BIOTA

KELLIE KNIGHT
YIFAN KONG
MENGXUAN LIU

Overview

BIOTA is "the animal and plant life of a particular region." These regions are defined according to their physiogeography, climate, soil type, and hydrology, and they are termed ecoregions. The qualities that define them allow for the establishment of life. Their communities are first vegetative and micro-organismal, providing habitat for wildlife communities.

HABITAT : The location where a particular plant or animal lives and its surroundings (both living and nonliving) and includes the presence of a group of particular environmental conditions surrounding an organism including: air, water, soil, mineral elements, moisture, temperature, and topography.

ECOREGION

An ecoregion is classified according to its topography, its specific soil moisture content, and its dominant plant types. This is often referred to as habitat. The transitions between these qualities provide smaller micro-habitats, which is the basis for heterogeneity within these communities.

AERIAL VIEW OF NEWPORT

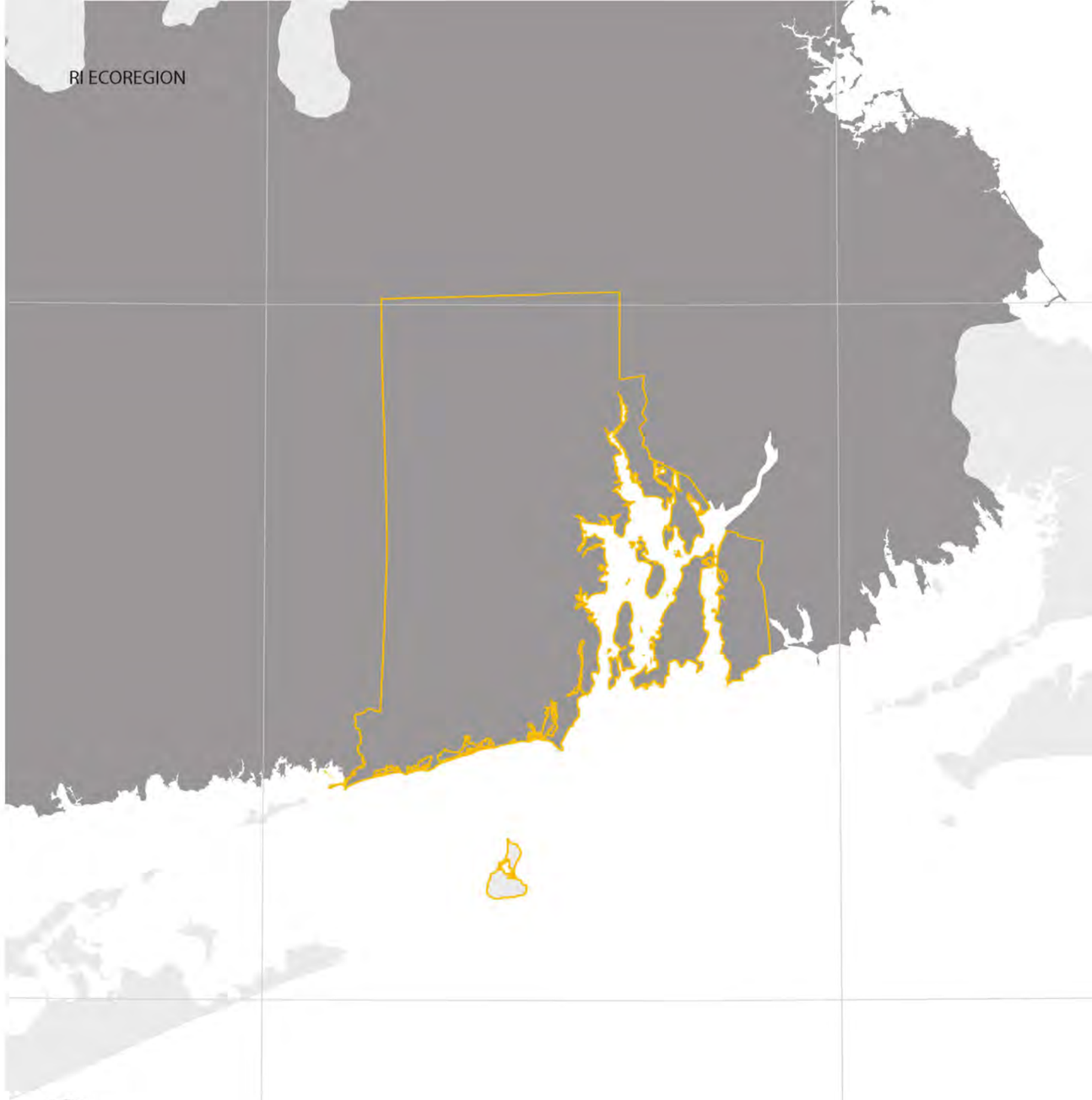
US ECOREGION

0 270 540 1,080 1,620
Miles

US-Ecoregion

- ALASKA BOREAL INTERIOR
- ALASKA TUNDRA
- ARCTIC CORDILLERA
- ATLANTIC HIGHLANDS
- BOREAL CORDILLERA
- BOREAL PLAIN
- BROOKS RANGE TUNDRA
- CENTRAL AMERICAN SIERRA MADRE AND CHIAPAS HIGHLANDS
- CENTRAL USA PLAINS
