

Agricultural Lands

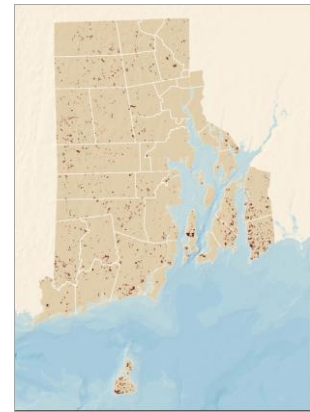
KEY HABITATS



Image: I. Stuckey

Description

Managed hayfields and pastures provide a significant habitat in Rhode Island as the principal nesting sites for a variety of grassland-nesting birds. Haylands are defined as areas vegetated with grasses, legumes and other forage crops which are machine harvested at least once during the growing season. Pasturelands are also vegetated with grasses, legumes and forbs to provide forage crops for grazing animals, but may also contain scattered small shrubs and other plants that are avoided by livestock. Hayfields and pastures are anthropogenic in origin and have no natural grassland analogue in Rhode Island, as such these habitats generally contain many alien plants; however, they provide the unique habitat structure required by grassland-dependent species.



~See map disclaimer in profiles introduction

Condition

The current extent of hayfields and pasturelands is much reduced from the historic peak in the mid-1800's when more than 20,000 acres were devoted to these practices. On Block Island, for example, all woody vegetation was eliminated and most of the upland made available for sheep grazing. Agricultural grassland habitats were concentrated in coastal communities and sought after for their development potential, especially as residential subdivisions, and the past several decades has witnessed a significant loss of these habitats. Today, according to NRCS approximately 7,400 acres of hay fields and 3000 acres of grazing land are present in the state, with many examples maintained under conservation easements and other protective means, the largest on Block Island and Aquidneck Island, in Little Compton and South Kingstown, and at several inland locations in Cranston, Lincoln, and Cumberland. There remains some opportunity to conserve additional unprotected sites and to develop management plans that balance the habitat requirements of grassland birds and the needs of farmers.

SpeciesBirds

- Grasshopper Sparrow (*Ammodramus saviarum*)
- Bobolink (*Dolichonyx oryzivorus*)
- Savannah Sparrow (*Passerculus sandwichensis*)
- Eastern Meadowlark (*Sturnella magna*)

Invertebrates

- Tumblebug (*Canthon pilularius*)
- Tumblebug (*Canthon vigilans*)
- Dung Beetle (*Copris fricator*)
- Dung Beetle (*Dichotomius carolinus*)
- Polished Dart Moth (*Euxoa perpolita*)
- American Burying Beetle (*Nicrophorus americanus*)
- Eastern Snail Eater (*Scaphinotus elevatus*)

Threats and Actions by Community Type

Upland (Agricultural)

Agricultural Lands - Vegetables; Turf; Nursery; Orchard; Vineyard; Christmas Trees

Condition: unknown; low plant species richness and diversity; agricultural chemicals. Importance to Biodiversity: 1. Degree of Threat: 2.

Threat 1 - Residential and commercial development; Housing and urban areas and commercial and industrial areas; Prime agricultural soils also highly developable

- Actions:
- Site/area protection; Continue efforts to preserve farmland through purchase of development rights, Farm, Forest and Open Space, and other programs. Rank: 3
 - Resource and habitat protection; support conservation programs implemented by NRCS and other agencies. Rank: 3

Threat 2 - Agricultural and forestry effluents; Fertilizers and pesticides used on non-organic operations

- Actions:
- Site/area management; encourage farmers to utilize organic farming methodologies. Rank: 2
 - Policies and regulations; Provide expertise and research on the effects of pesticides and herbicides on wildlife. Rank: 2

Threat 3 - Fire and fire suppression; Loss of habitat from plant succession

- Actions:
- Habitat and natural process restoration; Develop fire prescriptions for priority parcels. Rank: 2
 - Habitat and natural process restoration; Implement burn management on priority parcels. Rank: 2
 - Outreach; Expand public relations for fire management. Rank: 2

Threat 4 - Lack of information; Lack of information from research to address habitat and taxonomic issues; Lack of research to guide threat assessment and prioritization of conservation planning

- Actions:
- Research, survey, inventory, monitor populations; Evaluate use of migratory stopover/winter habitat. Rank: 1

Upland (Agricultural)

Agricultural Lands - Hayfields

Condition: poor; fair turning to good based on good management, but poor based on lack of size. Importance to Biodiversity: 3. Degree of Threat: 3; at risk due to ease of development, invasives when fields go fallow, end of cost-sharing might threaten a number of places.

Threat 1 - Residential and commercial development; Housing and urban areas and commercial and industrial areas

- Actions:
- Site/area protection; Identify and acquire key parcels for fee purchase and easement. Rank: 3
 - Resource and habitat protection; Prepare site-specific management plans and determine proper times for mowing/haying that protect nesting birds. Rank: 3
 - Policies and regulations; Prepare management plans. Rank: 2

Threat 2 - Agricultural and forestry effluents; Fertilizers and pesticides

- Actions:
- Site/area management; Investigate organic methods for hay production. Rank: 2
 - Policies and regulations; Provide expertise and research on the effects of pesticides and herbicides on wildlife. Rank: 3

Threat 3 - Invasive non-native/alien species; Invasion may be exacerbated by fertilizers Habitat is largely introduced species by definition

- Actions:
- Invasive/problematic species control; Control invasives when problems arise. Rank: 2

Threat 4 - Fire and fire suppression; Loss of habitat from plant succession

- Actions:
- Habitat and natural process restoration; Develop fire prescriptions for priority parcels. Rank: 2
 - Habitat and natural process restoration; Implement burn management on priority parcels. Rank: 2
 - Outreach; Expand public relations for fire management. Rank: 1

Threat 5 - Lack of information; Lack of information from research to address habitat and taxonomic issues

- Actions:
- Research, survey, inventory, monitor populations; Evaluate use of migratory stopover/winter

Rhode Island Wildlife Action Plan Habitat Profiles

habitat. Rank: 2

Upland (Agricultural)

Agricultural Lands - Pasture

Condition: poor; fair turning to good based on good management, but poor based on lack of size. Importance to Biodiversity: 3. Degree of Threat: 3; invasives when field go fallow, end of cost-sharing might threaten a number of places.

Threat 1 - Residential and commercial development; Housing and urban areas and commercial and industrial areas

- Actions:
- *Site/area protection; Identify and acquire key parcels for fee purchase and easement. . Rank: 2.5*
 - *Resource and habitat protection; Prepare site-specific management plans and determine proper management of grazing animals to protect nesting birds. Rank: 2*
 - *Policies and regulations; Prepare management plans. Rank: 2*

Threat 2 - Agricultural and forestry effluents; Nutrient loading from manure, etc.

- Actions:
- *Site/area management; Conduct field rotation of livestock to prevent buildup of manure, etc. Rank: 2*

Threat 3 - Invasive non-native/alien species; Grazing animals may encourage some invasives by diet selection (Example, barberry unpalatable to cows)

- Actions:
- *Invasive/problematic species control; Control invasives as needed. Rank: 2*

Threat 4 - Fire and fire suppression; Loss of habitat from plant succession

- Actions:
- *Habitat and natural process restoration; Develop fire prescriptions for priority parcels. Rank: 2*
 - *Habitat and natural process restoration; Implement burn management on priority parcels. Rank: 2*
 - *Outreach; Expand public relations for fire management. Rank: 1*

Threat 5 - Lack of information; Lack of information from research to address habitat and taxonomic issues

- Actions:
- *Research, survey, inventory, monitor populations; Evaluate use of migratory stopover/winter habitat. Rank: 2*

Hemlock Forest/Swamp

KEY HABITATS



Image: David Patte, USFWS

Description

Hemlock swamps are forested wetlands of poorly drained acidic mineral substrates found throughout central New England in a broad range of basin, seepage, and stream-associated wetlands. Eastern hemlock is the dominant coniferous tree cover (75-100%), often mixed with deciduous wetland trees, primarily red maple, yellow birch, and black gum. In most situations, hemlock forms a closed canopy and consequently there is a sparse shrub layer and minimal ground cover with low plant species diversity. Mature hemlock swamps are dark forests with pools of water and mossy mounds of soil overlying downed trees and upturned root systems that provide unique nesting opportunities for winter wren and Northern waterthrush.



~See map disclaimer in profiles introduction

Condition

In Rhode Island, hemlock swamps are found inland, generally in parts of the state above 300' elevation, with best examples in the northwestern towns of Burrillville and Glocester where they are protected in several State management areas. Although a significant amount of this habitat is protected, hemlock is currently threatened by the spread of woolly adelgid and in some areas this tree is being lost and swamps are reverting to typical deciduous, red maple-dominated communities. For this reason, the condition of hemlock swamps in Rhode Island is considered to be fair.

Species

Birds

- Northern Goshawk (*Accipiter gentilis*)
- Ruffed Grouse (*Bonasa umbellus*)
- Northern Waterthrush (*Parkesia noveboracensis*)
- Blackburnian Warbler (*Setophaga fusca*)

Mammals

- Bobcat (*Lynx rufus*)

Threats and Actions by Community Type

Palustrine (Forested Mineral Soil Wetlands)

Hemlock Forest/Swamp - Hemlock/Hardwood Swamp

Condition: fair. Importance to Biodiversity: 3. Degree of Threat: 2; hemlock woolly adelgid.

Threat 1 - Housing and urban areas; Legal buffer not adequate to protect habitat; changes in understory documented: sources include siltation of streams, non-native vegetation in edge habitat

- Actions:
- Site/area protection; Identify and acquire as needed, focusing on upland buffers. Rank: 2.5
 - Resource and habitat protection; Increase extent of undeveloped land in upland buffers. Rank:

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2.5

- *Policies and regulations; increase protection and extent of upland buffers in wetlands regulations. Rank: 2.5*

Threat 2 - Dams and water management/use; Any alterations in groundwater, overland flow can impact this habitat

- Actions:
- *Site/area protection; Identify any land acquisition needs that limit this threat. Rank: 2*
 - *Policies and regulations; support restrictions on changes in hydrology of wetlands. Rank: 1*

Threat 3 - Invasive non-native/alien species; Hemlock woolly adelgid causing dieoff of hemlock, resulting openings may provide areas for spread of invasive plants

- Actions:
- *Invasive/problematic species control; Utilize current acceptable methods for controlling woolly adelgid. Rank: 2.5*
 - *Habitat and natural process restoration; Allow natural succession of habitat in the event of loss of hemlock. Rank: 2*

Threat 4 - Garbage and solid waste; Wetlands used for illegal dumping

- Actions:
- *Site/area protection; Identify and acquire problem sites. Rank: 2*
 - *Site/area management; control public access by vehicles. Rank: 2*

Threat 5 - Other ecosystem modifications; Loss of habitat from plant succession

- Actions:
- *Research, survey, inventory, monitor habitats; Identify priority parcels to retain as core forest areas with minimal management. Rank: 3*

Upland (Coniferous Woodlands & Forests)

Hemlock Forest/Swamp - Hemlock/Hardwood Forest

Condition: poor. Importance to Biodiversity: 3. Degree of Threat: 3; hemlock woolly adelgid.

Threat 1 - Housing and urban areas; Highly developable habitat type; large portions already fragmented by housing

- Actions:
- *Site/area protection; Identify and acquire key parcels for fee purchase and easement. . Rank: 3*
 - *Resource and habitat protection; Identify and acquire key parcels for fee purchase and easement. . Rank: 3*
 - *Policies and regulations; identify and influence mechanisms for incentivizing land owners for conservation and watershed protection (farm, forest and OS; local planning policies that make it possible for land owners to economically benefit). Rank: 2.5*

Threat 2 - Dams and water management/use; Any alterations in groundwater, overland flow can impact this habitat

- Actions:
- *Site/area protection; Identify any land acquisition needs that limit this threat. Rank: 2*
 - *Policies and regulations; limit changes in hydrology of wetlands. Rank: 2*

Threat 3 - Garbage and solid waste; Wetlands used for illegal dumping,

- Actions:
- *Site/area protection; Identify and acquire problem sites. Rank: 2*
 - *Site/area management; control public access by vehicles. Rank: 2*

Threat 4 - Invasive and non-native/alien species; Woolly adelgid

- Actions:
- *Invasive/problematic species control; expand and fund early detection and response program; give towns tools to ID and manage invasives; develop BMPs for state and local transportation depts. (disposal sites, equipment cleaning etc); (earthworms, may include an education component); increase funding for control programs. . Rank: 2.5*
 - *Data collection and analysis; Research into resistant hemlock ecotypes. Rank: 1*

Threat 5 - Problematic native species; Demographic changes from excessive predation (animal)

- Actions:
- *Invasive/problematic species control; encourage the taking of more deer (special permits, etc, allow hunters to take more, introduce more hunting capacity if existing hunter population insufficient, get more people into hunting (women etc); temporary regulations to reduce the population and then maintain it. Rank: 1*

Pitch Pine Woodland/Barren

KEY HABITATS



Image: L. Gould

Description

Pitch pine woodlands and barrens are dry, fire-adapted communities with a variable canopy dominated by pitch pine and an understory of tall shrubs, especially scrub oak, and a low shrub layer of blueberry and other heaths. A variable amount of mixed oaks may be present in the overstory depending on frequency of fire. A more frequent fire rotation of 10 or fewer years may foster the growth of stunted pines, dense scrub oak, and scattered open patches of bare sand. Scrub oak stands may occur without pine cover, particularly in low-lying areas where cold-air drainage inhibits pine growth. The NETHCS classification identifies coastal and interior subtypes of pitch pine communities that are similar in structure and composition, but each type has species not shared by the other. Pitch pine barrens support a unique assemblage of priority moth and butterfly species that generally depend on a single larval food plant unique to these communities. Examples include the barrens buck moth, which utilizes scrub oak, and frosted elfin and persius duskywing that depend on wild lupine. Tiger beetles are a characteristic group of insects that require open, sandy patches for hunting and burrowing. Embedded within some pitch pine areas are vernal pools and other shallow wetlands that support a unique herptile fauna, including the Eastern spadefoot. Young, fire-maintained pitch pine woodlands provide nesting habitat for several priority birds.



~See map disclaimer in profiles introduction

Condition

Pitch pine communities were historically widespread predominantly in Kent and Washington Counties on light, sandy soils of outwash and glaciofluvial origin. One estimate of the original cover of these habitats in Rhode Island is 30,000 acres (Bromley 1935). Following settlement, pitch pine communities were exploited for agriculture and later residential development, and today they cover only about one-fifth (about 6000 acres) of their original extent. Most of this habitat occurs in two linear bands across the state, one following the Charlestown recessional moraine, and the second further north in the Arcadia Management Area and running east to West Greenwich, Warwick and Prudence Island.

Species

Birds

- Eastern Whip-poor-will (*Antrastomus vociferous*)
- Black-billed Cuckoo (*Coccyzus erythrophthalmus*)
- Nashville Warbler (*Oreothlypis ruficapilla*)

Herpetofauna

- Fowler's Toad (*Anaxyrus fowleri*)
- Eastern Hog-nosed Snake (*Heterodon platirhinos*)
- Eastern Spadefoot (*Scaphiopus holbrookii*)

Invertebrates

- False Mealworm Beetle (*Alobates morio*)
- Seed-eating Ground Beetle (*Amara chalcea*)
- Lagriid Beetle (*Anaedus brunneus*)

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Short-lined Chocolate	(<i>Argyrostroma anilis</i>)
Frosted Elfin	(<i>Callophrys (Decid.) irus (Baptisia type) AND Callophrys (Decid.) irus (Lupine type)</i>)
Hoary Elfin	(<i>Callophrys polios</i>)
Underwing Moth	(<i>Catocala n. sp.</i>)
Barrens Chaetagnaea	(<i>Chaetagnaea tremula</i>)
Big Sand Tiger Beetle	(<i>Cicindela formosa generosa</i>)
Cow Path Tiger Beetle	(<i>Cicindela purpurea purpurea</i>)
Oblique-lined Tiger Beetle	(<i>Cicindela tranquebarica tranquebarica</i>)
Festive Tiger Beetle	(<i>Cicindela scutellaris rugifrons</i>)
Contracted Datana	(<i>Datana contracta</i>)
Sleepy Duskywing	(<i>Erynnis brizo</i>)
Persius Duskywing	(<i>Erynnis persius</i>)
Ground Beetle	(<i>Geopinus incrassatus</i>)
Eastern Buck Moth	(<i>Hemileuca maia</i>)
Noctuid Moth	(<i>Hyperstrotia flaviguttata</i>)
Bee-like Robber Fly	(<i>Laphria champlainii</i>)
Robber Fly	(<i>Pogonosoma dorsatum</i>)
Edward's Hairstreak	(<i>Satyrium edwardsii</i>)
German Cousin	(<i>Sideridis congermana</i>)
Marooning Moth	(<i>Sideridis maryx</i>)
Blueberry Sallow	(<i>Sympistis dentata</i>)
Joyful Holomelina Moth	(<i>Virbia laeta</i>)
Barrens Xylotype	(<i>Xylotype capax</i>)
Black-eyed Zale	(<i>Zale curema</i>)
Pine Barrens Zale	(<i>Zale lunifera</i>)
Gray Spring Zale	(<i>Zale submediana</i>)
Pine Barrens Zanclognatha	(<i>Zanclognatha martha</i>)

Mammals

Eastern Mole (*Scalopus aquaticus*)

Plants

Bog Clubmoss (*Lycopodiella alopecuroides*)

Sickle-leaved Golden Aster (*Pityopsis falcata*)

Threats and Actions by Community Type

Upland (Coniferous Woodlands & Forests)

Pitch Pine Woodland/Barren - Barren

Condition: fair. Importance to Biodiversity: 3. Degree of Threat: 2; residential development, lack of natural disturbance (fire).

Threat 1 - Housing and urban areas; Highly developable habitat type; large portions already fragmented by housing (e.g., Kingston Pine Barrens)

- Actions:
- Site/area protection; Identify and acquire key parcels for fee purchase and easement. . Rank: 3
 - Resource and habitat protection; Identify and acquire key parcels for fee purchase and easement. . Rank: 3
 - Policies and regulations; identify and influence mechanisms for incentivizing land owners for conservation and watershed protection (farm, forest and OS; local planning policies that make it possible for land owners to economically benefit). Rank: 2.5

Threat 2 - Fire and fire suppression; Fire-dependent community, there-fore fire suppression is threat

- Actions:
- Site/area management; Controlled burns, selective harvesting. Rank: 3
 - Habitat and natural process restoration; restore plants (e.g., lupine) for pollinators (frosted elfin, etc.). Rank: 2

Threat 3 - Invasive non-native/alien species; This community has not been prone to the spread of invasives

- Actions:
- Invasive/problematic species control; Early detection; Provide control where needed. Rank: 2

Threat 4 - Problematic native species; Demographic changes from excessive deer browsing

- Actions:
- Invasive/problematic species control; Provide additional hunting opportunities in problem areas; Provide deer control where needed. Rank: 2

Rhode Island Wildlife Action Plan Habitat Profiles

Upland (Open Uplands (Grassland & Shrubland))

Pitch Pine Woodland/Barren - Pitch Pine Woodland

Condition: fair; invasives. Importance to Biodiversity: 3. Degree of Threat: 2; ATVs, invasives.

Threat 1 - Recreational activities; ATV use, trampling of habitat

- Actions:*
- *Site/area protection; Identify and acquire key parcels for fee purchase and easement. Rank: 2*
 - *Resource and habitat protection; Control public access. Rank: 1.5*
 - *Site/area management; Control public access. Rank: 1.5*

Threat 2 - Other ecosystem modifications; Lack of disturbance (natural and anthropogenic) to maintain community

- Actions:*
- *Habitat and natural process restoration; Identify methods for restoring this habitat. Rank: 2.5*
 - *Site/area management; Conduct management by methods identified in 2.3. Rank: 2.5*

Threat 3 - Invasive non-native/alien species; The potential for this threat is considered low in this habitat

- Actions:*
- *Invasive/problematic species control; Provide control where needed. Rank: 1.5*

Maritime Woodland

KEY HABITATS



Image: USFWS Headquarters

Description

A community of tall shrubs and small trees (up to 6 m tall) near the coast, generally on the inland side of the maritime shrubland community on barrier dunes and coastal uplands where there is some protection from the most extreme maritime influences of wind and salt spray. Maritime woodlands are comprised of dense woody vegetation with robust forms of maritime shrubs, especially shadbush, and stunted trees with contorted branches including black cherry, sassafras, oaks, beech and red cedar. Soils are generally fine to coarse sand with some organic material mixed into the top layers, and there is sometimes a thick duff layer. Groundwater levels vary, and have a strong influence on vegetation composition and structure. Maritime forest vegetation is subject to stresses like salt spray, high winds, dune deposition, sand shifting and blasting, and occasional overwash. Note, species listed for this habitat are just a few examples of SGCN that use the habitat.



~See map disclaimer in profiles introduction

Condition

Little is known about the former extent of maritime woodlands in Rhode Island given the degree of land alteration that has occurred in the coastal zone. Today, the best examples of this community are found on protected sites, especially Truston Pond and Ninigret National Wildlife Refuges. As it is likely this community was more prevalent during the pre-settlement period, the current condition is considered to be fair.

SpeciesBirds

Gray Catbird (*Dumetella carolinensis*)
Eastern Towhee (*Pipilo erythrophthalmus*)

Threats and Actions by Community Type

Upland (Deciduous Woodlands & Forests)

Maritime Woodland

Condition: fair. Importance to Biodiversity: 3. Degree of Threat: 2; salt water intrusion, invasives, deer.

Threat 1 - Invasive non-native species; Woody invasives primarily, but mature maritime woodlands are relatively invasive-free

Actions: • Invasive/problematic species control; provide early detection and rapid response to problem situations. Rank: 1.5

Threat 2 - Habitat shifting and alteration; Sea level rise considered a low level threat given the current extent and distribution of this habitat

Actions: • Site/area protection; Identify and acquire parcels. Rank: 2
• Resource and habitat protection; Provide opportunities for inland migration. Rank: 1.5
• Policies and regulations; Prepare management plans. Rank: 2.5

Rhode Island Wildlife Action Plan Habitat Profiles

Threat 3 - Housing and urban areas; Within highly developable parts of the state, but most examples of this habitat are protected at Trustom, Ninigret NWRs, and other sites

Actions: • *Site/area protection; Identify and acquire parcels. Rank: 2*

Threat 4 - Problematic native species; Demographic changes from excessive deer browsing

Actions: • *Invasive/problematic species control; Provide additional hunting opportunities in problem areas; Provide deer control where needed. Rank: 2*

Northern Hardwood Forest

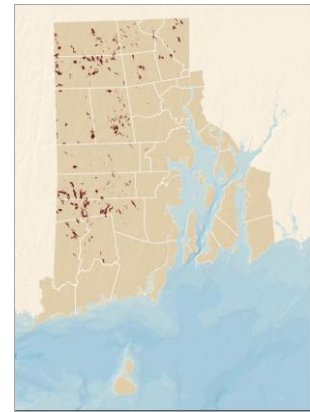
KEY HABITATS



Image: Richard Enser

Description

As the name implies, this deciduous forest community is principally found in northern portions of the Northeast, forming a dominant forested community throughout Vermont, New Hampshire, Maine, and New York, as well as large portions of Massachusetts and Connecticut. Rhode Island lies on the southern periphery of the range of this forest type. Northern hardwood forests are comprised of sugar maple, American beech, and yellow birch, sometimes mixed with hemlock. Northern red oak and some white oak also occur in these forests, but do not generally dominate the canopy. In the southern portions of the range of this forest type, including all of Rhode Island, oaks and tuliptree are also found. The shrub and herbaceous layers are moderately dense, providing habitat for many of the wildlife species that characterize the northeastern forest biota, including many RI GCN species.



~See map disclaimer in profiles introduction

Condition

Currently, there are approximately 12,000 acres of Northern hardwood forest in Rhode Island. The historic record provides evidence that large portions of Providence County, as well as parts of western Kent and Washington Counties, were comprised of this forest type during the ancestral period, and when using the pre-settlement period as a reference point, the current condition of Northern Hardwood Forest in Rhode Island is considered to be poor. Although small tracts of this forest remain within the northernmost towns of the state, it is likely that at least 90% of the former extent of this forest type has been lost. The beginning of this demise can be traced to the early colonial need for wood that quickly exhausted the forests near the Bay and spread to the interior. Once logged the cleared land became farmland, or was allowed to revert to woodlots that were regularly cut for firewood. By the mid-1800's, most of the state's original northern hardwood forest had been logged. Although forests typically regenerate quickly on abandoned farmland (by 1960 the state was roughly 60% forested), regeneration of the northern hardwood type was hindered for several reasons. Plowing and grazing degraded the native soils and species atypical of natural forests acquired a competitive edge. Of particular note is white pine, a relatively minor component of ancestral hardwood forests but one that quickly took advantage of the open post-agricultural landscape because of its tolerance of drought and full sun. As a result, large tracts of abandoned farmland were transformed into nearly pure stands of white pine.

Species

Birds

Black-throated Blue Warbler (*Setophaga caerulescens*)
Cerulean Warbler (*Setophaga cerulea*)

Invertebrates

Big Poplar Sphinx (*Pachysphinx modesta*)

Plants

Small Whorled Pogonia (*Isotria medeoloides*)
Ginseng (*Panax quinquefolius*)

Threats and Actions by Community Type

Upland (Deciduous Woodlands & Forests)

Northern Hardwood Forest - Beech/Sugar Maple/Red Oak Forest

Condition: fair; lack of disturbance, lack of regeneration, deer, invasive insects. Importance to Biodiversity: 3. Degree of Threat: 3; climate change, beech bark disease, acid rain.

Threat 1 - Housing and urban areas; Developable sites in NW part of state Although much of this habitat protected, even small development projects can create significant fragmentation

- Actions:
- *Site/area protection; Identify and acquire key parcels for fee purchase and easement. . Rank: 3*
 - *Resource and habitat protection; Identify and acquire key parcels for fee purchase and easement. . Rank: 3*
 - *Policies and regulations; identify and influence mechanisms for incentivizing land owners for conservation and watershed protection (farm, forest and OS; local planning policies that make it possible for land owners to economically benefit). Rank: 2.5*
 - *Outreach; Educate local planners, developers, and residents. Rank: 1*

Threat 2 - Roads and railroads; Although new primary roads unlikely, even access roads and driveways fragment habitat

- Actions:
- *Site/area protection; Identify and acquire parcels; Identify any land acquisition needs that limit this threat. Rank: 3*
 - *Resource and habitat protection; Provide opportunities for inland migration. Rank: 3*
 - *Policies and regulations; Provide local municipalities and state with the information to locate transportation corridors in appropriate places; locate roads for potential abandonment; incorporate sufficient natural buffer widths into local subdivision regulations. Rank: 2.5*

Threat 3 - Utility and service lines; New ROWs unlikely, but some existing ones have already created fragmentation

- Actions:
- *Site/area protection; Identify and acquire problem sites. Rank: 2*
 - *Resource and habitat protection; Provide opportunities for inland migration. Rank: 1*
 - *Site/area management. Rank: 2*
 - *Policies and regulations; Provide comments for new road planning. Rank: 1.5*

Threat 4 - Invasive and non-native/alien species; Greatest threat along edges of roads, ROWs, etc. Threat to interior related to ATV and other vehicle use transporting seeds, etc. Also threats from insect pests to specific trees, etc.

- Actions:
- *Invasive/problematic species control; Expand and fund early detection and response program; give towns tools to ID and manage invasives; Develop BMPs for state and local transportation depts. (disposal sites, equipment cleaning etc). Rank: 3*
 - *Habitat and natural process restoration; allow for natural mature, functioning forests that will be resistant to invasives. (limit cutting of snags, limit clearing, etc). Rank: 2.5*
 - *Policies and regulations; develop nuisance plant list to limit sale and use of problematic species, firewood movement restrictions. Rank: 2.5*
 - *Awareness and communications; Prepare materials to educate public about accidental transport of invasive species; Include outreach to municipalities and other road managers regarding transport of invasives. Rank: 3*

Threat 5 - Other ecosystem modifications; Clearing within forest core areas prevents forest maturation and increases threat from invasives

- Actions:
- *Site/area management; Allow natural processes to develop mature forest cores. Rank: 2.5*
 - *Habitat and natural process restoration; Conduct limited tree-cutting to simulate natural blowdowns and development of understory vegetation;. Restore populations of native plants. Rank: 1.5*
 - *Policies and regulations; Prepare management plans and guidelines for other agencies. Rank: 2.5*

Threat 6 - Problematic native species; Deer browsing of understory vegetation has caused declines in some plant populations

- Actions:
- *Invasive/problematic species control; Encourage the taking of more deer (special permits, etc,*

Rhode Island Wildlife Action Plan Habitat Profiles

allow hunters to take more, introduce more hunting capacity if existing hunter population insufficient, get more people into hunting (women etc); temporary regulations to reduce the population and then maintain it. Rank: 2.5

Threat 7 - Biological resource use; Logging and wood harvesting

- Actions:
- *Site/area management; Provide management according to management plans. Rank: 1*
 - *Habitat and natural process restoration; Allow natural processes to manage habitat. Rank: 3*
 - *Policies and regulations; Prepare management plans. Rank: 2.5*

Threat 8 - Air-borne pollutants; Acid rain, heavy metals at edges

- Actions:
- *Policies and regulations; support stronger rules to control air pollution. Rank: 1.5*

Threat 9 - Habitat shifting and alteration; Climate impacts will affect individual species with replacement by others

- Actions:
- *Data collection and analysis; Conduct research on vulnerability of individual species to warming climate. Rank: 2*

Upland (Deciduous Woodlands & Forests)

Northern Hardwood Forest - Mixed Hardwood Riverside Forest

Condition: good. Importance to Biodiversity: 3. Degree of Threat: 2.

