. The fruit are capsules; those of open flowers are 4 to 7mm long with 16 to 50 seeds, and those of the cleistogamous flowers 3 to 4.5 mm long with 8 to 14 seeds.

Best Life Stage for Identifying This Species

Plants with leaves and either flowers or capsules are best for identification.

The Best Time to See

Crocanthemum dumosum flowers from mid-May into late June. Fruits may persist through mid-October.



The time of year you would expect to find Bushy Rockrose in New York.

Similar Species

There are four different Crocanthemum species in New York and these are often confused with one another. Helianthemum bicknellii is very tall relative to other Crocanthemum species and the stems are densely covered with white hairs. Helianthemum propinquum is clearly clonal and the stems have few branches and are moderately covered with white hairs. Both Crocanthemum bicknellii and C. propinquum have inflorescences of 2 to 10 or more petaliferous flowers, and the capsules of their cleistogamous flowers have 1-2 (3) seeds. Crocanthemum canadense is the species most difficult to distinguish from C. dumosum. It has strongly ascending branches and branchlets at maturity, compared to the

widely divergent to almost horizontal branching of C. dumosum (which often looks stomped on), tends to bloom later, and the seeds of its cleistogamous flowers are on average smaller (2-3 mm) and fewer (5-10 per flower).

Conservation Comments

Arrington and Kubitzki (2003) proposed reviving the segregate genus Crocanthemum for New World members of Helianthemum sensu lato based on morphology, nuclear and chloroplast DNA phylogenies, and geography. Their molecular work also shows that Hudsonia is

Taxonomy

Kingdom Plantae
└ **Phylum** Anthophyta
└ **Class** Dicots (Dicotyledoneae)
└ **Order** Violales
└ **Family** Cistaceae (Rock-Rose Family)

Additional Common Names

Bushy Frostweed

Synonyms

Helianthemum dumosum ((Bickn.) Fern.)

Additional Resources

Links

Google Images
http://images.google.com/images?q=HELIANTHEMUM+DUMOSUM
NatureServe Explorer
http://natureserve.org/explorer/servlet/NatureServe?searchName=HELIANTHEMUM+DUMOSUM
USDA Plants Database
http://plants.usda.gov/java/nameSearch?mode=sciname&keywordquery=HELIANTHEMUM+DUMOSUM

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New York Natural Heritage Program
625 Broadway, 5th Floor,
Albany, NY 12233-4757
Phone: (518) 402-8935
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This guide was authored by

Coast Flatsedge

Cyperus polystachyos var. texensis

Photo credits: *Kimberly J. Smith*

Scientific Name *Cyperus polystachyos var. texensis* (Torr.) Fern.

Family Name Cyperaceae
Sedge Family

Did you know?
While mostly known from Suffolk County there were two collections of this rare flatsedge from Queens County in the 1890s. It was not collected in Queens again until 2004 when it was found around a small pond near the South Shore of Long Island, a span of over 100 years between sightings!

Summary

Protection Endangered Species in New York State, not listed federally.

This level of state protection means: listed species are those with: 1) 5 or fewer extant sites, or 2) fewer than 1,000 individuals, or 3) restricted to fewer than 4 U.S.G.S. 7 ? minute topographical maps, or 4) species listed as endangered by U.S. Department of Interior.

Rarity G5T5, S1

A global rarity rank of G5T5 means: Secure globally - Both the species as a whole and the subspecies/variety are common in the world; widespread and abundant (but may be rare in some parts of its range).
A state rarity rank of S1 means: This plant is endangered/critically imperiled in New York because of extreme rarity (typically 5 or fewer populations or very few remaining individuals) or is extremely vulnerable to extirpation from New York due to biological factors.

Conservation Status in New York

There are six existing populations but only two of them have over 100 plants. One population from 1989 has been overrun by Phragmites. There are seven records from the early 1900s through 1975 that have not been rediscovered but habitat still remains. Four populations from Western Long Island and Staten Island are now gone because they occurred in natural areas which no longer exist.

Short-term Trends

One population discovered in 1989 has been destroyed by Phragmites and other populations are threatened by it. Most populations have not been resurveyed and their short-term status is unknown.

Long-term Trends

This plant has always been rare in New York but the populations have declined in the last 100 years and may continue to decline. Many saltmarshes on Western Long Island and the New York City area have been developed or drained and habitat no longer exists. Phragmites is affecting present-day saltmarshes.

Conservation and Management

Threats

The failure to control the invasion of Phragmites and the failure to provide buffers from nearby developments that affect the quality of runoff and remove natural buffers are the largest threats.

Conservation Strategies and Management Practices

Control Phragmites invasions in the salt marshes where it exists and prevent new incursions. Natural buffers should be established around the salt marshes to decrease pollution runoff and other direct human disturbances.

Research Needs

Research is needed to discover habitat preferences that would allow the augmentation of existing populations.

Habitat

In New York, Coast Flatsedge grows in open, wet, sandy habitats influenced by saltwater, including high salt marshes, brackish meadows, pond shores, and roadside ditches (New York Natural Heritage Program 2010). Shores, ditches, swales between dunes (FNA 2002). Tidal river banks (Rhoads and Block 2000). Wet soil, mostly near the coast (Gleason and Cronquist 1991).

Associated Ecological Communities

Brackish Meadow
A moist, moderately well-drained brackish (salinity 0.5-18 ppt) perennial grassland with occasional isolated shrubs that is typically situated in a belt at the upper edge of salt marshes bordering sandy uplands, but may occupy large portions of interdunal basins. The community usually develops in areas with a unique combination of soils and hydrology, on deep deposits of periodically windblown or overwashed gleyed sands that are usually flooded only during spring tides and during major coastal storms, approximately two to three times per year.

Coastal Plain Pond Shore
The gently sloping shore of a coastal plain pond with seasonally and annually fluctuating water levels. Plants growing on the pond shore vary with water levels. In dry years when water levels are low there is often a dense growth of annual sedges, grasses, and herbs. Submerged and floating-leaved aquatic plants, such as fragrant waterlily and pondweeds, may become "stranded" on the exposed shore. In wet years when the water level is high only a few emergents and floating-leaved aquatics may be noticeable. The vegetation of this pond shore community can change dramatically from one year to the next depending on fluctuations in groundwater levels.

High Salt Marsh
A coastal marsh community that occurs in sheltered areas of the seacoast, in a zone extending from mean high tide up to the limit of spring tides. It is periodically flooded by spring tides and flood tides. High salt marshes typically consist of a mosaic of patches that are mostly dominated by a single graminoid species.

Other Probable Associated Communities

Saltwater tidal creek

Associated Species

Purple False Foxglove (*Agalinis purpurea*)
Perennial Bentgrass (*Agrostis perennans*)
Bearberry (*Arctostaphylos uva-ursi*)
Halberd-leaf Saltbush (*Atriplex patula*)
Eastern Baccharis (*Baccharis halimifolia*)
Densetuft Hairsedge (*Bulbostylis capillaris*)
Umbrella Flatsedge (*Cyperus diandrus*)
Inland Saltgrass (*Distichlis spicata*)
Marsh Fimbry (*Fimbristylis castanea*)
Yellow Iris (*Iris pseudacorus*)
Marsh Elder (*Iva frutescens*)
Black-grass Rush (*Juncus gerardii*)
Sea-lavender (*Limonium carolinianum*)
Pine-barren Sandwort (*Minuartia caroliniana*)
Green Carpet-weed (*Mollugo verticillata*)
Sweet Bayberry (*Myrica gale*)
Northern Bayberry (*Myrica pensylvanica*)

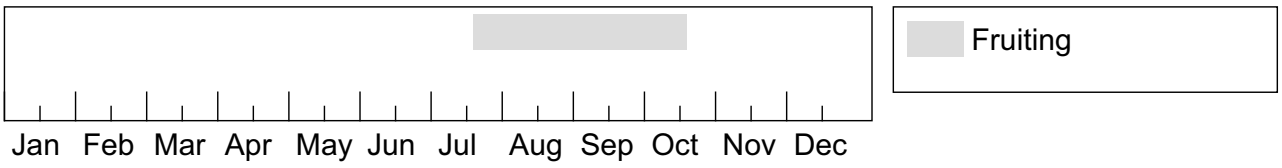
Switchgrass (*Panicum virgatum*)
Thin Paspalum (*Paspalum setaceum*)
Common Reed (*Phragmites australis*)
Pitch Pine (*Pinus rigida*)
Seaside Plantain (*Plantago maritima var. juncoides*)
Saltmarsh Fleabane (*Pluchea odorata*)
Wild Black Cherry (*Prunus serotina*)
Blunt Mountain Mint (*Pycnanthemum muticum*)
Sea Pink (*Sabatia stellaris*)
Dwarf Glasswort (*Salicornia bigelovii*)
Glasswort (*Salicornia depressa*)
Russian Thistle (*Salsola kali*)
Little Bluestem (*Schizachyrium scoparium*)
Three-square Bulrush (*Schoenoplectus americanus*)
Hooded Skullcap (*Scutellaria galericulata*)
Seaside Goldenrod (*Solidago sempervirens*)
Saltwater Cordgrass (*Spartina alterniflora*)
Saltmeadow Cordgrass (*Spartina patens*)
Trailing Fuzzybean (*Strophostyles helvula*)
Perennial Salt-marsh Aster (*Symphyotrichum tenuifolium var. tenuifolium*)
Canada Germander (*Teucrium canadense*)
Marsh St. John's Wort (*Triadenum virginicum*)
Seaside Arrowgrass (*Triglochin maritima*)
Southern Arrowwood (*Viburnum dentatum var. venosum*)

Identification Comments

Coast Flatsedge is a perennial, grass-like herb. Its stems are slender (up to 2 mm wide), 3-sided or more or less rounded, and up to 45 cm tall. It has 6 to 10 flat or V-shaped leaves, 1 to 4 mm wide and up to 30 cm long. The infloresence is subtended by 4 to 6 horizontal to ascending leafy bracts, and consists of a single spike. The spike may be either a single dense cluster of (15 to 30) spikelets or have the spikelets held on from 1 to 8 rays (branches) up to 3 cm long. The pistillate scales are straw-colored to light brown with a green stripe in the middle and a pointed tip. The fruit are laterally compressed, biconvex, minutely pitted achenes about 1 mm long (FNA 2002).

Best Life Stage for Identifying This Species

Coast Flatsedge is best identified when in mature fruit.



The time of year you would expect to find Coast Flatsedge in New York.

Similar Species

Cyperus flavescens and C. filicinus also have 2 sided achenes and light-colored pistillate scales. C. flavescens has relatively wider, egg-shaped pistillate scales about twice as long as wide, and C. filicinus has longer scales (2.5 to 3.5 mm long). Cyperus polystachyos var. texensis (our only variety in New York) has narrow (3 times as long as wide) and short (1.5 to 2.3 mm) pistillate scales (Gleason and Cronquist 1991).

Taxonomy

Kingdom Plantae
└ **Phylum** Anthophyta
└ **Class** Monocots (Monocotyledoneae)
└ **Order** Cyperales
└ **Family** Cyperaceae (Sedge Family)

Additional Common Names

Cyperus
Flat Sedge

Additional Resources

Links

USDA Plants Database
http://plants.usda.gov/java/nameSearch?mode=sciname&keywordquery=CYPERUS+POLYSTACHYOS+VAR+TEXENSIS

Google Images
http://images.google.com/images?q=CYPERUS+POLYSTACHYOS+VAR+TEXENSIS

NatureServe Explorer
http://natureserve.org/explorer/servlet/NatureServe?searchName=CYPERUS+POLYSTACHYOS+VAR+TEXENSIS

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New York Natural Heritage Program
625 Broadway, 5th Floor,
Albany, NY 12233-4757
Phone: (518) 402-8935
acris@nynhp.org

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This guide was authored by

Creeping Spikerush

Eleocharis fallax

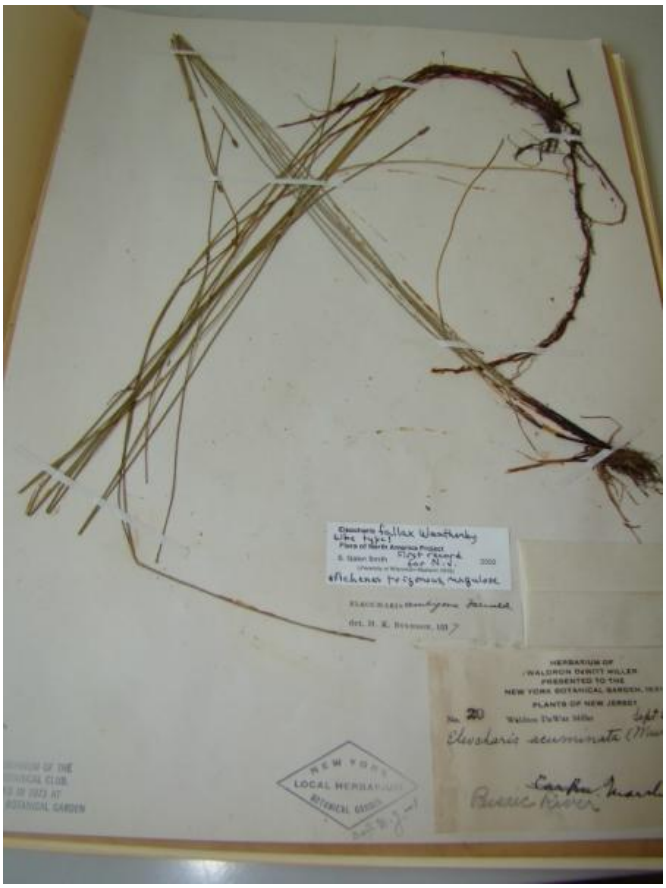


Photo credits: *Richard Ring*

Scientific Name *Eleocharis fallax* Weatherby

Family Name Cyperaceae Sedge Family

Did you know?
The species name fallax is Latin for deceitful or deceptive and its common name in some states is deceitful spike-rush. This refers to its close relationship to other similar species and the difficulty of telling them apart (Flora of North America Editorial Committee 2002). Another of its common names, creeping spike-rush, is also used for the more common Eleocharis palustris.

Summary

Protection Endangered Species in New York State, not listed federally.

This level of state protection means: listed species are those with: 1) 5 or fewer extant sites, or 2) fewer than 1,000 individuals, or 3) restricted to fewer than 4 U.S.G.S. 7 ? minute topographical maps, or 4) species listed as endangered by U.S. Department of Interior.

Rarity G4G5, S1

A global rarity rank of G4G5 means: Apparently or Demonstrably Secure globally - Uncommon to common in the world, but not rare; usually widespread, but may be rare in some parts of its range; possibly some cause for long-term concern due to declines or other factors. More information is needed to assign a single conservation status.
A state rarity rank of S1 means: This plant is endangered/critically imperiled in New York because of extreme rarity (typically 5 or fewer populations or very few remaining individuals) or is extremely vulnerable to extirpation from New York due to biological factors.