- COASTAL PLAIN AND HILLS OF SOCONUSCO
- COLD DESERTS
- DRY GULF OF MEXICO COASTAL PLAINS AND HILLS
- EASTERN SIERRA MADRE
- EVERGLADES
- HUDSON PLAIN
- HUMID GULF OF MEXICO COASTAL PLAINS AND HILLS
- INTERIOR DEPRESSIONS
- MARINE WEST COAST FOREST
- MEDITERRANEAN CALIFORNIA
- MEXICAN HIGH PLATEAU
- MISSISSIPPI ALLUVIAL AND SOUTHEAST USA COASTAL PLAINS
- MIXED WOOD PLAINS
- MIXED WOOD SHIELD
- NORTHERN ARCTIC
- NORTHWESTERN PLAIN OF THE YUCATAN PENINSULA
- OZARK/OUACHITA-APPALACHIAN FORESTS
- PLAIN AND HILLS OF THE YUCATAN PENINSULA
- SIERRA AND PLAINS OF EL CABO
- SIERRA LOS TUXTLAS
- SOFTWOOD SHIELD
- SOUTH CENTRAL SEMIARID PRAIRIES
- SOUTHEASTERN USA PLAINS
- SOUTHERN ARCTIC
- SOUTHERN PACIFIC COASTAL PLAIN AND HILLS
- SOUTHERN SIERRA MADRE
- TAIGA CORDILLERA
- TAIGA PLAIN
- TAIGA SHIELD
- TAMAULIPAS-TEXAS SEMIARID PLAIN
- TEMPERATE PRAIRIES
- TEXAS-LOUISIANA COASTAL PLAIN
- TRANSVERSAL NEO-VOLCANIC SYSTEM
- UPPER GILA MOUNTAINS
- WARM DESERTS
- WEST-CENTRAL SEMIARID PRAIRIES
- WESTERN CORDILLERA
- WESTERN PACIFIC COASTAL PLAIN, HILLS AND CANYONS
- WESTERN PACIFIC PLAIN AND HILLS
- WESTERN SIERRA MADRE
- WESTERN SIERRA MADRE PIEDMONT

RI ECOREGION



0 3.25 6.5 13 19.5 26
Miles

State Ecoregion

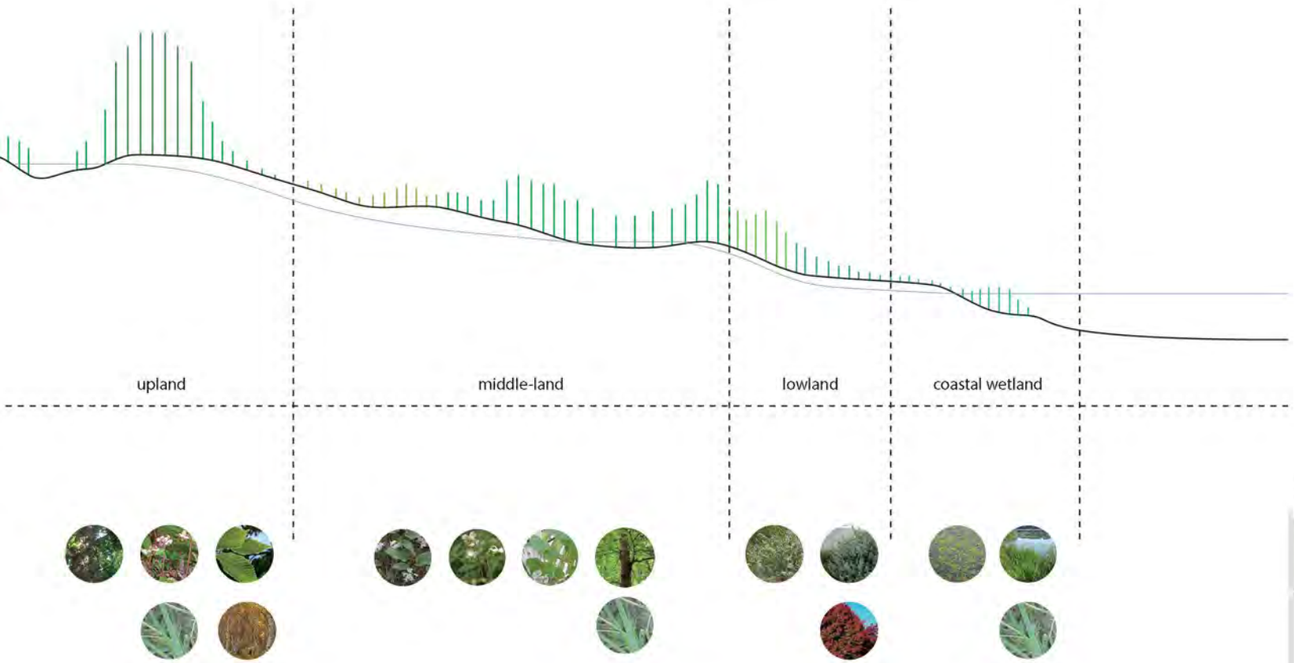
- MIXED WOOD PLAINS
- ATLANTIC HIGHLANDS
- MISSISSIPPI ALLUVIAL AND SOUTHEAST USA COASTAL PLAINS