Threat 1 - Residential and commercial development; Housing and urban areas and commercial and industrial areas; Best site can not be developed; other sites already heavily impacted by wide range of activities

- Actions:
- *Site/area protection; Identify and acquire key parcels for fee purchase and easement. . Rank: 3*
 - *Resource and habitat protection; Identify and acquire key parcels for fee purchase and easement. . Rank: 3*
 - *Habitat and natural process restoration; identify and influence mechanisms for incentivizing land owners for conservation and watershed protection (farm, forest and OS; local planning policies that make it possible for land owners to economically benefit). Rank: 2.5*

Threat 2 - Invasive non-native/alien species; Impacted sites can be heavily infested with invasive plants

- Actions:
- *Invasive/problematic species control. Rank: 1*
 - *Habitat and natural process restoration. Rank: 1*

Threat 3 - Storms and flooding; Increased precipitation and flooding could alter disturbance regime that maintains this habitat

- Actions:
- *Site/area protection. Rank: 1*
 - *Data collection and analysis; Conduct monitoring of habitats. Rank: 2.5*

Threat 4 - Lack of information; Lack of information from research to address habitat and taxonomic issues

- Actions:
- *Research, survey, inventory, monitor populations; Evaluate use of migratory stopover/winter habitat. Rank: 3*

Oak Forest

KEY HABITATS



Image: D. Payne

Description

Deciduous forests dominated by oaks are the most widely distributed habitat type in Rhode Island. In general, three basic oak forest types can be found in the state, each characterized by one or more dominant oak species. Chestnut oak forests are the least common, found mostly on very dry, rocky ridges. Other types are dominated by white oak, often with an understory of mountain laurel, or a mix of black and scarlet oak with an understory of huckleberry and blueberry. Overall, most oak forests can be described as mixed oak communities, with variation most identifiable in the understory. For example, an uncommon type found mostly in Little Compton and South Kingstown supports an understory of American holly. Variability in oak forest vegetation does account for some variation in animal communities, for example some insects rely exclusively on American holly as a food source; however, the primary wildlife values associated with oak forests is in the size of these habitats, with largest tracts supporting forest interior specialists. This relationship has been widely demonstrated in regards to nesting birds, as evidenced by the number of these species on the RIGCN list which is a result of the widespread fragmentation of forest habitat in Rhode Island.



~See map disclaimer in profiles introduction

Condition

According to mapping statistics compiled by Anderson, et.al. (2010), there are approximately 244,800 acres of Oak Forest in Rhode Island, or about 37% of the state's land area, and more than 80% of the state's total forest. The extent of Rhode Island's forest is much reduced since the pre-settlement period, when more than 95% of the state was forested, and despite the regeneration of forest following the agricultural period the amount of currently existing forest in Rhode Island is considered to be inadequate to fulfill the needs of many characteristic forest wildlife species. As such, the condition of Oak Forest in Rhode Island is considered to be fair.

Species

Birds

- Ruffed Grouse (*Bonasa umbellus*)
- Veery (*Catharus fuscescens*)
- Yellow-billed Cuckoo (*Coccyzus americanus*)
- Northern Flicker (*Colaptes auratus*)
- Pileated Woodpecker (*Dryocopus pileatus*)
- Acadian Flycatcher (*Empidonax vireescens*)
- Wood Thrush (*Hylocichla mustelina*)
- Black-and-white Warbler (*Mniotilta varia*)
- Great Crested Flycatcher (*Myiarchus crinitus*)
- Indigo Bunting (*Passerina cyanea*)
- Rose-breasted Grosbeak (*Pheucticus ludovicianus*)
- Hairy Woodpecker (*Picoides villosus*)
- Scarlet Tanager (*Piranga olivacea*)
- American Woodcock (*Scolopax minor*)
- Northern Parula (*Setophaga americana*)

Rhode Island Wildlife Action Plan Habitat Profiles

Hooded Warbler (*Setophaga citrina*)
Prairie Warbler (*Setophaga discolor*)
Chestnut-sided Warbler (*Setophaga pensylvanica*)
American Redstart (*Setophaga ruticilla*)
Blackpoll Warbler (*Setophaga striata*)
Brown Thrasher (*Toxostoma rufum*)
Blue-winged Warbler (*Vermivora cyanoptera*)
Yellow-throated Vireo (*Vireo flavifrons*)

Herpetofauna

Northern Black Racer (*Coluber constrictor constrictor*)
Timber Rattlesnake (*Crotalus horridus*)
Eastern Ratsnake (*Pantherophis alleghaniensis*)
Eastern Box Turtle (*Terrapene carolina carolina*)

Invertebrates

Fragile Dagger Moth (*Acrionicta fragilis*)
Triton Daggermoth (*Acrionicta tritona*)
Ground Beetle (*Bembidion semicinctum*)
Ground Beetle (*Calathus ingratus*)
Henry's Elfin (*Callophrys henrici*)
Tulip Tree Silkworm (*Callosamia angulifera*)
Promethia Silkworm (*Callosamia promethea*)
Caterpillar Hunter (*Calosoma wilcoxi*)
Serrate Shoulder Slug Hunter (*Carabus serratus*)
Sylvan Worm & Slug Hunter (*Carabus sylvosus*)
Round Worm & Slug Hunter (*Carabus vinctus*)
Goldsmith Beetle (*Cotalpa lanigera*)
Angus's Datana (*Datana angusii*)
Cecropia Moth (*Hyalophora cecropia*)
Black-dotted Ruddy Moth (*Illexia intractata*)
Holly Sallow (*Metaxaglaea violacea*)
Hanham's Owlet (*Phalaenostola hanhami*)
Purple Plagodis Moth (*Plagodis kuetzingi*)
Noctuid Moth (*Psaphida thaxterianus*)
Hickory Hairstreak (*Satyrrium caryaevorum*)
Bobcat (*Lynx rufus*)

Mammals

Black Bear (*Ursus americanus*)

Plants

Violet Wood-sorrel (*Oxalis violacea*)
Small-flowered Buttercup (*Ranunculus micranthus*)

Threats and Actions by Community Type

Upland (Deciduous Woodlands & Forests)

Oak Forest - Oak Forest

Condition: fair; lack of disturbance, lack of regeneration, deer, invasive insects. Importance to Biodiversity: 2.
Degree of Threat: 3.

Threat 1 - Residential and commercial development; Housing and urban areas and commercial and industrial areas; Most widespread upland forest type on highly developable upland soils

- Actions:
- Site/area protection; Identify and acquire key parcels for fee purchase and easement. . Rank: 3
 - Resource and habitat protection; Identify and acquire key parcels for fee purchase and easement. . Rank: 3
 - Policies and regulations; identify and influence mechanisms for incentivizing land owners for conservation and watershed protection (farm, forest and OS; local planning policies that make it possible for land owners to economically benefit). Rank: 2.5

Threat 2 - Roads and railroads; New road construction causes fragmentation of habitat

- Actions:
- Site/area protection; Identify and acquire parcels; Identify any land acquisition needs that limit

Rhode Island Wildlife Action Plan Habitat Profiles

this threat. Rank: 3

- *Resource and habitat protection; Provide opportunities for inland migration. Rank: 3*
- *Policies and regulations; provide local municipalities and state with the information to locate transportation corridors in appropriate places; locate roads for potential abandonment; incorporate sufficient natural buffer widths into local subdivision regulations. Rank: 2.5*

Threat 3 - Utility and service lines; Causes fragmentation of habitat, but plans for new corridors have been limited

- Actions:*
- *Site/area protection; Identify and acquire problem sites. Rank: 2*
 - *Resource and habitat protection; Provide opportunities for inland migration. Rank: 1*
 - *Policies and regulations; restrict utility upgrades, lines/pipes to existing corridors; encourage underground placement of utility lines. Rank: 2*

Threat 4 - Invasive and non-native/alien species; Threat to mature forests primarily at habitat edges, some incursion by woody species into interiors

- Actions:*
- *Invasive/problematic species control; expand and fund early detection and response program; give towns tools to ID and manage invasives; develop BMPs for state and local transportation depts. (disposal sites, equipment cleaning etc.). Rank: 2.5*
 - *Habitat and natural process restoration; allow for natural mature, functioning forests that will be resistant to invasives. (limit cutting of snags, limit clearing, etc). Rank: 2.5*
 - *Policies and regulations; develop nuisance plant list to limit sale and use of problematic species, firewood movement restrictions. Rank: 3*

Threat 5 - Other ecosystem modifications; Clearing within forest core areas prevents forest maturation and increases threat from invasives

- Actions:*
- *Habitat and natural process restoration. Rank: 3*
 - *Policies and regulations. Rank: 3*

Threat 6 - Problematic native species; Deer browsing

- Actions:*
- *Invasive/problematic species control; Encourage the taking of more deer (special permits, etc, allow hunters to take more, introduce more hunting capacity if existing hunter population insufficient, get more people into hunting (women etc); temporary regulations to reduce the population and then maintain it. Rank: 2.5*

Threat 7 - Lack of information; Lack of information from research to address habitat and taxonomic issues; Lack of information about loss of habitat from plant succession

- Actions:*
- *Data collection and analysis. Rank: 2*

Threat 8 - Recreational activities; Habitat fragmentation and degradation from human disturbance

- Actions:*
- *Outreach; Control public access at priority sites. Rank: 2*

Threat 9 - Fire and fire suppression; Habitat loss of critical micro-features

- Actions:*
- *Research, survey, inventory, monitor populations; Evaluate existing significant hibernacula and nesting substrate; Identify priority sites for management. Rank: 1*

Upland (Deciduous Woodlands & Forests)

Oak Forest - Chestnut Oak Forest

Condition: fair; lack of regeneration, deer, invasive insects. Importance to Biodiversity: 2. Degree of Threat: 3.

Threat 1 - Housing and urban areas; Tends to be on ridges and rocky soils with more limited development potential

- Actions:*
- *Site/area protection; Identify and acquire key parcels for fee purchase and easement. . Rank: 3*
 - *Resource and habitat protection; Identify and acquire key parcels for fee purchase and easement. . Rank: 3*
 - *Policies and regulations; identify and influence mechanisms for incentivizing land owners for conservation and watershed protection (farm, forest and OS; local planning policies that make it possible for land owners to economically benefit). Rank: 2.5*
 - *Outreach; Educate local land owners. Rank: 1*

Threat 2 - Roads and railroads; New road construction causes fragmentation of habitat

- Actions:*
- *Site/area protection; Identify and acquire parcels; Identify any land acquisition needs that limit*

Rhode Island Wildlife Action Plan Habitat Profiles

this threat. Rank: 3

- *Resource and habitat protection; Provide opportunities for inland migration. Rank: 3*
- *Policies and regulations; provide local municipalities and state with the information to locate transportation corridors in appropriate places; locate roads for potential abandonment; incorporate sufficient natural buffer widths into local subdivision regulations. Rank: 3*

Threat 3 - Utility and service lines; Causes fragmentation of habitat, but plans for new corridors have been limited

- Actions:*
- *Site/area protection; Identify and acquire problem sites. Rank: 2*
 - *Resource and habitat protection; Provide opportunities for inland migration. Rank: 2*
 - *Policies and regulations; restrict utility upgrades, lines/pipes to existing corridors; encourage underground placement of utility lines. Rank: 2*

Threat 4 - Invasive and non-native/alien species; Threat to mature forests primarily at habitat edges, some incursion by woody species into interiors

- Actions:*
- *Invasive/problematic species control; expand and fund early detection and response program; give towns tools to ID and manage invasives; develop BMPs for state and local transportation depts. (disposal sites, equipment cleaning etc.). Rank: 3*
 - *Habitat and natural process restoration; allow for natural mature, functioning forests that will be resistant to invasives. (limit cutting of snags, limit clearing, etc). Rank: 2.5*
 - *Policies and regulations; develop nuisance plant list to limit sale and use of problematic species, firewood movement restrictions. Rank: 3*

Threat 5 - Other ecosystem modifications; Clearing within forest core areas prevents forest maturation and increases threat from invasives

- Actions:*
- *Habitat and natural process restoration. Rank: 3*
 - *Policies and regulations. Rank: 3*

Threat 6 - Problematic native species; Deer browsing

- Actions:*
- *Invasive/problematic species control; Encourage the taking of more deer (special permits, etc, allow hunters to take more, introduce more hunting capacity if existing hunter population insufficient, get more people into hunting (women etc); temporary regulations to reduce the population and then maintain it. Rank: 2.5*

Threat 7 - Recreational activities; Habitat fragmentation and degradation from human disturbance

- Actions:*
- *Outreach; Control public access at priority sites. Rank: 2*

Threat 8 - Lack of information

- Actions:*
- *Research, survey, inventory, monitor populations; Evaluate use of migratory stopover/winter habitat. Rank: 1*

Threat 9 - Fire and fire suppression; Habitat loss of critical micro-features

- Actions:*
- *Research, survey, inventory, monitor populations; Evaluate existing significant hibernacula and nesting substrate; Identify priority sites for management. Rank: 1*

Upland (Deciduous Woodlands & Forests)

Oak Forest - Mixed Oak – American Holly Forest

Condition: fair; lack of disturbance, lack of regeneration, deer, invasive insects. Importance to Biodiversity: 3. Degree of Threat: 3.

Threat 1 - Housing and urban areas; This threat considered low as much of this habitat found on already protected sites

- Actions:*
- *Site/area protection; Identify and acquire key parcels for fee purchase and easement. . Rank: 3*
 - *Resource and habitat protection; Identify and acquire key parcels for fee purchase and easement. . Rank: 3*
 - *Policies and regulations; identify and influence mechanisms for incentivizing land owners for conservation and watershed protection (farm, forest and OS; local planning policies that make it possible for land owners to economically benefit). Rank: 2.5*

Threat 2 - Roads and railroads; New road construction causes fragmentation of habitat

- Actions:*
- *Site/area protection; Identify and acquire parcels; Identify any land acquisition needs that limit this threat. Rank: 3*

Rhode Island Wildlife Action Plan Habitat Profiles

- *Resource and habitat protection; Provide opportunities for inland migration. Rank: 3*
- *Policies and regulations; provide local municipalities and state with the information to locate transportation corridors in appropriate places; locate roads for potential abandonment; incorporate sufficient natural buffer widths into local subdivision regulations. Rank: 2.5*

Threat 3 - Utility and service lines; Causes fragmentation of habitat, but plans for new corridors have been limited

- Actions:
- *Site/area protection; Identify and acquire problem sites. Rank: 2*
 - *Policies and regulations; restrict utility upgrades, lines/pipes to existing corridors; encourage underground placement of utility lines. Rank: 2*

Threat 4 - Invasive and non-native/alien species; Threat to mature forests primarily at habitat edges, some incursion by woody species into interiors

- Actions:
- *Invasive/problematic species control; expand and fund early detection and response program; give towns tools to ID and manage invasives; develop BMPs for state and local transportation depts. (disposal sites, equipment cleaning etc.). Rank: 2.5*
 - *Habitat and natural process restoration; allow for natural mature, functioning forests that will be resistant to invasives. (limit cutting of snags, limit clearing, etc). Rank: 2.5*
 - *Policies and regulations; develop nuisance plant list to limit sale and use of problematic species, firewood movement restrictions. Rank: 3*

Threat 5 - Other ecosystem modifications; Clearing within forest core areas prevents forest maturation and increases threat from invasives

- Actions:
- *Habitat and natural process restoration. Rank: 3*
 - *Policies and regulations. Rank: 3*

Threat 6 - Problematic native species; Deer browsing

- Actions:
- *Invasive/problematic species control; Encourage the taking of more deer (special permits, etc, allow hunters to take more, introduce more hunting capacity if existing hunter population insufficient, get more people into hunting (women etc); temporary regulations to reduce the population and then maintain it. Rank: 2.5*

Threat 7 - Recreational activities; Habitat fragmentation and degradation from human disturbance

- Actions:
- *Outreach; Control public access at priority sites. Rank: 2*

Upland (Deciduous Woodlands & Forests)

Oak Forest - Mixed Oak/Hickory Forest

Condition: fair; lack of disturbance, lack of regeneration, deer, invasive insects. Importance to Biodiversity: 2. Degree of Threat: 3.

Threat 1 - Residential and commercial development; Housing and urban areas and commercial and industrial areas; Most widespread upland forest type on highly developable upland soils

- Actions:
- *Site/area protection; Identify and acquire key parcels for fee purchase and easement. . Rank: 3*
 - *Resource and habitat protection; Identify and acquire key parcels for fee purchase and easement. . Rank: 3*
 - *Policies and regulations; identify and influence mechanisms for incentivizing land owners for conservation and watershed protection (farm, forest and OS; local planning policies that make it possible for land owners to economically benefit). Rank: 2.5*

Threat 2 - Roads and railroads; New road construction causes fragmentation of habitat

- Actions:
- *Site/area protection; Identify and acquire parcels; Identify any land acquisition needs that limit this threat. Rank: 3*
 - *Resource and habitat protection; Provide opportunities for inland migration. Rank: 3*
 - *Policies and regulations; provide local municipalities and state with the information to locate transportation corridors in appropriate places; locate roads for potential abandonment; incorporate sufficient natural buffer widths into local subdivision regulations. Rank: 2.5*

Threat 3 - Utility and service lines; Causes fragmentation of habitat, but plans for new corridors have been limited

- Actions:
- *Site/area protection; Identify and acquire problem sites. Rank: 2*

Rhode Island Wildlife Action Plan Habitat Profiles

- *Policies and regulations; restrict utility upgrades, lines/pipes to existing corridors; encourage underground placement of utility lines. Rank: 2*

Threat 4 - Invasive and non-native/alien species; Threat to mature forests primarily at habitat edges, some incursion by woody species into interiors

- Actions:
- *Invasive/problematic species control; expand and fund early detection and response program; give towns tools to ID and manage invasives; develop BMPs for state and local transportation depts. (disposal sites, equipment cleaning etc.). Rank: 2.5*
 - *Habitat and natural process restoration; allow for natural mature, functioning forests that will be resistant to invasives. (limit cutting of snags, limit clearing, etc). Rank: 2.5*
 - *Policies and regulations; develop nuisance plant list to limit sale and use of problematic species, firewood movement restrictions. Rank: 3*

Threat 5 - Other ecosystem modifications; Clearing within forest core areas prevents forest maturation and increases threat from invasives

- Actions:
- *Habitat and natural process restoration. Rank: 3*
 - *Policies and regulations. Rank: 3*

Threat 6 - Problematic native species; Deer browsing

- Actions:
- *Invasive/problematic species control; Encourage the taking of more deer (special permits, etc, allow hunters to take more, introduce more hunting capacity if existing hunter population insufficient, get more people into hunting (women etc); temporary regulations to reduce the population and then maintain it. Rank: 2.5*

Threat 7 - Recreational activities; Habitat fragmentation and degradation from human disturbance

- Actions:
- *Outreach; Control public access at priority sites. Rank: 2*

Upland (Deciduous Woodlands & Forests)

Oak Forest - White Oak/Mountain Laurel Forest

Condition: fair; lack of disturbance, lack of regeneration, deer, invasive insects. Importance to Biodiversity: 2. Degree of Threat: 3.

Threat 1 - Residential and commercial development; Housing and urban areas and commercial and industrial areas; Not as widespread as previous type, but also on highly developable soils

- Actions:
- *Site/area protection; Identify and acquire key parcels for fee purchase and easement. . Rank: 3*
 - *Resource and habitat protection; Identify and acquire key parcels for fee purchase and easement. . Rank: 3*
 - *Policies and regulations; identify and influence mechanisms for incentivizing land owners for conservation and watershed protection (farm, forest and OS; local planning policies that make it possible for land owners to economically benefit). Rank: 2.5*

Threat 2 - Roads and railroads; New road construction causes fragmentation of habitat

- Actions:
- *Site/area protection; Identify and acquire parcels; Identify any land acquisition needs that limit this threat. Rank: 3*
 - *Resource and habitat protection; Provide opportunities for inland migration. Rank: 3*
 - *Policies and regulations; provide local municipalities and state with the information to locate transportation corridors in appropriate places; locate roads for potential abandonment; incorporate sufficient natural buffer widths into local subdivision regulations. Rank: 2.5*

Threat 3 - Utility and service lines; Causes fragmentation of habitat, but plans for new corridors have been limited

- Actions:
- *Site/area protection; Identify and acquire problem sites. Rank: 2*
 - *Policies and regulations; restrict utility upgrades, lines/pipes to existing corridors; encourage underground placement of utility lines. Rank: 2*

Threat 4 - Invasive and non-native/alien species; Threat to mature forests primarily at habitat edges, some incursion by woody species into interiors

- Actions:
- *Invasive/problematic species control; expand and fund early detection and response program; give towns tools to ID and manage invasives; develop BMPs for state and local transportation depts. (disposal sites, equipment cleaning etc.). Rank: 2.5*
 - *Habitat and natural process restoration; allow for natural mature, functioning forests that will*

Rhode Island Wildlife Action Plan Habitat Profiles

be resistant to invasives. (limit cutting of snags, limit clearing, etc). Rank: 2.5

- *Policies and regulations; develop nuisance plant list to limit sale and use of problematic species, firewood movement restrictions. Rank: 3*

Threat 5 - Other ecosystem modifications; Clearing within forest core areas prevents forest maturation and increases threat from invasives

- Actions:*
- *Habitat and natural process restoration. Rank: 3*
 - *Policies and regulations. Rank: 3*

Threat 6 - Problematic native species; Deer browsing

- Actions:*
- *Invasive/problematic species control; Encourage the taking of more deer (special permits, etc, allow hunters to take more, introduce more hunting capacity if existing hunter population insufficient, get more people into hunting (women etc); temporary regulations to reduce the population and then maintain it. Rank: 2.5*

Threat 7 - Recreational activities; Habitat fragmentation and degradation from human disturbance

- Actions:*
- *Outreach; Control public access at priority sites. Rank: 2*

Mixed Oak/Pitch Pine Forest

KEY HABITATS



Image: L. Gould

Description

Mixed deciduous/coniferous forests of oaks and pitch pine typically occur in transitional areas between pitch pine dominated barrens habitats, and the more characteristic mixed oak forests of Rhode Island. The understory shrub layer is generally more diverse than that of barrens habitats with scrub oak, blueberries, and huckleberry providing a fairly dense cover. Fire is the primary agent that maintains these mixed forests, although frequency of fire is less than on barrens sites. Suppression of wild fires in recent years has resulted in the conversion of pitch pine dominated woodlands and barrens to mixed forests. Note, map depicts both mixed oak-white pine (90%) and mixed oak-pitch pine forests (10%).



~See map disclaimer in profiles introduction

Condition

The extent of Mixed Oak-Pitch Pine Forest in Rhode Island is highly variable depending on fire history. As there are no particular wildlife values solely associated with this forest type the condition is considered to be good.

Species

Invertebrates

- Spotted Dart Moth (*Agrotis stigmata*)
- Pink Star Moth (*Derrima stellata*)
- Scrub Euchlaena Moth (*Euchlaena madusaria*)
- Dart Moth (*Leucania extincta*)

Threats and Actions by Community Type

Upland (Mixed Deciduous/Coniferous Forests)

Mixed Oak/Pitch Pine Forest

Condition: good; lack of disturbance, lack of regeneration, deer, invasive insects. Importance to Biodiversity: 3. Degree of Threat: 2; lack of disturbance, lack of regeneration, deer, invasive insects.

Threat 1 - Housing and urban areas; Highly developable habitat type; large portions already fragmented by housing

- Actions:
- Site/area protection; Identify and acquire key parcels for fee purchase and easement. Rank: 3
 - Resource and habitat protection; Identify and acquire key parcels for fee purchase and easement. Rank: 3
 - Policies and regulations; identify and influence mechanisms for incentivizing land owners for conservation and watershed protection (farm, forest and OS; local planning policies that make it possible for land owners to economically benefit). Rank: 2.5

Rhode Island Wildlife Action Plan Habitat Profiles

- *Outreach; Educate private landowners and general public about the threat of 'overmanagement' of forest lands (removal of understory, ground cover, and leaf litter for control of ticks). Rank: 1*

Threat 2 - Roads and railroads

- Actions:
- *Site/area protection; Identify and acquire parcels; Identify any land acquisition needs that limit this threat. Rank: 3*
 - *Resource and habitat protection; Provide opportunities for inland migration. Rank: 3*
 - *Policies and regulations; Provide local municipalities and state with the information to locate transportation corridors in appropriate places; locate roads for potential abandonment; incorporate sufficient natural buffer widths into local subdivision regulations. Rank: 3*

Threat 3 - Utility and service lines; 0

- Actions:
- *Site/area protection; Identify and acquire problem sites. Rank: 3*
 - *Resource and habitat protection; control human access by fencing, patrols, etc. Rank: 1*
 - *Habitat and natural process restoration. Rank: 1*

Threat 4 - Fire and fire suppression

- Actions:
- *Site/area management. Rank: 2*
 - *Habitat and natural process restoration; allow for natural mature, functioning forests that will be resistant to invasives. (limit cutting of snags, limit clearing, etc). Rank: 2.5*

Mixed Oak/White Pine Forest

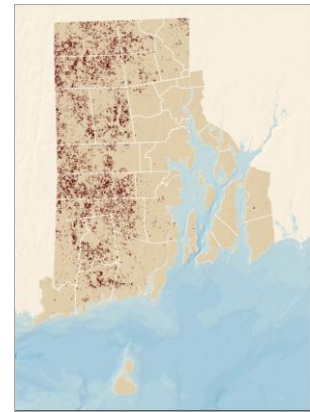
KEY HABITATS



Image: D. Payne

Description

Forests in this category are a combination of mixed hardwoods (primarily oaks) and white pine, a coniferous tree which may constitute as much as 90% of the overstory. Ancestrally, white pine was not a predominant tree in Southern New England forests; however, forests that regenerated after the widescale abandonment of farms in the late 1800's reverted to white pine because of this tree's competitive edge over most hardwood species. This forest of low to moderate moisture is usually closed canopy and can be heavily coniferous, with some nearly pure stands of white pine evident on the landscape which are also the result of reforestation activities conducted by foresters during the early-mid 20th Century. Mixed forests of hardwoods and white pine generally provide similar wildlife habitat values as deciduous (mixed oak) forests, whereas white pine-dominated forests and plantations support birds and other wildlife typical of coniferous forests. Note, map depicts both mixed oak-white pine (90%) and mixed oak-pitch pine forests (10%).



~See map disclaimer in profiles introduction

Condition

Mixed oak-white pine forests are found throughout the state, occurring as variable-sized stands within the predominant oak forest communities. Within management areas white pine stands are often regenerated by planting of seedlings on logged areas, but in areas where natural succession is proceeding white pine is gradually replaced by oaks and other hardwoods and forests are reverting to the more natural deciduous conditions.

SpeciesBirds

- Northern Goshawk (*Accipiter gentilis*)
- Least Flycatcher (*Empidonax minimus*)
- Purple Finch (*Haemorhous purpureus*)
- Yellow-rumped Warbler (*Setophaga coronata*)
- Blackburnian Warbler (*Setophaga fusca*)
- Blue-headed Vireo (*Vireo solitarius*)

Invertebrates

- Scarlet-winged Lichen Moth (*Hypoprepia miniata*)

Mammals

- Silver-haired Bat (*Lasionycteris noctivagans*)
- Eastern Red Bat (*Lasiurus borealis*)
- Hoary Bat (*Lasiurus cinereus*)
- Eastern Small-footed Myotis (*Myotis leibii*)
- Northern Long-eared Bat (*Myotis septentrionalis*)
- Tri-colored Bat (*Perimyotis subflavus*)
- New England Cottontail (*Sylvilagus transitionalis*)

Threats and Actions by Community Type

Upland (Mixed Deciduous/Coniferous Forests)

Mixed Oak/White Pine Forest

Condition: fair; lack of disturbance, lack of regeneration, deer, invasive insects. Importance to Biodiversity: 2.
Degree of Threat: 3.