Conservation Status in New York

There are 2 existing very small populations which may be threatened by Phragmites and overuse of the surrounding wetlands. There are four occurrences from the early 1900s which have not been rediscovered.

Short-term Trends

Follow-up surveys have not been done to gather data about short-term trends.

Long-term Trends

This plant has always been very rare in New York but not enough data has been gathered to understand long-term trends.

Conservation and Management

Threats

Phragmites is a threat in the marshes where this occurs.

Conservation Strategies and Management Practices

Control Phragmites invasions in the salt marshes where it exists and prevent new incursions. Natural buffers should be established around the salt marshes to decrease pollution runoff and other direct human disturbances.

Research Needs

This species has had a confusing taxonomic history and herbarium specimens of all closely-related species should be examined to determine if more populations exist. Research could also be done to help augment existing populations.

Habitat

Only two New York sites with Eleocharis fallax have been described; one was an artificial, weedy wetland adjacent to a wastewater treatment plant, and the other an open wetland adjacent to small pond. More information on the habitat requirements of Creeping Spikerush in New York is needed (New York Natural Heritage Program 2010). Fresh to brackish pond and lakeshores, marshes (FNA 2002). Fresh and brackish swamps along the coast (Gleason and Cronquist 1991).

Associated Ecological Communities

Other Probable Associated Communities

Coastal plain pond
Coastal plain pond shore
Sewage treatment pond

Identification Comments

Spikerushes consist of a simple stem (the leaves bladeless and inconspicuous), with the infloresence consisting of a solitary, many-scaled spikelet at the top of the stem. The perianth (sepals and petals), if present, is reduced to bristles. The base of the style is expanded into a tubercle, and is usually persistent on the fruit (achenes).

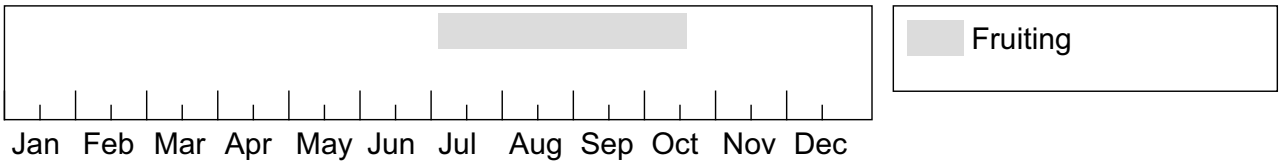
Eleocharis fallax is a perennial, mat-forming species with long rhizomes. The stems are round (often ridged in dry specimens), and 30 to 75 cm tall, with purplish bases. The leaf-sheaths are persistent with obtuse, firm, red tips. The spikelets are egg-shaped to rounded and 5 to 12 mm tall, and the floral scales are deciduous. There are 1 to 5, brown, stout, perianth bristles, unequal in length but none exceeding the achene. The achenes are either compressed 3-sided or thickly biconvex, with evident angles, and have an evidently pitted surface. The tubercles are whitish-brown, pyramid-shaped, and not depressed. (FNA 2002, Gleason and Cronquist 1991)

Best Life Stage for Identifying This Species

Specimens with complete stems and mature, intact fruits are needed for identification.

The Best Time to See

Creeping Spikerush's fruits mature in July and persist into October.



The time of year you would expect to find Creeping Spikerush in New York.

Taxonomy

Kingdom Plantae
└ **Phylum** Anthophyta
└ **Class** Monocots (Monocotyledoneae)
└ **Order** Cyperales
└ **Family** Cyperaceae (Sedge Family)

Additional Common Names

Spikerush

Synonyms

Eleocharis ambigens (Fern.)

Additional Resources

Links

USDA Plants Database
http://1.usa.gov/xRSf9X
Google Images
http://images.google.com/images?q=ELEOCHARIS+FALLAX
NatureServe Explorer
http://natureserve.org/explorer/servlet/NatureServe?searchName=ELEOCHARIS+FALLAX

Best Identification Reference

Gleason, Henry A. and A. Cronquist. 1991. Manual of Vascular Plants of Northeastern United States and Adjacent Canada. The New York Botanical Garden, Bronx, New York. 910 pp.

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New York Natural Heritage Program
625 Broadway, 5th Floor,
Albany, NY 12233-4757
Phone: (518) 402-8935
acris@nynhp.org

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This guide was authored by Stephen M. Young and Richard M. Ring

Conservation Guide

New York Natural Heritage Program

Fernald's Sedge

Carex merritt-fernaldii Stuart Koog

Scientific name *Carex merritt-fernaldii Mackenzie*

Family name Cyperaceae (Sedge Family)

Did you know?

The specific epithet merritt-fernaldii is named in honor of Merritt Fernald 1873-1950. Fernald discovered this species. He was one of the premier botanists in northeastern North America in the first half of the 20th century. He is the author of Gray's Manual of Botany, 8th edition, which has become the plant "bible" for this region.

Other Common Names

Sedge

How rare is it and why?

Protection Threatened Species in New York State, not listed federally.

This level of state protection means: listed species are those with: 1) 6 to fewer than 20 extant sites, or 2) 1,000 to fewer than 3,000 individuals, or 3) restricted to not less than 4 or more than 7 U.S.G.S. 7 ½ minute topographical maps, or 4) listed as threatened by U.S. Department of Interior.

Rarity G5, S2S3

A global rarity rank of G5 means: This species is demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.

A state rarity rank of S2S3 means: This plant is threatened/imperiled in New York because of rarity (typically 6-20 populations or few remaining individuals) or is vulnerable to extirpation from New York due to biological factors.

Reason(s) Rare in New York

While we are only aware of eight known populations, this plant is certainly overlooked. There are nearly 20 historical locations, but those may or may not be useful in locating new sites. This is a

disturbance-loving plant that may appear at a site for a short period of time and then return to the seed bank. As a Section Ovales sedge, many botanists either intentionally skip over identifying these or run into problems keying them out. With just a little experience, these can be easy to separate. More people who know how to identify this sedge are needed to search for it. With targetted surveys, additional populations are likely. These populations may be small though and the plant is subject to succession.

What are the conservation issues?

Threats

There are currently no threats known to Carex merritt-fernaldii in New York.

Management Considerations

No management is currently needed.

Research Needs

Since historical populations may be difficult to find due to habitat maturing at these populations, surveys should be conducted in likely habitat in the general region of these historical populations.

Short Term Trends

There are about a half dozen populations that have been seen in recent years. At a few of these populations the number of plants appears to have declined over a period of 10 or less years. Since this is a species of early successional habitat this should be expected. Other populations seen in recent years have only been seen once. These populations may have "reappeared" out of the seed bank as the result of a disturbance event. Since this is a species that fluctuates widely in above ground population size, it is difficult to assess short term trends. While one population may appear to be decreasing another population may be increasing. Overall, short term trends are not clear.

Long Term Trends

Currently only about a half dozen populations are known to be extant. There are approximately an additional 20 populations that have not been seen in recent years. It is unknown if these populations are still extant. Assessing the status of these populations might be difficult as C. merritt-fernaldii is a species that grows in early successional habitats and as the habitat matures, it remains dormant as seeds in the soil seed bank. Overall, long term trends are not clear.

Where is it found?

Habitat description

Carex merritt-fernaldii occurs on rocky outcrops, ledges, sandy deltas, sandy roadsides, fields, and abandoned railroad grades. It often grows in sandy soils. Some data from New York indicates that this species grows in calcareous sites but this information is probably based on misidentified specimens as C. merritt-fernaldii is a species of acidic soils (New York Natural Heritage Program 2006). Dry sands, gravels, rocky places, meadows, roadsides, on acidic substrates (Mastrogiuseppe et al. 2002). Carex merritt-fernaldii is a species of early successional habitat and appears, presumably from the seed bank, after physical disturbances or fire, and then gradually dies out as the habitat undergoes succession. Typical habitat includes sandy or gravelly roadsides and ditch banks, sand barrens, gravel and sand pits, and rock ledges, always in relatively sterile acidic soils (Rothrock and Reznicek 2001). Dry gravelly or rocky banks, dryish meadows and borders of woods (Fernald 1970).

Some good places to see it

Port Henry Railroad (Essex County)

The Diameter (Washington County)

Associated ecological communities

Sand beach

A sparsely vegetated community that occurs on unstable sandy shores of large freshwater lakes, where the shore is formed and continually modified by wave action and wind erosion. Characteristic species that are usually present at very low percent cover include various grasses and other herbs.

Cliff community

A community that occurs on vertical exposures of resistant, non-calcareous bedrock (such as quartzite, sandstone, or schist) or consolidated material; these cliffs often include ledges and small areas of talus.

Rocky summit grassland

A grassland community that occurs on rocky summits and exposed rocky slopes of hills. Woody plants are sparse and may be scattered near the margin of the community. Small trees and shrubs may be present at low percent cover.

Successional old field

A meadow dominated by forbs and grasses that occurs on sites that have been cleared and plowed (for farming or development), and then abandoned or only occasionally mowed.

Acidic talus slope woodland

An open to closed canopy woodland that occurs on talus slopes (slopes of boulders and rocks, often at the base of cliffs) composed of non-calcareous rocks such as granite, quartzite, or schist.

Pitch pine-oak-heath rocky summit

A community that occurs on warm, dry, rocky ridgetops and summits where the bedrock is non-calcareous (such as quartzite, sandstone, or schist), and the soils are more or less acidic. This community is broadly defined and includes examples that may lack pines and are dominated by scrub oak and/or heath shrubs apparently related to fire regime.

Roadcut cliff/slope

A sparsely vegetated cliff or steep slope, along a road, that was created by blasting or digging during road construction.

Gravel mine

An excavation in a gravel deposit from which gravel has been removed. Often these are dug into glacial deposits such as eskers or kames. Vegetation may be sparse if the mine is active; there may be substantial vegetative cover if the mine has been inactive for several years. Near-vertical slopes are used by bank swallows for nesting sites.

Sand mine

An excavation in a sand deposit or sand dune from which sand has been removed. Vegetation is usually sparse.

Other likely associated ecological communities

Cliff community

Rocky summit grassland

Successional old field

Acidic talus slope woodland

Pitch pine-oak-heath rocky summit

Roadcut cliff/slope

Gravel mine

Sand mine

What is its range?

New York State Distribution

Carex merritt-fernaldii occurs in northern, eastern, and southeastern New York including Long Island. It is also known from one disjunct population in western New York. The western New York population should be verified.

Global Distribution

Carex merritt-fernaldii is known from southwestern New Brunswick west to Maine, southern Quebec, southern Ontario, and southeastern Manitoba south to eastern Minnesota, Wisconsin, northern Michigan, New York, Connecticut and Massachusetts. It is also known from disjunct populations in northern Ohio and western New York. It is frequent in parts of New England and does not occur in large parts of southern Ohio, southern Michigan, and western New York because the acidic coarse soils that C. merritt-fernaldii prefers are lacking in these regions (Rothrock and Reznicek 2001, New York Natural Heritage Program 2006).

What does it look like?

Fernald's sedge is a tufted grass-like perennial. Leaves are 1.5-3.0 mm wide. As with other members of section Ovales, Fernald's sedge has two kinds of stems. Some stems have flower/fruit clusters (spikes) at their summits (reproductive stems) and some stems lack spikes (vegetative stems). The reproductive stems are 30-100 cm tall and have 4-10 stalkless spikes towards the top of the stems. The spikes have female flowers above and male flowers below. The female flowers develop into fruits (perigynia) which are 3.3-5.0 mm long, 2.3-3.5 mm wide, and papery thin (Mastrogiuseppe et al. 2002).

Identifying Characteristics

Carex merritt-fernaldii is densely cespitose and short rhizomatous or appears long rhizomatous in old clumps. The leaf sheaths are white hyaline adaxially and finely papillose. Leaf blades are 1.5-3.0 mm wide. Reproductive culms are 30-100 cm tall and the inflorescences are compact to open, or in large robust individuals they arch or nod. The spikes are (4-)6-8(-10) per culm, ovoid, and are rounded at the apices and bases. Pistillate scales are shorter than the perigynia. Perigynia are ascending, conspicuously 5-9 veined abaxially, veinless or faintly 1-5 veined adaxially, have broadly ovate to orbiculate bodies, are 2.3-3.5 mm wide, very papery thin, and have 1-2 veins in the yellowish wings (Mastrogiuseppe et al. 2002).

The best life stage for identifying this species

This species is easiest to identify when it has just immature to mature perigynia which are not yet easily shedding. Caution should also be taken to use only inflorescences from the culms produced during the initial spring flush.

The best time to see

Immature perigynia appear in mid-June, these mature to persist into late July, early August, and sometimes later. In the later part of this season the perigynia start to shed easily. In addition, occasional culms are produced throughout the growing season and these will produce flowers and fruits that mature later than the ones from the initial spring flush. These later culms will have more condensed inflorescences and are often not accounted for in floras and keys. Therefore, the best time to survey for Carex merritt-fernaldii is from mid-June to late July.

Other species similar to this one

Carex bicknellii is similar to C. merritt-fernaldii and the two share coriaceous leaves, papillose leaf sheaths, and relatively few culms per tussock (Rothrock and Reznicek 2001). Carex bicknellii differs in having translucent, reddish-brown tinged mature perigynium wings, pistillate scales reddish

brown, anthers longer [(2.4-)2.8-4.2 mm long], perigynia longer [(4.5-)5.1-6.7(-7.1) mm long] and wider [(2.4-)2.8-4.2 mm wide], and 4-8 adaxial veins over the achenes. In comparison, C. merritt-fernaldii has yellowish mature perigynium wings, pistillate scales yellowish brown, anthers shorter [1.3-2.6 mm long], perigynia shorter [3.3-5.0 mm long] and narrower [2.3-3.5 mm wide], and 1-5 faint adaxial veins over the achenes.

Carex brevior and C. molesta are perhaps somewhat similar. They have more coriaceous opaque perigynia with achenes not visible through the adaxial faces, perigynium wings at base of beak at most ciliate and somewhat symmetric, and smooth leaf sheaths. In comparison, C. merritt-fernaldii has more membranaceous translucent perigynia with achenes visible through the adaxial faces, perigynium wings at base of beak erose and asymmetric, and finely papillose leaf sheaths visible at high magnification (30-40X). In addition C. molesta has fewer spikes per culm [2-4(-5)] and shorter more compact inflorescences [1.3-3.0(-3.5) cm long]. In comparison, C. merritt-fernaldii has more spikes per culm [(4-)6-8(-10)] and longer sometimes more open inflorescences [1.5-5.0 cm long].