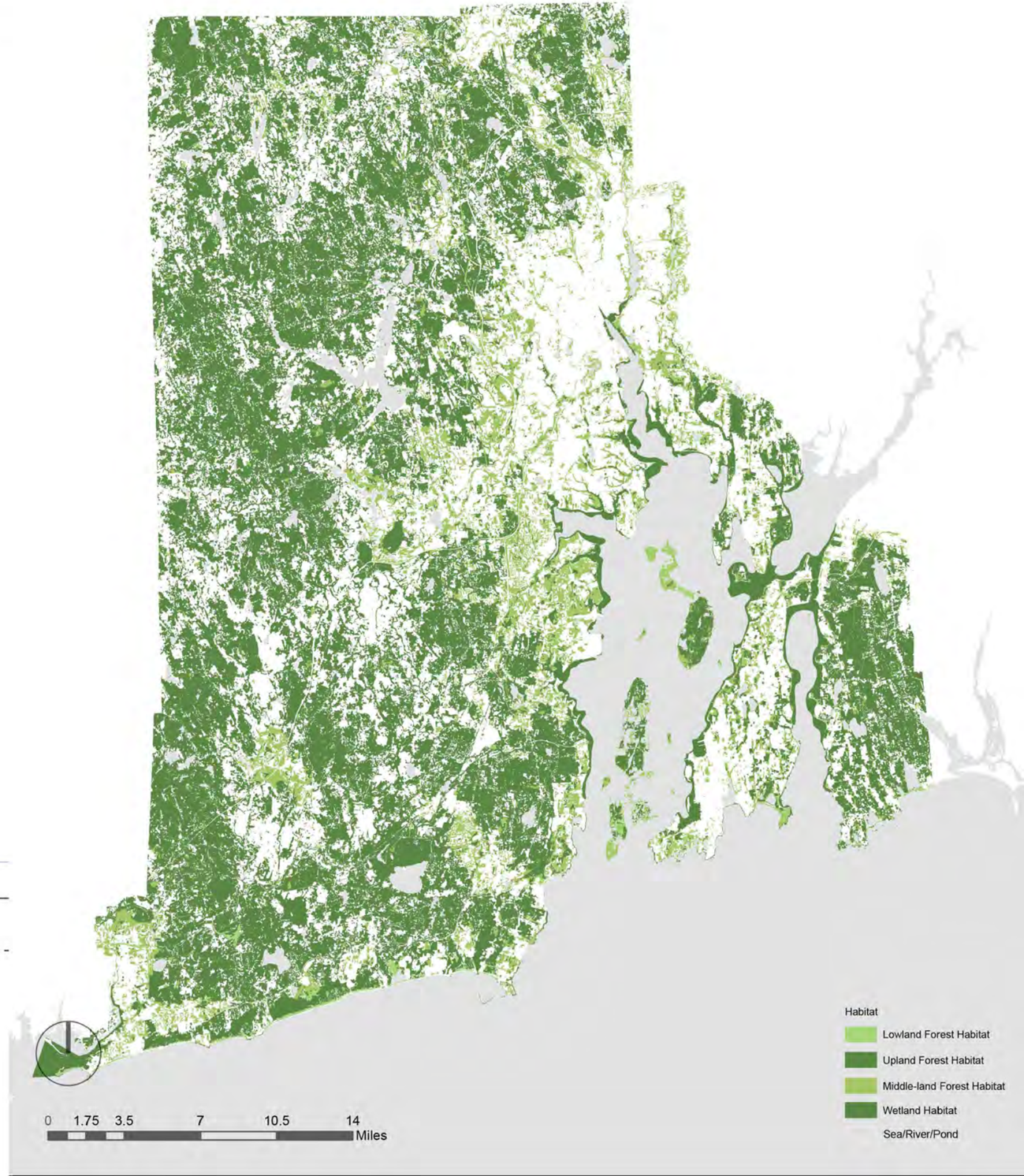
HABITAT CLASSIFICATION

Ecoregions are classified according to the change in topography and elevation, their specific soil moisture content and dominant plant type, often referred to as habitat. The transition between vegetation type and soil moisture content provide smaller micro-habitats for which allow for heterogeneity to develop within these communities.