Threat 1 - Residential and commercial development; A widespread upland forest type on highly developable upland soils

- Actions:
- Site/area protection; Identify and acquire key parcels for fee purchase and easement. Rank: 3
 - Resource and habitat protection; Identify and acquire key parcels for fee purchase and easement. Rank: 3
 - Policies and regulations; identify and influence mechanisms for incentivizing land owners for conservation and watershed protection (farm, forest and OS; local planning policies that make it possible for land owners to economically benefit). Rank: 2.5
 - Outreach; Educate private landowners and general public about the threat of 'overmanagement' of forest lands (removal of understory, ground cover, and leaf litter for control of ticks). Rank: 1

Threat 2 - Roads and railroads; New road construction causes fragmentation of habitat

- Actions:
- Site/area protection; Identify and acquire parcels; Identify any land acquisition needs that limit this threat. Rank: 3
 - Resource and habitat protection; Provide opportunities for inland migration. Rank: 3
 - Policies and regulations; Provide local municipalities and state with the information to locate transportation corridors in appropriate places; locate roads for potential abandonment; incorporate sufficient natural buffer widths into local subdivision regulations. Rank: 2.5

Threat 3 - Utility and service lines; Causes fragmentation of habitat, but plans for new corridors have been limited

- Actions:
- Site/area protection; Identify and acquire problem sites. Rank: 2
 - Resource and habitat protection; control human access by fencing, patrols, etc. Rank: 1
 - Policies and regulations; restrict utility upgrades, lines/pipes to existing corridors; encourage underground placement of utility lines. Rank: 2

Threat 4 - Invasive and non-native/alien species; Threat to mature forests primarily at habitat edges, some incursion by woody species into interiors

- Actions:
- Invasive/problematic species control; expand and fund early detection and response program; give towns tools to ID and manage invasives; develop BMPs for state and local transportation depts. (disposal sites, equipment cleaning etc); (earthworms, may include an education component); increase funding for control programs. . Rank: 3
 - Habitat and natural process restoration; allow for natural mature, functioning forests that will be resistant to invasives. (limit cutting of snags, limit clearing, etc). Rank: 2.5

Threat 5 - Other ecosystem modifications; Clearing within forest core areas prevents forest maturation and increases threat from invasives

- Actions:
- Habitat and natural process restoration. Rank: 2
 - Policies and regulations. Rank: 2

Threat 6 - Problematic native species; Deer browsing

- Actions:
- Invasive/problematic species control; Encourage the taking of more deer (special permits, etc, allow hunters to take more, introduce more hunting capacity if existing hunter population insufficient, get more people into hunting (women etc); temporary regulations to reduce the population and then maintain it. Rank: 2

Coastal Beach and Dune

KEY HABITATS



Image: USFWS

Description

Coastal beach and dune communities are governed by the persistent winds, salt spray, and storm surge that are characteristic conditions at the edge of the ocean. Closest to the action is the beach strand community that occupies the open beach in a narrow band between the highest normal tide and edge of the sand dune. The beach strand is characterized by scattered patches of highly specialized plants including sea-rocket and orache that can withstand periodic overwash by severe storms. Sand dunes are most notable along the southern Rhode Island shore where they create the “barriers” of salt ponds. The shifting sands are almost exclusively vegetated by beach grass, with sheltered areas in back dune areas vegetated with woody shrubs including bayberry, viburnum, and red cedar. Because of its unique setting at the upper edge of tidal influence, maritime beach strand provides critical habitat for several birds of conservation concern, including the Federally threatened piping plover, as well as least tern and American oystercatcher, and several invertebrates including the Federally threatened northeastern beach tiger beetle (last observed in Rhode Island in 1972), and the seabeach tiger beetle.



~See map disclaimer in profiles introduction

Condition

The amount of Coastal Beach and Dune habitats in Rhode Island is 3,762 acres, extending along the shorelines of southern Washington County, at Little Compton in Newport County, and on Block Island. Historically, beaches and dunes have been subject to human impact by housing development and heavy recreational use. Many natural dune systems have likely been lost, but others have been resurrected, such as on Napatree Point in Westerly which was wiped clean of homes by the 1938 hurricane. Today, many beach/dune habitats are protected as National Wildlife Refuges, The Nature Conservancy preserves, and other protected sites, and they have received additional recognition by the National Audubon Society as Important Bird Areas. Although there appears to be adequate protection for coastal beaches there is a high potential for these systems to be heavily altered in the near future by unprecedented sea level rise, and because of these uncertainties the condition of Beach Strand is considered to be fair. Dune communities also face some uncertainty due to climate change but should be less impacted than the open beach, therefore the condition of Herbaceous and Shrub Dune is considered to be good.

Species

Birds

- Great Egret (*Ardea alba*)
- Gray Catbird (*Dumetella carolinensis*)
- Snowy Egret (*Egretta thula*)
- Rusty Blackbird (*Euphagus carolinus*)
- Yellow-crowned Night Heron (*Nyctanassa violacea*)
- Black-crowned Night Heron (*Nycticorax nycticorax*)
- Glossy Ibis (*Plegadis falcinellus*)
- Roseate Tern (*Sterna dougallii*)
- Common Tern (*Sterna hirundo*)

Rhode Island Wildlife Action Plan Habitat Profiles

Invertebrates

Benjamin's Abagrotis (*Abagrotis nefascia benjamini*)

Fringed Dart (*Eucoptocnemis fimbriaris*)

Plants

Purple Needlegrass (*Aristida purpurascens*)

Maryland Golden Aster (*Chrysopsis mariana*)

Yellow Thistle (*Cirsium horridulum* var. *horridulum*)

Bushy Rockrose (*Crocanthemum dumosum*)

New England Blazing Star (*Liatris novae-angliae*)

Slender Beadgrass (*Paspalum setaceum* var. *psammophilum*)

Threats and Actions by Community Type

Upland (Open Uplands (Grassland & Shrubland))

Coastal Beach and Dune - Maritime Beach Strand

Condition: good. Importance to Biodiversity: 3. Degree of Threat: 3; climate change and severe weather, lack of migration opportunity.

Threat 1 - Climate change and severe weather; Habitat shifting and alteration and storms and flooding; Rapid sea level rise reduces habitat and limits reestablishment; increases in storm severity

- Actions:
- Site/area protection; insure opportunities for inland migration with sea level rise. Rank: 2.5
 - Resource and habitat protection; Identify and acquire key parcels for fee purchase and easement. Rank: 2.5
 - Site/area management; insure opportunities for inland migration with sea level rise. Rank: 2.5
 - Habitat and natural process restoration. Rank: 1

Threat 2 - Invasive non-native alien species; Japanese Sand Sedge (*Carex kobomugi*)

- Actions:
- Invasive/problematic species control; control of current populations and early detection of new incursions. Rank: 2.5
 - Habitat and natural process restoration; control of current populations and early detection of new incursions. Rank: 2.5

Threat 3 - Recreational activities; Beachgoers and dogs trampling habitat, disturbing nesting birds

- Actions:
- Site/area protection; control human access by fencing, patrols, etc. Rank: 3
 - Resource and habitat protection; control human access by fencing, patrols, etc. Rank: 3
 - Site/area management; control human access by fencing, patrols, etc. Rank: 3
 - Awareness and communications; signage, etc. Rank: 3

Threat 4 - Industrial and military effluents; Oil spills

- Actions:
- Policies and regulations; support regulations to curtail threat. Rank: 2.5
 - Resource and habitat protection; intensify clean-up actions in event of spill. Rank: 2.5

Upland (Open Uplands (Grassland & Shrubland))

Coastal Beach and Dune - Maritime Herbaceous Dune

Condition: fair. Importance to Biodiversity: 3. Degree of Threat: 3; climate change and severe weather, lack of migration opportunity.

Threat 1 - Climate change and severe weather; Habitat shifting and alteration and storms and flooding; Rapid sea level rise reduces habitat and limits reestablishment; increases in storm severity

- Actions:
- Site/area protection; insure opportunities for inland migration with sea level rise. Rank: 2.5
 - Resource and habitat protection; Identify and acquire key parcels for fee purchase and easement. Rank: 2.5
 - Site/area management; insure opportunities for inland migration with sea level rise. Rank: 2.5

Threat 2 - Invasive non-native/alien species; Japanese Sand Sedge (*Carex kobomugi*) on foredune

- Actions:
- Invasive/problematic species control; control of current populations and early detection of new incursions. Rank: 2.5
 - Habitat and natural process restoration; control of current populations and early detection of

Rhode Island Wildlife Action Plan Habitat Profiles

new incursions. Rank: 2.5

- *Site/area management; control of current populations and early detection of new incursions. Rank: 2.5*

Threat 3 - Recreational activities; Beachgoers and dogs trampling habitat

- Actions:*
- *Site/area protection; control human access by fencing, patrols, etc. Rank: 3*
 - *Resource and habitat protection; control human access by fencing, patrols, etc. Rank: 3*
 - *Site/area management; control human access by fencing, patrols, etc. Rank: 3*
 - *Awareness and communications; signage, etc. Rank: 3*

Threat 4 - Housing and urban areas; Although potential for new development is low, a sizable amount of this habitat is already built on

- Actions:*
- *Site/area protection; support regulations to curtail threat. Rank: 2.5*
 - *Resource and habitat protection; intensify clean-up actions in event of spill. Rank: 2.5*

Coastal Shrubland and Grassland

KEY HABITATS



Image: Peter August

Description

Coastal shrublands are upland habitats dominated by woody shrubs that occur on seaside bluffs and headlands exposed to ocean winds and salt spray, and on adjacent inland areas that receive wind and spray during storm events. Exposed areas are vegetated with shorter, compact shrubs of bayberry, wild rose, beach plum, and poison ivy, while less-exposed areas have taller shrubs of arrowwood, shadbush, black cherry and red cedar. Open patches of grasses and mixed forbs may form on the most heavily exposed sites, but these areas are generally <1 acre in size and mostly found on Block Island. Away from the immediate coast alien invasive shrubs are often present in coastal shrublands, including multiflora rose, oriental bittersweet, and honeysuckles. The principal wildlife value of coastal shrublands is as nesting habitat for birds associated with shrubland and early successional habitats (old fields), including GCN species. The yellow-breasted chat is a notable species of conservation concern in Rhode Island that nests exclusively in coastal shrublands. In addition, coastal shrublands provide important feeding areas for migrant songbirds, with studies indicating these habitats may be critical for many birds in accumulating the energy needed for undertaking long migration flights.



~See map disclaimer in profiles introduction

Condition

The amount of shrubland in Rhode Island was recently estimated by Buffum (2011) who used a combination of visual and automated approaches to derive an estimate of statewide coverage of these habitats. In this analysis, a coastal buffer was identified that included all areas within 1km of the coast, and all portions of Block Island, or about 16% of the land area in Rhode Island. Within this area, a total of 8,148 acres of shrubland was identified, about 3100 acres of which is considered to be the naturally-occurring coastal shrubland type. The highest percentage of coastal shrubland is found on Block Island where 40% of the entire upland is this habitat type. The coastal zone of Rhode Island has long been recognized as the most heavily human-altered portion of the Rhode Island landscape, originally because of the relatively high agricultural value of the soils, and later due to its military importance and desirability for residential development, especially vacation homes and associated commercial amenities. Therefore, the extent of coastal shrubland habitat prior to settlement is difficult to discern as coastal shrublands were probably limited to a much narrower fringe along the immediate coast when forest covered a greater portion of the landscape. Today, land within the coastal zone is being targeted for conservation with the establishment of several National Wildlife refuges, State management areas, and nature preserves managed by The Nature Conservancy and other nonprofits, and many of these properties are actively protecting coastal shrubland habitat.

Species

Birds

Short-eared Owl (*Asio flammeus*)

Piping Plover (*Charadrius melodus*)

American Oystercatcher (*Haematopus palliatus*)

Yellow-breasted Chat (*Icteria virens*)

Herring Gull (*Larus argentatus*)

Rhode Island Wildlife Action Plan Habitat Profiles

Least Tern (*Sternula antillarum*)

Invertebrates

- Northeast Beach Tiger Beetle (*Cicindela dorsalis dorsalis*)
- Hairy-necked Tiger Beetle (*Cicindela hirticollis rhodensis*)
- Violet Dart Moth (*Euxoa violaris*)
- Flea Beetle (*Phyllotreta chalybeipennis*)
- Hister Beetle (*Spilodiscus arcuatus*)
- Robber Fly (*Stichopogon argenteus*)
- Dune Noctuid Moth (*Sympistis riparia*)

Plants

- Seabeach Amaranth (*Amaranthus pumilus*)
- Seabeach Knotweed (*Polygonum glaucum*)
- Herbaceous Sea Blite (*Suaeda maritima* ssp. *richii*)

Threats and Actions by Community Type

Upland (Open Uplands (Grassland & Shrubland))

Coastal Shrubland and Grassland - Maritime Grassland

Condition: good. Importance to Biodiversity: 3. Degree of Threat: 3; climate change and severe weather, lack of migration opportunity.

Threat 1 - Invasive non-native species; Advance of invasives on this habitat type has been slowed due to harsher conditions

- Actions:
- Invasive/problematic species control; provide early detection and rapid response to problem situations. Rank: 2.5
 - Site/area protection; Low priority as most examples of habitat have been protected. Rank: 2.5
 - Site/area management; insure opportunities for inland migration with sea level rise. Rank: 2.5

Threat 2 - Housing and urban areas

- Actions:
- Site/area protection; conduct protection as needed. Rank: 2
 - Resource and habitat protection; Provide opportunities for inland migration. Rank: 2
 - Site/area management; little need for this action. Rank: 2

Threat 3 - Habitat shifting and alteration; May be some shifting of habitat with stronger storms and sea level rise; however, habitat may also benefit from climate alteration

- Actions:
- Site/area protection; Identification and eventual protection of areas for inland migration of this habitat. Rank: 2
 - Habitat and natural process restoration; Monitor habitat and provide restoration support where needed. Rank: 2

Threat 4 - Fire and fire suppression; Loss of habitat from plant succession

- Actions:
- Habitat and natural process restoration; Develop fire prescriptions for priority parcels. Rank: 2
 - Habitat and natural process restoration; Implement burn management on priority parcels. Rank: 2
 - Outreach; Expand public relations for fire management. Rank: 2

Upland (Open Uplands (Grassland & Shrubland))

Coastal Shrubland and Grassland - Maritime Shrub Dune

Condition: fair. Importance to Biodiversity: 3. Degree of Threat: 3; climate change and severe weather, lack of migration opportunity.

Threat 1 - Climate change and severe weather; Habitat shifting and alteration and storms and flooding; Rapid sea level rise reduces habitat and limits reestablishment; increases in storm severity

- Actions:
- Site/area protection; insure opportunities for inland migration with sea level rise. Rank: 2.5
 - Resource and habitat protection; Identify and acquire key parcels for fee purchase and easement. Rank: 2.5
 - Site/area management; insure opportunities for inland migration with sea level rise. Rank: 2.5

Rhode Island Wildlife Action Plan Habitat Profiles

Threat 2 - Invasive non-native/alien species

- Actions:
- *Invasive/problematic species control; Early detection and rapid response to control spread of invasives into habitat. Rank: 3*
 - *Habitat and natural process restoration; Allow natural processes to restore habitats if needed. Rank: 2.5*

Threat 3 - Recreational activities; Beachgoers and dogs trampling habitat

- Actions:
- *Site/area protection; Habitat already protected as conservation land but infill sites may still be available. Rank: 2*
 - *Resource and habitat protection; Habitat already protected as conservation land but infill sites may still be available. Rank: 2*
 - *Site/area management; Identification and eventual protection of areas for inland migration of this habitat. Rank: 2*
 - *Awareness and communications; Public awareness can be effective in controlling overuse. Rank: 2*

Threat 4 - Housing and urban areas; Although potential for new development is low, a large amount of this habitat is already built on

- Actions:
- *Site/area protection; This habitat already protected by regulation, but many homes are currently present; Opportunities exist for more inland locations where this habitat may eventually extend. Rank: 2.5*
 - *Resource and habitat protection; This habitat already protected by regulation, but many homes are currently present. Opportunities exist for more inland locations where this habitat may eventually extend. Rank: 2.5*
 - *Site/area management; This habitat already protected by regulation, but many homes are currently present; Opportunities exist for more inland locations where this habitat may eventually extend. Rank: 2.5*
 - *Habitat and natural process restoration; Allow natural processes to rehabilitate sites when structures are removed. Rank: 2.5*

Upland (Open Uplands (Grassland & Shrubland))

Coastal Shrubland and Grassland - Maritime Shrubland

Condition: fair; known sites only on Block Island. Importance to Biodiversity: 3. Degree of Threat: 2.

Threat 1 - Housing and urban areas; Uplands near the coast are prime areas for development

- Actions:
- *Site/area protection; much of this habitat is protected by TNC, State and Federal agencies, but still opportunities for infilling. Rank: 2.5*
 - *Resource and habitat protection; Identify and acquire key parcels for fee purchase and easement. Rank: 2.5*
 - *Policies and regulations; Recognition of wildlife importance of natural maritime shrublands within policies, rules, etc. Rank: 2.5*

Threat 2 - Invasive non-native/alien species; Degree of threat depends on level of disturbance, management (or lack of), and potential value of invasive shrubs to migratory and wintering birds

- Actions:
- *Invasive/problematic species control; Invasives in this habitat are mostly woody shrubs that may need regular control in situations where their presence is compromising wildlife values. Rank: 2*

Threat 3 - Problematic native species; Deer

- Actions:
- *Invasive/problematic species control; Provide control where needed. Rank: 2*
 - *Resource and habitat protection; Identification and eventual protection of areas for inland migration of this habitat. Rank: 1*
 - *Site/area management; Identification and eventual protection of areas for inland migration of this habitat. Rank: 1*
 - *Habitat and natural process restoration; Monitor habitat and provide restoration support where needed. Rank: 2.5*

Ruderal Grassland/Shrubland

KEY HABITATS



Image: Scott Ruhren

Description

Ruderal grasslands and shrublands constitute early successional habitats, defined by Anderson, et. al. (1976) as uplands where the potential natural vegetation is predominantly grasses, grass-like plants, forbs, or shrubs. Ancestrally, these habitats would have developed in the openings created within forests by natural disturbances, primarily severe storms and fires. Today, the majority of these habitats are anthropogenic in origin with most old field habitat created and maintained on State management areas, other conservation lands, and private properties under management agreements. Clearcuts are identified as a separate habitat type because the natural successional patterns differ from those on former agricultural fields. Utility rights-of-way also provide early successional habitat that is periodically managed by the utility, with electric powerlines usually maintained as shrublands, and gaslines kept in more open grassy conditions. The maintenance of early successional habitats provides opportunities for a variety of wildlife that utilize natural shrublands.



~See map disclaimer in profiles introduction

Condition

Historically, the widespread clearing of the forest by the colonists for wood and farmland provided a large amount of potential early successional habitat that eventually developed a maximum extent during the post Civil War era when large tracts of farmland were abandoned. Shrubland wildlife significantly benefited by the increase of old field habitat during this period, but since that time there has been a steady decline in shrublands as old fields succeeded to forest and many old farms were converted to residential and commercial developments. According to Buffum (2010), 3.3% (about 12,000 acres) of the state is currently shrubland habitat, although coverage varies widely. Coastal communities (e.g., Block Island and Jamestown) that also maintain natural maritime shrublands have the greatest amounts; inland areas typically have less coverage that is mostly anthropogenic early successional types. About 82% of the powerlines in Rhode Island were classified as shrublands. Wildlife managers can not rely on natural disturbances to maintain or create enough shrubland habitat to support GCN species, and anthropogenic methods are needed to augment natural shrublands. Litviatis (2003) points out that such an approach should not jeopardize the survival of species affiliated with other habitats, especially mature forests, and efforts to provide shrubland habitats in human-dominated landscapes should incorporate existing modified lands to avoid concerns of additional habitat fragmentation. Large, clustered patches of shrubland habitat may be more practical and beneficial, especially in coastal areas where the creation and maintenance of ruderal shrublands can augment the naturally maintained coastal shrubland habitats.

Species

Birds

- American Kestrel (*Falco sparverius*)
- Eastern Towhee (*Pipilo erythrophthalmus*)
- Eastern Bluebird (*Sialia sialis*)
- Field Sparrow (*Spizella pusilla*)
- Tree Swallow (*Tachycineta bicolor*)
- Barn Owl (*Tyto alba*)

Rhode Island Wildlife Action Plan Habitat Profiles

Invertebrates

- Dusted Skipper (*Atrytonopsis hianna*)
Rusty-patched Bumble Bee (*Bombus affinis*)
Yellowbanded Bumblebee (*Bombus terricola*)
Olive Hairstreak (*Callophrys gryneus*)
Bay Underwing (*Catocala badia*)
Waved Sphinx (*Ceratonia undulosa*)
9-spotted Lady Beetle/ladybug (*Coccinella novemnotata*)
Monarch Butterfly (*Danaus plexippus*)
Pink Streak Moth (*Dargida rubripennis*)
Spotted Datana (*Datana perspicua*)
Achemon Sphinx (*Eumorpha achemon*)
Cobweb Skipper (*Hesperia metea*)
Pink-border Yellow (*Phytometra rhodarialis*)
Four-spotted Speranza Moth (*Speranza coortaria*)

Mammals

- Block Island Meadow Vole (*Microtus pennsylvanicus provectus*)

Plants

- Nantucket Shadbush (*Amelanchier nantucketensis*)
Wild Coffee (*Triosteum perfoliatum*)

Threats and Actions by Community Type

Upland (Open Uplands (Grassland & Shrubland))

Ruderal Grassland/Shrubland - Clearcut

Condition: fair; invasives are present. Importance to Biodiversity: 2. Degree of Threat: 3; development, invasives, natural system (fire) suppression, deer impacts.

Threat 1 - Housing and urban areas; These habitats are highly desirable for development

- Actions:
- Site/area protection; Identify and acquire key parcels for fee purchase and easement. Rank: 2.5
 - Resource and habitat protection; Prepare site-specific management plans. Rank: 1

Threat 2 - Other ecosystem modifications; Requires tree cutting

- Actions:
- Site/area management; Conduct tree-cutting. Rank: 3
 - Policies and regulations; Prepare site-specific management plans. Rank: 3

Threat 3 - Invasive non-native/alien species; Invasion threat influenced by disturbance, proximity and land management (or lack of)

- Actions:
- Invasive/problematic species control; Control invasives where needed. Rank: 2

Threat 4 - Problematic native species; Deer may selectively browse woody species

- Actions:
- Invasive/problematic species control; Provide additional hunting opportunities in problem areas. Rank: 2

Upland (Open Uplands (Grassland & Shrubland))

Ruderal Grassland/Shrubland - Hedgerow

Condition: fair; invasives are present. Importance to Biodiversity: 2. Degree of Threat: 2; development, invasives, natural system (fire) suppression.

Threat 1 - Housing and urban areas; These habitats are desirable for development in conjunction with old field and other habitats

- Actions:
- Site/area protection; Identify and acquire key parcels for fee purchase and easement. Rank: 2
 - Resource and habitat protection; Conduct management where needed. Rank: 2

Threat 2 - Other ecosystem modifications; May need some mechanical management, but not as intensive as neighboring old fields

- Actions:
- Site/area management; Conduct management. Rank: 2
 - Policies and regulations; Prepare site-specific management plans. Rank: 2

Threat 3 - Invasive non-native/alien species; Threat very low as many hedgerows formed of invasive shrubs

Rhode Island Wildlife Action Plan Habitat Profiles

Actions: • *Invasive/problematic species control; Control invasives where needed. Rank: 2*

Upland (Open Uplands (Grassland & Shrubland))

Ruderal Grassland/Shrubland - Old Field

Condition: fair; many are managed, invasives are present. Importance to Biodiversity: 3. Degree of Threat: 3; development, invasives, natural system (fire) suppression.

Threat 1 - Housing and urban areas; These habitats are highly desirable for development

- Actions:
- *Site/area protection; Identify and acquire key parcels for fee purchase and easement. Rank: 2.5*
 - *Resource and habitat protection; Development of management plans for protected sites. Rank: 2.5*
 - *Policies and regulations; Recognition of wildlife importance of this habitat within policies, rules, etc. Rank: 2.5*
 - *Outreach; Educate private landowners and general public about the threat of 'overmanagement' of forest lands (removal of understory, ground cover, and leaf litter for control of ticks). Rank: 1*

Threat 2 - Other ecosystem modifications; Requires periodic management by mechanical means (e.g., mowing, brush cutting) to maintain open conditions

- Actions:
- *Site/area management; Conduct management. Rank: 2.5*
 - *Policies and regulations; Prepare site-specific management plans. Rank: 2.5*

Threat 3 - Fire and fire suppression; Suppression of natural fire considered a low threat, can be replaced by mechanical management and controlled burns

- Actions:
- *Site/area management; Conduct controlled burning where allowed. Rank: 2*
 - *Habitat and natural process restoration; Restore associated natural habitats that support similar wildlife values; i.e., maritime shrublands. Rank: 2*

Threat 4 - Invasive non-native/alien species; Widespread invasions can reduce plant diversity; but, some invasives may be beneficial

- Actions:
- *Invasive/problematic species control; Identify problem sites and conduct control when needed. Rank: 2.5*

Threat 5 - Problematic native species; Deer may be an issue by selective browsing

- Actions:
- *Invasive/problematic species control; Provide additional hunting opportunities in areas suffering from overbrowsing. Rank: 2.5*

Threat 6 - Fire and fire suppression; Loss of habitat from plant succession

- Actions:
- *Habitat and natural process restoration; Develop fire prescriptions for priority parcels. Rank: 3*
 - *Habitat and natural process restoration; Implement burn management on priority parcels. Rank: 3*
 - *Outreach; Expand public relations for fire management. Rank: 3*

Upland (Open Uplands (Grassland & Shrubland))

Ruderal Grassland/Shrubland - Utility Rights-of-Way

Condition: good; many are managed, invasives are present. Importance to Biodiversity: 2. Degree of Threat: 1; invasives, natural system (fire) suppression, ATVs.

Threat 1 - Recreational activities; Primarily by ATV and other vehicle use

- Actions:
- *Site/area protection; Control public access. Rank: 2*
 - *Resource and habitat protection; Control public access. Rank: 2*
 - *Policies and regulations; Support regulations to control public access. Rank: 1.5*

Threat 2 - Agricultural and forestry effluents; Herbicide use for managing woody vegetation

- Actions:
- *Site/area management; ecologists should work with utility companies to manage these habitats. Rank: 2*

Threat 3 - Invasive non-native/alien species; Spread of invasives in ROWs can pose threat to adjacent natural habitats

- Actions:
- *Invasive/problematic species control; Early detection and rapid response to identified invasive*

Rhode Island Wildlife Action Plan Habitat Profiles

sites. Many invasive plants have initially been found on ROWs. Rank: 2.5

Sparsely Vegetated Rock

KEY HABITATS



Image: L. Gould

Description

This class of habitats combines several communities which are characterized by bare rock and soil substrates and minimal growth of plants. Inland rocky outcrops are found mostly on granitic or limestone ledges and cliffs exposed by human activity, primarily mining. Maritime rocky cliffs occur as upland extensions of the estuarine rocky shore community that are high enough above the normal high tide level to support a few salt-tolerant plants. Maritime bluffs are composed of clays and glacial till exposed by storm action and are primarily found on Block Island where they can rise more than 100 feet above the beach. Although bluffs are mostly unvegetated, groundwater seeps that arise on the face can support linear patches of wetland plants. In general, sparsely vegetated habitats are inhabited by a small community of highly specialized animals, most notably tiger beetles which favor the exposed areas for hunting and digging burrows.



~See map disclaimer in profiles introduction

Condition

Sparsely vegetated habitats are relatively uncommon in Rhode Island, for example it has been estimated that there is <5 acres of inland rocky outcrop, and there is even less maritime rocky cliff. However, there has been relatively little change in these habitats for many years and their condition is considered to be good.

Species

Birds

Bank Swallow (*Riparia riparia*)
Barn Owl (*Tyto alba*)

Invertebrates

Common Claybank Tiger Beetle (*Cicindela limbalis*)
Eastern Red-bellied Tiger Beetle (*Cicindela rufiventris rufiventris*)
Tufted Sedge Moth (*Hypocoena inquinata*)

Plants

Mountain Spleenwort (*Asplenium montanum*)
Missouri Mustard (*Boechera missouriensis*)
Lion's-foot Rattlesnake-root (*Nabulus serpentarius*)

Threats and Actions by Community Type

Upland (Open Uplands (Grassland & Shrubland))

Sparsely Vegetated Rock - Inland Rocky Outcrop

Condition: good. Importance to Biodiversity: 2. Degree of Threat: 1; recreation (hiking).