Additional Common Names

Sedge

Comments on the classification

Carex merritt-fernaldii is in section Ovales. It is also in the informal Carex brevior group which in New York includes C. bicknellii, C. brevior, C. molesta, and C. festucacea. Carex merritt-fernaldii is closest to C. bicknellii (Rothrock and Reznicek 2001). Gleason and Cronquist (1991) lumped C. merritt-fernaldii under C. brevior but the two species are quite distinct and C. merritt-fernaldii is actually more closely related to C. bicknellii (Rothrock and Reznicek 2001).

Additional Resources

Links

New York Flora Atlas

Flora of North America

Google

NatureServe

USDA Plants Database

Other references

Fernald, M.L. 1950. Gray's manual of botany. 8th edition. D. Van Nostrand, New York. 1632 pp.

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Conservation Guide

New York Natural Heritage Program

Great Plains Flatsedge

Scientific name *Cyperus lupulinus ssp. lupulinus*

Family name Cyperaceae (Sedge Family)

Cyperus lupulinus ssp. lupulinus Stephen M. Youn

Did you know?

A good way to remember that the scales of this subspecies are more loosely arranged around the fruit than the closely related Cyperus lupulinus ssp. macilentus, which has scales that tightly clasp the fruit, is that the name lupulinus refers to the hop genus Lupulus which has inflated fruits. This subspecies may be undercollected because it very closely resembles the common subspecies macilentus.

Other Common Names

Cyperus
Flat Sedge

How rare is it and why?

Protection Threatened Species in New York State, not listed federally.

This level of state protection means: listed species are those with: 1) 6 to fewer than 20 extant sites, or 2) 1,000 to fewer than 3,000 individuals, or 3) restricted to not less than 4 or more than 7 U.S.G.S. 7 ½ minute topographical maps, or 4) listed as threatened by U.S. Department of Interior.

Rarity G5T5?, S2

A global rarity rank of G5T5? means: This variety/subspecies is demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.

A state rarity rank of S2 means: This plant is threatened/imperiled in New York because of rarity (typically 6-20 populations or few remaining individuals) or is vulnerable to extirpation from New York due to biological factors.

This species has the following National Wetland Inventory (NWI) status: UPL - Obligate Upland: Plants of this wetland status are rarely found in wetlands. In fact, they are almost always limited to upland (i.e., non-wetland) situations (estimated wetland probability less than 1%).

Reason(s) Rare in New York

There are seven existing populations but most of them are from specimens identified after collections took place so there is no detailed information about their locations or populations. There are 15 historical populations that have not been actively surveyed.

What are the conservation issues?

Threats

The species occurs in open sandy environments which are often used for recreation or development but not enough survey work has been done to fully understand current threats.

Management Considerations

The open sandy habitat where this species grows needs to be protected from development and maintained in its open condition by preventing succession.

Research Needs

More herbarium work is needed to check specimens for correct identification. Habitat preference should be studied to understand why this species is not more common in a habitat that is common on Long Island. A search image needs to be refined to better locate this species among its closely related taxa.

Short Term Trends

Not enough survey work has been done to understand short-term trends.

Long Term Trends

Long-term trends are not yet fully understood. There are about 15 historical records mostly from Long Island but not enough survey work has been done to relocate these occurrences nor to understand how common this species is now.

Where is it found?

Habitat description

More information on this species' habitat requirements is needed. In New York it has been collected from sandy soils at beaches, railroads, roadsides, and pastures (New York Natural Heritage Program 2007). Dry woods and fields (Gleason and Cronquist 1991).

Some good places to see it

Sebonac Beach (Suffolk County)

Associated species

Lake Champlain Beachgrass (Ammophila breviligulata)

American Sea-rocket (Cakile edentula)

(Euphorbia po)

Seaside Spurge (Chamaesyce polygonifolia)

Sand-heather (Hudsonia tomentosa)

Hairy Pinweed (Lechea mucronata)

Russian Thistle (Salsola kali)

Seaside Goldenrod (Solidago sempervirens)

Associated ecological communities

Sand beach

A sparsely vegetated community that occurs on unstable sandy shores of large freshwater lakes, where the shore is formed and continually modified by wave action and wind erosion.

Characteristic species that are usually present at very low percent cover include various grasses and other herbs.

Railroad

A permanent road having a line of steel rails fixed to wood ties and laid on a gravel roadbed that provides a track for cars or equipment drawn by locomotives or propelled by self-contained motors. There may be sparse vegetation rooted in the gravel substrate. The railroad right of way may be maintained by mowing or herbicide spraying.

Construction/road maintenance spoils

A site where soil from construction work and/or road maintenance materials have been recently deposited. There is little, if any, vegetation.

Pastureland

Agricultural land permanently maintained (or recently abandoned) as a pasture area for livestock.

What is its range?

New York State Distribution

In New York most collections of this species are from Long island, with a few collections from the Hudson Valley to as far north as Albany County.

Global Distribution

Hop Sedge is found from Massachusetts through the Upper Midwest and Ontario, as far west as Minnesota, and south to North Carolina to , extending west to Texas, Missouri and Colorado. It is also disjunct to Oregon and Idaho.

What does it look like?

Hop sedge is a perennial sedge that grows from short tuberous rhizomes, from 1 to 5 dm tall. It has thin (.8-3.5 mm) leaves and a crowded, round, sessile spike. The leaves and bracts have scabrous margins. The spikelets are flattened and 2.5 to 5mm wide, and the achenes are trigonous, 1.4 to 2.2mm long, and about half as wide.

Identifying Characteristics

The best life stage for identifying this species

Fruiting individuals are needed to identify this plant.

The best time to see

This species fruits in late July, the fruits persistent into fall.

Other species similar to this one

The other subspecies of Cyperus lupulinus, C. luplinus ssp. macilentus, is more widely distributed in New York, has 3-7 floral scales whose margins clasp the achenes, whereas C.lupulinus ssp. lupulinus has 5 -22 floral scales, not touching the achenes. C. hougtonii and C. schweinitzii each tend to have shorter achenes and scales (Voss 1972).

Additional Common Names

Cyperus Flat Sedge

SYNONYMS

Cyperus filiculmis auct. non Vahl

Additional Resources

Links

Google

NatureServe

USDA Plants Database

New York Flora Atlas

Flora of North America

Other references

Flora of North America Editorial Committee. 2002. Flora of North America, North of Mexico. Volume 23. Magnoliophyta: Commelinidae (in part): Cyperaceae. Oxford University Press, New York. 608 pp.

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Weldy, Troy W. and David Werier. 2005. New York Flora Atlas. [S.M. Landry, K.N. Campbell, and L.D. Mabe (original application development), Florida Center for Community Design and Research. University of South Florida]. New York Flora Association, Albany, NY. Available on the web at (http://atlas.nyflora.org/).

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Conservation Guide

New York Natural Heritage Program

Large Fruited Fireweed

Scientific name *Erechtites hieraciifolius var. megalocarpus (Fern.) Cronq.*

Family name Asteraceae (Aster Family)

Stephen M. Youn

Did you know?

The Latin genus name was traditionally treated as grammatically feminine but the International Code of Botanical Nomenclature (naming code) states that names ending in "-ites" are to be treated as masculine. (Weldy, Troy and David Werier 2010). Therefore the species name has been changed from hieraciifolia in previous lists to hieraciifolius.

Other Common Names

Pilewort

How rare is it and why?

Protection Endangered Species in New York State, not listed federally.

This level of state protection means: listed species are those with: 1) 5 or fewer extant sites, or 2) fewer than 1,000 individuals, or 3) restricted to fewer than 4 U.S.G.S. 7 ½ minute topographical maps, or 4) species listed as endangered by U.S. Department of Interior.

Rarity G5T3, S1

A global rarity rank of G5T3 means: This variety/subspecies is either rare and local throughout its range (21 to 100 occurrences), or found locally (even abundantly at some of its locations) in a restricted range (e.g. a single physiographic region), or vulnerable to extinction throughout its range because of other factors.

A state rarity rank of S1 means: This plant is endangered/critically imperiled in New York because of extreme rarity (typically 5 or fewer populations or very few remaining individuals) or is extremely vulnerable to extirpation from New York due to biological factors.

Reason(s) Rare in New York

There are four existing populations but many thousands of plants on Fishers Island. More

populations are expected to be found on the North Fork and elsewhere on Eastern Long Island when surveys and identification are done late in the season when characters are best observed. There is only one, possibly two, records from the early 1900s.

What are the conservation issues?

Threats

There are no current threats known.

Research Needs

Research is needed to find out if this species is intermixed with the common variety or whether it can be assumed that plants found along saltmarshes are always the rare variety.

Short Term Trends

There is not enough recent information to assess short-term trends.

Long Term Trends

This plant has always been rare on Long Island and more populations are being found than were historically known.

Where is it found?

Habitat description

Plants occur on the upper edge of beaches in sand, gravel, and cobbles and sometimes border small brackish marshes and shrub thickets (New York Natural Heritage Program 2012). Saline coastal marshes (Gleason and Cronquist 1991).

Some good places to see it

No populations are known from locations accessible to the public.

Associated species

(Amaranthus)
Mexican Tea (Dysphania ambrosioides)
Black Nightshade (Solanum ptychanthum)
Beach Pea (Lathyrus japonicus)
Sea-chickweed (Honckenya peploides)
(Euthamia)
Dock-leaf Smartweed (Persicaria lapathifolia)
Seaside Spurge (Chamaesyce polygonifolia)
Seaside Goldenrod (Solidago sempervirens)
(Atriplex)

Associated ecological communities

Maritime shrubland

A shrubland community that occurs on dry seaside bluffs and headlands that are exposed to offshore winds and salt spray.

Maritime beach

A community with extremely sparse vegetation that occurs on unstable sand, gravel, or cobble ocean shores above mean high tide, where the shore is modified by storm waves and wind erosion.

High salt marsh

A coastal marsh community that occurs in sheltered areas of the seacoast, in a zone extending from mean high tide up to the limit of spring tides. It is periodically flooded by spring tides and flood tides. High salt marshes typically consist of a mosaic of patches that are mostly dominated by a single graminoid species.

Other likely associated ecological communities

High salt marsh

What is its range?

New York State Distribution

This tall herb has only been found on the North Fork of Long Island, Plum Island, and Fishers Island in Suffolk County.

Global Distribution

This herb is restricted to the coastal marshes of New Jersey, New York, Connecticut, and Massachusetts.

What does it look like?

This plant is an erect, coarse herb up to 2 meters tall. The leaves are succulent, alternate up the stem and the lower ones often wither at flowering time. They are 6-20 cm long and 2-8 cm wide and without petioles. The margins are coarsely toothed and sometimes weakly lobed. They become smaller up the stem and look like clasping bracts. There are 2-20 heads in the inflorescence and the involucre is long and tube-shaped with a swollen base. There are no ray flowers and white to yellowish disc flowers. The white fluffy pappus is very conspicuous in fruit. The fruit is 4-5 mm long with 16-20 nerves. Sometimes there are small hairs between the nerves (FNA 2006).

Identifying Characteristics

The best life stage for identifying this species

The best time to identify this species is in late in the season when it is in fruit.

The best time to see

This species comes up during the summer and flowers in late July through early September. It fruits in late September through October.

Other species similar to this one

The more common variety hieraciifolius is an upland plant with stems and leaves that are dry or turgid but not succulent. Its receptacles are 5-8 mm in diameter instead of 4-5 mm and the fruits are 2.3-3 mm long, not 4-5 mm and they have only 10-12 nerves on each face, not 16-20 like var. megalocarpus.

Additional Common Names

Pilewort

SYNONYMS

Erechtites megalocarpa Fern.

Comments on the classification

In agreement with article 62.4 of the International Code of Botanical Nomenclature (McNeill et al. 2006), Erechtites is masculine because it ends in ites and therefore adjectival specific epithets are to be modified to have a masuline ending (i.e. E. hier

Additional Resources

Links

Google

NatureServe

USDA Plants Database

Other references

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New York State Department of Environmental Conservation
Hudson River Estuary Program

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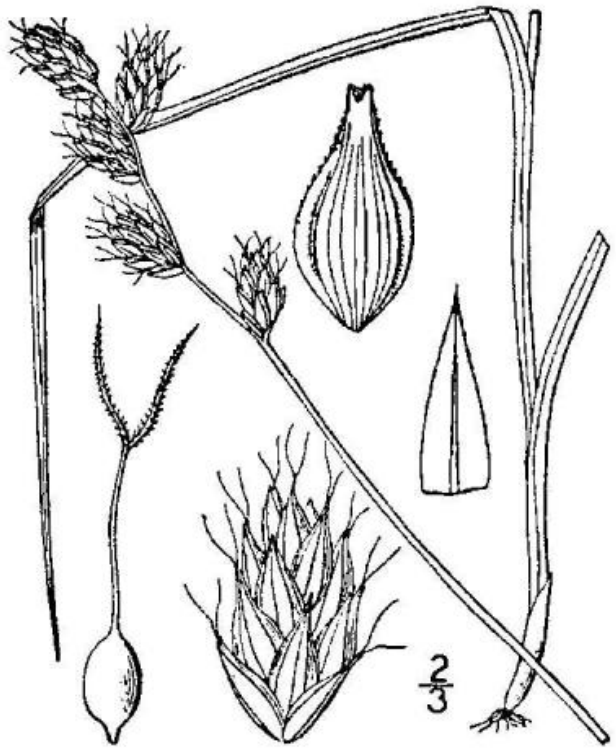
Marsh Straw Sedge

Carex hormathodes line drawing



Scientific Name *Carex hormathodes* Fern.

Family Name Cyperaceae
Sedge Family

Did you know?
Hormathodes means necklace-like (Fernald 1970) which is in reference to the spikes on the stems which appear somewhat like beads on a necklace. Some other species fit this description as well.

Photo credits: *Britton, N.L., and A. Brown (1913); downloaded from USDA-Plants Database.*

Summary

Protection Threatened Species in New York State, not listed federally.

This level of state protection means: listed species are those with: 1) 6 to fewer than 20 extant sites, or 2) 1,000 to fewer than 3,000 individuals, or 3) restricted to not less than 4 or more than 7 U.S.G.S. 7 ? minute topographical maps, or 4) listed as threatened by U.S. Department of the Interior.

Rarity G4G5, S2

A global rarity rank of G4G5 means: Apparently or Demonstrably Secure globally - Uncommon to common in the world, but not rare; usually widespread, but may be rare in some parts of its range; possibly some cause for long-term concern due to declines or other factors. More information is needed to assign a single conservation status.
A state rarity rank of S2 means: This plant is threatened/imperiled in New York because of

rarity (typically 6-20 populations or few remaining individuals) or is vulnerable to extirpation from New York due to biological factors.

Conservation Status in New York

There are fifteen known populations and over 20 historical sites. Many of the known sites are small or within degraded habitats. This plant is located along the upper borders of marsh habitats, a habitat that has been widely manipulated and subject to significant invasive species challenges. Phragmites and development have been the prime threats. As many as ten of the former historical locations are now extirpated. Additional populations are likley, but these may be small and also threatened by invasive species.

Short-term Trends

There are about 15 populations that have been seen in recent years. One population has over 100 plants. Three populations have under 50 plants. The extent and number of plants at the other populations is unknown. The limiting factor at many sites may be the extent of available habitat. Overall, short term trends are unclear.

Long-term Trends

In addition to the about 15 known extant populations there are at least 20 and probably up to about 30 populations that are only known from historical records. It is unknown if these populations are still extant. There are six populations which are known from Queens and Staten Island that are believed extirpated due to urban development. Long term trends clearly indicate a decline at least in the New York City region.

Conservation and Management

Threats

A few populations appear to be threatened by the invasive non-native species common reed (Phragmites australis ssp. australis). Trampling by people is another threat. Potential threats include habitat alteration due to road expansion and ditching.

Conservation Strategies and Management Practices

Phragmites should be monitored closely at sites where it appears to be negatively impacting C. hormathodes populations. If appropriate, the Phragmites should be controlled. At one population visitors needed to be prevented from trampling on the C. hormathodes. Ditching should be avoided at populations where C. hormathodes occurs.

Research Needs

Historical populations need to be surveyed to determine if they are still extant.

Habitat

Carex hormathodes occurs most commonly in and adjacent to salt or brackish coastal, or rarely slightly inland, tidal marshes. In these settings it can occur in dune swales and on dry or wet sands.

It also grows in fens, on margins of wetlands, and in wet forests adjacent to the coast (New York Natural Heritage Program 2006). Maritime rock ledges, brackish or freshwater marshes, moist coastal sands at sea level (Mastrogiuseppe et al. 2002). Brackish to fresh marshes, sands and rocks near the coast (Fernald 1970). Salt marshes and borders of salt marshes along the coast (Mackenzie 1931-1935).

Associated Ecological Communities

Brackish Interdunal Swales

Temporarily tidally flooded temperate marshes in interdunal swales dominated by salt-tolerant graminoids. Individual swales occur as small patches positioned between fore-, primary and secondary dunes in a maritime dunes system, typically on barrier islands.

Brackish Meadow

A moist, moderately well-drained brackish (salinity 0.5-18 ppt) perennial grassland with occasional isolated shrubs that is typically situated in a belt at the upper edge of salt marshes bordering sandy uplands, but may occupy large portions of interdunal basins. The community usually develops in areas with a unique combination of soils and hydrology, on deep deposits of periodically windblown or overwashed gleyed sands that are usually flooded only during spring tides and during major coastal storms, approximately two to three times per year.

Brackish Tidal Marsh

A marsh community that occurs where water salinity ranges from 0.5 to 18.0 ppt, and water is less than 2 m (6 ft) deep at high tide. The vegetation in a brackish tidal marsh is dense and dominated by tall grass-like plants.

High Salt Marsh

A coastal marsh community that occurs in sheltered areas of the seacoast, in a zone extending from mean high tide up to the limit of spring tides. It is periodically flooded by spring tides and flood tides. High salt marshes typically consist of a mosaic of patches that are mostly dominated by a single graminoid species.

Sea Level Fen

A wetland that occurs at the upper edge of salt marshes but is fed primarily by acidic groundwater seeping out along the upland edge. This fresh water sometimes mixes with salt or brackish water during unusually high tides. There is a high abundance of sedges that decompose slowly and create a deep substrate of peat. This peat is underlain by deep sand or gravel. These fens usually have a high diversity of herbs but may also have scattered trees and shrubs.

Other Probable Associated Communities

Brackish intertidal shore
Maritime beach
Maritime dunes

Associated Species

Seaside Bulrush (*Bolboschoenus maritimus ssp. paludosus*)
Manyspike Flatsedge (*Cyperus polystachyos*)
Switchgrass (*Panicum virgatum*)
Common Reed (*Phragmites australis ssp. australis*)
Saltmarsh Fleabane (*Pluchea odorata*)
Beach Plum (*Prunus maritima*)
Three-square Bulrush (*Schoenoplectus pungens*)
Saltmeadow Cordgrass (*Spartina patens*)

Identification Comments

Marsh straw sedge is a tufted grass-like perennial. There are 3-5 leaves per stem. These are strap-like and 1-3 mm wide. Stems are 20-80 cm tall and are taller than the leaves. Towards the top of the stems are 3-9 stalkless flower/fruit clusters (spikes). The upper part of the stem, where the spikes occur, nods. The spikes are 6-15 mm long, widest in the middle, and are composed of female flowers above and male flowers below. The female flowers develop into fruits (perigynia) which are 3.8-5.6 mm long and taper at their apex to a beak.

Identifying Characteristics

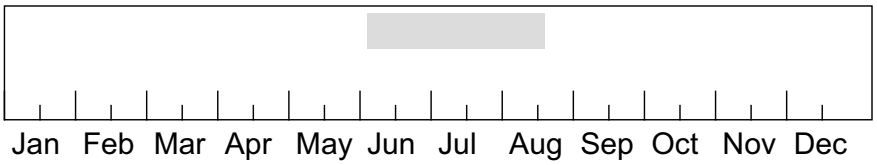
Carex hormathodes is densely cespitose and short rhizomatous. Leaf sheaths are green-veined adaxially with at most a short hyaline area at the summits. Leaf blades are 1-3 mm wide. The reproductive culms are 20-80 cm long and are terminated by a nodding inflorescence 2.5-6.0 mm long. There are 3-9 gynecandrous spikes that are distant or the upper somewhat approximate, ellipsoid, and gradually taper to the apex and base. The staminate portion of the lateral spikes is equal to or less than 2 mm. Pistillate scales are lanceolate and are acuminate to awned at their apex. Perigynia spread, are lance-ovate to barely obovate, 1.9-2.8 mm wide, and 3.8-5.6 mm long. Perigynium beaks are less than half the length of the body (Mastrogiuseppe et al. 2002).

Best Life Stage for Identifying This Species

The easiest time to identify C. hormathodes is when it possess just immature to mature perigynia which are not easily shedding.

The Best Time to See

Immature perigynia start in mid-June. These mature and persist till early August or sometimes later. Towards the end of this season the perigynia are shedding easily and the inflorescences tend to be more congested and less typical. Therefore, the best time to survey for C. hormathodes is from mid-June through July.



The time of year you would expect to find Marsh Straw Sedge in New York.

Similar Species

Carex hormathodes is the only Ovales sedge in New York, besides Carex silicea, that will appear in saline to brackish waters and sands. With Carex silicea, the pistillate scales are as long as or longer than the perigynia they subtend and are acute at the apex. In comparison, C. hormathodes has pistillate scales that are shorter than the perigynia they subtend and are acuminate to awned at the apex.

Carex straminea is closely related and superficially similar. Carex straminea has spikes globose, the bases of the pistillate portions abruptly tapering at their bases, and the staminate portions of the spikes 2-6 mm long. In comparison, C. hormathodes has spikes ellipsoid, the pistillate portions gradually tapering at their bases, and the staminate portions of the spikes equal to or less than 2 mm long. In addition, C. straminea has longer beaks, perigynia bodes somewhat orbiculate, and grows in freshwater wetlands. Carex hormathodes has shorter beaks, perigynia bodies lance-ovate to barely obovate, and grows in maritime areas often getting some salt spray.

Conservation Comments

Carex hormathodes is in section Ovales. It is sometimes treated as a variety of C. straminea, as in Gleason and Cronquist (1991), but C. hormathodes is distinct morphologically, ecologically, and geographically (Mastrogiuseppe et al. 2002).

Taxonomy

Kingdom Plantae
└ **Phylum** Anthophyta
└ **Class** Monocots (Monocotyledoneae)
└ **Order** Cyperales
└ **Family** Cyperaceae (Sedge Family)

Additional Common Names

Sedge

Synonyms

Carex straminea var. invisa (Boott)

Additional Resources

Links

USDA Plants Database
http://plants.usda.gov/java/nameSearch?mode=sciname&keywordquery=CAREX+HORMATHODES

NatureServe Explorer
http://natureserve.org/explorer/servlet/NatureServe?searchName=CAREX+HORMATHODES

Google Images
http://images.google.com/images?q=CAREX+HORMATHODES

Flora of North America
http://efloras.org/florataxon.aspx?flora_id=1&taxon_id=242357244

New York Flora Atlas
http://www.newyork.plantatlas.usf.edu/Plant.aspx?id=1170

Best Identification Reference

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(original application development), Florida Center for Community Design and Research http://www.fccdr.usf.edu/. University of South Florida http://www.usf.edu/

New York Natural Heritage Program
625 Broadway, 5th Floor,
Albany, NY 12233-4757
Phone: (518) 402-8935
acris@nynhp.org

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- Division of Lands & Forests, Department of Environmental Conservation
- New York State Office of Parks, Recreation and Historic Preservation

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This guide was authored by

Northern Blazing-star

Liatris scariosa var. novae-angliae

Photo credits: *Stephen M. Young*

Scientific Name *Liatris scariosa var. novae-angliae* (Lunell) Gandhi, S.M. Young & P. Somers

Family Name Asteraceae
Aster Family

Did you know?
The number and range of this plant has been greatly reduced on Long Island as development has reduced its open upland habitat. An interesting naming problem occurred with this variety as the name Liatris scariosa var. novae-angliae (meaning New England) was being used in botany manuals without first being formally published. This was corrected in 2003 with a formal recognition of the name. The origin of the name Liatris is unknown.

Summary

Protection Threatened Species in New York State, not listed federally.

This level of state protection means: listed species are those with: 1) 6 to fewer than 20 extant sites, or 2) 1,000 to fewer than 3,000 individuals, or 3) restricted to not less than 4 or more than 7 U.S.G.S. 7 ? minute topographical maps, or 4) listed as threatened by U.S. Department of the Interior.

Rarity G5?T3, S2

A global rarity rank of G5?T3 means: Vulnerable globally - The subspecies/variety is at moderate risk of extinction due to rarity or other factors; typically 80 or fewer populations or locations in the world, few individuals, restricted range, few remaining acres (or miles of stream), and/or recent and widespread declines. (The species as a whole is most likely common globally.)
A state rarity rank of S2 means: This plant is threatened/imperiled in New York because of rarity (typically 6-20 populations or few remaining individuals) or is vulnerable to extirpation from New York due to biological factors.

Conservation Status in New York

There are 19 existing populations but only four of these are in good condition. The rest are usually less than 100 plants each in small grassland or roadside habitats. There are approximately 30 historical occurrences but about 10 of these have been extirpated in Western Long Island and Westchester County.

Short-term Trends

The short-term trend seems stable although a few populations were extirpated by habitat alteration in recent years.

Long-term Trends

The long-term trend has been declining over the last 100 years as grassland habitats have become more fragmented by human development. There are only a few populations that remain in fairly large grasslands as others have held on in smaller grassland fragments or along roadsides. The 10 or so historical occurrences from Western Long Island, New York city and Westchester County are considered extirpated.

Conservation and Management

Threats

These plants may be lost to succession if the grassland communities are not maintained, preferrably by fire management. Roadside populations are threatened by improper mowing schedules which remove plants before they can disperse seed or by maintenance which can destroy plants. Some plants are threatened by house construction or by picking for flower arrangements. More study needs to be done to see if plants are being over-browsed by deer. Without periodic fires moth larvae eat the seeds of Liatris and reduce reproduction (Vickery 2002, Kane 2001).

Conservation Strategies and Management Practices

Grassland habitats need to be kept open by mowing, grazing, or preferrably by prescribed fires which increase seed production for (Vickery 2002, Kane 2001). Mowing schedules should avoid direct damage to plants. High dispersal populations can be targeted for management efforts to promote regeneration (Gravuer 2003).

Research Needs

More research is needed into maintenance techniques that will preserve and augment populations. Deer browse studies are needed to determine their effect (Kane 2001).

Habitat

In New York State this species occupies dry, sandy habitats, usually grasslands or grassy openings. Many of the extant sites are maritime grasslands, or grassy openings within maritime heathlands, though it also will inhabit open rocky summits, as well as artificially disturbed, weedy grasslands on sandy roadsides (New York Natural Heritage Program 2007). Prairies, open woods,

and other dry, open places (Gleason and Cronquist 1991). Dry argillaceous to siliceous open woods, thickets, and clearings (Fernald 1970).

Associated Ecological Communities

Farm Pond/artificial Pond
The aquatic community of a small pond constructed on agricultural or residential property. These ponds are often eutrophic, and may be stocked with panfish such as bluegill and yellow perch.

Maritime Heathland
A dwarf shrubland community that occurs on rolling outwash plains and moraine of the glaciated portion of the Atlantic coastal plain, near the ocean and within the influence of onshore winds and salt spray.

Other Probable Associated Communities

Maritime grassland
Red cedar rocky summit

Associated Species

Bearberry (*Arctostaphylos uva-ursi*)
Yellow Thistle (*Cirsium horridulum*)
Northern Bayberry (*Myrica pensylvanica*)
Canada Toadflax (*Nuttallanthus canadensis*)
Switchgrass (*Panicum virgatum*)
Pitch Pine (*Pinus rigida*)
Sickle-leaf Golden-aster (*Pityopsis falcata*)
Beach Plum (*Prunus maritima*)
White Oak (*Quercus alba*)

Identification Comments

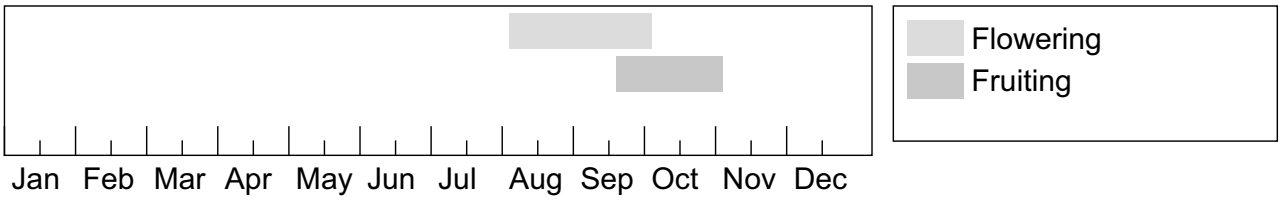
Northern Blazing-star is a perennial herb of the Aster family, growing up to 1.2 m tall. Its leaves are long (11 to 27 cm), narrow (.5 to 2.5 cm), and glabrous or minutely hairy. There are 5 to 30 flowering heads of disc flowers only, each on a peduncle 1-5 cm long. The flowers (35-60 per head) are a bright (blazing) pink, and tube-shaped, lending the heads a distinctive "shaggy" appearance.