Threat 1 - Recreational activities; Trampling of sensitive species by hikers

- Actions:
- Site/area protection; Identify and acquire key parcels for fee purchase and easement. Rank: 1.5
 - Resource and habitat protection; Control public access. Rank: 1.5

Rhode Island Wildlife Action Plan Habitat Profiles

Threat 2 - Other ecosystem modifications; Reduction in open rocky habitat from plant succession

Actions: • *Site/area management; Management to maintain open conditions. Rank: 1.5*

Upland (Open Uplands (Grassland & Shrubland))

Sparsely Vegetated Rock - Maritime Bluff

Condition: good. Importance to Biodiversity: 2. Degree of Threat: 1; potential sea-level rise impacts, change due to erosion.

Threat 1 - Habitat shifting and alteration; Sea level rise may reduce habitat, with little opportunity for migration

Actions: • *Site/area protection; Identify and acquire key parcels for fee purchase and easement. Rank: 1.5*
• *Resource and habitat protection; Identify and acquire key parcels for fee purchase and easement. Rank: 1.5*

Threat 2 - Recreational activities; Some trampling of habitat

Actions: • *Site/area protection; Identify and acquire parcels. Rank: 1.5*
• *Site/area management; Control public access. Rank: 1.5*

Upland (Open Uplands (Grassland & Shrubland))

Sparsely Vegetated Rock - Maritime Rocky Cliff

Condition: good. Importance to Biodiversity: 3. Degree of Threat: 1; potential sea-level rise impacts.

Threat 1 - Habitat shifting and alteration; Sea level rise may reduce habitat, with little opportunity for migration

Actions: • *Site/area protection; Identify and acquire key parcels for fee purchase and easement. Rank: 1*
• *Resource and habitat protection; Identify and acquire key parcels for fee purchase and easement. Rank: 1*

Threat 2 - Invasive non-native and alien species; Threat considered relatively low in this habitat

Actions: • *Invasive/problematic species control; Provide control where needed. Rank: 1.5*

Ruderal Forest

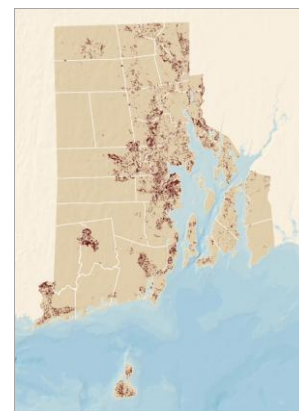
KEY HABITATS



Image: Jeanine Silversmith, RI Families in Nature

Description

Ruderal forests result from the significant modification of natural forest vegetation so that the structural and floristic characteristics of the community have no clearly known natural analogue. In Rhode Island, most ruderal forests are found in urban areas on lands set aside for parks, cemeteries, hospital grounds, schoolyards, and similar purposes where human access may be minimal, but in many sites overuse has resulted in heavily degraded understory layers. Ruderal upland forests also occur around the fringes of small red maple swamps and floodplains that have remained undeveloped within the otherwise heavily urbanized landscape. There is no particular plant species composition that characterizes ruderal forests, but generally there is an overstory comprised of native trees, including red maple, black cherry, gray birch, sassafras, American beech, and oaks, with a variable mix of introduced trees, and an understory of tall shrubs and saplings of primarily alien species, many of which are invasive. Ruderal forests are a valuable natural amenity within the highly developed contexts in which they are found, providing opportunities for environmental education and passive recreation, as well as ecological services of air purification and water retention. Moreover, ruderal forests are important wildlife habitats that serve as stopover sites for migrating songbirds, wintering areas, and breeding sites for a variety of birds including several GCN species generally associated with early successional habitats. Note, species listed for this habitat are just a few examples of SGCN that use the habitat. It should be noted that other SGCN could occur in ruderal forests; however, this is highly dependent on the individual forest, surrounding land use, etc.



~See map disclaimer in profiles introduction

Condition

It is estimated that about 36,817 acres (Photoscience mapping of RIECC habitats) of ruderal forest exist in Rhode Island urbanized communities, including the cities of Providence, Cranston, Warwick, Woonsocket, and Newport. Maintenance of ruderal forests is the responsibility of the property owner and management can vary widely depending on whether ownership is public or private. As such, the condition of these forests is highly variable depending on the size (acreage) and degree of public access.

Species

Birds

- Gray Catbird (*Dumetella carolinensis*)
- American Woodcock (*Scolopax minor*)
- Blackpoll Warbler (*Setophaga striata*)

Threats and Actions by Community Type

Rhode Island Wildlife Action Plan Habitat Profiles

Upland (Plantation & Ruderal Forest)

Ruderal Forest - Ruderal Forest

Condition: fair; low plant species richness and diversity. Importance to Biodiversity: 1. Degree of Threat: 2.

Threat 1 - Residential and commercial development; Many wooded tracts within urban areas remain unprotected; however, larger tracts exist in parks, cemeteries, etc.

- Actions:
- Site/area protection; Identify and acquire key parcels for fee purchase and easement. Rank: 3
 - Resource and habitat protection; Identify and acquire key parcels for fee purchase and easement. Rank: 3
 - Policies and regulations; identify and influence mechanisms for incentivizing land owners for conservation and watershed protection (farm, forest and OS; local planning policies that make it possible for land owners to economically benefit). Rank: 2.5
 - Outreach; Educate private landowners and general public about the threat of 'overmanagement' of forest lands (removal of understory, ground cover, and leaf litter for control of ticks). Rank: 2

Threat 2 - Invasive non-native/alien species; Ruderal forests are generally heavily infested with invasives

- Actions:
- Invasive/problematic species control; Conduct invasive control projects and restore sites with native species. Rank: 2.5
 - Policies and regulations; Implement and enforce nuisance plant regulations. Rank: 2.5

Threat 3 - Problematic native species; Deer browsing contributes to reduced shrub and herb density and diversity, favoring spread of invasive plants

- Actions:
- Invasive/problematic species control; Investigate other methods for controlling deer populations in urbanized settings. Rank: 2.5

Threat 4 - Recreational activities; Situated in populated portions of the state, wooded tracts are heavily impacted by trampling, illegal dumping, and other intrusions

- Actions:
- Site/area protection; Identify and acquire unprotected sites. Rank: 2
 - Policies and regulations; Implement and enforce regulations to prevent illegal dumping, access by ATVs, and other intrusions. Rank: 2.5

Upland (Plantation & Ruderal Forest)

Ruderal Forest - Tree Plantation

Condition: poor; disease, insects. Importance to Biodiversity: 1. Degree of Threat: 3; out of natural range.

Threat 1 - Invasive non-native species; Because plantations typically consist of a single tree (usually a conifer) species, they are highly susceptible to insect and other pest damage

- Actions:
- Site/area management; Control invasive species. Rank: 2

Threat 2 - Problematic native species; Deer may cause browsing impact on community establishment and composition

- Actions:
- Invasive/problematic species control; Provide more hunting opportunities in problem areas. Rank: 1.5

Threat 3 - Housing and urban areas; Many of these habitats are on protected land, especially state management areas and parks

- Actions:
- Site/area protection; Identify and acquire parcels. Rank: 2

River

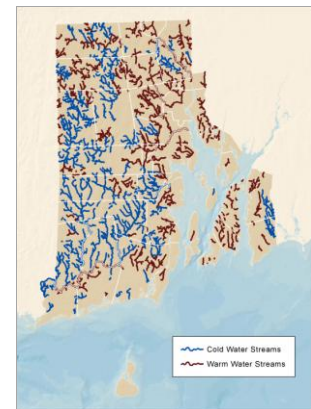
KEY HABITATS



Image: Peter August

Description

Flowing water ecosystems are first defined by the size of the upstream drainage area, and in Rhode Island the following apply: Stream size is given the highest ranking because of its strong effect on determining aquatic biological assemblages at the reach scale. The physical size of a stream relates to major ecosystem changes from small headwater streams to large river mouths. In narrow headwater streams, coarse particulate organic matter (e.g. leaves and twigs) from the riparian zone provides the energy source for a consumer community dominated by shredding insects. As a river broadens at mid-order sites, energy inputs change as sunlight reaches the stream to support significant periphyton production and grazing insects. As the river further increases in size, fine particulate organic matter inputs increase and macrophytes become more abundant as reduced channel gradient and finer sediments form suitable conditions for their establishment. In even larger rivers, the main channel becomes unsuitable for macrophytes due to turbidity, fast current, depth and/or lack of stable substrates. Headwaters and Creeks: Of the more than 1400 miles of streams and rivers in Rhode Island the majority (84%) are classified as headwaters and creeks. Most of these smaller streams are cool, moderately fast-moving systems of low elevation hills and gentle slopes. They have substrates dominated by cobble, gravel, and sand with occasional small patches of boulders. Cool water temperatures support fish communities with a higher proportion of cool and warm water species relative to coldwater species. Only about 10% of Rhode Island's headwaters and creeks are high gradient (fast-moving), cold temperature streams. These streams occur on slopes made of resistant bedrock and tend to run fast and cold, ensuring that they are fully oxygenated. The cold temperature in these systems means coldwater fish species, such as brook trout, likely represent over half of the fish community and can utilize this habitat year-round. Typically these streams are characterized by cascade and step-pool habitats where channels are narrowly confined. Small Rivers: About 11% of Rhode Island's flowing water ecosystems are classified as small rivers with low to moderately fast-moving, cool waters. Those with slow-moving waters are dominated by runs with interspersed pool sections and a few short, or no distinct riffles. Substrates are usually silt, sand, and fine gravel and they may exhibit high turbidity and be somewhat poorly oxygenated. They are typically surrounded by floodplain forest, wetlands, or eroded sand banks or fine sediment bars. Small rivers with moderate gradients have substrates composed of more gravels and cobbles and tend to be better oxygenated. Medium Rivers: The largest flowing water systems in Rhode Island are classified as medium rivers that have an average bankfull width of 115 feet. Slower moving, lower gradient sections of these rivers are expected to be more unconfined with higher sinuosity, broader floodplain valleys, more riparian wetlands, and lower width/depth ratios than the more moderate gradient portions. Warm water temperatures in these rivers means the fish community will contain a higher proportion of warmwater species relative to coolwater species, and they are unlikely to support any resident coldwater species.



~See map disclaimer in profiles introduction

Rhode Island Wildlife Action Plan Habitat Profiles

Condition

A general rule when considering the condition of Rhode Island's rivers and streams is that first order streams tend to have better water quality than higher order streams and rivers. [Stream order is based on the number of tributaries flowing into a stream from upstream areas, the smallest un-branched stream with no tributaries being designated a first order stream]. Headwaters and creeks are more prevalent in undeveloped portions of the state whereas larger rivers (e.g., Blackstone River) have a long history of human use and higher levels of pollutants. In general, fish species diversity increases with stream order; however, much of this increase is due to the introduction of non-native species.

Species

Fish

- Atlantic Sturgeon (*Acipenser oxyrinchus*)
- Blueback Herring (*Alosa aestivalis*)
- Alewife (*Alosa pseudoharengus*)
- American Shad (*Alosa sapidissima*)
- American Eel (*Anguilla rostrata*)
- Weakfish (*Cynoscion regalis*)
- American Brook Lamprey (*Lampetra appendix*)
- Redbreast Sunfish (*Lepomis auritus*)
- Inland Silverside (*Menidia beryllina*)
- White Perch (*Morone americana*)
- Bridle Shiner (*Notropis bifrenatus*)
- Rainbow Smelt (*Osmerus mordax*)
- Blacknose Dace (*Rhinichthys atratulus*)
- Atlantic Salmon (*Salmo salar*)
- Brook Trout (*Salvelinus fontinalis*)

Herpetofauna

- Wood Turtle (*Glyptemys insculpta*)

Invertebrates

- Alewife Floater (*Anodonta implicata*)
- Watersnipe Flies (*Atherix spp.*)
- Giant Stonefly (*Attaneuria ruralis*)
- Yellow Stonefly (*Eccopectura xanthenes*)
- Sallflies (*Haploperla sp.*)
- Brook Snaketail (*Ophiogomphus aspersus*)
- Maine Snaketail (*Ophiogomphus mainensis*)
- Golden Stoneflies (*Paragnetina sp.*)
- Coppery Emerald (*Somatochlora georgiana*)
- Squawfoot (*Strophitus undulatus*)
- Arrow Clubtail (*Stylurus spiniceps*)
- Delta-spotted Spiketail (*Cordulegaster diastatops*)
- Twin-spotted Spiketail (*Cordulegaster maculata*)
- Spine-crowned Clubtail (*Gomphus abbreviatus*)
- Mustached Clubtail (*Gomphus adelphus*)
- American Rubyspot (*Hetaerina americana*)
- Mayflies (little Maryatts) (*Epeorus sp.*)
- Small Minnow Mayflies (*Heterocloeon sp.*)
- Southern Pygmy Clubtail (*Lanthus vernalis*)
- Zebra Clubtail (*Stylurus scudderii*)

Threats and Actions by Community Type

River (Lower Perennial)

River - Cold Water, Swiftly Flowing Stream

Condition: fair; historic loss due to impoundments and development. Importance to Biodiversity: 2. Degree of Threat: 2; some regulation has helped slow habitat degradation.

Threat 1 - Residential and commercial development; All categories impact this habitat type

Rhode Island Wildlife Action Plan Habitat Profiles

Actions: • Land/water protection; preserving, restoring cover for streams, and mitigating runoff. Rank: 3

Threat 2 - Dams and water management/use; Inhibit the movement of fish, increase water temperature, and create lentic habitat

Actions: • Land/water protection; protection, management, mitigate runoff. Rank: 3

Threat 3 - Invasive non-native/alien species; Competition

Actions: • Education and awareness; educate the public. Rank: 2

River (Lower Perennial)

River - Warm Water, Swiftly Flowing Stream

Condition: fair; historic loss due to impoundments and development. Importance to Biodiversity: 2. Degree of Threat: 2; some regulation has helped slow habitat degradation and development, invasives.

Threat 1 - Residential and commercial development; All categories impact this habitat type

Actions: • Land/water protection; preserving, restoring cover for streams, and mitigating runoff. Rank: 3

Threat 2 - Dams and water management/use; Inhibit the movement of fish, increase water temperature, and create lentic habitat

Actions: • Land/water protection; protection, management, mitigate runoff. Rank: 3

Threat 3 - Invasive non-native/alien species; Competition

Actions: • Education and awareness; educate the public. Rank: 2

River (Lower Perennial)

River - Cold Water, Slower Flowing Stream

Condition: fair; historic loss due to impoundments and development. Importance to Biodiversity: 2. Degree of Threat: 2; some regulation has helped slow habitat degradation and development, invasives.

Threat 1 - Residential and commercial development; All categories impact this habitat type

Actions: • Land/water protection; preserving, restoring cover for streams, and mitigating runoff. Rank: 3

Threat 2 - Dams and water management/use; Inhibit the movement of fish, increase water temperature, and create lentic habitat

Actions: • Land/water protection; protection, management, mitigate runoff. Rank: 3

Threat 3 - Invasive non-native/alien species; Competition

Actions: • Education and awareness; educate the public. Rank: 2

River (Lower Perennial)

River - Warm Water, Slower Flowing Stream

Condition: poor; nutrient input and sediment runoff from agriculture and development. Importance to Biodiversity: 3. Degree of Threat: 2; some regulation has helped slow habitat degradation and development.

Threat 1 - Residential and commercial development; All categories impact this habitat type

Actions: • Land/water protection; preserving, restoring cover for streams, and mitigating runoff. Rank: 3

Threat 2 - Dams and water management/use; Inhibit the movement of fish, increase water temperature, and create lentic habitat

Actions: • Land/water protection; protection, management, mitigate runoff. Rank: 3

Threat 3 - Invasive non-native/alien species; Competition

Actions: • Education and awareness; educate the public. Rank: 2

River (Upper Perennial)

River - Cold Water, Swiftly Flowing Stream

Condition: poor; historic loss due to impoundments and development. Importance to Biodiversity: 2. Degree of Threat: 2; some regulation has helped slow habitat degradation.

Threat 1 - Residential and commercial development; All categories impact this habitat type

Rhode Island Wildlife Action Plan Habitat Profiles

Actions: • Land/water protection; preserving, restoring cover for streams, and mitigating runoff. Rank: 3

Threat 2 - Dams and water management/use; Inhibit the movement of fish, increase water temperature, and create lentic habitat

Actions: • Land/water protection; protection, management, mitigate runoff. Rank: 3

Threat 3 - Invasive non-native/alien species; Competition

Actions: • Education and awareness; educate the public. Rank: 2

River (Upper Perennial)

River - Warm Water, Swiftly Flowing Stream

Condition: fair; historic loss due to impoundments and development. Importance to Biodiversity: 2. Degree of Threat: 2; some regulation has helped slow habitat degradation.

Threat 1 - Residential and commercial development; All categories impact this habitat type

Actions: • Land/water protection; preserving, restoring cover for streams, and mitigating runoff. Rank: 3

Threat 2 - Dams and water management/use; Inhibit the movement of fish, increase water temperature, and create lentic habitat

Actions: • Land/water protection; protection, management, mitigate runoff. Rank: 3

Threat 3 - Invasive non-native/alien species; Competition

Actions: • Education and awareness; educate the public. Rank: 2

River (Upper Perennial)

River - Cold Water, Slower Flowing Stream

Condition: fair; historic loss due to impoundments and development. Importance to Biodiversity: 2. Degree of Threat: 2; some regulation has helped slow habitat degradation.

Threat 1 - Residential and commercial development; All categories impact this habitat type

Actions: • Land/water protection; preserving, restoring cover for streams, and mitigating runoff. Rank: 3

Threat 2 - Dams and water management/use; Inhibit the movement of fish, increase water temperature, and create lentic habitat

Actions: • Land/water protection; protection, management, mitigate runoff. Rank: 3

Threat 3 - Invasive non-native/alien species; Competition

Actions: • Education and awareness; educate the public. Rank: 2

River (Upper Perennial)

River - Warm Water, Slower Flowing Stream

Condition: fair; historic loss due to impoundments and development. Importance to Biodiversity: 2. Degree of Threat: 2; some regulation has helped slow habitat degradation.

Threat 1 - Residential and commercial development; All categories impact this habitat type

Actions: • Land/water protection; preserving, restoring cover for streams, and mitigating runoff. Rank: 3

Threat 2 - Dams and water management/use; Inhibit the movement of fish, increase water temperature, and create lentic habitat

Actions: • Land/water protection; protection, management, mitigate runoff. Rank: 3

Threat 3 - Invasive non-native/alien species; Competition

Actions: • Education and awareness; educate the public. Rank: 2

Tidal (Coastal Stream)

River - Warm Water, Slower Flowing Stream

Condition: fair; nutrient input and sediment runoff from agriculture and development. Importance to Biodiversity: 3. Degree of Threat: 2; some regulation has helped slow habitat degradation.

Threat 1 - Residential and commercial development; All categories impact this habitat type

Rhode Island Wildlife Action Plan Habitat Profiles

Actions: • *Land/water protection; preserving, restoring cover for streams, and mitigating runoff. Rank: 3*

Threat 2 - Dams and water management/use; Inhibit the movement of fish, increase water temperature, and create lentic habitat

Actions: • *Land/water protection; protection, management, mitigate runoff. Rank: 3*

Threat 3 - Invasive non-native/alien species; Competition

Actions: • *Education and awareness; educate the public. Rank: 2*

Lake

KEY HABITATS



Image: Scott Ruhren

Description

Lakes and ponds can vary in size, depth, and geographic location, with natural lakes most commonly found in depressions that are remnants of the last Ice Age. Many lakes and ponds are artificially constructed for drinking water supplies, and industrial and agricultural uses. Bodies of water less than 10 acres are considered ponds, while small lakes are 10-99 acres, medium lakes 100-999 acres, large lakes 1000-9999 acres, and those over 10,000 acres are classified as very large lakes. Water bodies are then classified (and also mapped) according to a set of four attributes: geology, elevation, shoreline sinuosity, and connectivity to streams and other water bodies.



~See map disclaimer in profiles introduction

Condition

The condition of ponds and lakes is primarily influenced by the degree and type of land use in the surrounding area and can vary tremendously. Lakes and ponds with undeveloped shorelines may be considered in good condition, whereas others that support dense shoreline residential developments are subject to influx of nutrients from out-of-date septic systems, runoff of fertilizers and other yard chemicals, and increased recreational use that can degrade condition.

Species

Birds

- Northern Pintail (*Anas acuta*)
- Canada Goose - Atlantic Population (*Branta canadensis*)
- Canada Goose - North Atlantic Population (*Branta canadensis*)

Fish

- Common Shiner (*Luxilus cornutus*)

Invertebrates

- Triangle Floater (*Alasmidonta undulata*)
- Predaceous Diving Beetle (*Cybister fimbriolatus*)
- Eastern Pond Mussel (*Ligumia nasuta*)
- Eastern Pearlshell (*Margaritifera margaritifera*)

Threats and Actions by Community Type

Lake/Pond (Eutrophic)

Lake - Shallow

Condition: poor; nutrient input and sediment runoff from agriculture and development. Importance to Biodiversity: 3. Degree of Threat: 2; some regulation has helped slow habitat degradation and invasives.

Rhode Island Wildlife Action Plan Habitat Profiles

Threat 1 - Residential and commercial development; All categories impact this habitat type

Actions: • *Land/water protection; mitigate runoff and nutrient input from defective septic systems. Rank: 3*

Threat 2 - Pollution; Increased nutrients, stimulate plant growth

Actions: • *Land/water protection; protection, management, mitigate runoff. Rank: 3*

Threat 3 - Invasive non-native/alien species; Competition

Actions: • *Education and awareness; educate the public. Rank: 2*

Lake/Pond (Oligatrophic)

Lake - Deep

Condition: poor; nutrient input and sediment runoff from agriculture and development. Importance to Biodiversity: 1. Degree of Threat: 2; some regulation has helped slow habitat degradation and recreation.

Threat 1 - Residential and commercial development; All categories impact this habitat type

Actions: • *Land/water protection; mitigate runoff and nutrient input from defective septic systems. Rank: 3*

Threat 2 - Pollution; Increased nutrients, stimulate plant growth

Actions: • *Land/water protection; protection, management, mitigate runoff. Rank: 3*

Threat 3 - Invasive non-native/alien species; Competition

Actions: • *Education and awareness; educate the public. Rank: 2*

Inland Pond and River Shore

KEY HABITATS



Image: L. Gould

Description

This habitat type represents the sparsely vegetated, exposed shorelines of freshwater lakes, ponds, and larger rivers. Substrates are generally sandy to gravelly and muddy patches may also be present, and the habitat appears as narrow zones of sparse vegetation on sandy beaches or sand bars (in rivers). The amount and composition of vegetation is dependent on the degree of exposure as these habitats are ephemeral, usually present during periods of low water, but otherwise inundated. Upper zones that are exposed for longer periods may be vegetated with shrubs, including sweet gale, willows, huckleberry, and chokecherry, with lower less frequently exposed zones with scattered patches of herbaceous plants including various grasses, sedges, and forbs. Exposed shorelines provide nesting habitat for spotted sandpiper, as well as feeding areas for migratory shorebirds, and feeding and breeding sites for tiger beetles and other insects.



~See map disclaimer in profiles introduction

Condition

Historically, the extent of shoreline habitats was dependent on natural hydrological cycles and annual periods of exposure, mostly associated with larger ponds, lakes and larger rivers, especially the Blackstone and Pawtuxet Rivers. Following settlement, the damming of rivers and ponds to provide continual supplies of water for industry reduced the degree of shoreline exposure. Today, exposure is primarily governed by periods of drought and more extensive “flats” often appear during mid-summer within larger water supply reservoirs.

Species

Birds

Spotted Sandpiper (*Actitis macularia*)

Invertebrates

Lampmussel (*Lampsilis radiata*)

Round Sand Beetle (*Omophron tessellatum*)

Plants

Rotala (*Rotala ramosior*)

Sclerolepis (*Sclerolepis uniflora*)

Threats and Actions by Community Type

Lake/Pond (Shoreline)

Inland Pond and River Shore - Shallow

Condition: fair. Importance to Biodiversity: 3. Degree of Threat: 2.

Threat 1 - Dams and water management/use

- Actions: • *Habitat and natural process restoration; restore natural hydrologic processes where needed.*
 Rank: 2

Rhode Island Wildlife Action Plan Habitat Profiles

Threat 2 - Industrial and military effluents; Especially in impounded areas along major rivers where sediments may contain sizable amounts of chemicals, heavy metals, and other effluents

- Actions:
- *Site/area management; Clean up, remove contaminate sediments; identify marsh habitats within existing clean-up sites. Rank: 1.5*
 - *Policies and regulations; Consider reducing existing discharge limits. Rank: 1*

Threat 3 - Invasive non-native/alien species; 0

- Actions:
- *Invasive/problematic species control; Identify problem areas and conduct control measures. Rank: 2.5*
 - *Policies and regulations; Support regulated buffers of small wetlands to reduce spread of invasives from surrounding uplands. Rank: 1*
 - *Education and awareness; guidelines to limit unintended transport of invasives (boater guides, boot cleaning, aquaria draining, etc.). Rank: 3*

Threat 4 - Storms and flooding

- Actions:
- *Data collection and analysis; Monitoring for community changes due to changing water regime. Rank: 2*

Brackish Marsh

KEY HABITATS



Image: I. Stuckey

Description

Brackish marshes are estuarine wetland communities that occur along the upper edges of tidal rivers, in tidally-fed salt ponds, and in small ponds near the shore that are not tidally connected to the open ocean but that do receive salt spray and storm overwash. Vegetation of these open wetlands is a combination of emergent plants including narrow-leaved cattail, fresh cordgrass, marsh fleabane, rose mallow, bulrushes, and spike-rushes. In rare situations along the upper portions of tidal streams and rivers a unique freshwater emergent marsh may develop in areas where the water level still fluctuates according to daily tidal influence. Wild rice is a characteristic plant of this so-called freshwater tidal marsh. Brackish marshes exhibit a higher diversity of emergent plants than tidal marshes and as such are valuable habitats for nesting birds including rails, bitterns, and waterfowl.

Map Unavailable
Due to Insufficient Data

~See map disclaimer in profiles introduction

Condition

Primarily occurring as transitional habitats between more saline tidal marshes and freshwater wetlands, the extent of brackish marshes in Rhode Island is limited. Current estimates suggest there are less than 300 acres of these habitats scattered throughout the coastal zone. This figure is much reduced from the pre-settlement period before dams were constructed at the mouths of most rivers in the state which restricted tidal flow. Old Mill Creek in Warwick is the only remaining tidal waterway in Rhode Island exhibiting the natural progression of tidal wetlands from saline to fresh marsh. Brackish marshes dominated by cattails are also present in several ponds along the south shore of Washington County and within the Narrow River system. Although protected by regulation, brackish marshes are highly threatened by the predicted rise in sea level, and combined with their minimal occurrence in the state the condition of these habitats is considered to be poor.

SpeciesBirds

- Saltmarsh Sparrow (*Ammodramus caudacutus*)
- Pied-billed Grebe (*Podilymbus podiceps*)
- King Rail (*Rallus elegans*)
- Clapper Rail (*Rallus longirostris*)

Invertebrates

- Eastern Emerald Elysia (*Elysia chlorotica*)
- Amphipod (*Gammarus faciatius*)

Plants

- New England Bulrush (*Bolboschoenus novae-angliae*)
- Elatine (*Elatine americana*)
- Robust Spikerush (*Eleocharis rostellata*)
- Cut-leaved Water-milfoil (*Myriophyllum pinnatum*)
- Sea Pink (*Sabatia stellaris*)

Rhode Island Wildlife Action Plan Habitat Profiles

Annual Sea-purslane (*Sesuvium maritimum*)

Big Cordgrass (*Spartina cynosuroides*)

Threats and Actions by Community Type

Estuarine (Intertidal)

Brackish Marsh - Brackish Marsh

Condition: poor; small and localized. Importance to Biodiversity: 3. Degree of Threat: 3; sea-level rise (becoming saline),.

Threat 1 - Habitat shifting and alteration; Habitat considered the most vulnerable to impacts of sea level rise - increased salinity, storm damage, and limited migration opportunities

- Actions:
- Site/area protection; Identify and protect areas for habitat migration. Rank: 2.5
 - Habitat and natural process restoration; insure natural processes continue in event of sea level rise. Rank: 2
 - Policies and regulations; strengthen existing regulations to protect potential sites for habitat migration. Rank: 3
 - Education and awareness; Outreach events to educate public about potential loss of biological resources from sea level rise and other climate change issues. Rank: 2.5

Threat 2 - Invasive non-native/alien species; Phragmites, Japanese knotweed, tall pepper weed, others

- Actions:
- Invasive/problematic species control; control spread of Phragmites using appropriate methods, control other invasives as needed. Rank: 2.5

Threat 3 - Household sewage and urban waste water; High, but improving with cesspool phase out and wastewater treatment improvements

- Actions:
- Site/area protection; Identify and protect sites, especially upland buffers. Rank: 2.5
 - Resource and habitat protection; maintain buffers. Rank: 2.5
 - Policies and regulations; strengthen existing regulations to protect wider upland buffers. Rank: 2.5

Threat 4 - Industrial and military effluents

- Actions:
- Site/area protection; Identify and protect sites, especially upland buffers. Rank: 2
 - Resource and habitat protection; maintain adequate upland buffers. Rank: 2.5
 - Policies and regulations; strengthen existing regulations to protect wider buffers. Rank: 2.5

Threat 5 - Other ecosystem modifications; Invasives control by chemical means can impact these systems

- Actions:
- Site/area management; control invasive species using mechanical methods. Rank: 2
 - Policies and regulations; prohibit use of chemical controls in these wetland habitats. Rank: 2

Threat 6 - Lack of information; Lack of information from research to address habitat and taxonomic issues

- Actions:
- Research, survey, inventory, monitor populations; Evaluate use of migratory stopover/winter habitat. Rank: 3

Threat 7 - Recreational activities; Habitat fragmentation and degradation from human disturbance

- Actions:
- Outreach; Control public access at priority sites. Rank: 3

Palustrine (Open Mineral Soil Wetlands)

Brackish Marsh - Freshwater Tidal Marsh

Condition: good; cattail hybrids. Importance to Biodiversity: 3. Degree of Threat: 2; invasives.

Threat 1 - Dams and water management; The historic elimination of this community type was caused by construction of dams that impeded tidal flow in rivers

- Actions:
- Habitat and natural process restoration; Dam removals. Rank: 2.5
 - Policies and regulations; Assistance to permitting agencies regarding dam removal projects. Rank: 2.5

Threat 2 - Invasive non-native/alien species; Primarily Phragmites and purple loosestrife

- Actions:
- Invasive/problematic species control; identify problem areas and conduct control measures. Several loosestrife infestations are using insect control. Rank: 2.5

Threat 3 - Industrial and military effluents; As these habitats were formally at the mouths of major rivers,

Rhode Island Wildlife Action Plan Habitat Profiles

sediments likely contain high levels of pollutants

- Actions:
- *Site/area management; Determine best methods for conducting cleanup of sites, current best option is allowing sediments to remain undisturbed. Rank: 2*
 - *Policies and regulations; Strengthening of current regulations and discharge limits . Rank: 2*

Threat 4 - Climate change and severe weather; Habitat shifting and alteration and storms and flooding; Increased flooding may alter riverine habitats

- Actions:
- *Resource and habitat protection; Currently there is limited potential for migration of this type with sea level rise. Dam removals are needed for this type to persist in RI. Rank: 2.5*
 - *Habitat and natural process restoration; Dam removal to permit tidal flow to its natural inland extent. Rank: 2.5*

Threat 5 - Fire and fire suppression; Loss of habitat from plant succession

- Actions:
- *Habitat and natural process restoration; Develop fire prescriptions for priority parcels. Rank: 2*
 - *Habitat and natural process restoration; Implement burn management on priority parcels. Rank: 2*
 - *Outreach; Expand public relations for fire management. Rank: 2*

Intertidal Shore

KEY HABITATS



Image: Shannon Alexander

Description

Intertidal habitats include areas between the highest and lowest tide levels where the substrate is regularly exposed and flooded by semi-diurnal tides. Unlike tidal marshes which are densely vegetated, intertidal shores are mostly devoid of vascular plants. Mud flats are comprised of a mixture of sand, silt and clay that are usually located in quiet pockets of bays and protected by headlands. Other flats made up primarily of sand are found in embayed areas where rocky or sandy barriers help create protected sounds and lagoons. Rocky shores are composed of bedrock and subject to both daily inundation by salt water and constant pounding by waves. Tide pools are biologically diverse features of the rocky shore. All intertidal shores support abundant and diverse invertebrate populations and are valued feeding sites for a variety of shorebirds, especially those that rely on these areas during spring and fall migration periods.



~See map disclaimer in profiles introduction

Condition

As a group, intertidal shore communities are widespread along the coast of Rhode Island. Rocky Shores, at the southern periphery of their range, are limited to Newport County (primarily Aquidneck and Conanicut Islands) and Washington County (mostly the town of Narragansett), whereas Mud and Sand Flats are found throughout Narragansett Bay and in other small bays and salt ponds along the south shore that are tidally influenced. Many are protected within National Wildlife Refuges and other sites, but the potential for these habitats to be affected by sea level rise in the near future is high, which is of concern due to the importance of mud and sand flats especially to migratory shorebirds. Therefore, the condition of Intertidal Shores in Rhode Island is considered to be fair.

SpeciesBirds

Ruddy Turnstone	<i>(Arenaria interpres)</i>
Atlantic Brant	<i>(Branta bernicla)</i>
Sanderling	<i>(Calidris alba)</i>
Dunlin	<i>(Calidris alpina)</i>
Red Knot	<i>(Calidris canutus)</i>
Purple Sandpiper	<i>(Calidris maritima)</i>
Semipalmated Sandpiper	<i>(Calidris pusilla)</i>
Semipalmated Plover	<i>(Charadrius semipalmatus)</i>
Common Loon	<i>(Gavia immer)</i>
Harlequin Duck	<i>(Histrionicus histrionicus)</i>
Black Scoter	<i>(Melanitta americana)</i>
White-winged Scoter	<i>(Melanitta deglandi)</i>
Surf Scoter	<i>(Melanitta perspicillata)</i>
Black-bellied Plover	<i>(Pluvialis squatarola)</i>

Rhode Island Wildlife Action Plan Habitat Profiles

Invertebrates

- Blood Worm (*Glycera dibranchiata*)
- Digging Amphipod (*Haustorius canadensis*)
- Cone Worm (*Pectinaria gouldii*)

Threats and Actions by Community Type

Estuarine (Intertidal)

Intertidal Shore - Mud Flat/Sand Flat

Condition: fair; only a small number that support shore birds. Importance to Biodiversity: 3. Degree of Threat: 3; sea-level rise, boat use impacts.

Threat 1 - Recreational activities; Disturbance to feeding shorebirds from boaters, shellfishers, etc.

- Actions:
- Site/area protection; Identify and protect uplands adjacent to mud flats to control public intrusion. Rank: 2
 - Policies and regulations; establish regulations to control public intrusion on important feeding areas. Rank: 2
 - Awareness and communications; include habitat sensitivities in boating instruction, shellfishing areas. Rank: 2

Threat 2 - Invasive non-native/alien species; Phragmites

- Actions:
- Invasive/problematic species control; Control spread of Phragmites using appropriate methods. Rank: 2

Threat 3 - Habitat shifting and alteration; A naturally shifting habitat, vulnerable to lack of habitat formation sites

- Actions:
- Site/area protection; provide opportunity for habitat migration. Rank: 2.5
 - Resource and habitat protection; provide opportunity for shifting habitat. Rank: 2.5
 - Other; Conduct monitoring to detect habitat changes caused by climate change. Rank: 2.5

Threat 4 - Household sewage and urban waste water; Sediments prone to accumulation of pollutants

- Actions:
- Site/area management; Maintain upland buffers to reduce pollution. Rank: 2.5
 - Policies and regulations; provide for more extensive upland buffers in regulations to protect important sites. Rank: 2.5

Threat 5 - Lack of information; Lack of information from research to address habitat and taxonomic issues

- Actions:
- Research, survey, inventory, monitor populations; Evaluate use of migratory stopover/winter habitat. Rank: 3

Threat 6 - Recreational activities; Habitat fragmentation and degradation from human disturbance

- Actions:
- Outreach; Control public access at priority sites. Rank: 3

Estuarine (Intertidal)

Intertidal Shore - Rocky Shore

Condition: good. Importance to Biodiversity: 3. Degree of Threat: 1; invasives.

Threat 1 - Invasive non-native species; Marine invasives (algae and invertebrates)

- Actions:
- Invasive/problematic species control; Control problematic species where feasible. Rank: 3
 - Legislation; Strengthen regulations concerning container vessels bringing in invasive alien species. Rank: 2.5

Threat 2 - Habitat shifting and alteration; Potential issues with sea level rise

- Actions:
- Site/area protection; Identify and protect areas for potential habitat migration. Rank: 3
 - Data collection and analysis; Monitor changes in habitat caused by climate change. Rank: 2.5

Threat 3 - Of information from research to address habitat and taxonomic issues; 0

- Actions:
- Research, survey, inventory, monitor populations; Evaluate use of migratory stopover/winter habitat. Rank: 3

Threat 4 - Fragmentation and degradation from human disturbance

- Actions:
- Outreach; Control public access at priority sites. Rank: 3

Rhode Island Wildlife Action Plan Habitat Profiles

Estuarine (Intertidal)

Intertidal Shore - Sand Flat

Condition: fair; only a small number that support shore birds. Importance to Biodiversity: 3. Degree of Threat: 3; sea-level rise, boat use impacts.

Threat 1 - Recreational activities; Disturbance to feeding shorebirds from boaters, shellfishers, etc.

- Actions:
- *Site/area protection; Identify and protect uplands adjacent to sand flats to control public intrusion. Rank: 2*
 - *Policies and regulations; establish regulations to control public intrusion on important feeding areas. Rank: 2*
 - *Awareness and communications; include habitat sensitivities in boating instruction, shellfishing areas. Rank: 2*

Threat 2 - Invasive non-native/alien species; Phragmites

- Actions:
- *Invasive/problematic species control; Control spread of Phragmites using appropriate methods. Rank: 2*

Threat 3 - Habitat shifting and alteration; A naturally shifting habitat, vulnerable to lack of habitat formation sites

- Actions:
- *Site/area protection; provide opportunity for habitat migration. Rank: 2.5*
 - *Resource and habitat protection; provide opportunity for shifting habitat. Rank: 2.5*
 - *Other; Conduct monitoring to detect habitat changes caused by climate change. Rank: 2.5*

Threat 4 - Household sewage and urban waste water; Sediments prone to accumulation of pollutants

- Actions:
- *Site/area management; Maintain upland buffers to reduce pollution. Rank: 2.5*
 - *Policies and regulations; provide for more extensive upland buffers in regulations to protect important sites. Rank: 2.5*

Threat 5 - Lack of information; Lack of information from research to address habitat and taxonomic issues

- Actions:
- *Research, survey, inventory, monitor populations; Evaluate use of migratory stopover/winter habitat. Rank: 3*

Threat 6 - Recreational activities; Habitat fragmentation and degradation from human disturbance

- Actions:
- *Outreach; Control public access at priority sites. Rank: 3*

Tidal Salt Marsh

KEY HABITATS



Image: Shannon Alexander

Description

The broadly-named tidal salt marsh type actually consists of several clearly delineated communities that develop according to elevation and consequent level of salinity. The typical salt marsh profile, from heaviest to lightest exposure to saline water, features a low-lying, regularly-flooded low marsh that is dominated by salt marsh cordgrass; an irregularly flooded high marsh of saltmeadow cordgrass; salt panes that form in depressions where salt accumulates and are characterized by saltworts; and, a salt scrub-shrub margin between the marsh edge and upland with marsh elder and groundsel-tree. Salt marshes occur on the bay side of barrier beaches and the outer portions of tidal rivers where salinity is not diluted by freshwater input. Salt marshes have long been valued as wildlife habitat, providing opportunities for the shellfisher, waterfowl hunter, naturalist, and birder. Salt marshes provide a unique habitat for a specialized flora and fauna. Breeding birds found exclusively in these habitats include clapper rail (and occasionally the conspecific king rail), willet, and seaside sparrow. In 2007, the Important Bird Areas program of the National Audubon Society identified many of the largest salt marsh complexes in Rhode Island as IBAs based on the importance of these habitats to the saltmarsh sparrow which has been identified as the species of greatest conservation importance in southern New England by the Partners In Flight program (Dettmers and Rosenberg 2000). These communities are also important feeding areas for nesting waders and shorebirds, as stopover and feeding areas for migrant shorebirds, and also wintering areas for American black duck and other waterfowl.



~See map disclaimer in profiles introduction

Condition

Salt marshes have long been valued as wildlife habitat, providing opportunities for the shellfisher, waterfowl hunter, naturalist, and birder. Salt marshes provide a unique habitat for a specialized flora and fauna. Breeding birds found exclusively in these habitats include clapper rail (and occasionally the conspecific king rail), willet, and seaside sparrow. In 2007, the Important Bird Areas program of the National Audubon Society identified many of the largest salt marsh complexes in Rhode Island as IBAs based on the importance of these habitats to the saltmarsh sparrow which has been identified as the species of greatest conservation importance in southern New England by the Partners In Flight program (Dettmers and Rosenberg 2000). These communities are also important feeding areas for nesting waders and shorebirds, as stopover and feeding areas for migrant shorebirds, and also wintering areas for American black duck and other waterfowl.

SpeciesBirds

- Nelson's Sparrow (*Ammodramus nelsoni*)
- Seaside Sparrow (*Ammodramus maritimus*)
- White-rumped Sandpiper (*Calidris fuscicollis*)
- Least Sandpiper (*Calidris minutilla*)
- Short-billed Dowitcher (*Limnodromus griseus*)
- Osprey (*Pandion haliaetus*)
- Greater Yellowlegs (*Tringa melanoleuca*)

Rhode Island Wildlife Action Plan Habitat Profiles

Willet (*Tringa semipalmata*)

Herpetofauna

Northern Diamond-backed Terrapin (*Malaclemys terrapin terrapin*)

Invertebrates

Modest Alderia (*Alderia modesta*)

Atlantic Mud Piddock (*Barnea truncata*)

Ground Beetle (*Bembidion confusum*)

Margined Tiger Beetle (*Cicindela marginata*)

Amphipod (*Gammarus lawrencianus*)

Ribbed Mussel (*Geukensia demissa*)

Amphipod (*Hyale plumulosa*)

Northern Lacuna (*Lacuna vincta*)

Twin-dotted Macrochilo Moth (*Macrochilo hypocritalis*)

Marsh Snail (*Melampus bidentatus*)

American Marsh Hopper (*Ochestia grillus*)

Mouse Ear Marsh Snail (*Ovatella myosotis*)

False Angelwing (*Petricolaria pholadiformis*)

Purple Marsh Crab (*Sesarma reticulatum*)

Red-jointed Fiddler Crab (*Uca minax*)

Atlantic Sand Fiddler Crab (*Uca pugilator*)

Atlantic Marsh Fiddler Crab (*Uca pugnax*)

Banded Marsh Hopper (*Uholorchestia uhleri*)

Threats and Actions by Community Type

Estuarine (Intertidal)

Tidal Salt Marsh - Low Salt Marsh; High Salt Marsh; Salt Panne; Salt Scrub

Condition: poor; anoxic pool deteriorating high marsh. Importance to Biodiversity: 3. Degree of Threat: 3; higher risk to high marsh than low marsh, sea-level rise, invasive plants (high marsh), boat wake (low marsh).

Threat 1 - Habitat shifting and alteration; Threat considered greatest to high marsh type due to limited migration opportunities

- Actions:
- Site/area protection; Identify areas for protection that could potentially provide habitat migration opportunities. Rank: 2.5
 - Policies and regulations; Incorporate potential migration areas into regulatory programs. Rank: 2.5
 - Habitat and natural process restoration; allow natural migration of habitat. Rank: 2
 - Research, survey, monitoring habitats; Monitor changes in habitat caused by climate change. Rank: 2.5

Threat 2 - Invasive non-native/alien species; Phragmites, Japanese knotweed, tall pepper weed, and potentially others

- Actions:
- Invasive/problematic species control; identify and conduct control of invasives as needed. Rank: 2.5
 - Training; Establish early detection and rapid response program for invasive species. Rank: 3

Threat 3 - Household sewage and urban waste water; Pollutants accumulate in sediments in urban areas, along tidal portions of major rivers

- Actions:
- Site/area protection; Identify and acquire sites, especially upland buffers to these habitats. Rank: 2.5
 - Resource and habitat protection; maintain adequate upland buffers. Rank: 2.5
 - Policies and regulations; strengthen regulations to enhance protection of upland buffers. Rank: 2.5

Threat 4 - Housing and urban areas; Commercial and industrial areas; Tourism and recreation areas

- Actions:
- Site/area protection; Identify sites for protection, especially upland buffers. Rank: 2
 - Resource and habitat protection; maintain upland buffers. Rank: 2
 - Policies and regulations; strengthen regulations to protect upland buffers. Rank: 2.5

Rhode Island Wildlife Action Plan Habitat Profiles

Threat 5 - Recreational activities; Boating, shellfishing

- Actions:*
- *Site/area management; control public access to reduce impacts from intrusion. Rank: 2*
 - *Policies and regulations; strengthen existing regulations regarding boat motor size, no wake zone, etc. Rank: 1.5*

Threat 6 - Lack of information; Lack of information from research to address habitat and taxonomic issues

- Actions:*
- *Research, survey, inventory, monitor populations. Rank: 3*

Threat 7 - Recreational activities; Habitat fragmentation and degradation from human disturbance

- Actions:*
- *Outreach; Control public access at priority sites. Rank: 3*

Brackish Tidal Aquatic Vegetation

KEY HABITATS

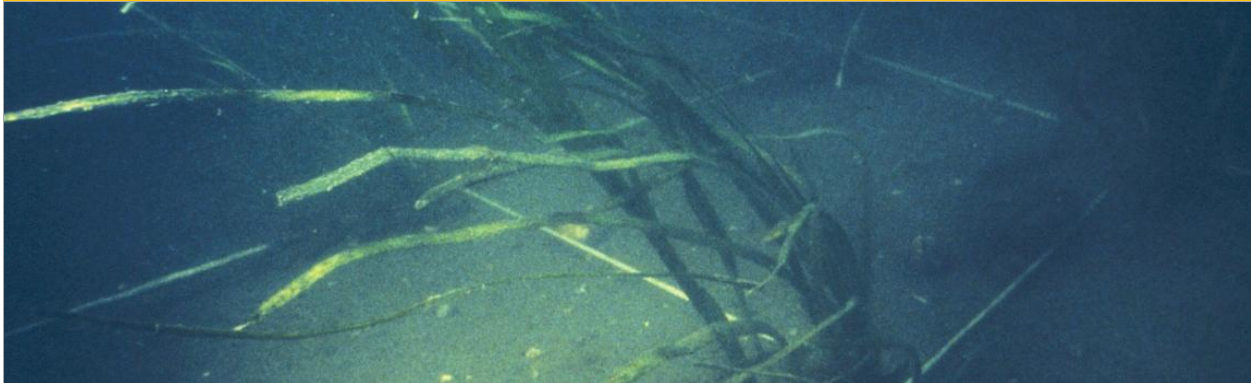


Image: Jay Preshoso, NOAA

Description

Brackish Aquatic Beds are habitats found in permanently flooded upper reaches of estuaries, including upper reaches of tidal creeks and coastal salt ponds. Such areas tend to be warmer and shallower than closer to river mouths or breachways of salt ponds. These habitats are also found adjacent to brackish tidal marshes. Tidal aquatic vegetation forms in areas with continuously flooded substrates, where water is less than two meters deep at low tide, and salinity ranges from 0.5 – 18.0 ppt. A characteristic plant of higher salinity beds is eelgrass (*Zostera marina*); lower salinity beds support widgeon grass (*Ruppia maritima*), wild celery (*Vallisneria* spp.), tapegrass (*Vallisneria americana*), pondweeds (*Potamogeton pectinatus*), and naiads (*Najas guadalupensis* and *N. minor*). Finfish such as Alewife (*Alosa pseudoharengus*), American shad (*Alosa sapidissima*), and striped bass (*Moronesaxitilus*) are characteristic of this habitat. Invertebrates include horseshoe crabs (*Limulus polyphemus*) and mud crabs (e.g., *Neopanope texana*). Over 1,400 acres of eelgrass habitat has been mapped in Rhode Island coastal waters, of which the majority (38%) is found in coastal salt ponds along the south shore of Rhode Island. Eelgrass plays a crucial role in the health of coastal systems because it provides critical habitat for juvenile marine life, helps stabilize surface sediments, and aids in filtering particles from the water column. Seagrass beds require a specific set of ecological conditions for success, and they are generally perceived as areas of high environmental quality. Eelgrass has been deemed a critical marine resource and is currently protected by both Federal (Clean Water Act; 33 U.S.C. 26 Section 1251) and Rhode Island (RI Coastal Resource Management Plan, Section 300.18) legislation.



~See map disclaimer in profiles introduction

Condition

Tidal aquatic vegetation is threatened by sea-level rise and anthropogenic impacts to tidal flow and changes in salinity regimes. Some rooted vascular species occupying this community have limited (or no) salt tolerance. Eelgrass is very sensitive to the input of nitrogen and sediments. In coastal waters with excessive nitrogen inputs eelgrass is replaced by fast growing blooms of green macroalgae. Blooms of green macroalgae result in negative impacts on benthic or bottom dwelling animals, including shellfish and fin fish. University of Rhode Island and Save the Bay conduct annual surveys of eelgrass habitat in Rhode Island. From 2006-2012, the survey noted a 23.6% increase in eelgrass acreage in Narragansett Bay. A general decline in eelgrass acreage was noted in coastal salt ponds of South County, Rhode Island. Overall, the eelgrass environment is in good condition.

Species

Fish

Lined Seahorse (*Hippocampus erectus*)

Invertebrates

Amphipod (*Gammarus tigrinus*)

Red Gilled Worm (*Marphysa belli*)

Nudibranch (*Tergipes tergipes*)

Threats and Actions by Community Type

Estuarine (Subtidal)

Brackish Tidal Aquatic Vegetation - Brackish Subtidal Aquatic Bed

Condition: fair. Importance to Biodiversity: 3. Degree of Threat: 3; water quality, invasive crabs (sub-benthic creatures turning up sediment, uprooting plants), resident geese and other waterfowl (mute swans).

Threat 1 - Recreational activities; Damage from boating

- Actions:
- Awareness and communications; Inform public of potential impacts of intrusion. Rank: 2
 - Policies and regulations; determine need for regulations to curb public intrusion, i.e., limiting boat motor size, etc. Rank: 2

Threat 2 - Habitat shifting and alteration; Sea level rise increases salinity, increased damage from storms

- Actions:
- Site/area protection; Identify and protect areas for potential habitat migration. Rank: 2.5
 - Data collection and analysis; monitor changes in habitat caused by climate change. Rank: 2.5

Threat 3 - Problematic native species; Heavy browsing on aquatic plants from Canada goose and mute swans

- Actions:
- Invasive/problematic species control; control problematic species with increased hunting opportunities for geese, expanding programs to control swan populations. Rank: 2
 - Policies and regulations; expand hunting seasons, bag limits, etc. Rank: 1.5

Threat 4 - Household sewage and urban waste water; Runoff from adjacent uplands; stormwater overflow

- Actions:
- Site/area management; maintain adequate upland buffers. Rank: 2.5
 - Policies and regulations; strengthen existing regulations to provide wider buffers. Rank: 2.5

Threat 5 - Agricultural and forestry effluents; Runoff from adjacent croplands primarily

- Actions:
- Site/area management; maintain adequate upland buffers. Rank: 2.5
 - Policies and regulations; strengthen existing regulations to provide for wider buffers. Rank: 2.5

Threat 6 - Invasive non-native/alien species

- Actions:
- Invasive/problematic species control. Rank: 2
 - Data collection and analysis; Early detection. Rank: 2

Threat 7 - Residential and commercial development; Loss of wetlands due to shore line development, bulkheads, and poor urban development

- Actions:
- Site/area management; Avoid locating roads near wetlands and fish bearing streams; Roads should be sited to avoid sensitive areas such as wetlands, streams, steep slopes, etc.; Where ever possible, "soft" approaches (such as beach nourishment, vegetative plantings, and placement of large woody debris) to shoreline modifications should be used. Rank: 2
 - Policies and regulations; The diking and draining of tidal marshlands and estuaries should not be undertaken unless a satisfactory compensatory mitigation plan is in effect and monitored. Rank: 2
 - Site/area management; Use an adaptive management plan with ecological indicators to oversee monitoring and ensure mitigation objectives are met; Take corrective action as needed. Rank: 2

Threat 8 - Other ecosystem modifications; Dredging, dredge disposal and other benthic disturbances such as trawling

- Actions:
- Data collection and analysis; Undertake multi season, pre- and post- dredging biological surveys to assess impacts to animal and submerged aquatic vegetation communities. Rank: 1
 - Data collection and analysis; Address cumulative impacts of past and current dredging operations on fishery resources by considering them as part of the permitting process; Identify and characterize the fisher habitat functions and service in the project area. Rank: 1
 - Policies and regulations. Rank: 1

Salt Pond

KEY HABITATS



Image: Shannon Alexander

Description

Salt ponds (or coastal lagoons) are enclosed areas landward of the shoreline with a permanent-to-intermittent flooding regime of ocean waters. Salt ponds contain both intertidal and subtidal habitats, including tidal marshes and flats, seagrasses, oyster reefs, and soft sediments. These ponds occur along the coast and are partially closed off from the sea by barrier beaches. Salinity may vary from nearly fresh to nearly saline depending on duration and extent of connection to the sea. Vegetation is comprised of finer scale communities nested within this type, including Brackish Marsh, Brackish Aquatic Bed, and Brackish Intertidal Flat. In spite of the loss of a number of brackish-water fisheries, such as alewife and oysters, due to permanent breaching, the ponds today are still highly productive and popular fishing grounds. Recreationally fished species include summer flounder, striped bass, winter flounder, shad, white perch, mackerel, and tautog. Among shellfish, quahog is by far the most common species recreationally collected in the ponds, but (depending on the pond and the season) steamers, blue mussel, and bay scallop may also be found. Not only are the salt ponds valuable spawning and nursery grounds for many aquatic species, but they are also prime feeding areas for migrating waterfowl, including Canada goose, greater scaup, and great blue heron.



~See map disclaimer in profiles introduction

Condition

Coastal salt pond environments are sensitive to changes in hydrology and pollution. Permeant breachways are maintained by state and local agencies. Without proper maintenance, these environments can be significantly altered. Several environmental organizations monitor the biotic and chemical condition of salt ponds in Rhode Island. Overall, the salt ponds are in fair condition.

SpeciesBirds

- Canvasback (*Aythya valisineria*)
- Bufflehead (*Bucephala albeola*)
- Common Goldeneye (*Bucephala clangula*)
- Ruddy Duck (*Oxyura jamaicensis*)
- Horned Grebe (*Podiceps auritus*)

Threats and Actions by Community Type

Estuarine (Subtidal)

Salt Pond - Coastal Salt Pond

Condition: fair; highly variable. Importance to Biodiversity: 3. Degree of Threat: 3; lack of dredging and breaching., recreational water activities (jet ski, boating).

Threat 1 - Habitat shifting and alteration; Sea level rise may reduce protective barriers, alter salinity levels in ponds, etc.

Rhode Island Wildlife Action Plan Habitat Profiles

- Actions:
- *Site/area protection; identify sites to support potential migration of habitat. Rank: 2.5*
 - *Policies and regulations; provide additional regulatory protection for potential migration sites. Rank: 2.5*
 - *Other; monitor habitat for changes caused by climate change. Rank: 2.5*

Threat 2 - Other ecosystem modifications; Management needed on some ponds to open/close breachways

- Actions:
- *Site/area management; manage breachways as needed. Rank: 2*

Threat 3 - Invasive non-native/alien species; Phragmites and other aquatic plants

- Actions:
- *Invasive/problematic species control; identify and control invasives as needed. Rank: 2.5*

Threat 4 - Problematic native species; Overbrowsing of aquatic plants by Canada goose and mute swans

- Actions:
- *Invasive/problematic species control; expand hunting opportunities for geese, expand population control measures for swans. Rank: 1.5*
 - *Policies and regulations; expand hunting seasons, bag limits, etc. Rank: 2*

Threat 5 - Agricultural and forestry effluents; Runoff from adjacent croplands primarily

- Actions:
- *Site/area management; maintain adequate upland buffers. Rank: 2*
 - *Policies and regulations; strengthen existing regulations to support wider upland buffers. Rank: 2.5*

Threat 6 - Household sewage and urban waste water; Runoff from lawns, septic systems of nearby residential development

- Actions:
- *Site/area protection; Identify and protect sites, especially upland buffers. Rank: 3*
 - *Policies and regulations; strengthen existing regulations to provide for wider protected buffers. Rank: 2.5*

Tidal Creek/River

KEY HABITATS



Image: L. Gould

Description

The aquatic community of a continuously flooded creek that drains the tidal waters of a coastal salt marsh. Water levels fluctuate with the tides; the creek bottom is permanently flooded, but the banks are exposed at low tide. Characteristic plants include eelgrass (*Zostera marina*), widgeon grass (*Ruppia maritima*) and several cyanophyta. Abundant food and protection from predators make tidal creeks and rivers ideal nursery grounds for marine invertebrates and finfish. As a result, larvae and juveniles dominate the marsh creek fauna, as much as 80 percent of the animals sampled in Rhode Island studies. Note, in the absence of specific mapping data for tidal rivers and streams, the map depicts salt marsh habitats, which show the extent of tidal influence inland. Note, species listed for this habitat are just a few examples of SGCN that use the habitat.