Best Life Stage for Identifying This Species

This species is most easily spotted and identified when in flower, though it may be identified when fruiting as well.

The Best Time to See

Northern Blazing-star flowers and fruits in late summer, and may persist until frost.



The time of year you would expect to find Northern Blazing-star in New York.

Similar Species

L. scariosa var. angliae and L. cylindracea are the only Liatris species native in New York, and the only ones with the flowering heads on pedicels as long as the involucres. Liatris cylindracea differs from Liatris scariosa var. novae-angliae by its linear leaves (normally no more than 6 mm wide), and glabrous stem, and is a Midwestern species known in New York only from Niagara County.

Taxonomy

Kingdom Plantae
└ **Phylum** Anthophyta
└ **Class** Dicots (Dicotyledoneae)
└ **Order** Asterales
└ **Family** Asteraceae (Aster Family)

Additional Common Names

New England Blazing-star

Synonyms

Liatris borealis (auct. non Nutt.)
Liatris novae-angliae ((Lunell) Shinners)

Additional Resources

Links

New York Flora Atlas
http://www.newyork.plantatlas.usf.edu/Plant.aspx?id=492
USDA Plants Database
http://plants.usda.gov/java/nameSearch?mode=sciname&keywordquery=LIATRIS+SCARIOSA+VAR+NOVAE-ANGLIAE
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New York Natural Heritage Program
625 Broadway, 5th Floor,
Albany, NY 12233-4757
Phone: (518) 402-8935
acris@nynhp.org

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- New York State Department of Environmental Conservation Hudson River Estuary Program
- Division of Lands & Forests, Department of Environmental Conservation
- New York State Office of Parks, Recreation and Historic Preservation

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This guide was authored by

Oakes' Evening-primrose

Oenothera oakesiana in flower

Photo credits: *Stephen M. Young*

Scientific Name *Oenothera oakesiana* (Gray) J.W. Robbins ex S. Wats. & Coult.

Family Name Onagraceae
Evening-Primrose Family

Did you know?
The species name honors William Oakes (1799-1848), a famous New England botanist who first collected this plant. His career was cut short when he fell overboard from a ferry boat between Boston and East Boston and drowned. His name was used for another New York rare plant, Oakesia conradii, which later was changed to Corema conradii.

Summary

Protection Threatened Species in New York State, not listed federally.

This level of state protection means: listed species are those with: 1) 6 to fewer than 20 extant sites, or 2) 1,000 to fewer than 3,000 individuals, or 3) restricted to not less than 4 or more than 7 U.S.G.S. 7 ? minute topographical maps, or 4) listed as threatened by U.S. Department of the Interior.

Rarity G4G5Q, S2

A global rarity rank of G4G5Q means: Apparently or Demonstrably Secure globally - Uncommon to common in the world, but not rare; usually widespread, but may be rare in some parts of its range; possibly some cause for long-term concern due to declines or other factors. More information is needed to assign a single conservation status. The Q indicates this species? status as a distinctive full species is uncertain.
A state rarity rank of S2 means: This plant is threatened/imperiled in New York because of rarity (typically 6-20 populations or few remaining individuals) or is vulnerable to extirpation from New York due to biological factors.

Conservation Status in New York

There are six existing populations but only two of them have more than 100 plants. Their locations are in disturbed areas which may have a larger effect on population sizes from year to year. There are 26 historical occurrences but many of these have probably been extirpated by development of the open sandy areas.

Short-term Trends

Existing populations seem to be stable at low numbers but most populations have only been surveyed once.

Long-term Trends

Populations seem to be declining from historical numbers but this species is difficult to identify and may move around from one disturbance to another so trends are difficult to assess.

Conservation and Management

Threats

When plants occur along sand roads they are vulnerable to ORV traffic during the growing season. Improper road maintenance activities may also be a problem.

Conservation Strategies and Management Practices

This species needs disturbance to reduce competition from woody plants or more aggressive herbaceous plants but too much direct disturbance to the plants will reduce or eliminate the population. Its habitat could be disturbed in the non-growing season to open it up for seed germination and colonization but direct disturbance should be prevented during the growing season.

Research Needs

Research is needed into the demography of the species on Long Island. Information is needed about how much this species moves around among disturbances and if it establishes a seed bank.

Habitat

Most populations of this plant in New York occur on maritime dunes, though there are a few occurrences on disturbed, sandy soils along roadsides or streamsides in pine barrens (New York Natural Heritage Program 2010). Disturbed open places (Gleason and Cronquist 1991). Sandy or rocky shores, dunes, and clearings along the Great Lakes; occasionally inland along railroads, on sandy shores, in clearings or other disturbed places (Voss 1985).

Associated Ecological Communities

Maritime Dunes

A community dominated by grasses and low shrubs that occurs on active and stabilized dunes along the Atlantic coast. The composition and structure of the vegetation is variable depending on stability of the dunes, amounts of sand deposition and erosion, and distance from the ocean.

Mowed Roadside/pathway

A narrow strip of mowed vegetation along the side of a road, or a mowed pathway through taller vegetation (e.g., meadows, old fields, woodlands, forests), or along utility right-of-way

corridors (e.g., power lines, telephone lines, gas pipelines). The vegetation in these mowed strips and paths may be dominated by grasses, sedges, and rushes; or it may be dominated by forbs, vines, and low shrubs that can tolerate infrequent mowing.

Other Probable Associated Communities

Maritime pitch pine dune woodland
Pitch pine-oak forest

Associated Species

Annual Ragweed (*Ambrosia artemisiifolia*)
American Beachgrass (*Ammophila breviligulata ssp. breviligulata*)
Common Wormwood (*Artemisia vulgaris*)
Spotted Knapweed (*Centaurea stoebe ssp. micranthos*)
Canadian Horseweed (*Conyza canadensis*)
Poorjoe (*Diodia teres*)
White-top Fleabane (*Erigeron annuus*)
Beach Pinweed (*Lechea maritima*)
Perennial Ryegrass (*Lolium perenne*)
Sweet Bayberry (*Myrica gale*)
Switchgrass (*Panicum virgatum*)
Virginia Creeper (*Parthenocissus quinquefolia*)
Pitch Pine (*Pinus rigida*)
Largebracted Plantain (*Plantago aristata*)
Rugosa Rose (*Rosa rugosa*)
Seaside Goldenrod (*Solidago sempervirens*)

Identification Comments

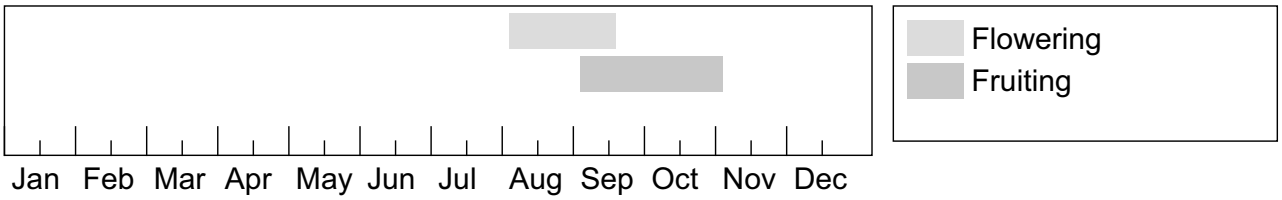
Oenothera oakesiana is an annual herb species with erect or ascending stems simple or branching from the base (the upper portion of the infloresence nodding at the tip), 0.5 to 2 m tall, and covered with long, spreading, whitish hairs. The leaves are gray-green in color, narrowly oblanceolate or elliptic, and entire or remotely toothed. The flowers are sessile, open at twilight, and are borne in the axils of the upper leaves. They have greenish or yellow sepals with red flecks or stripes, connivent at the base, and pale yellow petals 7 to 20 mm long. The fruit are rounded capsules thickest near their bases and 1.5 to 4.0 cm long, containing angular, unpitted seeds (Gleason and Cronquist 1991, Voss 1985, Rhoads 2000).

Best Life Stage for Identifying This Species

Plants in flower are easiest to identify, though those with mature fruit may also be identified.

The Best Time to See

Oeonother oakesiana flowers in August and into September, and the fruits may persist from September through October.



The time of year you would expect to find Oakes' Evening-primrose in New York.

Similar Species

Oenothera oakesiana is closely related to (and formerly considered a variety of) both O. biennis and to O. parviflora. O. biennis is distinguished from O. oakesiana by having its floresence erect to the tip and sepals closely connivent at the base. O. parviflora has brighter green leaves than those of O. oakesiana, and its infloresence has gland-tipped hairs (Rhoads 2000, Voss 1985).

Taxonomy

Kingdom Plantae
└ **Phylum** Anthophyta
└ **Class** Dicots (Dicotyledoneae)
└ **Order** Myrtales
└ **Family** Onagraceae (Evening-Primrose Family)

Synonyms

Oenothera parviflora ssp. angustissima ((Gates) Munz)
Oenothera parviflora var. *oakesiana* ((Gray) Fern.)

Additional Resources

Links

Google Images
http://images.google.com/images?q=OENOTHERA+OAKESIANA
NatureServe Explorer
http://natureserve.org/explorer/servlet/NatureServe?searchName=OENOTHERA+OAKESIANA
USDA Plants Database
http://plants.usda.gov/java/nameSearch?mode=sciname&keywordquery=OENOTHERA+OAKESIANA
Ohio DNR Rare Plant Abstracts
http://ohiodnr.com/Portals/3/Abstracts/Abstract_pdf/O/Oenothera%20oakesiana.pdf

Best Identification Reference

Gleason, Henry A. and A. Cronquist. 1991. Manual of Vascular Plants of Northeastern United States and

Conservation Guide

New York Natural Heritage Program

Retrorse Flatsedge

Stephen M. Youn

Scientific name *Cyperus retrorsus var. retrorsus*

Family name Cyperaceae (Sedge Family)

Did you know?

The species name means "turned backward or downward" and refers to the perigynia of the spikelets that face downward when mature (Fernald 1950). A collection on Jones Beach Island in 2003 was the first time it had been seen on the island since 1935.

Other Common Names

Cyperus
Flat Sedge

How rare is it and why?

Protection Endangered Species in New York State, not listed federally.

This level of state protection means: listed species are those with: 1) 5 or fewer extant sites, or 2) fewer than 1,000 individuals, or 3) restricted to fewer than 4 U.S.G.S. 7 ½ minute topographical maps, or 4) species listed as endangered by U.S. Department of Interior.

Rarity G5T5, S1

A global rarity rank of G5T5 means: This variety/subspecies is demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.

A state rarity rank of S1 means: This plant is endangered/critically imperiled in New York because of extreme rarity (typically 5 or fewer populations or very few remaining individuals) or is extremely vulnerable to extirpation from New York due to biological factors.

Reason(s) Rare in New York

There are three existing populations but there is no information on population size from any one of them. There are three populations, from 1899, the 1930s, and 1976 that have not been rechecked although habitat still exists. There are eight populations that are gone because their habitat no

longer exists.

What are the conservation issues?

Threats

The overuse of beaches and nearby swales and saltmarshes threaten this plant by direct disturbance and by the invasion of Phragmites.

Management Considerations

Beach and dune areas where it occurs should be protected from vehicle and human use. The Phragmites should be eliminated if it threatens populations.

Research Needs

Habitat preferences and reproduction success should be studied to understand how populations could be augmented at its present locations.

Short Term Trends

None of the known populations have been rechecked so there is no information on short-term trends.

Long Term Trends

There have never been more than 20 known populations in the state so this plan has always been rare. Many of its sites in the New York City area have been destroyed so it has not fared well over long-term.

Where is it found?

Habitat description

In New York this species has been collected from sandy coastal habitats including maritime dunes and the upper edges of a salt marsh. More information on the habitat requirements of this species in the state is needed (New York Natural Heritage Program 2010). Open woods and thickets in moist to dry, sandy soils (FNA 2002). Sandy barrens and coast (Gleason & Cronquist 1991).

Some good places to see it

Jones Beach State Park (Suffolk County)

Associated species

Sand-heather (Hudsonia tomentosa)
Beach Plum (Prunus maritima)
A Pinweed (Lechea pulchella)
Gray's Flatsedge (Cyperus grayi)
Eastern Prickly-pear (Opuntia humifusa)
Little Bluestem (Schizachyrium scoparium)
Common Evening-primrose (Oenothera biennis)
Seaside Goldenrod (Solidago sempervirens)

Associated ecological communities

Maritime dunes

A community dominated by grasses and low shrubs that occurs on active and stabilized dunes along the Atlantic coast. The composition and structure of the vegetation is variable depending on stability of the dunes, amounts of sand deposition and erosion, and distance from the ocean.

Maritime grassland

A grassland community that occurs on rolling outwash plains of the glaciated portion of the Atlantic coastal plain, near the ocean and within the influence of offshore winds and salt spray.

Maritime shrubland

A shrubland community that occurs on dry seaside bluffs and headlands that are exposed to offshore winds and salt spray.

Other likely associated ecological communities

Maritime grassland

Maritime shrubland

What is its range?

New York State Distribution

This flatsedge is currently known from Queens and Suffolk counties. It was historically known from most of Long Island, Staten Island and Westchester County.

Global Distribution

This flatsedge occurs along the Atlantic and Gulf coastal plain from Massachusetts and New York to Florida. It is also common inland from Virginia to Missouri and Oklahoma south to Texas.

What does it look like?

Coast Flatsedge is a perennial, clump-forming, grass-like herb. Its stems are slender (up to 2 mm wide) 3-sided, or more or less rounded, and up to 50 cm tall. It has 3 to 6 V or W-shaped leaves, 1.5 to 4 mm wide and up to 40 cm long. The infloresence consists of a single spike held on 4 to 8 rays (branches), up to 3.5 cm long, subtended by 4 to 6 ascending, rough-margined leafy bracts. There are 40 to 120 spikelets (each of 1 to 3 flowers) clustered into dense heads. The pistillate scales are persistent,appressed, straw-colored to brownish but green in the middle, with 3-4 ribs, and 1.8–2.5 mm long. The fruit are 3-sided, brown achenes 1.2 to 1.7 mm long (FNA 2002).

Identifying Characteristics

Distinguishing characteristics: perennial, ellipsoid-cylindric heads, lowest flowering scale 2-2.5 mm; stigmas three; achenes trigonous.

The best life stage for identifying this species

Mature fruit are needed for positive identification.

The best time to see

Retrorse Flatsedge's fruit appears in late July and persists through October.