~See map disclaimer in profiles introduction

Condition

Tidal river and creek environments are altered by dredging and subsequent changes to hydrology and channel morphology. Nutrient pollution can impact biotic habitats such as aquatic vegetation. In Rhode Island, tidal river and creek environments are monitored by the state and several environmental organizations. Consolidation of the monitoring data will help further evaluate the condition of this environment. Overall, the tidal river/creek environment is in fair condition.

Species

Fish

Blueback Herring (*Alosa aestivalis*)

Alewife (*Alosa pseudoharengus*)

White Perch (*Morone americana*)

Threats and Actions by Community Type

Estuarine (Subtidal)

Tidal Creek/River - Tidal Creek

Condition: fair. Importance to Biodiversity: 3. Degree of Threat: 3; sea-level rise (becoming saline), bank erosion.

Threat 1 - Recreational activities; Damage from boating

- Actions:
- Awareness and communications; provide public with information regarding habitat values and potential damages caused by human intrusion. Rank: 2
 - Policies and regulations; determine need for regulations to limit damage by public intrusion. Rank: 2

Threat 2 - Habitat shifting and alteration; Unknown impacts at this time

Rhode Island Wildlife Action Plan Habitat Profiles

- Actions:
- *Site/area protection; identify sites for potential habitat shifting. Rank: 2.5*
 - *Data collection and analysis; monitor habitat for changes caused by climate change. Rank: 2.5*

Estuarine (Subtidal)

Tidal Creek/River - Tidal River/Stream

Condition: fair; pollutants, undersized culverts. Importance to Biodiversity: 3. Degree of Threat: 2; water quality and quantity, sediments,.

Threat 1 - Dams and water management/use; Can affect natural hydrology

- Actions:
- *Habitat and natural process restoration; remove dams to allow maximum natural tidal flow. Rank: 2.5*

Threat 2 - Invasive non-native/alien species; Chinese mitten crab, etc.

- Actions:
- *Invasive/problematic species control; Identify and control invasives as needed. Rank: 2*

Threat 3 - Household sewage and urban waste water; Improving with cesspool phaseout and wastewater treatment improvements

- Actions:
- *Site/area protection; Identify and protect sites, especially upland buffers. Rank: 2.5*
 - *Resource and habitat protection; maintain adequate upland buffers. Rank: 2.5*
 - *Policies and regulations; strengthen existing regulations to protect wider upland buffers. Rank: 2.5*

Threat 4 - Industrial and military effluents

- Actions:
- *Site/area protection; Identify sites for protection, especially upland buffers. Rank: 2*
 - *Resource and habitat protection; maintain adequate upland buffers. Rank: 2*
 - *Policies and regulations; strengthen existing regulations to protect wider buffers. Rank: 2*

Threat 5 - Agricultural and forestry effluents

- Actions:
- *Site/area protection; identify and protect sites, especially upland buffers. Rank: 2*
 - *Resource and habitat protection; maintain adequate upland buffers. Rank: 2*
 - *Policies and regulations; strengthen existing regulations to protect wider upland buffers. Rank: 2*

Threat 6 - Habitat shifting and alteration; Sea level rise may diminish habitat, need to provide opportunities for migration

- Actions:
- *Site/area protection; Identify areas for potential habitat migration. Rank: 2.5*
 - *Data collection and analysis; monitor habitat condition to detect changes caused by climate change. Rank: 2.5*

Molluscan Shellfish Reef

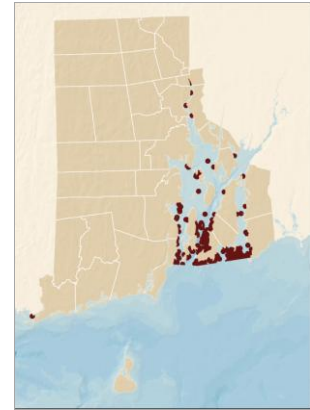
KEY HABITATS



Image: USFWS

Description

Nearshore features found in estuaries and coastal salt ponds often associated with unconsolidated cobble and gravel substrates at or below mean-low-water. Free-swimming mussel (*Geukensia demissa*) or oyster (*Crassostrea virginica*) larvae often attach to these substrates, forming a veneer of dead and live oyster shell. After several successful generations of shellfish settlement, complex reef structures can form providing habitat to juvenile finfish and invertebrates. Small invertebrates such as grass shrimp along with larval blue crabs seek refuge from predators within the interstices of the reef structure. Small fishes, including silversides, gobies, and juvenile sea bass find shelter from the strong tidal currents and feed extensively on the larval animals associated with the reefs.



~See map disclaimer in profiles introduction

Condition

Over 90% of Rhode Island’s shellfish reef habitat has been removed through commercial harvesting, shoreline development and sedimentation, and disease. Increase sea surface temperatures and introduction of non-native pathogens through shellfish aquaculture. Overall, the shellfish environment is poor condition.

Species

Invertebrates

- Eastern Oyster (*Crassostrea virginica*)
- Flatback Mud Crab (*Eurypanopeus depressus*)
- Atlantic Mud Crab (*Panopeus herbstii*)
- Harris Mud Crab (*Rhithropanopeus harrisi*)

Threats and Actions by Community Type

Estuarine (Nearshore)

Molluscan Shellfish Reef - Nearshore Rocky Reef

Condition: poor; sediment runoff and nutrient loading can impact habitat quality in these important areas making them unusable. Importance to Biodiversity: 3. Degree of Threat: 3; some regulation and mitigation efforts (i.e. stormwater BMPs) have helped.

Threat 1 - Residential and commercial development; All categories impact this habitat type

Actions: • Land/water protection; mitigating impacts from runoff. Rank: 2.5

Threat 2 - Livestock farming and ranching; Nutrient loading and sediment runoff

Actions: • Land/water protection; Best management practices for agriculture will mitigate impacts. Rank: 2.5

Threat 3 - Fishing and harvesting aquatic resources; Structure can be targeted by fishing and overexploited

Rhode Island Wildlife Action Plan Habitat Profiles

for certain species impacting biodiversity

- Actions: • *Site/area protection; Marine protected areas can be created to protect particularly sensitive areas. Rank: 1*

Threat 4 - Residential and commercial development; Loss of riparian vegetation, fringe wetlands due to shore line development, bulkheads, and poor urban development

- Actions: • *Site/area management; Minimize the loss of riparian habitats as much as possible; Avoid locating roads near wetlands and fish bearing streams; Roads should be sited to avoid sensitive areas such as wetlands, streams, and steep slopes; Where ever possible, "soft" approaches (such as beach nourishment, vegetative plantings, and placement of large woody debris) to shoreline modification should be used. Rank: 2*
- *Site/area management; Avoid placing pipelines and accessory equipment used in conjunction with construction or dredging operations close to kelp beds, eelgrass beds, estuarine/salt marshes and any other high value habitat. Rank: 2*

Threat 5 - Other ecosystem modifications; Dredging, dredge disposal and other benthic disturbances such as trawling

- Actions: • *Data collection and analysis; Undertake multi season, pre- and post- dredging biological surveys to assess impacts to animal and submerged aquatic vegetation communities. Rank: 1*
- *Data collection and analysis; Identify and characterize fisher habitat functions and service in the project area. Rank: 1*

Threat 6 - Pollution; Sewage pollution: combined sewage overflow, failing and inadequate systems, boat waste

- Actions: • *Data collection and analysis; Identify areas in greatest need of storm and waste water infrastructure improvements. Rank: 1*
- *Compliance and enforcement; Enforce marine waste water disposal regulations. Rank: 1*
- *Outreach; Provide educational opportunities and video advertisement that explains effects of storm water runoff and importance of proper boat waste disposal. Rank: 1*

Estuarine (Offshore)

Mulluscan Shellfish Reef - Offshore Rocky Reef

Condition: poor; despite being removed from immediately adjacent to the shoreline these areas are impacted by runoff and nutrient loading. Importance to Biodiversity: 3. Degree of Threat: 3; all impacts associated with nearshore areas in estuaries remain for offshore areas as well and.

Threat 1 - Residential and commercial development; All categories impact this habitat type

- Actions: • *Land/water protection; mitigating impacts from runoff. Rank: 2.5*

Threat 2 - Agriculture and aquaculture; Nutrient loading and sediment runoff

- Actions: • *Land/water protection; Best management practices for agriculture and aquaculture will mitigate impacts. Rank: 2.5*

Threat 3 - Fishing and harvesting aquatic resources; Structure can be targeted by fishing and overexploited for certain species impacting biodiversity

- Actions: • *Site/area protection; Marine protected areas can be created to protect particularly sensitive areas. Rank: 2.5*

Threat 4 - Other ecosystem modifications; Dredging, dredge disposal and other benthic disturbances such as trawling

- Actions: • *Data collection and analysis; Undertake multi season, pre- and post- dredging biological surveys to assess impacts to animal and submerged aquatic vegetation communities; Address cumulative impacts of past and current dredging operations on fisher resources by considering them as part of the permitting process; identify and characterize fishery habitat functions and service in the project area. Rank: 2*
- *Site/area management; Adequate compensatory mitigations should be provided for unavoidable impacts; Study all options for disposal of dredged materials, including disposal sites and methods used, upland disposal sites should be considered as an alternative to offshore disposal sites. Rank: 2*
- *Law and policy; Avoid new dredging to the maximum extent possible; Projects should be*

Rhode Island Wildlife Action Plan Habitat Profiles

permitted only for water dependant purposes and only when no feasible alternatives are available. Rank: 2

Threat 5 - Industrial and military effluents; Oil spills, marine accidents, ocean dumping

- Actions:*
- *Data collection and analysis; Increase data bank on species habitat preferences and us in oil spill response planning an mapping. Rank: 1*
 - *Law and policy; Increase number and training of response teams in the event of an accident. Rank: 1*

Pelagic

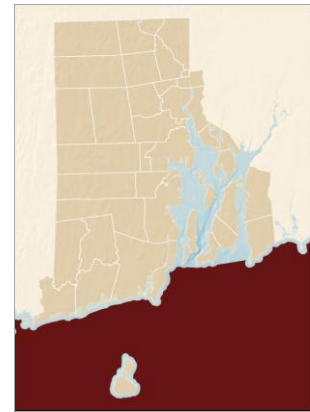
KEY HABITATS



Image: Shannon Alexander

Description

The area of open water lying over and beyond the continental shelf, while excluding nearshore and estuary areas. Organisms associated to the pelagic habitat occur in the water column above the seafloor and below the surface and consist of free-swimming creatures also known as nekton and free-floating or less motile plankton. The open ocean habitat of Rhode Island sustains a relatively large number of species of fish, marine mammals, marine turtles, and invertebrates, many of commercial importance. Species use this pelagic environment in a permanent or transitional phase for spawning, breeding, feeding, or growth to maturity.



~See map disclaimer in profiles introduction

Condition

The marine pelagic zone may be impacted by changes in temperature and precipitation, pollution and nutrient run-off, and overharvesting of commercially important finfish which leads to trophic cascades. The effects of climate change, primarily changes to sea surface temperatures and hydrology, has been linked to decreases in aquatic ecosystem productivity and diversity. Overall, the pelagic environment is in good condition.

Species

Birds

- Razorbill (*Alca torda*)
- Cory's Shearwater (*Calonectris diomedea*)
- Northern Gannet (*Morus bassanus*)
- Great Shearwater (*Puffinus gravis*)

Fish

- Bay Anchovy (*Anchoa mitchilli*)
- Atlantic Menhaden (*Brevoortia tyrannus*)
- Sand Tiger (*Carcharias taurus*)
- Atlantic Herring (*Clupea harengus*)
- False Albacore (*Euthynnus alletteratus*)
- Atlantic Silverside (*Menidia menidia*)
- Bluefish (*Pomatomus saltatrix*)
- Butterfish (*Poronotus triacanthus*)

Herpetofauna

- Loggerhead Turtle (*Caretta caretta*)
- Atlantic Green Turtle (*Chelonia mydas mydas*)
- Leatherback Turtle (*Dermochelys coriacea*)
- Kemp's Ridley Turtle (*Lepidochelys kempii*)

Rhode Island Wildlife Action Plan Habitat Profiles

Invertebrates

Longfin Inshore Squid (*Loligo pealeii*)

Mammals

Fin Whale (*Balaenoptera physalus*)

North Atlantic Right Whale (*Eubalaena glacialis*)

Humpback Whale (*Megaptera novaeangliae*)

Threats and Actions by Community Type

Coastal (Pelagic)

Pelagic - Coastal Pelagic

Condition: fair. Importance to Biodiversity: 2. Degree of Threat: 2; out of natural range.

Threat 1 - Residential and commercial development; Runoff can impact water quality making the habitat unusable for pelagic species

Actions: • *Land/water protection; mitigating impacts from runoff. Rank: 2*

Threat 2 - Agriculture and aquaculture; Nutrient loading and sediment runoff

Actions: • *Land/water protection; Best management practices for agriculture and aquaculture will mitigate impacts. Rank: 2.5*

Threat 3 - Fishing and harvesting aquatic resources; Pelagic species can be targeted and harvested by multiple gear types in these areas (i.e. trawl, gillnets, rod and reel)

Actions: • *Species management; careful management can mitigate the impacts of this threat . Rank: 2*

Estuarine (Pelagic)

Pelagic - Estuarine Pelagic

Condition: poor. Importance to Biodiversity: 2. Degree of Threat: 3.

Threat 1 - Residential and commercial development; Runoff can impact water quality making the habitat unusable for pelagic species

Actions: • *Land/water protection; mitigating impacts from runoff. Rank: 2.5*

Threat 2 - Agriculture and aquaculture; Nutrient loading and sediment runoff

Actions: • *Land/water protection; Best management practices for agriculture and aquaculture will mitigate impacts. Rank: 3*

Threat 3 - Fishing and harvesting aquatic resources; Pelagic species can be targeted and harvested by multiple gear types in these areas (i.e. trawl, gillnets, rod and reel)

Actions: • *Species management; careful management can mitigate the impacts of this threat . Rank: 2*

Marine (Pelagic)

Pelagic - Marine Pelagic

Condition: good. Importance to Biodiversity: 2. Degree of Threat: 1.

Threat 1 - Fishing and harvesting aquatic resources; Large volume fisheries for important secondary consumers (i.e. herring) can impact this habitat type

Actions: • *Species management; careful management can mitigate the impacts of this threat . Rank: 2*

Threat 2 - Lack of information; Lack of information from research to address habitat and taxonomic issues

Actions: • *Data collection and analysis; Evaluate use of migratory stopover/winter habitat. Rank: 2*

Seeps, Springs, Vernal Pools

KEY HABITATS



Image: D. Payne

Description

This group of habitats includes several small freshwater wetland communities that support particularly unique assemblages of plants and animals. Seeps and springs arise from groundwater sources and maintain a constant cold temperature and high levels of dissolved oxygen. Most springs are typically found in association with headwater streams and may simply appear from below ground and trickle into an adjacent stream, or they may be man-altered into small pools of clear water. Vernal pools develop in seasonally flooded basins that are too shallow to maintain permanent water so that they become dry by the end of the growing season. In general, these wetlands lack fish populations and consequently are highly valued as habitats of rare amphibians.

Map Unavailable
Due to Insufficient Data

~See map disclaimer in profiles introduction

Condition

Springs and seeps are uncommon, isolated habitats scattered throughout Rhode Island. Most notable are several in the northwestern part of the state that support the only known populations of northern spring salamander. Vernal pools are more common and widely distributed in almost every community, although habitat quality is highly variable depending on the proximity of developed land. In a survey of the Pawcatuck River watershed more than 1000 potential vernal pools were identified, with an estimated likelihood that about 50% of these pools supported viable amphibian populations. Although vernal pools could benefit from stricter wetlands regulations, the overall condition of Seeps, Springs, and Vernal Pools in Rhode Island is considered to be good.

Species

Herpetofauna

Spotted Salamander (*Ambystoma maculatum*)

Marbled Salamander (*Ambystoma opacum*)

Northern Dusky Salamander (*Desmognathus fuscus*)

Northern Spring Salamander (*Gyrinophilus porphyriticus porphyriticus*)

Invertebrates

Arrowhead Spiketail (*Cordulegaster obliqua*)

Threats and Actions by Community Type

Palustrine (Forested Mineral Soil Wetlands*)

Seeps, Springs, Vernal Pools

Condition: good. Importance to Biodiversity: 3. Degree of Threat: 2; development, poor logging practice, groundwater draw-down.

Threat 1 - Residential and commercial development; Most of these habitats are too small to be afforded

Rhode Island Wildlife Action Plan Habitat Profiles

adequate protection under current wetlands regulations

- Actions:
- *Site/area protection; acquisition of clusters of pools when possible. Rank: 2.5*
 - *Resource and habitat protection; retain natural forest cover surrounding these wetlands. Rank: 3*
 - *Policies and regulations; amend wetlands regulations to support greater protection for small wetlands. Rank: 2.5*

Threat 2 - Garbage and solid waste; Vernal pools often used for illegal dumping

- Actions:
- *Site/area protection; Identify and acquire problem sites. Rank: 2*
 - *Policies and regulations; support greater penalties for illegal dumping. Rank: 2*

Threat 3 - Logging and wood harvesting; Heavy equipment use during logging operations; opening of tree canopy may alter habitat

- Actions:
- *Training; foresters and loggers to avoid these habitats. Rank: 3*
 - *Awareness and communications; land owner education concerning values of vernal pools. Rank: 3*

Threat 4 - Dams and water management/use; Water table drawdowns

- Actions:
- *Site/area management; Manage sites to maintain natural hydrologies. Rank: 2.5*
 - *Policies and regulations; increase restrictions to alteration of natural hydrologies. Rank: 2*

Threat 5 - Invasive non-native/alien species; This threat has been relatively minor in these habitats

- Actions:
- *Invasive/problematic species control; Identify and control control of invasives as needed. Rank: 2*

Threat 6 - Household sewage and urban waste water; Including salt and other road runoff

- Actions:
- *Resource and habitat protection; greater protection of buffers. Rank: 2*
 - *Site/area management; management of adjacent land uses to prevent pollution. Rank: 2*
 - *Policies and regulations; increase restrictions in land use planning to prevent pollution. Rank: 2*

Floodplain Forest

KEY HABITATS



Image: Richard Enser

Description

Floodplain forests are found along major rivers where low-lying terraces adjacent to river channels are annually flooded in the spring and occasionally in the fall, but where standing water is generally lacking during the rest of the year. These are broadly defined communities where plant species composition is highly variable depending on frequency and duration of flooding, size of the river, topography, and substrate. In general, there are two primary types of floodplain forests in Rhode Island. Along larger rivers in the northern part of the state, dominant trees include sycamore, silver maple, box elder, cottonwood, American elm, and green ash. In southern Rhode Island, especially along the lower reaches of the Pawcatuck River, red maple, pin oak, and green ash are characteristic trees. A unique riverside forest consisting of red oak, American beech, sugar maple, white ash, and other hardwoods is found locally along the Blackstone River, on upper terraces that are irregularly flooded. This community is a transition type between typical floodplain forests and upland Northern hardwood forests that is distinguished from the latter by an open understory of scattered shrubs and lush growth of ferns.



~See map disclaimer in profiles introduction

Condition

Throughout the Northeast, human impacts to floodplain communities have made high quality occurrences rare, and this circumstance is particularly evident in Rhode Island where river floodplains were heavily altered during the industrial development of the state. In particular, the silver maple-sycamore type has been relegated to narrow, linear patches within the otherwise heavily developed matrix, and there appears to be little opportunity to restore these habitats. Consequently, the condition of floodplain forests in Rhode Island is considered to be poor.

SpeciesInvertebrates

Bambardier Beetle (*Brachinus cyanipennis*)

Plants

White-edged Sedge (*Carex debilis*)

Macgregor's Ryegrass (*Elymus macgregori*)

Threats and Actions by Community Type

Palustrine (Forested Mineral Soil Wetlands)

Floodplain Forest - Silver Maple/Sycamore Floodplain Forest; Red Maple/Pin Oak Floodplain

Condition: fair. Importance to Biodiversity: 3. Degree of Threat: 3; drier due to floodplain control; Silver maple type in poor condition.

Threat 1 - Residential and commercial development; Historically, floodplains heavily developed for industrial and commercial uses, landfills, low income housing, recreational fields, etc.

Actions: • Site/area protection; Identify and acquire habitats as needed. Rank: 2

Rhode Island Wildlife Action Plan Habitat Profiles

- *Resource and habitat protection; Identify potential restoration sites. Rank: 3*
- *Site/area management; Conduct restoration projects. Rank: 2.5*
- *Habitat and natural process restoration; allow natural flooding regimes to function. Rank: 3*

Threat 2 - Industrial and military effluents; Situated along major rivers, sediments may contain variable levels of pollutants

- Actions:*
- *Site/area management; Identify potential cleanup sites. Rank: 3*
 - *Habitat and natural process restoration; Let some areas remain undisturbed to prevent release of pollutants from sediments. Rank: 2*

Threat 3 - Garbage and solid waste; These areas are often used for illegal dumping, and also capture large amounts of trash during flood events

- Actions:*
- *Site/area management; control public access by vehicles. Rank: 2.5*
 - *Policies and regulations; support increases in fines for illegal dumping. Rank: 2*

Threat 4 - Habitat shifting and alteration; Increased flooding may alter habitat

- Actions:*
- *Site/area protection; identify upland areas that may support this habitat type in future years. Rank: 2*
 - *Data collection and analysis; Monitor changes in habitat that may be caused by climate change. Rank: 2.5*

Threat 5 - Storms and flooding; Increased flooding may alter habitat

- Actions:*
- *Site/area protection; identify upland areas that may support this habitat type in future years. Rank: 2*
 - *Data collection and analysis; Monitor changes in habitat that may be caused by climate change. Rank: 2.5*

Deciduous Forested Swamp

KEY HABITATS



Image: L. Gould

Description

In concert with Rhode Island's upland forest legacy the normal successional development of open wetland habitats in this region results in mature forested swamps, and the overwhelming majority of these swamps are dominated by red maple. Associated trees include black gum, yellow birch, white ash, and American elm, and in nutrient-rich areas black ash may be a co-dominant, but this type is fairly uncommon in Rhode Island. Red maple swamps typically support a dense understory shrub layer of highbush blueberry, spicebush, sweet pepperbush, winterberry, swamp azalea, and fetterbush. Ground layers are characterized by skunk cabbage, cinnamon fern, jewelweed, and other herbs. An uncommon subtype found in southern Rhode Island contains a dense understory of great rhododendron. A second deciduous forested swamp community characterized by swamp white oak in the overstory was known to occur in Rhode Island, but it is not certain if this community is still present in the state. As with upland forests, wildlife habitat values of red maple swamps tend to increase with overall size, especially when surrounding uplands are also forested. The largest tracts of contiguous deciduous forested swamp, or mixed swamp/upland forests, support such rare nesting birds as Northern saw-whet owl, prothonotary warbler, and Northern parula. Other birds typically found in larger red maple swamps include red-shouldered hawk, Canada warbler, northern waterthrush, and veery. Red maple swamps support a diverse reptile and amphibian community that may include marbled salamander and three-toed salamander. Although most mammals that occur in red maple swamps may be classified as habitat generalists, the water shrew is an uncommon mammal that is chiefly a swamp dweller. Note, species listed for this habitat are just a few examples of SGCN that use the habitat.



~See map disclaimer in profiles introduction

Condition

According to National Wetland Inventory statistics approximately 44,000 acres of deciduous forested wetland are found in Rhode Island, distributed fairly evenly throughout the state. Although it is difficult to assess the historic extent, wetland habitats in general have benefited from legal protection first instituted in the early 1970's. By statute, all wetlands are regulated by the DEM, including a 50-foot wide perimeter upland buffer around all forested swamps >3 acres in size. Swamps <3 acres are considered special aquatic sites and also regulated but without the added perimeter buffer.

SpeciesBirds

- Northern Goshawk (*Accipiter gentilis*)
- Wood Duck (*Aix sponsa*)
- Canada Warbler (*Cardellina canadensis*)
- Northern Waterthrush (*Parkesia noveboracensis*)
- Prothonotary Warbler (*Protonotaria citrea*)

Rhode Island Wildlife Action Plan Habitat Profiles

Herpetofauna

Four-toed Salamander (*Hemidactylium scutatum*)

Wood Frog (*Lithobates sylvaticus*)

Invertebrates

Blackwater Bluet (*Enallagma weewa*)

Mammals

American Water Shrew (*Sorex (Otisorex) palustris*)

Plants

Mitchell's Sedge (*Carex mitchelliana*)

Bent Sedge (*Carex styloflexa*)

Threats and Actions by Community Type

Palustrine (Forested Mineral Soil Wetlands)

Deciduous Forested Swamp - Red Maple Swamp

Condition: good. Importance to Biodiversity: 3. Degree of Threat: 2; emerald ash borer.

Threat 1 - Residential and commercial development; Legal buffer not adequate to protect habitat; changes in understory documented: sources include siltation of streams, non-native vegetation in edge habitat

- Actions:
- Site/area protection; Identify and acquire as needed, focusing on upland buffers. Rank: 2.5
 - Resource and habitat protection; Increase extent of undeveloped land in upland buffers. Rank: 2.5
 - Policies and regulations; increase protection and extent of upland buffers in wetlands regulations. Rank: 2.5

Threat 2 - Dams and water management/use; Any alterations in groundwater, overland flow can impact this habitat

- Actions:
- Site/area protection; Identify any land acquisition needs that limit this threat. Rank: 2
 - Policies and regulations; limit changes in hydrology of wetlands. Rank: 2

Threat 3 - Invasive non-native/alien species; Emerald ash borer in black ash subtype

- Actions:
- Invasive/problematic species control; Include early detection; Identify problem sites and conduct control as needed. Rank: 2
 - Policies and regulations; support restrictions on nuisance organisms. Rank: 2

Threat 4 - Garbage and solid waste; Wetlands used for illegal dumping

- Actions:
- Site/area protection; Identify and acquire problem sites. Rank: 2
 - Site/area management; control public access by vehicles. Rank: 2

Threat 5 - Other ecosystem modifications; Loss of habitat from plant succession

- Actions:
- Research, survey, inventory, monitor habitats; Identify priority parcels to retain as core forest areas with minimal management. Rank: 2

Palustrine (Forested Mineral Soil Wetlands)

Deciduous Forested Swamp - Swamp White Oak Swamp

Condition: unknown. Importance to Biodiversity: 3. Degree of Threat: 1.