Other species similar to this one

Cyperus echinatus has similar 3-sided achenes and few-flowered, dense heads, but differs by having large pistillate scales (lowest scale 3.5 to 4.3 mm versus 2 to 2.5 mm for C. retrorsus) and rounder heads (C. retrorsus has ellipsoid heads) (Gleason and Cronquist 1991).

Additional Common Names

Cyperus Flat Sedge

Additional Resources

Links

Google

NatureServe

USDA Plants Database

Other references

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Gleason, Henry A. and A. Cronquist. 1991. Manual of Vascular Plants of Northeastern United States and Adjacent Canada. The New York Botanical Garden, Bronx, New York. 910 pp.

Holmgren, Noel. 1998. The Illustrated Companion to Gleason and Cronquist's Manual. Illustrations of the Vascular Plants of Northeastern United States and Adjacent Canada. The New York Botanical Garden, Bronx, New York.

New York Natural Heritage Program. 2010. Biotics database. New York Natural Heritage Program. New York State Department of Environmental Conservation. Albany, NY.

Weldy, T. and D. Werier. 2010. New York flora atlas. [S.M. Landry, K.N. Campbell, and L.D. Mabe (original application development), Florida Center for Community Design and Research http://www.fccdr.usf.edu/. University of South Florida http://www.usf.edu/]. New York Flora Association http://wwws.nyflora.org/, Albany, New York

Zaremba, Robert E. 1991. Corrections to phenology list of April 9, 1991.

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New York State Department of Environmental Conservation
Hudson River Estuary Program

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Salt-marsh Spikerush

Eleocharis uniglumis var. halophila

Photo credits: *Stephen M. Young*

Scientific Name *Eleocharis uniglumis var. halophila* Fern. & Brack.

Family Name Cyperaceae Sedge Family

Did you know?
This is one of the few Eleocharis species in New York that can grow in salt water. Its variety name means "lover of salt."

Summary

Protection Threatened Species in New York State, not listed federally.

This level of state protection means: listed species are those with: 1) 6 to fewer than 20 extant sites, or 2) 1,000 to fewer than 3,000 individuals, or 3) restricted to not less than 4 or more than 7 U.S.G.S. 7 ? minute topographical maps, or 4) listed as threatened by U.S. Department of the Interior.

Rarity G4T4, S2

A global rarity rank of G4T4 means: Apparently Secure globally - Both the species as a whole and the subspecies/variety are uncommon in the world but not rare; usually widespread, but may be rare in some parts of its range; possibly some cause for long-term concern due to declines or other factors.
A state rarity rank of S2 means: This plant is threatened/imperiled in New York because of rarity (typically 6-20 populations or few remaining individuals) or is vulnerable to extirpation from New York due to biological factors.

Conservation Status in New York

There are seven existing populations and just over half of them are in good to excellent condition. There are 16 historical occurrences but many of these are probably gone although all of them should be surveyed again. Since this species is difficult to identify and is often overlooked there may be much more of it than is currently known.

Short-term Trends

The short-term trend seems stable as most populations have been about the same size when resurveyed.

Long-term Trends

The long-term trend is probably declining even though many of the historical occurrences have not been checked. That's because many of them are in areas that have seen much human activity and a few of them are even considered extirpated.

Conservation and Management

Threats

Populations in high marsh areas are being degraded by runoff and by the invasion of phragmites.

Conservation Strategies and Management Practices

Its habitat should be protected from the invasion by phragmites and from excessive and polluted runoff. Keeping high salt marsh in excellent condition is desirable.

Research Needs

There needs to be more research into the habitat preference of this species and why it prefers only a small portion of a larger habitat. Pheonology and taxonomic studies could be done to devise a better search image so populations could be located easier.

Habitat

In New York this species has been collected in a variety of habitat types, all in or near salty or at least brackish water, and most at the margin of fluctuating shorelines. So long as these basic requirements are met, it appears to tolerate soil substrates ranging from peaty to mucky to sandy (New York Natural Heritage Program 2007). Mainly of coastal salt marshes (Gleason & Cronquist 1991). Saline or brackish shores (Fernald 1970).

Associated Ecological Communities

Coastal Plain Pond

The aquatic community of the permanently flooded portion of a coastal plain pond with seasonally, and annually fluctuating water levels. These are shallow, groundwater-fed ponds that occur in kettle-holes or shallow depressions in the outwash plains south of the terminal moraines of Long Island, and New England. A series of coastal plain ponds are

often hydrologically connected, either by groundwater, or sometimes by surface flow in a small coastal plain stream.

Coastal Plain Pond Shore
The gently sloping shore of a coastal plain pond with seasonally and annually fluctuating water levels. Plants growing on the pond shore vary with water levels. In dry years when water levels are low there is often a dense growth of annual sedges, grasses, and herbs. Submerged and floating-leaved aquatic plants, such as fragrant waterlily and pondweeds, may become "stranded" on the exposed shore. In wet years when the water level is high only a few emergents and floating-leaved aquatics may be noticeable. The vegetation of this pond shore community can change dramatically from one year to the next depending on fluctuations in groundwater levels.

Other Probable Associated Communities

Brackish tidal marsh
High salt marsh
Low salt marsh

Associated Species

Waterhemp Pigweed (*Amaranthus cannabinus*)
Sweet Vernal Grass (*Anthoxanthum odoratum*)
Purple-stem Swamp Beggar-ticks (*Bidens connata*)
Devil's Beggartick (*Bidens frondosa*)
Shallow Sedge (*Carex lurida*)
Common Buttonbush (*Cephalanthus occidentalis*)
Asiatic Dayflower (*Commelina communis*)
Slender Flatsedge (*Cyperus bipartitus*)
Deer-tongue Witchgrass (*Dichanthelium clandestinum*)
Inland Saltgrass (*Distichlis spicata*)
Threeway Sedge (*Dulichium arundinaceum*)
Needle Spikerush (*Eleocharis acicularis*)
Purple-leaf Willow-herb (*Epilobium coloratum*)
Crimsoneyed Rosemallow (*Hibiscus moscheutos*)
Many-flowered Pennywort (*Hydrocotyle umbellata*)
Black-grass Rush (*Juncus gerardii*)
Rice Cutgrass (*Leersia oryzoides*)
Mudwort (*Limosella australis*)
Yellowseed False Pimpernel (*Lindernia dubia*)
Purple Loosestrife (*Lythrum salicaria*)
Japanese Stiltgrass (*Microstegium vimineum*)
Climbing Hempweed (*Mikania scandens*)
Switchgrass (*Panicum virgatum*)
Dotted Smartweed (*Persicaria punctata*)
Arrow-leaf Tearthumb (*Persicaria sagittata*)
Common Reed (*Phragmites australis*)
Saltmarsh Fleabane (*Pluchea odorata*)
Pickerelweed (*Pontederia cordata*)
Marsh Mermaidweed (*Proserpinaca palustris*)

Russian Thistle (*Salsola kali*)
Three-square Bulrush (*Schoenoplectus americanus*)
Woolgrass Bulrush (*Scirpus atrovirens*)
Cottongrass Bulrush (*Scirpus cyperinus*)
Climbing Nightshade (*Solanum dulcamara*)
Seaside Goldenrod (*Solidago sempervirens*)
Saltmeadow Cordgrass (*Spartina patens*)
New York Aster (*Symphyotrichum novi-belgii*)
Marsh Fern (*Thelypteris palustris*)
Marsh St. John's Wort (*Triadenum virginicum*)

Identification Comments

Spikerushes consist of a simple stem (the leaves bladeless and inconspicuous), with the infloresence a solitary, many-scaled spikelet at the top of the stem. The perianth (sepals and petals), if present, is reduced to bristles. The base of the style is expanded (called a tubercle), and is usually persistent on the fruit (achenes).

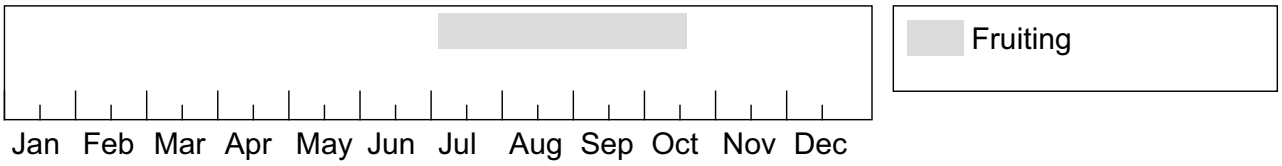
Eleocharis uniglumis var. halophila is perennial, growing from a rhizome and forming dense mats. The stems are 10 to 60 cm tall and only .2 to 1.5 mm wide. The spikelet is 5-10 by 2-3 (4)mm, coming to an acute point, with floral scales 1.8 to 2 mm wide. The flowers have from 0 to 4 perianth bristles the length of the achene or shorter.

Best Life Stage for Identifying This Species

Fruiting specimens are needed to identify this species.

The Best Time to See

The fruits of Salt-marsh Spikerush are visible from July through mid-October.



The time of year you would expect to find Salt-marsh Spikerush in New York.

Similar Species

This species is difficult to distinguish from several other spikerushes. Habitat information may help. Eleocharis erythropoda has a spikelet with the fertile scales narrower (less than 1.8mm wide) and more closely appressed together. Eleocharis palustris (sensu stricta) and Eleocharis smallii may have wider culms (0.5-5 mm thick at summit of upper sheath) and the perianth bristles are commonly elongate (those of E. uniglumis var. halophila are the length of the achene or smaller).

Taxonomy

Kingdom Plantae
└ **Phylum** Anthophyta
└ **Class** Monocots (Monocotyledoneae)
└ **Order** Cyperales
└ **Family** Cyperaceae (Sedge Family)

Additional Common Names

Spikerush

Additional Resources

Links

Natureserve
http://www.natureserve.org/
New York Flora Atlas
http://www.newyork.plantatlas.usf.edu/Plant.aspx?id=1033
Flora of North America
http://efloras.org/florataxon.aspx?flora_id=1&taxon_id=200026754
USDA Plants Database
http://plants.usda.gov/java/nameSearch?mode=sciname&keywordquery=ELEOCHARIS+HALOPHILA
Google Images
http://images.google.com/images?q=ELEOCHARIS+HALOPHILA
NatureServe Explorer
http://natureserve.org/explorer/servlet/NatureServe?searchName=ELEOCHARIS+HALOPHILA

Best Identification Reference

Gleason, Henry A. and A. Cronquist. 1991. Manual of Vascular Plants of Northeastern United States and Adjacent Canada. The New York Botanical Garden, Bronx, New York. 910 pp.

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New York Natural Heritage Program
625 Broadway, 5th Floor,
Albany, NY 12233-4757
Phone: (518) 402-8935
acris@nynhp.org

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- New York State Office of Parks, Recreation and Historic Preservation

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This guide was authored by

Conservation Guide

New York Natural Heritage Program

Scotch Lovage

Scientific name *Ligusticum scothicum ssp. scothicum*

Family name Apiaceae (Carrot Family)

Ligusticum scoticum Robert E. Zaremb

Did you know?

In the Gaspé peninsula of Québec scotch lovage is harvested and sold as a substitute for parsley and celery stalks and seeds (Union of agricultural producers 2010).

Other Common Names

Beach Lovage

How rare is it and why?

Protection Endangered Species in New York State, not listed federally.

This level of state protection means: listed species are those with: 1) 5 or fewer extant sites, or 2) fewer than 1,000 individuals, or 3) restricted to fewer than 4 U.S.G.S. 7 ½ minute topographical maps, or 4) species listed as endangered by U.S. Department of Interior.

Rarity G5T4T5, S1

A global rarity rank of G5T4T5 means: This variety/subspecies is likely secure globally, though it may be quite rare in parts of its range, especially at the periphery.

A state rarity rank of S1 means: This plant is endangered/critically imperiled in New York because of extreme rarity (typically 5 or fewer populations or very few remaining individuals) or is extremely vulnerable to extirpation from New York due to biological factors.

Reason(s) Rare in New York

There are six existing populations but only half of these have over 100 plants. The populations are declining from overharvest and Phragmites. There are two historical populations.

What are the conservation issues?

Threats

The reason for the decline in some populations is unknown but it may be succession of its salt marsh habitat.

Management Considerations

Protect the populations from human interaction and from the incursion of Phragmites.

Research Needs

Find out why the plants are disappearing on Long Island.

Short Term Trends

The plants are in decline in the last ten years because of phragmites invasion and overharvest of plants.

Long Term Trends

This plant has always been rare and most of the populations survived to the present.

Where is it found?

Habitat description

One population is located on stabilized dunes with low shrubs and scattered oaks on a barrier beach. Most of the plants are under red cedars with grasses and wildflowers. The soil is organic juniper leaves. Other plants are located on the edge of disturbed coastal oak-hickory forest located near the headwaters of a short tidal river or next to a high marsh or salt pond. They may also be on the steep eroded bank above the ocean (New York Natural Heritage Program 2012). Sandy or rocky seashores (Gleason and Cronquist 1991). Saline marshes and rocks along the shore (Fernald 1950).

Some good places to see it

Orient Beach State Park (Suffolk County)

Associated species

Seaside Goldenrod (Solidago sempervirens)
Eastern Poison Ivy (Toxicodendron radicans)
Eastern Prickly-pear (Opuntia humifusa)
(Oenothera)
Colt's Foot (Tussilago farfara)
Eastern Baccharis (Baccharis halimifolia)
Northern Bayberry (Myrica pensylvanica)
(Gnaphalium)
(Rosa)

Associated ecological communities

Coastal oak-hickory forest

A hardwood forest with oaks and hickories codominant that occurs in dry, well-drained, loamy sand of knolls, upper slopes, or south-facing slopes of glacial moraines of the Atlantic Coastal Plain.

High salt marsh

A coastal marsh community that occurs in sheltered areas of the seacoast, in a zone extending from mean high tide up to the limit of spring tides. It is periodically flooded by spring tides and flood tides. High salt marshes typically consist of a mosaic of patches that are mostly dominated by a single graminoid species.

Maritime red cedar forest

A conifer forest that occurs on dry sites near the ocean. Eastern red cedar is the dominant tree, often forming nearly pure stands. Other characteristic trees include post oak and black cherry.

What is its range?

New York State Distribution

All known occurrences are from Suffolk County on eastern Long Island and one historical record that is considered extirpated near Syracuse.

Global Distribution

This low herb reaches its southern limits on Long Island, where it is rare, and extends north through New England to the Maritime provinces, Québec, and Ontario.

What does it look like?

These are simple or branched, stout plants 3-6 decimeters tall and not rhizomatous but with a stout taproot. The leaves are thicker fleshy and can be shiny. The sheath of the upper leaf is less than 1 centimeters wide. They are divided once into 3 petioles and then once again with 3 leaflets at the end of each petiole to make a total of 9 leaflets. The leaflets are rhombic to obovate, widest at the top and 3-10 centimeters long. There are sharply toothed only above the middle. The lower half of the margin is without teeth and wedge-shaped at the base. The umbels are compound with 10-20 rays. The bractlets are linear and the sepals can be seen at a magnification of 10x. The fruit is oblong and 6-10 millimeters long with prominent ribs that are narrowly winged. The enlarged base of the style is well developed and the reflexed styles are scarcely longer than the enlarged base.

Identifying Characteristics

The best life stage for identifying this species

It is best to identify this plant when it is in flower or fruit.

The best time to see

The plants come up in May and flower from July to September. The fruits are visible September through November.

Other species similar to this one

Angelica lucida, seacoast angelica, is in the same habitat and may look similar but its leaves have more leaflets and they are serrate to the base. The teeth can be whitish at the tips. The terminal leaflet is 3-lobed or with 3 leaflets and with two simple leaflets below it. The flowers have no or only a few narrow bractlets and they soon fall off. The fruits are wider and shorter and the ribs are not winged.

Additional Common Names

Beach Lovage

SYNONYMS

Ligusticum scoticum auct. non

Ligusticum scothieum

Additional Resources

Links

Google

NatureServe

USDA Plants Database

Gaspe peninsula agricultural producers

Other references

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Seabeach Knotweed

Polygonum glaucum

Photo credits: *Kimberly J. Smith*

Scientific Name *Polygonum glaucum* Nutt.

Family Name Polygonaceae Buckwheat Family

Did you know?
Even though this beach plant seems secure on Long Island, our state has the most populations in the world and the species is much more rare in other parts of its range.

Summary

Protection Rare in New York State, not listed federally.

This level of state protection means: listed species have: 1) 20 to 35 extant sites, or 2) 3,000 to 5,000 individuals statewide.

Rarity G3, S3

A global rarity rank of G3 means: This species is either rare and local throughout its range (21 to 100 occurrences), or found locally (even abundantly at some of its locations) in a restricted range (e.g. a single physiographic region), or is vulnerable to extinction throughout its range because of other factors.
A state rarity rank of S3 means: This plant is rare in New York (typically 21-50 populations, limited number of individuals, or limited range).

Conservation Status in New York

There are 43 existing populations but about half of them are small with less than 100 plants. There are no other older populations which have not been rediscovered. Numbers fluctuate from year to year in its dynamic beach habitat so quantity and quality of populations are based upon five-year averages.

Short-term Trends

Short-term trends seem stable although there can be wide fluctuations in plant numbers from year to year.

Long-term Trends

Populations have remained relatively stable since it was first documented in 1861 and New York harbors the largest number of populations in the world.

Conservation and Management

Threats

The plants are subject to the natural threats of storm damage and succession by beachgrasses. Humans threaten the plants by driving over them with vehicles, beach raking, and by trampling them.

Conservation Strategies and Management Practices

Seabeach knotweed needs wide natural beaches free from vehicle use and excessive trampling. The use of string fencing provides enough protection to enable it to germinate and produce fruit.

Research Needs

There are a number of research needs to understand its distribution, germination and growth, and interaction with its environment.

Habitat

In New York Polygonum glaucum is known only from maritime beaches and the margins of adjacent dunes and salt marshes. It may be the dominant plant in areas of little or no other vegetation. It grows in open conditions on a variety of substrates, including, sand, silt, pebbles or cobbles, and dredging spoils (New York Natural Heritage Program 2011). Maritime beaches (FNA 2005). Sandy beaches (Gleason and Cronquist 1991).

Associated Ecological Communities

Maritime Beach
A community with extremely sparse vegetation that occurs on unstable sand, gravel, or cobble ocean shores above mean high tide, where the shore is modified by storm waves and wind erosion.

Maritime Dunes
A community dominated by grasses and low shrubs that occurs on active and stabilized dunes along the Atlantic coast. The composition and structure of the vegetation is variable depending on stability of the dunes, amounts of sand deposition and erosion, and distance from the ocean.

Other Probable Associated Communities

High salt marsh

Associated Species

Common Yarrow (*Achillea millefolium*)
Carelessweed (*Amaranthus palmeri*)
Lake Champlain Beachgrass (*Ammophila breviligulata*)
Clasping-leaf Dogbane (*Apocynum cannabinum*)
Field Sagewort (*Artemisia campestris ssp. caudata*)
Beach Wormwood (*Artemisia stelleriana*)
Garden Asparagus (*Asparagus officinalis*)
Atriplex arenaria
Crested Saltbush (*Atriplex cristata*)
Halberd-leaf Saltbush (*Atriplex patula*)
Eastern Baccharis (*Baccharis halimifolia*)
Seacoast Bulrush (*Bolboschoenus robustus*)
American Sea-rocket (*Cakile edentula*)
Seaside Spurge (*Chamaesyce polygonifolia*)
Chicory (*Cichorium intybus*)
Winged Pigweed (*Cycloloma atriplicifolium*)
Autumn Olive (*Elaeagnus umbellata*)
Sea-chickweed (*Honckenya peploides ssp. robusta*)
Marsh Elder (*Iva frutescens*)
Red Cedar (*Juniperus virginiana*)
Beach Pea (*Lathyrus japonicus*)
Field Pepperweed (*Lepidium campestre*)
Japanese Daisy (*Leucanthemum nipponicum*)
Sweet Bayberry (*Myrica gale*)
Oriental Poppy (*Papaver orientale*)
Seaside Plantain (*Plantago maritima var. juncoides*)
Small's Knotweed (*Polygonum aviculare ssp. buxiforme*)
Common Purslane (*Portulaca oleracea*)
Rambler Rose (*Rosa multiflora*)
Russian Thistle (*Salsola kali*)
Seaside Goldenrod (*Solidago sempervirens*)
Horned Sea-blite (*Suaeda calceoliformis*)
Common Dandelion (*Taraxacum officinale*)
Eastern Poison Ivy (*Toxicodendron radicans*)
Purple Sandgrass (*Triplasis purpurea*)
Canada Cockle-bur (*Xanthium strumarium var. canadense*)

Identification Comments

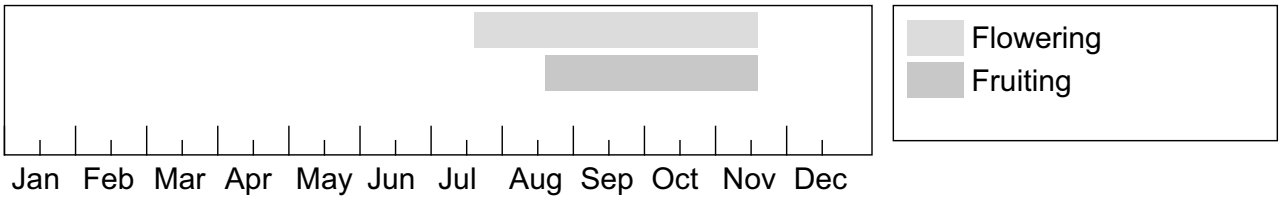
Seabeach Knotweed is a silvery or whitish annual herb, with prostrate or somewhat ascending stems, branching from the base and up to 70 centimeters long. A characteristic of all Polygonum species is that their stipules are united to form a sheath around the stem (called an "ocrea") at each node. In this species the ocrea is 7 to 15 millimeters long, with the proximal part glaucous. The leaves are 10 to 30 mm long with the edges rolled under. The flowers are in clusters of 1 to 3, emerging from the leaf axils, each flower with 8 stamens and 5 tepals. The tepals are 3 to 4 mm long and white (sometimes with pink edges). The fruit are reddish -brown, smooth, 3-sided achenes 2.5 to 3 mm long (late season achenes may reach 5 mm) exserted (sticking out) from the perianth (FNA 2005).

Best Life Stage for Identifying This Species

Seabeach knotweed is most easily identified in fruit, though it may be identifed in vegetative form as well.

The Best Time to See

Seabeach Knotweed flowers beginning in July and the fruits may persist past the first frost.



The time of year you would expect to find Seabeach Knotweed in New York.

Similar Species

Small's Knotweed is another Polygonum species rare in New York which occupies maritime beaches and dunes. among the Polygonum species present within New York. It differs from P. glaucum by having ocreas only half as long (up to 6.5 mm) and not glaucous, leaves not glaucous or revolute, cucullate flowers, and achenes not exserted from the perianth.

Taxonomy

Kingdom Plantae
- **Phylum** Anthophyta
  - **Class** Dicots (Dicotyledoneae)
    - **Order** Polygonales
      - **Family** Polygonaceae (Buckwheat Family)

Synonyms

Polygonum maritimum (L.)
Polygonum raii (Bab.)

Additional Resources

Links

Google Images
http://images.google.com/images?q=POLYGONUM+GLAUCUM
NatureServe Explorer
http://natureserve.org/explorer/servlet/NatureServe?searchName=POLYGONUM+GLAUCUM
USDA Plants Database
http://plants.usda.gov/java/nameSearch?mode=sciname&keywordquery=POLYGONUM+GLAUCUM

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New York Natural Heritage Program
625 Broadway, 5th Floor,
Albany, NY 12233-4757
Phone: (518) 402-8935
acris@nynhp.org

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Conservation Guide

New York Natural Heritage Program

Spring Ladies'-tresses

Spiranthes vernalis flowers Stephen M. Youn

Scientific name *Spiranthes vernalis Engelm. & Gray*

Family name Orchidaceae (Orchid Family)

Did you know?

This orchid can grow twice as tall as any other ladies tresses orchid in New York. Even though it blooms in mid summer here its species name means spring-blooming. This happened because it was originally described from the Southern United States where it blooms in the spring (Fernald 1950).

How rare is it and why?

Protection Endangered Species in New York State, not listed federally.

This level of state protection means: listed species are those with: 1) 5 or fewer extant sites, or 2) fewer than 1,000 individuals, or 3) restricted to fewer than 4 U.S.G.S. 7 ½ minute topographical maps, or 4) species listed as endangered by U.S. Department of Interior.

Rarity G5, S1

A global rarity rank of G5 means: This species is demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.

A state rarity rank of S1 means: This plant is endangered/critically imperiled in New York because of extreme rarity (typically 5 or fewer populations or very few remaining individuals) or is extremely vulnerable to extirpation from New York due to biological factors.

This species has the following National Wetland Inventory (NWI) status: FAC - Facultative: Plants of this wetland status are equally likely to occur in wetlands or non-wetlands (estimated wetland probability 34%-66%).

Reason(s) Rare in New York

There are eight existing populations but only three of them have been seen in recent years. All except one of them have fewer than 100 plants each. There are 26 records from the late 1800s through 1975 which need rechecking to see if they still exist. Nine populations no longer exist because their habitat has been destroyed.

What are the conservation issues?

Threats

This orchid occurs in successional areas so the failure to maintain this habitat is a threat. A number of occurrences appear to be declining perhaps due to collecting.

Management Considerations

The early-succession disturbance regime needs to be maintained at the existing populations.

Research Needs

More demographic studies are needed to follow populations through time to see if they come up every year and to understand fluctuations in population size.

Short Term Trends

The short-term trend of this orchid is unknown because there have not been enough recent surveys to determine whether the plants are still at four of the known populations.

Long Term Trends

It seems that there has been a severe decline in populations of last 100 years. There were 35 known locations and nine of these have been confirmed extirpated. More survey work is needed at known sites older than 30 years to confirm this decline.

Where is it found?

Habitat description

Maritime grassland with Andropogon scoparius, Danthonia spicata, Chrysopsis mariana and Aster paternus; disturbed grassland with Andropogon scoparius; sandpit with some areas but mostly overgrown with Andropogon scoparius, Solidago nemoralis, Solidago tenuifolia and Sorghastrum nutans; meadow with Drosera; grassy abandoned road in successional maritime forest; interdunal swales; meadow; moist sand; dry grassy ground; dry hills; edge of thicket; moist rocky hillside; cattail swamp; brackish meadow (New York Natural Heritage Program 2011). Dry to moist meadows, dune hollows, prairies, old fields, roadsides, cemeteries, lawns (FNA 2002). Open, sandy, moist or dry acid soil (Gleason & Cronquist 1991). Dry to moist siliceous, argillaceous or gravelly fields, clearings and swales (Fernald 1970).

Some good places to see it

Sensitive species. No locations given.

Associated species

Little Bluestem (Schizachyrium scoparium)

Maryland Golden Aster (Chrysopsis mariana)

Yellow Indiangrass (Sorghastrum nutans)

Late Purple Aster (Symphyotrichum patens var. patens)

Poverty Oatgrass (Danthonia spicata)

Field Goldenrod (Solidago nemoralis)

Slender Flattop Goldenrod (Euthamia caroliniana)

Associated ecological communities

Maritime grassland

A grassland community that occurs on rolling outwash plains of the glaciated portion of the Atlantic coastal plain, near the ocean and within the influence of offshore winds and salt spray.

Maritime beech forest

A hardwood forest with American beech as a dominant that usually occurs on north-facing exposed bluffs and the back portions of rolling dunes in well-drained fine sands. Wind and salt spray cause the trees to be stunted (average height 4 m to 15 m) and multiple-stemmed with contorted branches, especially on the exposed bluffs.

Maritime freshwater interdunal swales

A mosaic of wetlands that occur in low areas between dunes along the Atlantic coast; the low areas (swales) are formed either by blowouts in the dunes that lower the soil surface to groundwater level, or by the seaward extension of dune fields. Water levels fluctuate seasonally and annually. Sedges and herbs are usually the most abundant types of plants. These wetlands may be quite small (less than 0.25 acre).

Maritime pitch pine dune woodland

A maritime woodland that occurs on stabilized parabolic dunes. The substrate is wind and wave deposited sand that is usually excessively well-drained and nutrient poor. The community is subject to high winds, sand-blasting, salt spray, and shifting substrate.

Maritime heathland

A dwarf shrubland community that occurs on rolling outwash plains and moraine of the glaciated portion of the Atlantic coastal plain, near the ocean and within the influence of onshore winds and salt spray.

Maritime dunes

A community dominated by grasses and low shrubs that occurs on active and stabilized dunes along the Atlantic coast. The composition and structure of the vegetation is variable depending on stability of the dunes, amounts of sand deposition and erosion, and distance from the ocean.

Other likely associated ecological communities

Maritime beech forest

Maritime pitch pine dune woodland

Maritime heathland

What is its range?

New York State Distribution

This work is currently known from Suffolk County, Long Island with historical records to the west in Nassau County, Staten Island, and the Bronx. There is an unconfirmed report from Dutchess County.

Global Distribution

This orchid is widespread east of the short grass prairies but absent from Northern New England and with only scattered populations in the northern tier of states from South Dakota to Massachusetts.

What does it look like?