Threat 1 - Housing and urban areas; Impacts in buffer areas; little known about this community Small distribution; more work needed

- Actions:
- Site/area protection; Identify and acquire as needed, focusing on upland buffers. Rank: 2.5
 - Resource and habitat protection; Increase extent of undeveloped land in upland buffers. Rank: 2.5
 - Policies and regulations; increase protection and extent of upland buffers in wetlands regulations. Rank: 2.5

Threat 2 - Dams and water management/use; Any alterations in groundwater, overland flow can impact this habitat

- Actions:
- Site/area protection; Identify any land acquisition needs that limit this threat. Rank: 2
 - Policies and regulations; support restrictions on changes in hydrology of wetlands. Rank: 1

Rhode Island Wildlife Action Plan Habitat Profiles

Threat 3 - Invasive and other problematic species and genes; Threat from invasive plants is primarily along upland edges

- Actions:*
- *Invasive/problematic species control; Identify problem sites and conduct control as needed. Rank: 2*
 - *Policies and regulations; support restrictions on nuisance organisms. Rank: 2*

Threat 4 - Garbage and solid waste; Wetlands used for illegal dumping

- Actions:*
- *Site/area protection; Identify and acquire problem sites. Rank: 2*
 - *Site/area management; control public access by vehicles. Rank: 2*

White Cedar Swamp

KEY HABITATS

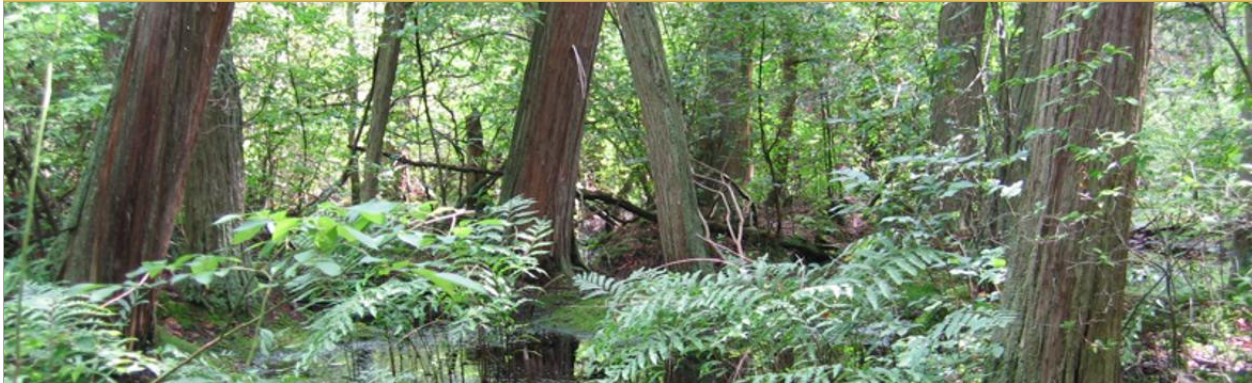
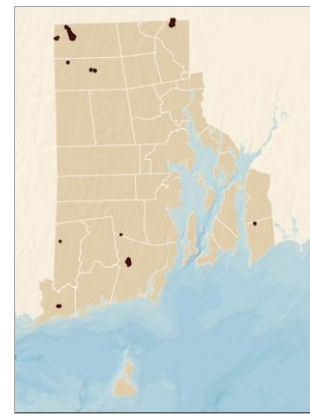


Image: Jim Kuhn

Description

Atlantic white cedar forms extensive coniferous forested swamps on organic (peat and muck) soils from southern Maine to Florida, and Rhode Island lies geographically at the northern edge of the distribution of this tree. Atlantic white cedar is an obligate wetland tree, or one that almost always (>99%) occurs in wetlands, on peatlands in poorly drained depressions, along stream and pond edges, and at the edges of bogs and fens. Two subtypes of this community are recognized based on the understory shrub layer. A variable mix of tall shrubs, including winterberry, highbush blueberry, swamp azalea, and sweet pepperbush, comprise the understory of most cedar swamps, and a rarer second type is characterized by an understory of great rhododendron, a shrub that provides dense vegetation and valued nesting habitat for a unique suite of birds. Atlantic white cedar often forms continuous, even-aged stands over dozens of acres. Forest floors lush with bright green mosses, liverworts, and scattered herbs contribute to a primeval atmosphere in these cool, dark wetlands. However, Atlantic white cedar does not germinate in dense shade, and the seedlings do not grow well under dense canopies. Therefore, germination depends on disturbance, blowdown, or fire, to create openings in the canopies of mature forests. Atlantic white cedar is the sole larval food plant for Hessel's hairstreak butterfly and several of the pinion moths, and provides nesting habitat for several SGCN birds.



~See map disclaimer in profiles introduction

Condition

The current condition of Atlantic white cedar swamps in Rhode Island is considered to be good. According to NETHCS mapping, there are currently 1,750 acres of this habitat in Rhode Island, with larger (>100 acres) examples found in Washington County at Crandall Swamp in Westerly, Indian Cedar Swamp in Charlestown, and The Great Swamp in South Kingstown. Smaller tracts are also found in Providence, Kent, and Newport Counties. Losses of this habitat type are mostly historic, during the period when cedar was commercially logged and larger swamps were accessed by narrow gauge railroads. In some areas the clear-cutting of cedar allowed red maple to regenerate and become the dominate tree. Other cedar swamps were eliminated by human-constructed dams that created permanent open water impoundments and caused mortality of white cedar. With this historic perspective, it has been estimated that more than 78% of Atlantic white cedar swamps have been lost rangewide; although, Rhode Island losses are probably less. Today, Atlantic white cedar swamps are protected by wetland regulations, and many tracts have been conserved in State management areas, TNC preserves, ASRI sanctuaries, and other sites.

Species

Invertebrates

- Hessel's Hairstreak (*Callophrys hesseli*)
- Thaxter's Pinon Moth (*Lithophane thaxteri*)
- Pale Green Pinion Moth (*Lithophane viridipallens*)

Rhode Island Wildlife Action Plan Habitat Profiles

Plants

Collin's Sedge (*Carex collinsii*)

Threats and Actions by Community Type

Palustrine (Forested Peatlands)

White Cedar Swamp

Condition: good. Importance to Biodiversity: 3. Degree of Threat: 1; beaver (flooding), wet and protected.

Threat 1 - Dams and water management/use; Water withdrawals; undersized/blocked culverts

- Actions:
- Habitat and natural process restoration; Restore natural hydrologic processes where needed. Rank: 2
 - Policies and regulations; incorporate hydrologic functioning in permitting process. Rank: 2

Threat 2 - Invasive non-native/alien species; This threat has been relatively minor in these habitats

- Actions:
- Invasive/problematic species control; Identify and control invasives as needed. Rank: 1.5

Threat 3 - Problematic native species; Deer browsing, this threat has been relatively low in this habitat

- Actions:
- Invasive/problematic species control; Increase hunting opportunities for deer in problem areas. Rank: 1.5

Palustrine (Forested Peatlands)

White Cedar Swamp - White Cedar-Rhododendron Swamp

Condition: good. Importance to Biodiversity: 3. Degree of Threat: 1; beaver (flooding), wet and protected.

Threat 1 - Dams and water management/use; Water withdrawals; undersized/blocked culverts

- Actions:
- Habitat and natural process restoration; Restore natural hydrologic processes where needed. Rank: 1
 - Policies and regulations; incorporate hydrologic functioning in permitting process. Rank: 2

Threat 2 - Invasive non-native/alien species; This threat has been relatively minor in these habitats

- Actions:
- Invasive/problematic species control; Identify and control invasives as needed. Rank: 1.5

Threat 3 - Problematic native species; Deer browsing, this threat has been relatively low in this habitat

- Actions:
- Invasive/problematic species control; Increase hunting opportunities for deer in problem areas. Rank: 1.5

Coastal Plain Pond/Pondshore

KEY HABITATS



Image: L. Gould

Description

Although all freshwater ponds maintain vegetated shorelines of varying extent, coastal plain ponds are considered unique ecosystems in New England for several reasons. These ponds are naturally formed as the remnants of glacial lakes or in kettle holes, and they exhibit a complex hydrology in which large sections of the pond bottom are occasionally exposed which stimulates the growth of a diverse and often dense plant community from a dormant seed bank. This community supports several rare plants and animals including several species of odonates (dragonflies and damselflies) and freshwater mollusks.



~See map disclaimer in profiles introduction

Condition

The best examples of coastal plain pond/pondshore habitats in Rhode Island are found in the towns of South Kingstown and Charlestown where they have been conservation priorities for several decades. The Matunuck Hills complex of kettle hole ponds has been mostly protected by The Nature Conservancy, and significant sections of the shoreline on Worden Pond in South Kingstown and Watchaug Pond in Charlestown are protected in State management areas. Historically, coastal plain pondshore communities were known from several ponds in the urbanized part of the state, primarily in the city of Warwick, but these examples have been considerably altered for many decades. Overall, the condition of coastal plain ponds/pondshores in Rhode Island is considered to be good.

Species

Birds

Lesser Scaup (*Aythya affinis*)

Invertebrates

Comet Darner (*Anax longipes*)

Drunk Apamea Moth (*Apamea inebriata*)

Scarlet Bluet (*Enallagma pictum*)

Pine Barrens Bluet (*Enallagma recurvatum*)

Lyre-tipped Spreadwing (*Lestes unguiculatus*)

Bog Copper (*Lycaena epixanthe*)

Southern Sprite (*Nehalennia integricollis*)

Common Sanddragon (*Progomphus obscurus*)

Plants

Pink Tickseed (*Coreopsis rosea*)

Three-angled Spikesedge (*Eleocharis tricostata*)

New England Boneset (*Eupatorium novae-angliae*)

Rhode Island Wildlife Action Plan Habitat Profiles

Creeping St. John's-wort (*Hypericum adpressum*)
Shrubby Loosestife (*Ludwigia sphaerocarpa*)
Golden Club (*Orontium aquaticum*)
Plymouth Gentian (*Sabatia kennedyana*)
Thread-leaved Arrowhead (*Sagittaria teres*)
Swamp Bulrush

Threats and Actions by Community Type

Palustrine (Open Mineral Soil Wetlands)

Coastal Plain Pond/Pondshore

Condition: good. Importance to Biodiversity: 3. Degree of Threat: 2; development, septic systems, deer, climate change (precipitation pattern change).

Threat 1 - Housing and urban areas; Although some smaller isolated sites still threatened by development, most of the better examples are protected; Threat primarily runoff from developed land

- Actions:
- Site/area protection; Identify and acquire key parcels for fee purchase and easement. Rank: 2.5
 - Resource and habitat protection; Identify any negative impacts to ponds, i.e., chemical and other effluents in runoff, docks, etc. intruding on shorelines. Rank: 2

Threat 2 - Invasive non-native/alien species

- Actions:
- Invasive/problematic species control; Currently, *Phragmites* has intruded at two sites - Worden and Tuckers Pond; European Gray Willow has been found on several ponds; Early detection and rapid response needed to detect both new populations of *Phragmites*, and new species. Rank: 2.5
 - Site/area management; Currently, *Phragmites* has intruded at two sites - Worden and Tuckers Pond; European Gray Willow has been found on several ponds; Early detection and rapid response needed to detect both new populations of *Phragmites*, and new species. Rank: 2.5
 - Policies and regulations; This type is protected as a special feature under wetlands regulations, but additional protection is needed by expanding buffer zone requirements, etc. Rank: 2

Threat 3 - Problematic native species; Canada goose browsing of aquatic plants

- Actions:
- Invasive/problematic species control; Investigate methods for reducing goose use. Rank: 2

Threat 4 - Recreational activities; Boating on larger ponds and ATV traffic on beaches/shorelines

- Actions:
- Policies and regulations; Some regulation may be needed to limit boat motor size and access by ATVs. Rank: 2

Threat 5 - Storms and flooding; Alteration of hydrologic cycle may affect regular fluctuation of pond water levels on which this community depends

- Actions:
- Data collection and analysis; Develop an appropriate monitoring scheme to detect changes in the physical and biological characteristics of the ponds caused by climate change. Rank: 3

Freshwater Emergent Marsh

KEY HABITATS



Image: Shannon Alexander

Description

Emergent freshwater marshes are composed of primarily herbaceous vegetation occurring in flat-bottomed shallow basins, or on the periphery of deeper basins. These open wetlands develop in the ponds created by the damming of larger rivers, and are also scattered throughout the Rhode Island landscape on the margins of lakes, ponds, slow-moving streams, and ditches. Vegetation does not persist through the winter. Scattered shrubs may be present but usually <25% total cover, and trees are generally absent. The substrate is typically muck over mineral soil, and the two types are primarily distinguished by depth of water. Semi-permanently Flooded (Deep) Marshes have water depths up to 2 m, and standing water present throughout the year. Plant composition is highly variable with some deep marshes dominated by a single species such as cattail, but most sites support a variety of emergents including bur-reeds, arrowhead, arrow arum, and bayonet rush. Pools of water are present within these marshes that support floating-leaved and submerged aquatic plants including water lily, duckweeds, pondweeds, spatterdock, coontail, water milfoils, and bladderworts. Seasonally Flooded (Shallow) Marshes have water depths ranging up to 1 m, and surface water is typically absent during drier portions of the year. Plant composition is higher in grasses and sedges, including bluejoint, manna grasses, rice cutgrass, wool grass, rushes, three-way sedge, and tussock sedge. Shallow marshes often have scattered woody shrubs including alders, dogwoods, meadowsweet, and buttonbush. In addition to providing critical nesting habitat for a large number of GCN birds, emergent marshes are important migratory staging areas and wintering sites for many of the waterfowl species that travel the Atlantic flyway.



~See map disclaimer in profiles introduction

Condition

Today, there are roughly 5000 acres of freshwater emergent marshes in Rhode Island. It is difficult to evaluate the historic extent of these habitats because many natural wetlands in the floodplains of major rivers were filled during the early industrial era to provide land for factories and supporting infrastructure. On the other hand, the construction of dams along the same rivers provided the opportunity for marsh development in the quieter waters upstream. Of particular note in Rhode Island is the large marsh complex behind the Valley Falls dam that today encompasses more than 200 acres of emergent marsh and shrub swamp. The unique wildlife habitat values of emergent marshes have afforded these habitats regulatory protection and direct losses from filling and conversion have essentially been curtailed in recent decades.

SpeciesBirds

- American Black Duck (*Anas rubripes*)
- Northern Harrier (*Circus cyaneus*)
- Marsh Wren (*Cistothorus palustris*)
- Wilson's Snipe (*Gallinago delicata*)
- Least Bittern (*Ixobrychus exilis*)
- Hooded Merganser (*Lophodytes cucullatus*)

Rhode Island Wildlife Action Plan Habitat Profiles

Sora (*Porzana carolina*)

Virginia Rail (*Rallus limicola*)

Herpetofauna

Red-spotted Newt (*Notophthalmus viridescens viridescens*)

Invertebrates

Curved Halter Moth (*Capis curvata*)

Louisiana Owlet Moth (*Macrochilo louisiana*)

Umber Shadowdragon (*Neurocordulia obsoleta*)

Golden Ambersnail (*Succinea wilsoni*)

Mammals

Southern Bog Lemming (*Synaptomys cooperi*)

Threats and Actions by Community Type

Palustrine (Open Mineral Soil Wetlands)

Freshwater Emergent Marsh - Freshwater Emergent Marsh

Condition: good. Importance to Biodiversity: 3. Degree of Threat: 2; shallow marsh may be more threatened by invasives and development, may be a positive impact from increased beaver, invasives the higher threat.

Threat 1 - Industrial and military effluents; Larger examples are in impounded areas along major rivers where sediments may contain sizable amounts of chemicals, heavy metals, and other effluents

- Actions:
- Site/area management; clean up, remove contaminated sediments; identify marsh habitats within existing clean-up sites. Rank: 1.5
 - Policies and regulations; consider reducing existing discharge limits. Rank: 1

Threat 2 - Invasive non-native/alien species; Primarily Phragmites, water chestnut, and purple loosestrife

- Actions:
- Invasive/problematic species control; identify problem areas and conduct control measures. Several loosestrife infestations are using insect control. Rank: 2.5
 - Policies and regulations; Support regulated buffers of small wetlands to reduce spread of invasives from surrounding uplands; Implement and enforce 2010 stormwater regulations. Rank: 2
 - Education and awareness; Guidelines to limit unintended transport of invasives (boater guides, boot cleaning, aquaria draining, etc). Rank: 3

Threat 3 - Agricultural and forestry effluents; Primarily chemicals from croplands, a chronic background problem varying by location

- Actions:
- Site/area management; Establishment of vegetative setbacks and/or livestock excluders between marsh and development area by landowner. Rank: 3
 - Policies and regulations; support the promulgation of buffer zones around small marshes; develop and enforce BMPs. Rank: 2

Threat 4 - Climate change and severe weather; Habitat shifting and alteration and storms and flooding; Increased flooding may alter riverine habitats

- Actions:
- Site/area management; protect upland habitats to provide migration opportunities. Rank: 2
 - Data collection and analysis; Monitoring for community changes due to changing water regime. Rank: 3

Threat 5 - Household sewage and urban wastewater

- Actions:
- Site/area management; road salt control; sediment management; stormwater system improvements and maintenance; septic system upgrades and maintenance; cesspool phase out (esp. in lake communities). Rank: 3
 - Policies and regulations; support and enforce existing regulations and ordinances and BMPs. Rank: 2.5

Palustrine (Open Mineral Soil Wetlands)

Freshwater Emergent Marsh - Semi-permanently Flooded (Deep) Marsh

Condition: good; cattail hybrids. Importance to Biodiversity: 3. Degree of Threat: 2; may be a positive impact from increased beaver, invasives the higher threat.

Rhode Island Wildlife Action Plan Habitat Profiles

Threat 1 - Industrial and military effluents; Larger examples are in impounded areas along major rivers where sediments may contain sizable amounts of chemicals, heavy metals, and other effluents

- Actions:
- *Site/area management; clean up, remove contaminated sediments; identify marsh habitats within existing clean-up sites. Rank: 1.5*
 - *Policies and regulations; consider reducing existing discharge limits. Rank: 1*

Threat 2 - Invasive non-native/alien species; Primarily Phragmites, water chestnut, and purple loosestrife

- Actions:
- *Invasive/problematic species control; identify problem areas and conduct control measures. Several loosestrife infestations are using insect control. Rank: 2.5*
 - *Policies and regulations; support regulated buffers of small wetlands to reduce spread of invasives from surrounding uplands. . Rank: 2*
 - *Education and awareness; guidelines to limit unintended transport of invasives (boater guides, boot cleaning, aquaria draining, etc) . Rank: 3*

Threat 3 - Agricultural and forestry effluents; Primarily chemicals from croplands, a chronic background problem varying by location

- Actions:
- *Site/area management; establishment of vegetative setbacks and/or livestock excluders between marsh and development area by landowner. Rank: 3*
 - *Policies and regulations; support the promulgation of buffer zones around small marshes; develop and enforce BMPs. Rank: 2*

Threat 4 - Climate change and severe weather; Habitat shifting and alteration and storms and flooding; Increased flooding may alter riverine habitats

- Actions:
- *Site/area protection; protect upland habitats to provide migration opportunities. Rank: 2*
 - *Data collection and analysis; Monitoring for community changes due to changing water regime. Rank: 3*

Threat 5 - Household sewage and urban wastewater

- Actions:
- *Site/area management; road salt control; sediment management; stormwater system improvements and maintenance; septic system upgrades and maintenance; cesspool phase out (esp. in lake communities);. Rank: 3*
 - *Policies and regulations; support and enforce existing regulations and ordinances and BMPs. Rank: 2.5*

Threat 6 - Fire and fire suppression; Loss of habitat from plant succession

- Actions:
- *Habitat and natural process restoration; Develop fire prescriptions for priority parcels. Rank: 2*
 - *Habitat and natural process restoration; Implement burn management on priority parcels. Rank: 2*
 - *Outreach; Expand public relations for fire management. Rank: 2*

Modified/Managed Marsh

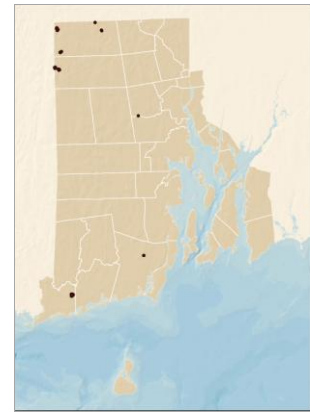
KEY HABITATS



Image: Richard Enser

Description

Modified/Managed Marshes are distinct from Freshwater Emergent Marshes or Tidal Freshwater Marshes as they are anthropogenic, man-made features. They include two basic types - Impoundments and Modified Marshes, which are essentially detention basins or other man-made marshes, such as those created along highways to mitigate the loss of a natural wetland. The key aspect is anthropogenic vs. man-made. Impoundments, for example, are created by damming streams or diking wooded swamps to raise water levels and kill trees to provide open water and marshes for waterfowl production.



~See map disclaimer in profiles introduction

Condition

The condition of modified/managed marshes depends on the purposes for which the management was conducted. These include retention of runoff, amelioration of pollutants, or management of waterfowl and other wildlife. Some marshes have been created as mitigation for the loss of wetlands due to highway construction and other developments, in which case condition needs to be assessed on a case-by-case basis depending on the wetland values being mitigated.

Threats and Actions by Community Type

Palustrine (Open Mineral Soil Wetlands)

Modified/Managed Marsh - Impoundment

Condition: good; if water levels maintained properly (to provide waterfowl nesting habitat). Importance to Biodiversity: 2. Degree of Threat: 2.

Threat 1 - Invasive non-native species; Phragmites, purple loosestrife, other aquatics

- Actions:*
- *Invasive/problematic species control; Identify and control problem situations. Rank: 2*
 - *Site/area management; maintain water levels as deterrent to invasion; conduct early detection. Rank: 2*

Palustrine (Open Mineral Soil Wetlands)

Modified/Managed Marsh - Ruderal Marsh

Condition: fair. Importance to Biodiversity: 1. Degree of Threat: 1.

Threat 1 - Invasive non-native species; Phragmites, purple loosestrife, other aquatics

- Actions:*
- *Invasive/problematic species control; Identify and control problem situations. Rank: 2*

Rhode Island Wildlife Action Plan Habitat Profiles

- *Site/area management; maintain water levels as deterrent to invasion; conduct early detection. Rank: 2*

Threat 2 - Household sewage and urban waste water; Primarily runoff from roads and other impervious surfaces

- Actions:*
- *Site/area management; install drainage areas and other controls of road runoff. Rank: 1*
 - *Policies and regulations; increase penalties for illegal dumping. Rank: 1*

Threat 3 - Lack of information; Lack of research to guide threat assessment and prioritization of conservation plan; Lack of information from research to address habitat and taxonomic issues

- Actions:*
- *Data collection and analysis. Rank: 1*

Shrub Swamp/Wet Meadow

KEY HABITATS



Image: Richard Enser

Description

Shrub-dominated swamps and wet meadows are open wetlands on mineral soils that are characteristic of the glaciated Northeast and scattered areas southward. These wetlands are often found in association with lakes, ponds or streams, and can be small solitary pockets or, more often, part of a larger wetland complex. In general, these habitats appear as shrub-dominated wetlands with scattered small openings of primarily herbaceous plants. Typical species include willow, red-osier dogwood, alder, buttonbush, meadowsweet, bluejoint grass, tall sedges, and rushes. Trees are generally absent or thinly scattered. Shrub swamps and wet meadows are associated with lakes and ponds or along headwater and larger streams where water levels do not fluctuate greatly. They are commonly flooded for part of the growing season but generally do not have standing water throughout the year. Shrub swamps are dynamic systems that may revert to emergent marsh habitat in beaver impounded areas, or eventually mature into wooded swamps as sediment accumulates. Shrub swamps and wet meadows are recognized as valuable wildlife habitats. Depending on the ecological setting, at the edge of a pond, along a river margin, or isolated in a basin, these wetlands support a diverse assemblage of breeding birds, including those also identified as GCN species in emergent marshes, coastal shrublands, and early successional habitats.



~See map disclaimer in profiles introduction

Condition

Currently there are an estimated 5130 acres of Shrub Swamp-Wet Meadow habitat in Rhode Island, somewhat evenly distributed throughout the state but with larger examples found along river floodplains. Historically, it is likely that the total acreage for all wetland types was greater than today, but actual figures are conjectural because many of these habitats were lost early in the state's development. Today, wetlands are protected by regulation and there has been relatively little decline in the extent of shrub swamp in recent years, subsequently the condition of Shrub Swamp is considered to be good. Wet meadows are naturally a minor presence within larger wetland complexes and have therefore never been a common feature, and because of this rarity the condition of Wet Meadow is considered to be fair.

SpeciesBirds

Willow Flycatcher (*Empidonax traillii*)

Herpetofauna

Northern Leopard Frog (*Lithobates pipiens*)

Invertebrates

Meadow Fritillary (*Boloria bellona*)

Sharp Angle Shades Moth (*Conservula anodonta*)

Unexpected Cynia (*Cynia inopinatus*)

Hydrangea Sphinx (*Darapsa versicolor*)

Elderberry Borer (*Desmocerus palliatus*)

Sharp-lined Powder Moth (*Eufidonia discospilata*)

Rhode Island Wildlife Action Plan Habitat Profiles

Black Dash	(<i>Euphyes conspicua</i>)
Lost Sallow Moth	(<i>Eupsilia devia</i>)
Little Virgin Tiger Moth	(<i>Grammia virguncula</i>)
American Brindle Moth	(<i>Lithomoia germana</i>)
Bronze Copper	(<i>Lycaena hyllus</i>)
Coastal Swamp Metarranthis	(<i>Metarranthis pilosaria</i>)
Chain Fern Borer Moth	(<i>Papaipema stenocelis</i>)
Included Cordgrass Borer Moth	(<i>Photedes includens</i>)
Acadian Hairstreak	(<i>Satyrium acidicum</i>)
Chalky Wave Moth	(<i>Scopula purata</i>)
Sulphur Angle Moth	(<i>Speranza sulphurea</i>)
Aphrodite Fritillary	(<i>Speyeria aphrodite</i>)
Hermit Sphinx	(<i>Sphinx eremitus</i>)

Plants

Shrubby Poplar	(<i>Populus heterophylla</i>)
Lizard's-tail	(<i>Saururus cernuus</i>)

Threats and Actions by Community Type

Palustrine (Open Mineral Soil Wetlands)

Shrub Swamp/Wet Meadow - Shrub Swamp

Condition: good. Importance to Biodiversity: 3. Degree of Threat: 2; succession to red maple,.

Threat 1 - Dams and water management/use; Any alteration of hydrology; groundwater flow; water table fluctuation

- Actions:
- Site/area protection; Identify and acquire sites, focusing on extending upland buffers. Rank: 2
 - Resource and habitat protection; insure natural regulation of water levels in wetlands. Rank: 2
 - Policies and regulations; Support strengthening of wetlands regulations regarding minimal size of wetlands and extending buffer limits; Implement and enforce 2010 stormwater regulations. Rank: 2

Threat 2 - Invasive non-native/alien species; Phragmites, purple loosestrife, other aquatics

- Actions:
- Invasive/problematic species control; identify problem areas and conduct control measures. Several loosestrife infestations are using insect control. Rank: 2

Threat 3 - Agricultural and forestry effluents; A chronic background problem varying by location

- Actions:
- Site/area management; conduct management practices that do not impact wetland hydrology or introduce chemicals into wetland systems. Rank: 2
 - Policies and regulations; adopt best management practices that limit wetland pollution. Rank: 2

Threat 4 - Climate change and severe weather; Habitat shifting and alteration and storms and flooding; Could be issues with increased precipitation, flooding, etc.

- Actions:
- Data collection and analysis; Monitor sites and document any changes in wetland systems caused by climate change. Rank: 2
 - Site/area management; conduct management necessary based on monitoring information. Rank: 2

Palustrine (Open Mineral Soil Wetlands)

Shrub Swamp/Wet Meadow - Wet Meadow

Condition: fair; going fallow, need management,. Importance to Biodiversity: 3. Degree of Threat: 3; lack of management, may be too small for wetland regulations to be effective.

Threat 1 - Dams and water management/use; Any alteration of hydrology; groundwater flow; water table fluctuation

- Actions:
- Site/area protection; Identify and acquire sites, focusing on extending upland buffers. Rank: 2
 - Resource and habitat protection; insure natural regulation of water levels in wetlands. Rank: 2
 - Policies and regulations; support strengthening of wetlands regulations regarding minimal size of wetlands and extending buffer limits. Rank: 2

Threat 2 - Invasive non-native/alien species; Phragmites, purple loosestrife, other aquatics

Rhode Island Wildlife Action Plan Habitat Profiles

- Actions: • *Invasive/problematic species control; identify problem areas and conduct control measures. Several loosestrife infestations are using insect control. Rank: 2*

Threat 3 - Agricultural and forestry effluents; A chronic background problem varying by location

- Actions: • *Site/area management; conduct management practices that do not impact wetland hydrology or introduce chemicals into wetland systems. Rank: 2*
- *Policies and regulations; adopt best management practices that limit wetland pollution. Rank: 2*

Threat 4 - Climate change and severe weather; Habitat shifting and alteration and storms and flooding; Could be issues with increased precipitation, flooding, etc.

- Actions: • *Data collection and analysis; Monitor sites and document any changes in wetland systems caused by climate change. Rank: 2*
- *Site/area management; conduct management necessary based on monitoring information. Rank: 2*

Threat 5 - Household sewage and urban wastewater; Habitat degradation from impairment of water quality

- Actions: • *Research, survey, inventory, monitor populations; Evaluate water quality effects on priority species. Rank: 3*
- *Planning; Develop strategies to mitigate aquatic degradation. Rank: 3*

Threat 6 - Lack of information; Lack of research to guide threat assessment and prioritization of conservation planning; Lack of information from research to address habitat and taxonomic issues

- Actions: • *Research, survey, inventory, monitor populations; Need more inventory to determine extent of type in state. Rank: 3*

Coastal Plain Peatlands

KEY HABITATS



Image: Richard Enser

Description

Coastal Plain Peatlands (fens and quagmires) differ from Northern Peatlands (bogs) by their association with groundwater and/or overland water flow that provides a constant influx of water and nutrients, thus supporting a richer plant community than nutrient-poor bogs. Graminoid fens and quagmires are often found in abandoned stream channels where a shallow layer of peat overlies a solid layer of sandy mineral soil laid down in the old stream bed. In these situations sphagnum moss does not form a floating mat but occurs in scattered clumps among the dominant sedge and forb vegetation. Quagmires tend to hold standing water for longer periods and develop a muckier substrate and higher occurrence of floating aquatic plants. Sea level fens are unique peat-based emergent wetlands that typically develop at the upper edge of salt marshes where fresh groundwater seeps to the surface. Fauna of conservation concern that inhabit coastal plain peatlands are primarily invertebrates, especially members of the Odonata (dragonflies and damselflies) and Lepidoptera (moths and butterflies).