Spring Ladies-tresses is a perennial orchid species growing from numerous thick (up to 1 centimeter) roots. It has a cluster of 4 to 5 narrow, grass-like basal leaves, 1 centimeter wide and up to 25 centimeters long, the stem leaves reduced to small bracts subtending the flowers. The single

stem is densely covered with pointed, downy hairs, bearing flowers in a spiralling (or sometimes one-sided) infloresence 5 to 25 cm long.The flowers consist of an upper hood of 3 fused tepals, a lower lip consisting of a single tepal, and 2 lateral tepals. They are small (6-12 millimeters long and 2-3 mm wide) and white or cream-colored, with a yellow patch in the center of the lip (FNA 2002).

Identifying Characteristics

The best life stage for identifying this species

Spiranthes vernalis is best identified when in flower.

The best time to see

Flowers late July through August.

Other species similar to this one

The narrow, grass-like basal leaves and presence of dense, non-glandular hairs separate Spring Ladies' tresses from the seven other Spiranthes species in New York.

SYNONYMS

Spiranthes praecox (Walt.) S. Wats.

Ibidium vernale (Engelm. & A. Gray) House

Ibidium praecox (Walt.) House

Additional Resources

Links

Google

NatureServe

USDA Plants Database

Missouri Plants

Nearctica - Eastern Wildflowers

Kansas Wildflowers and Grasses

Massachusetts Natural Heritage Program

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Conservation Guide

New York Natural Heritage Program

Velvet Panic Grass

Scientific name *Dichanthelium scoparium (Lam.) Gould*

Family name Poaceae (Grass Family)

Did you know?

The name for the genus comes from the Greek words meaning two-flowering, and refers to the 2 flowering periods of these grasses, once on the primary stalk in the spring and again on the branches in late summer (Flora North America Editors 2003). The species name means broom-like (Fernald 1950). This species is in the section Clandestina with two other related species, Dichanthelium clandestinum, the common deer-tongue grass, and the New York rare grass Dichanthelium scabriusculum.

How rare is it and why?

Protection Endangered Species in New York State, not listed federally.

This level of state protection means: listed species are those with: 1) 5 or fewer extant sites, or 2) fewer than 1,000 individuals, or 3) restricted to fewer than 4 U.S.G.S. 7 ½ minute topographical maps, or 4) species listed as endangered by U.S. Department of Interior.

Rarity G5, S1

A global rarity rank of G5 means: This species is demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.

A state rarity rank of S1 means: This plant is endangered/critically imperiled in New York because of extreme rarity (typically 5 or fewer populations or very few remaining individuals) or is extremely vulnerable to extirpation from New York due to biological factors.

This species has the following National Wetland Inventory (NWI) status: FACW - Facultative Wetland: Plants of this wetland status are typically found in wetlands (estimated wetland probability 67%-99%), but are occasionally found in non-wetland settings.

Reason(s) Rare in New York

There is one existing population on Staten Island although it has been subject to succession in the last 20 years and may only survive in the seed bank waiting for the right disturbance. There are five populations from the early 1900s through the 1950s which have not been rediscovered although habitat still exists. There are two populations that are now gone because their habitat has been developed.

What are the conservation issues?

Threats

The existing population is threatened by succession of nearby shrubs and successional species.

Management Considerations

This species needs disturbance to reduce competition from woody plants or more aggressive herbaceous plants but too much direct disturbance to the plants will reduce or eliminate the population. Its habitat could be disturbed in the non-growing season to open it up for seed germination and colonization but direct disturbance should be prevented during the growing season.

Research Needs

Research is needed to determine the proper disturbance schedule for this grass.

Short Term Trends

The only existing population was last seen in 1992 and has been rechecked once and not seen. It may still exist in the seed bank waiting for the proper disturbance.

Long Term Trends

Although this plant was always rare with fewer than 10 occurrences documented in the state it has now been reduced to one population which may or may not still be there. More active surveying may discover new populations since this plant is difficult to identify.

Where is it found?

Habitat description

The only extant site for this species in the state is a grassland on serpentine soils. However, the historical record shows collections from non-serpentine wetlands in the New York City and Long Island areas (New York Natural Heritage Program 2010). Moist, sandy, often disturbed areas (FNA 2003). Wet soil (Gleason & Cronquist 1991). Damp thickets, swales and shores (Fernald 1970).

Some good places to see it

Belmont Lake State Park (Suffolk County)

Associated species

Little Bluestem (Schizachyrium scoparium)

Globe Flatsedge (Cyperus echinatus)

()

Associated ecological communities

Serpentine barrens

A grass-savanna community that occurs on shallow soils over outcrops of serpentine bedrock. In New York this community is known only from Staten Island, where the remnants are

relatively disturbed.

What is its range?

New York State Distribution

This grass is currently known from Staten Island but ranged through New York City and Long Island. There are also some historical records from the Finger Lakes area in Seneca, Tioga, and Yates counties.

Global Distribution

This grass occurs along the coastal plain from Massachusetts (where it is possibly extirpated) south to northern Florida and the Gulf Coast to Texas. It also occurs inland from Virginia to southeastern Kansas south through eastern Oklahoma and eastern Texas. There are a few rare populations in the upper Midwest on the southern borders of Illinois, Indiana, and Ohio and one disjunct population in northeastern Michigan.

What does it look like?

This species is a perennial grass which forms small clumps. The stems are from 50 to 150 cm tall, soft-hairy throughout, and arise from a rosette of lance-shaped basal leaves. The nodes are swollen, and have a dense "beard" of hairs above a constricted, sticky ring. There are 7 to 11 stem leaves, these also hairy and 9 to 20 mm wide. Both the internodes and the ends of the leaves are purplish. The primary infloresence is a panicle 6-16 cm long and 5 to 12 cm wide, flowering from May to July. The spikelets are 2.2 to 2.8 mm long, prominently veined and pubescent on the margins and apices. The lower florets are sterile, and the upper (fertile) ones sharply pointed on top (FNA 2003).

Identifying Characteristics

The best life stage for identifying this species

Plants with stems and fruits (preferably both early and late-season infloresences) are best for identification, though vegetative material may also be identified.

The best time to see

The mature fruits develop from July through October.

Other species similar to this one

The velvety hairs and swollen nodes with a "beard" of dense hairs above a glabrous, sticky ring are distinctive.

SYNONYMS

Dichanthelium scoparium (Lam.) Gould

Panicum scoparium Lam.

Additional Resources

Links

Google

NatureServe

USDA Plants Database

Missouri Plants

Flora of North America Vol. 25/Grass Manual on the Web

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Wild Pink

Closeup of flowers.

Photo credits: *Stephen M. Young*

Scientific Name *Silene caroliniana ssp. pensylvanica* (Michx.) Clausen

Family Name Caryophyllaceae
Pink Family

Did you know?
Wild pinks are now widely available in the horticulture trade. There are three varieties of the species and they are separated geographically with variety caroliniana from the Southeast, variety pensylvanica from the Northeast and variety wherryi from the East-Central US. North Carolina is the only state where all three varieties grow.

Summary

Protection Exploitably vulnerable in New York State, not listed federally.

This level of state protection means: listed species are likely to become threatened in the near future throughout all or a significant portion of their range within the state if causal factors continue unchecked.

Rarity G5T4T5, S2

A global rarity rank of G5T4T5 means: Apparently or Demonstrably Secure globally - The subspecies/variety is uncommon to common in the world, but not rare; usually widespread, but may be rare in some parts of its range; possibly some cause for long-term concern due to declines or other factors. More information is needed to assign a single conservation status. (The species as a whole is common globally.)
A state rarity rank of S2 means: This plant is threatened/imperiled in New York because of rarity (typically 6-20 populations or few remaining individuals) or is vulnerable to extirpation from New York due to biological factors.

Conservation Status in New York

There are 12 existing populations but with more surveys it may be found to be more common on Eastern Long Island and the Southern Taconic Mountains. There are about 15 historical populations that no longer exist.

Short-term Trends

The short term trend is stable.

Long-term Trends

This plant was always limited in distribution in New York but numbers have declined from historical levels. There are fewer locations known from the North Fork and it may be gone from Western Long Island and Staten Island where it was known to occur. There are historical records from Dutchess County but no plants have been found there recently.

Conservation and Management

Threats

It is subject to elimination on roadsides by improper roadside maintenance. Some populations have been lost to development and others to exotic invasive species where they invade cliff and other rocky communities.

Conservation Strategies and Management Practices

Roadside and trailside habitats must be kept open but plants must not be mowed repeatedly during the growing season. Cliff and open rocky habitats should be kept free of invasive species.

Research Needs

Research is needed to find out why this species is limited in distribution in common habitats.

Habitat

On Eastern Long Island the plants are in open grassy and shrubby areas along the edge of sandy trails, roads and powerlines as well as stabilized dunes of red cedar near the coast. In New York City and Westchester County they are in partial sun on low cliffs of metamorphic rock and on rocky ridges under oak forest. In the Taconic Mountains the plants are on southwest-facing slopes of ridges in chestnut oak forest with schist and granite ledges, rocky outcrops, and talus. They are growing in grassy openings and scattered around on rock outcrops (NYNHP 2011). Occurs in rocky, usually calcareous woods (Gleason and Conquist 1991). Dry sandy, gravelly or rocky woods and openings (Fernald 1950).

Associated Ecological Communities

Appalachian Oak-hickory Forest
A hardwood forest that occurs on well-drained sites, usually on ridgetops, upper slopes, or south- and west-facing slopes. The soils are usually loams or sandy loams. This is a broadly defined forest community with several regional and edaphic variants. The dominant trees include red oak, white oak, and/or black oak. Mixed with the oaks, usually at lower densities, are pignut, shagbark, and/or sweet pignut hickory.

Cliff Community

A community that occurs on vertical exposures of resistant, non-calcareous bedrock (such as quartzite, sandstone, or schist) or consolidated material; these cliffs often include ledges and small areas of talus.

Maritime Grassland
A grassland community that occurs on rolling outwash plains of the glaciated portion of the Atlantic coastal plain, near the ocean and within the influence of offshore winds and salt spray.

Maritime Red Cedar Forest
A conifer forest that occurs on dry sites near the ocean. Eastern red cedar is the dominant tree, often forming nearly pure stands. Other characteristic trees include post oak and black cherry.

Pitch Pine-oak Forest
A mixed forest that typically occurs on well-drained, sandy soils of glacial outwash plains or moraines; it also occurs on thin, rocky soils of ridgetops. The dominant trees are pitch pine mixed with one or more of the following oaks: scarlet oak, white oak, red oak, or black oak.

Pitch Pine-oak-heath Rocky Summit
A community that occurs on warm, dry, rocky ridgetops and summits where the bedrock is non-calcareous (such as quartzite, sandstone, or schist), and the soils are more or less acidic. This community is broadly defined and includes examples that may lack pines and are dominated by scrub oak and/or heath shrubs apparently related to fire regime.

Pitch Pine-oak-heath Woodland
A pine barrens community that occurs on well-drained, infertile, sandy soils. The structure of this community is intermediate between a shrub-savanna and a woodland. Pitch pine and white oak are the most abundant trees.

Pitch Pine-scrub Oak Barrens
A shrub-savanna community that occurs on well-drained, sandy soils that have developed on sand dunes, glacial till, and outwash plains.

Associated Species

Nantucket Shadbush (*Amelanchier nantucketensis*)
Pennsylvania Sedge (*Carex pensylvanica*)
Pink Lady's-slipper (*Cypripedium acaule*)
Wild Ipecac (*Euphorbia ipecacuanhae*)
Longbranch Frostweed (*Helianthemum canadense*)
Red Cedar (*Juniperus virginiana*)
Lechea
Canada Toadflax (*Nuttallanthus canadensis*)
Switchgrass (*Panicum virgatum*)
Scrub Oak (*Quercus ilicifolia*)
Black Oak (*Quercus velutina*)
Northern Dewberry (*Rubus flagellaris*)
Little Bluestem (*Schizachyrium scoparium*)
Virginia Tephrosia (*Tephrosia virginiana*)

Identification Comments

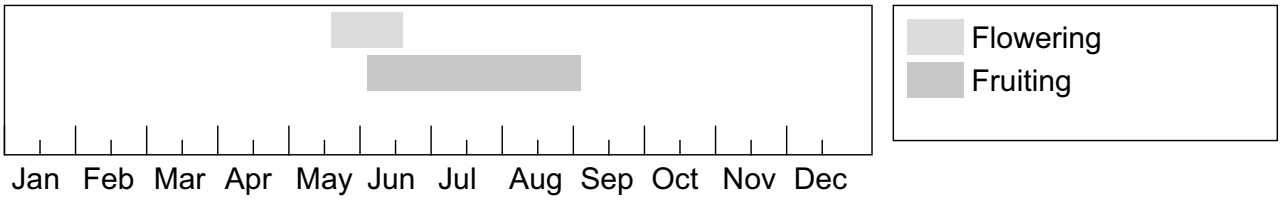
Wild pinks form small to large colonies of low, herbaceous, perennial plants with petiolate basal leaves about 5-12 cm long with acute tips. The few to many stems are about 8-20 cm tall, with dense glandular hairs, and have 2-3 pairs of sessile leaves with ciliate margins. The flowers are in short, dense clusters with a tubular calyx covered in glandular hairs. The showy petals are white to dark pink and widest at the tip with ragged edges. There is a ring of appendages at the base of the petals where the white stamens can be seen sticking out. The fruit is a capsule with tiny, prominently inflated seeds that are covered with little projections (tubercules).

Best Life Stage for Identifying This Species

The best time to identify the plant is when it is in flower and easily visible. It is difficult to see among other vegetation once the flowers produce fruit.

The Best Time to See

Flowers are visible from late May through early June. Plants with fruits may be visible through August.



The time of year you would expect to find Wild Pink in New York.

Similar Species

When this plant is in flower there are no other plants that look like it.

Taxonomy

Kingdom Plantae
└ **Phylum** Anthophyta
└ **Class** Dicots (Dicotyledoneae)
└ **Order** Caryophyllales
└ **Family** Caryophyllaceae (Pink Family)

Synonyms

Melandrium pensylvanicum ((Michx.) Rohr.)
Silene caroliniana var. *pensylvanica* ((Michx.) Fern.)

Additional Resources

Links

Google Images
http://images.google.com/images?q=SILENE+CAROLINIANA
NatureServe Explorer
http://natureserve.org/explorer/servlet/NatureServe?searchName=SILENE+CAROLINIANA
USDA Plants Database
http://plants.usda.gov/java/nameSearch?mode=sciname&keywordquery=SILENE+CAROLINIANA
Delaware Wildflowers
http://delawarewildflowers.org/plant.php?id=1867

Best Identification Reference

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New York Natural Heritage Program
625 Broadway, 5th Floor,
Albany, NY 12233-4757
Phone: (518) 402-8935
acris@nynhp.org

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