~See map disclaimer in profiles introduction

Condition

Coastal plain peatlands are primarily found in Washington County, the largest examples being at the Great Swamp in South Kingston; Grass Pond in Richmond; and Phantom Bog in Hopkinton, all currently protected as nature preserves. Other sites are protected by State wetlands regulations and the overall condition of fens and quagmires in Rhode Island is considered to be good. On the other hand, sea level fens are extremely uncommon (only two small occurrences currently known), and because this habitat type faces the potential of being lost due to sea level rise, the condition of sea level fens is considered to be fair.

SpeciesHerpetofauna

Spotted Turtle (*Clemmys guttata*)

Common Ribbonsnake (*Thamnophis sauritus sauritus*)

Invertebrates

Silver-bordered Fritillary (*Boloria selene*)

Taper-tailed Darner (*Gomphaeschna antilope*)

Crimson-ringed Whiteface (*Leucorrhinia glacialis*)

Bridgham's Brocade (*Oligia bridghami*)

Ringed Boghaunter (*Williamsonia lintneri*)

Plants

Horsetail Spikerush (*Eleocharis equisetoides*)

Inundated Beaked Rush (*Rhynchospora inundata*)

Threats and Actions by Community Type

Rhode Island Wildlife Action Plan Habitat Profiles

Palustrine (Open Peatlands)

Coastal Plain Peatlands - Coastal Plain Quagmire

Condition: good; many are protected currently. Importance to Biodiversity: 3. Degree of Threat: 2; beaver (flooding), invasives, water draw-down.

Threat 1 - Residential and commercial development; Development in adjacent uplands causing siltation and other impacts

- Actions:
- Site/area protection; Identify and acquire sites, focusing on extending upland buffers. Rank: 2.5
 - Policies and regulations; increase protection of buffer areas by wetlands regulations. Rank: 2.5

Threat 2 - Dams and water management/use; Groundwater pumping

- Actions:
- Site/area protection; Identify and acquire sites that provide additional protection to water sources. Rank: 3
 - Policies and regulations; strengthen regulations to restrict impacts to water resources. Rank: 2

Threat 3 - Invasive and non-native alien species; This threat has been relatively minor in these habitats

- Actions:
- Invasive/problematic species control; Identify and control invasives as needed. Rank: 1.5

Threat 4 - Household sewage and urban waste water; Some potential for this threat in conjunction with nearby development

- Actions:
- Site/area protection; Identify and acquire sites as needed, focusing on upland buffers. Rank: 2
 - Resource and habitat protection; maintain natural buffers. Rank: 2
 - Habitat and natural process restoration; allow natural processes to restore degraded sites. Rank: 1.5
 - Policies and regulations; strengthen regulations to prevent pollution. Rank: 2

Threat 5 - Agricultural and forestry effluents; Nutrients and pesticides/herbicides

- Actions:
- Site/area protection; Identify and acquire sites as needed, focusing on upland buffers. Rank: 2
 - Policies and regulations; strengthen regulations to control runoff. Rank: 2

Palustrine (Open Peatlands)

Coastal Plain Peatlands - Graminoid Fen

Condition: good; many are protected currently. Importance to Biodiversity: 3. Degree of Threat: 3; groundwater draw-down, development in watershed.

Threat 1 - Residential and commercial development; Development in adjacent uplands causing siltation and other impacts

- Actions:
- Site/area protection; Identify and acquire sites, focusing on extending upland buffers. Rank: 3
 - Policies and regulations; increase protection of buffer areas by wetlands regulations. Rank: 3

Threat 2 - Dams and water management/use; Groundwater pumping

- Actions:
- Site/area protection; Identify and acquire sites that provide additional protection to water sources. Rank: 3
 - Policies and regulations; strengthen regulations to restrict impacts to water resources. Rank: 2

Threat 3 - Invasive and non-native alien species; This threat has been relatively minor in these habitats

- Actions:
- Invasive/problematic species control; Identify and control invasives as needed. Rank: 1.5

Threat 4 - Household sewage and urban waste water; Some potential for this threat in conjunction with nearby development

- Actions:
- Site/area protection; Identify and acquire sites as needed, focusing on upland buffers. Rank: 2
 - Resource and habitat protection; maintain natural buffers. Rank: 2
 - Habitat and natural process restoration; allow natural processes to restore degraded sites. Rank: 1.5
 - Policies and regulations; strengthen regulations to prevent pollution. Rank: 2

Threat 5 - Agricultural and forestry effluents; Nutrients and pesticides/herbicides

- Actions:
- Site/area protection; Identify and acquire sites as needed, focusing on upland buffers. Rank: 2
 - Policies and regulations; strengthen regulations to control runoff. Rank: 2

Threat 6 - Fire and fire suppression; Loss of habitat from plant succession

Rhode Island Wildlife Action Plan Habitat Profiles

- Actions:
- *Habitat and natural process restoration; Develop fire prescriptions for priority parcels. Rank: 2*
 - *Habitat and natural process restoration; Implement burn management on priority parcels. Rank: 2*
 - *Outreach; Expand public relations for fire management. Rank: 2*

Palustrine (Open Peatlands)

Coastal Plain Peatlands - Sea Level Fen

Condition: poor; limited occurrences. Importance to Biodiversity: 3. Degree of Threat: 3; limited size, sea-level rise.

Threat 1 - Invasive non-native species; Phragmites a dominant feature at one location

- Actions:
- *Invasive/problematic species control; Control Phragmites using mechanical (non-chemical) methods. Rank: 2.5*

Threat 2 - Habitat shifting and alteration; May not be able to shift landward with rising sea level

- Actions:
- *Site/area protection; identify opportunities for habitat migration. Rank: 3*
 - *Data collection and analysis; monitor habitats for changes caused by climate change. Rank: 3*

Threat 3 - Dams and water management/use; Groundwater seepage from uplands is key element of this community; disruption of flow is threat

- Actions:
- *Site/area protection; identify and protect upland sources of groundwater. Rank: 2.5*
 - *Resource and habitat protection; maintain adequate buffers for upland freshwater sources. Rank: 2.5*

Northern Peatlands

KEY HABITATS



Image: Richard Enser

Description

Peatlands develop in small basins of glacial formation (often called kettleholes) that are closed to overland water flow. The nutrient-poor substrates and relatively stagnant waters foster the development of peat and peatland vegetation; in deeper basins, vascular vegetation grows on a peat mat that floats over water with no mineral soil development. Most basin peatlands consist of a mat of sphagnum moss with a >50% cover of low-growing, compact shrubs, most notably leatherleaf, sheep laurel, cranberry, and dwarf huckleberry, with scattered open patches of sedges and forbs. In shallower basins the peat substrates accumulate and become stable enough to support trees and ultimately mature into coniferous forested peatland swamps, most dominated by Atlantic white cedar. In northern New England, black spruce is the typical tree of peatland swamps, but this tree is rare in Rhode Island at the southern extremity of Northern Peatland distribution. Bogs and fens are highly unique habitats that support a similarly distinctive suite of plants and animals. The plant community is comprised of plants adapted to low-nutrient environments, including the insectivorous pitcher plant and sundews, and many plants serve as a primary food source for a variety of invertebrates. The bog copper butterfly, for example, relies on cranberry as a larval food and both of these species are limited to northern peatland habitats.

Map Unavailable
Due to Insufficient Data

~See map disclaimer in profiles introduction

Condition

The current estimate of the extent of Northern Peatland habitat in Rhode Island is 355 acres, most of it scattered throughout the state in small, <5 acre sites. Although this amount appears minimal in comparison to other habitats, there has probably been little change in these numbers since pre-settlement. In some cases, especially on Block Island, peat extraction may have altered these habitats but in general bogs have remained unchanged. Only one example of a black spruce bog remains in Rhode Island within the Arcadia Management Area. Black spruce has continued to decline elsewhere in the state, but much of this diminution may be accounted for by the natural range retraction of this species. Rhode Island recognizes all bogs as regulated wetlands, and many examples of these habitats have been protected in State management areas, Audubon Society of Rhode Island refuges, The Nature Conservancy preserves, and other protected areas, hence the current condition of Northern Peatlands in Rhode Island is considered to be good.

SpeciesInvertebrates

- Ground Beetle (*Agonum darlingtoni*)
- Pitcher Plant Moth (*Exyra fax*)
- Bog Tiger Moth (*Grammia speciosa*)
- Venus Flytrap Cutworm (*Hemipachnobia subporphyrea*)
- Bog Oligia (*Oligia minuscula*)
- Pitcher Plant Borer (*Papaipema appassionata*)

Threats and Actions by Community Type

Palustrine (Open Peatlands)

Northern Peatlands - Black Spruce Bog

Condition: *poor*. Importance to Biodiversity: 3. Degree of Threat: 3; development in watershed, lack of natural disturbance/fire.

Threat 1 - Habitat shifting and alteration; May result in loss of plants with northern affinities, including black spruce

- Actions:
- *Data collection and analysis; monitor site for changes in physical and biological characteristics caused by climate change. Rank: 3*

Palustrine (Open Peatlands)

Northern Peatlands - Dwarf Shrub Fen/Bog

Condition: *good*. Importance to Biodiversity: 3. Degree of Threat: 1; groundwater draw-down, development in watershed.

Threat 1 - Residential and commercial development; Development in adjacent uplands causing siltation and other impacts

- Actions:
- *Site/area protection; Identify and acquire habitats as needed. Rank: 2.5*
 - *Policies and regulations; Increase size of upland buffers. Rank: 2.5*

Threat 2 - Dams and water management/use; Groundwater pumping

- Actions:
- *Site/area protection; Identify and acquire sites that provide additional protection to water sources. Rank: 2*
 - *Policies and regulations; increase extent of upland buffers. Rank: 2.5*

Threat 3 - Invasive and non-native alien species; This threat has been relatively minor in these habitats

- Actions:
- *Invasive/problematic species control; Identify and conduct control of invasives as needed. Rank: 2*

Threat 4 - Household sewage and urban waste water; Some potential for this threat in conjunction with nearby development

- Actions:
- *Site/area protection; Identify and acquire sites that increase protection for these wetlands. Rank: 2*
 - *Resource and habitat protection; manage upland areas to reduce effluent flow to wetlands. Rank: 2*
 - *Habitat and natural process restoration; allow natural processes to restore impacted habitats. Rank: 1.5*
 - *Policies and regulations; strengthen regulations regarding septic systems. Rank: 2*

Threat 5 - Agricultural and forestry effluents; Nutrients and pesticides/herbicides

- Actions:
- *Site/area protection; Identify and acquire problem sites. Rank: 2*
 - *Policies and regulations; strengthen regulations regarding runoff. Rank: 1.5*

Marine Rocky Reef

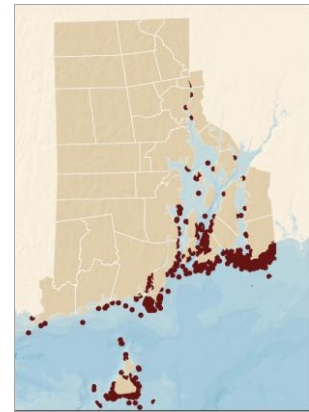
KEY HABITATS



Image: Jay Osenkowski

Description

Rocky bottom habitats are areas of rock or consolidated sediments found in nearshore and offshore coastal-marine waters of Rhode Island. Types of rocky habitats include solid bedrock, artificial reefs, piers, wrecks and any other submerged hard substrate. The habitat can be flat, have vertical structure, be crevassed, or smooth. Artificial reefs, piers, wrecks and other man-made structures are important additions to this community type as they create artificial hard or rocky bottom habitat. Typically the hard or rocky substrate will be covered with sessile invertebrates including sponges, bryozoans, corals, anemones, polychaete worms, and mollusks, and crustaceans. Sessile invertebrates provide food and shelter for many demersal (i.e., bottom-feeding) fish. For numerous species, this area may also provide nursery or spawning habitat. Commercially important finfish utilizing this habitat include tautog, cunner, and lobster, and migratory species such as scup and black sea bass.



~See map disclaimer in profiles introduction

Condition

The status and condition of rocky habitat is relatively unknown and in need of additional inventory, research and monitoring. These habitats are subject to disturbance and alteration by overfishing, sedimentation and burial, invasive species, and changing sea surface temperatures. The current extent of these habitat alterations is unknown and in need of inventory and monitoring. Overall, the rocky bottom environment is in good condition.

Species

Fish

Black Sea Bass (*Centropristis striata*)

Tautog (*Tautoga onitis*)

Invertebrates

Common Sea Star (*Asterias forbesi*)

Northern Star Coral (*Astrangia poculata*)

Jonah Crab (*Cancer borealis*)

Rock Crab (*Cancer irroiatatus*)

Coral Worm (*Dodecaceria coralii*)

American Lobster (*Homarus americanus*)

Longnose Spider Crab (*Libinia dubia*)

Portly Spider Crab (*Libinia emarginata*)

Northern Horse Mussel (*Modiolus modiolus*)

Blue Mussel (*Mytilus edulis*)

Short Spined Brittle Star (*Ophioderma brevispinum*)

Green Sea Urchin (*Strongylocentrotus droebachiensis*)

Mammals

Harbor Seal (*Phoca vitulina*)

Harbor Porpoise (*Phocoena phocoena*)

Threats and Actions by Community Type

Coastal (Nearshore)

Marine Rocky Reef - Hard, Rocky Bottom

Condition: fair; sediment runoff and nutrient loading can impact habitat quality in these important areas making them unusable. Importance to Biodiversity: 3. Degree of Threat: 2; some regulation and mitigation efforts (i.e. stormwater BMPs) have helped and salt water intrusion, invasives, deer, lack of migratory area.

Threat 1 - Residential and commercial development; All categories impact this habitat type

Actions: • *Land/water protection; mitigating impacts from runoff. Rank: 2.5*

Threat 2 - Livestock farming and ranching; Nutrient loading and sediment runoff

Actions: • *Land/water protection; Best management practices for agriculture will mitigate impacts. Rank: 2.5*

Threat 3 - Fishing and harvesting aquatic resources; Structure can be targeted by fishing and overexploited

Actions: • *Site/area protection; Marine protected areas can be created to protect particularly sensitive areas. Rank: 2.5*

Coastal (Offshore)

Marine Rocky Reef - Hard, Rocky Bottom

Condition: fair; these areas are often targeted for fishing. Importance to Biodiversity: 3. Degree of Threat: 2; certain areas are threatened and given new fishing technologies, many of these areas are no longer out of the reach of fishermen and.

Threat 1 - Fishing and harvesting aquatic resources; Fishing techniques can impact habitats (i.e. trawling with rockhopper gear, fish pots)

Actions: • *Site/area protection; Marine protected areas can be created to protect particularly sensitive areas and regulations can help maintain biodiversity in areas. Rank: 2.5*

Marine (Nearshore)

Marine Rocky Reef - Marine Habitats

Condition: good; these areas are easily exploitable which can impact biodiversity creating ecological problems. Importance to Biodiversity: 3. Degree of Threat: 2; regulation will help maintain these areas in good condition and salt water intrusion, invasives, deer, lack of migratory area.

Threat 1 - Fishing and harvesting aquatic resources; Fishing techniques can impact habitats (i.e. trawling with rockhopper gear)

Actions: • *Site/area protection; Marine protected areas can be created to protect particularly sensitive areas. Rank: 2*

Threat 2 - Fishing and harvesting aquatic resources; Overexploitation can impact biodiversity in these habitats

Actions: • *Species management; careful management can mitigate the impacts of this threat. Rank: 2*

Marine (Offshore)

Marine Rocky Reef - Offshore Rocky Reef

Condition: good; these areas are often targeted for fishing. Importance to Biodiversity: 3. Degree of Threat: 1; certain areas are threatened and given new fishing technologies, many of these areas are no longer out of the reach of fishermen and.

Threat 1 - Fishing and harvesting aquatic resources; Fishing techniques can impact habitats (i.e. trawling with rockhopper gear, fish pots)

Actions: • *Site/area protection; Marine protected areas can be created to protect particularly sensitive areas and regulations can help maintain biodiversity in areas. Rank: 2*

Threat 2 - Fishing and harvesting aquatic resources; Overexploitation can impact biodiversity in these habitats

Actions: • *Species management; Regulations can help maintain biodiversity in areas. Rank: 2*

Rhode Island Wildlife Action Plan Habitat Profiles

Threat 3 - Other ecosystem modifications; Dredging, dredge disposal and other benthic disturbances

- Actions:*
- *Data collection and analysis; Undertake multi season, pre- and post- dredging biological surveys to assess impacts to animal and submerged aquatic vegetation communities. Rank: 2*
 - *Data collection and analysis; Address cumulative impacts of past and current dredging operations on fishery resources by considering them as part of the permitting process; Identify and characterize fishery habitat functions and service in the project area. Rank: 2*
 - *Site/area management; Adequate compensatory mitigation should be provided for unavoidable impacts; Study all options for disposal of dredged materials, including disposal sites and methods used, upland disposal sites should be considered as an alternative to offshore disposal sites. Rank: 2*
 - *Law and policy; Avoid new dredging to the maximum extent possible; Projects should be permitted only for water dependant purposes and only when no feasible alternatives are available. Rank: 2*

Threat 4 - Industrial and military effluents; Oil spills, marine accidents, ocean dumping

- Actions:*
- *Data collection and analysis; Increase data bank on species habitat preferences and use in oil spill response planning and mapping. Rank: 2*
 - *Law and policy; Increase number and training of response teams in the event of an accident. Rank: 2*

Marine Soft Sediment

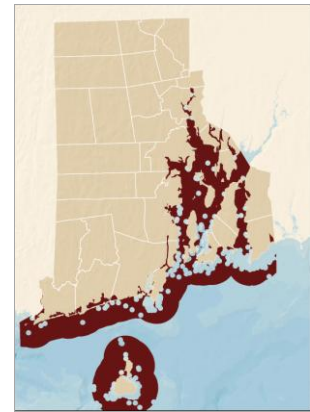
KEY HABITATS



Image: NOAA

Description

Marine soft sediments cover 70% of Rhode Island's seafloor and estuaries. Soft sediments host a diverse array of organisms and play a pivotal role in coastal-marine ecosystem functioning. Soft sediment environments are characterized by fine unconsolidated substrates (sand, mud) and that are dominated in percent cover or in estimated biomass by marine invertebrates that create feeding pits/mounds, or by structures associated with these fauna (e.g., polychaete tubes). Over 150 species of macroinvertebrates have been identified in coastal-marine soft sediment communities of Rhode Island. Because sediment is an accumulation of particles that have settled to the seabed, it is generally rich in organic matter, with fresh new detritus continually falling to the seabed from above. Animals inhabiting the sediment use this organic detritus as a source of food, but may also graze on microscopic algae that grow on the sediment surface. Commercially-important finfish and invertebrates, such as whelk and winter flounder, forage for macroinvertebrates in marine soft sediments.



~See map disclaimer in profiles introduction

Condition

Soft sediment environments are subject to disturbance and alteration by dredging and disposal, marine construction (e.g., pipe and cable lines) and bottom tending fishing gear. The current extent of these habitat alterations is unknown and in need of inventory and monitoring. Overall, the soft sediment environment is in poor condition.

SpeciesBirds

- American Wigeon (*Anas americana*)
- Greater Scaup (*Aythya marila*)
- Red-throated Loon (*Gavia stellata*)
- Red-breasted Merganser (*Mergus serrator*)
- Common Eider (*Somateria mollissima*)

Fish

- American Sand Lance (*Ammodytes americanus*)
- Sheepshead Minnow (*Cyprinodon variegatus*)
- Mummichog (*Fundulus heteroclitus*)
- Spotfin Killifish (*Fundulus luciae*)
- Striped Killifish (*Fundulus majalis*)
- Atlantic Cod (*Gadus morhua*)
- Sticklebacks (*Gasterosteus spp*)
- Rainwater Killifish (*Lucania parva*)
- Atlantic Tomcod (*Microgadus tomcod*)
- Grubby Sculpin (*Myoxocephalus aenaeus*)
- Oyster Toadfish (*Opsanus tau*)
- Pollock (*Pollathius virens*)
- Northern Sea Robin (*Prionotus carolinus*)

Rhode Island Wildlife Action Plan Habitat Profiles

Winter Flounder (*Pseudopleuronectes americanus*)

Skates (*Raja spp.*)

Windowpane (*Scophthalmus aquosus*)

Spiny Dogfish (*Squalus acanthius*)

Hogchoker (*Trinectes maculatus*)

Invertebrates

Burrowing Anemone (*Actinotheroe modesta*)

Clam Worm (*Alitta virens*)

Tube Dwelling Amphipod (*Ampelisca spp.*)

Sand Burrower (*Amphiporeia virginiana*)

Ocean Quahog (*Arctica islandica*)

Bay Scallop (*Argopecten irradians*)

Channeled Whelk (*Busycon canaliculatus*)

Knobbed Whelk (*Busycon carica*)

Blue Crab (*Callinectes sapidus*)

American Tube Dwelling Anemone (*Ceriantheopsis americana*)

Parchment Worm (*Chaetopterus variopedatus*)

Bamboo Worm (*Clymenella torquata*)

Sevenspine Bay Shrimp (*Crangon septemspinosa*)

Striped Nudibranch (*Cratena pilata*)

Tube Worm (*Diopatra cuprea*)

Common Sand Dollar (*Echinarachnius parma*)

Burrowing Anemone (*Edwardsia elegans*)

Nudibranch (*Elysia catulus*)

Razor Clam (atlantic Jackknife) (*Ensis directus*)

Dwarf Balloon Aeolis (*Eubranchus exigus*)

Painted Ballon Worm (*Eubranchus pallidus*)

Morton's Eggcockle (*Laevicardium mortoni*)

Atlantic Horseshore Crab (*Limulus polyphemus*)

Bay Quahog (*Mercenaria mercenaria*)

Soft-shell Clam (*Mya arenaria*)

Lady Crab (*Ovalipes ocellatus*)

Sea Scallop (*Placopecten magellanicus*)

Hairy Sea Cucumber (*Sclerodactyla briareus*)

Parchment Tube Worm (*Spiochaetopterus costarum oculatus*)

Atlantic Surf Clam (*Spisula solida*)

Mantis Shrimp (*Squilla empusa*)

Coastal Mud Shrimp (*Upogebia affinis*)

Threats and Actions by Community Type

Coastal (Nearshore)

Marine Soft Sediment - Soft Bottom

Condition: poor; nutrient input and sediment runoff from agriculture and development. Importance to Biodiversity: 3. Degree of Threat: 3; some regulation and mitigation efforts (i.e. stormwater BMPs) have helped but impacts remain high, invasives.

Threat 1 - Residential and commercial development; All categories impact this habitat type

Actions: • Land/water protection; mitigating impacts from runoff. Rank: 2.5

Threat 2 - Agriculture and aquaculture; Nutrient loading and sediment runoff

Actions: • Land/water protection; Best management practices for agriculture and aquaculture will mitigate impacts. Rank: 2.5

Threat 3 - Fishing and harvesting aquatic resources; Fishing techniques can impact habitats (i.e. trawling, dredging)

Actions: • Site/area protection; Marine protected areas can be created to protect particularly sensitive areas. Rank: 2.5

Rhode Island Wildlife Action Plan Habitat Profiles

Coastal (Offshore)

Marine Soft Sediment - Soft Bottom

Condition: fair; these areas are often targeted for dumping dredge materials and can be heavily fished if known to be productive. Importance to Biodiversity: 3. Degree of Threat: 2; certain areas are threatened but there are large areas that can remain undisturbed.

Threat 1 - Garbage and solid waste; These areas are often seen as viable for offshore dumping of waste (i.e. dredge materials)

- Actions:*
- *Land/water protection; perform bio-assessments of areas before dumping can take place.*
- Rank: 2.5*

Threat 2 - Fishing and harvesting aquatic resources; Fishing techniques can impact habitats (i.e. trawling, dredging)

- Actions:*
- *Site/area protection; Marine protected areas can be created to protect particularly sensitive areas.*
- Rank: 2.5*

Estuarine (Nearshore)

Marine Soft Sediment - Nearshore Soft Sediment

Condition: poor; nutrient input and sediment runoff from agriculture and development. Importance to Biodiversity: 3. Degree of Threat: 3; some regulation and mitigation efforts (i.e. stormwater BMPs) have helped but impacts remain high, invasives.

Threat 1 - Residential and commercial development; All categories impact this habitat type

- Actions:*
- *Land/water protection; mitigating impacts from runoff.*
- Rank: 2.5*

Threat 2 - Agriculture and aquaculture; Nutrient loading and sediment runoff

- Actions:*
- *Land/water protection; Best management practices for agriculture and aquaculture will mitigate impacts.*
- Rank: 2.5*

Threat 3 - Fishing and harvesting aquatic resources; Fishing techniques can impact habitats (i.e. trawling, dredging)

- Actions:*
- *Site/area protection; Marine protected areas can be created to protect particularly sensitive areas.*
- Rank: 2*

Threat 4 - Residential and commercial development; Loss of riparian vegetation, fringe wetlands due to shore line development, bulkheads, and poor urban development

- Actions:*
- *Site/area management; Minimize the loss of riparian habitats as much as possible; Avoid locating roads near wetlands and fish bearing streams; Roads should be sited to avoid sensitive areas such as wetlands, streams, and steep slopes; Where ever possible, "soft" approaches (such as beach nourishment, vegetative plantings, and placement of large woody debris) to shoreline modification should be used.*
 - *Site/area management; Avoid placing pipelines and accessory equipment used in conjunction with construction or dredging operations close to kelp beds, eelgrass beds, estuarine/salt marshes and any other high value habitat.*
 - *Law and policy.*
 - *The diking and draining of tidal marshlands and estuaries should not be undertaken unless a satisfactory compensatory mitigation plan is in effect and monitored.*
- Rank: 2*

Threat 5 - Other ecosystem modifications; Dredging, dredge disposal and other benthic disturbances such as trawling

- Actions:*
- *Data collection and analysis; Undertake multi season, pre- and post- dredging biological surveys to assess impacts to animal and submerged aquatic vegetation communities.*
 - *Data collection and analysis; Identify and characterize fisher habitat functions and service in the project area.*
- Rank: 2*

Estuarine (Offshore)

Marine Soft Sediment - Offshore Soft Sediment

Condition: poor; despite being removed from immediately adjacent to the shoreline these areas are impacted by runoff and nutrient loading. Importance to Biodiversity: 3. Degree of Threat: 3; all impacts associated with

Rhode Island Wildlife Action Plan Habitat Profiles

nearshore areas in estuaries remain for offshore areas as well.

Threat 1 - Residential and commercial development; All categories impact this habitat type

Actions: • Land/water protection; mitigating impacts from runoff. Rank: 2.5

Threat 2 - Agriculture and aquaculture; Nutrient loading and sediment runoff

Actions: • Land/water protection; Best management practices for agriculture and aquaculture will mitigate impacts. Rank: 2.5

Threat 3 - Fishing and harvesting aquatic resources; Fishing techniques can impact habitats (i.e. trawling, dredging)

Actions: • Site/area protection; Marine protected areas can be created to protect particularly sensitive areas. Rank: 2.5

Marine (Nearshore)

Marine Soft Sediment - Nearshore Soft Sediment

Condition: good; main impacts are due to fishing because these areas are not directly adjacent to the coast. These areas can also be targeted for dredge material and garbage dumping. Importance to Biodiversity: 3. Degree of Threat: 2; regulation will help maintain these areas in good condition, invasives.

Threat 1 - Fishing and harvesting aquatic resources; Fishing techniques can impact habitats (i.e. trawling, dredging)

Actions: • Site/area protection; Marine protected areas can be created to protect particularly sensitive areas. Rank: 2

Threat 2 - Garbage and solid waste; These areas are often seen as viable for offshore dumping of waste (i.e. dredge materials)

Actions: • Land/water protection; perform bio-assessments of areas before dumping can take place. Rank: 2.5

Marine (Offshore)

Marine Soft Sediment - Offshore Soft Sediment

Condition: good; these areas are often targeted for dumping dredge materials and can be heavily fished if known to be productive. Importance to Biodiversity: 3. Degree of Threat: 1; certain areas are threatened but there are large areas that can remain undisturbed and.

Threat 1 - Garbage and solid waste; These areas are often seen as viable for offshore dumping of waste (i.e. dredge materials)

Actions: • Land/water protection; perform bio-assessments of areas before dumping can take place. Rank: 2

Threat 2 - Fishing and harvesting aquatic resources; Fishing techniques can impact habitats (i.e. trawling, dredging)

Actions: • Site/area protection; Marine protected areas can be created to protect particularly sensitive areas. Rank: 2.5