-FOREST HABITAT

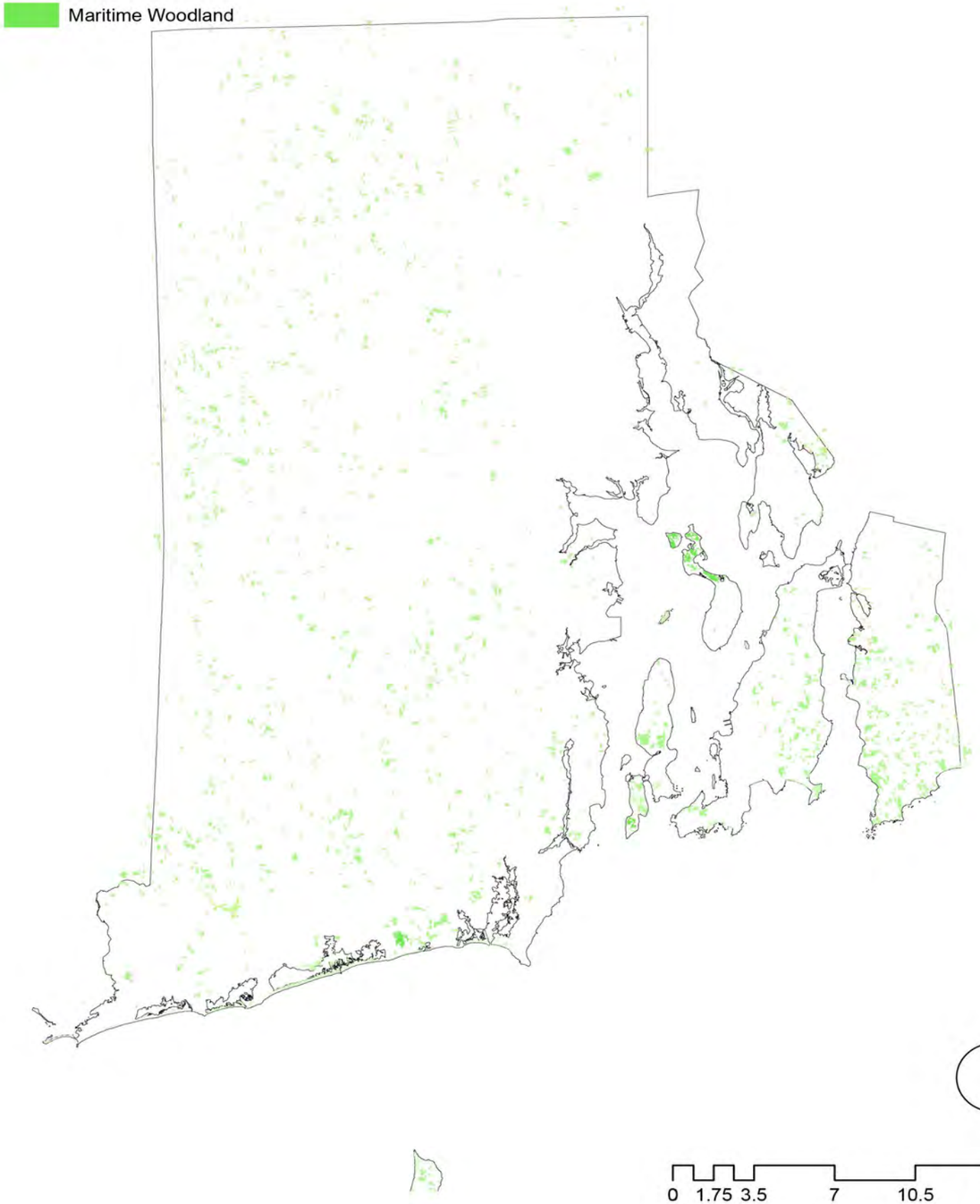
Forest habitat is an environmental condition characterized by woody vegetation, trees, and shrubs. The Rhode Island forest is diverse in its structure. It varies in composition from the dry upland forest down to the low wetland forest.





LOWLAND FOREST HABITAT

- Coastal Grassland
- Coastal Shrubland
- Floodplain Forests
- Hayfields/Pasture
- Inland Sand Barren
- Maritime Woodland



0 1.75 3.5 7 10.5 14 Miles

Coastal Grassland

Orach

Sea-rocket

Coastal Shrubland

Beach plum

Bayberry

Floodplain Forest

Tupelo

Hayfields/Pasture

Witch hazel

Shinleaf

Inland Sand Berran

Beach plum

Bayberry

Maritime Woodland

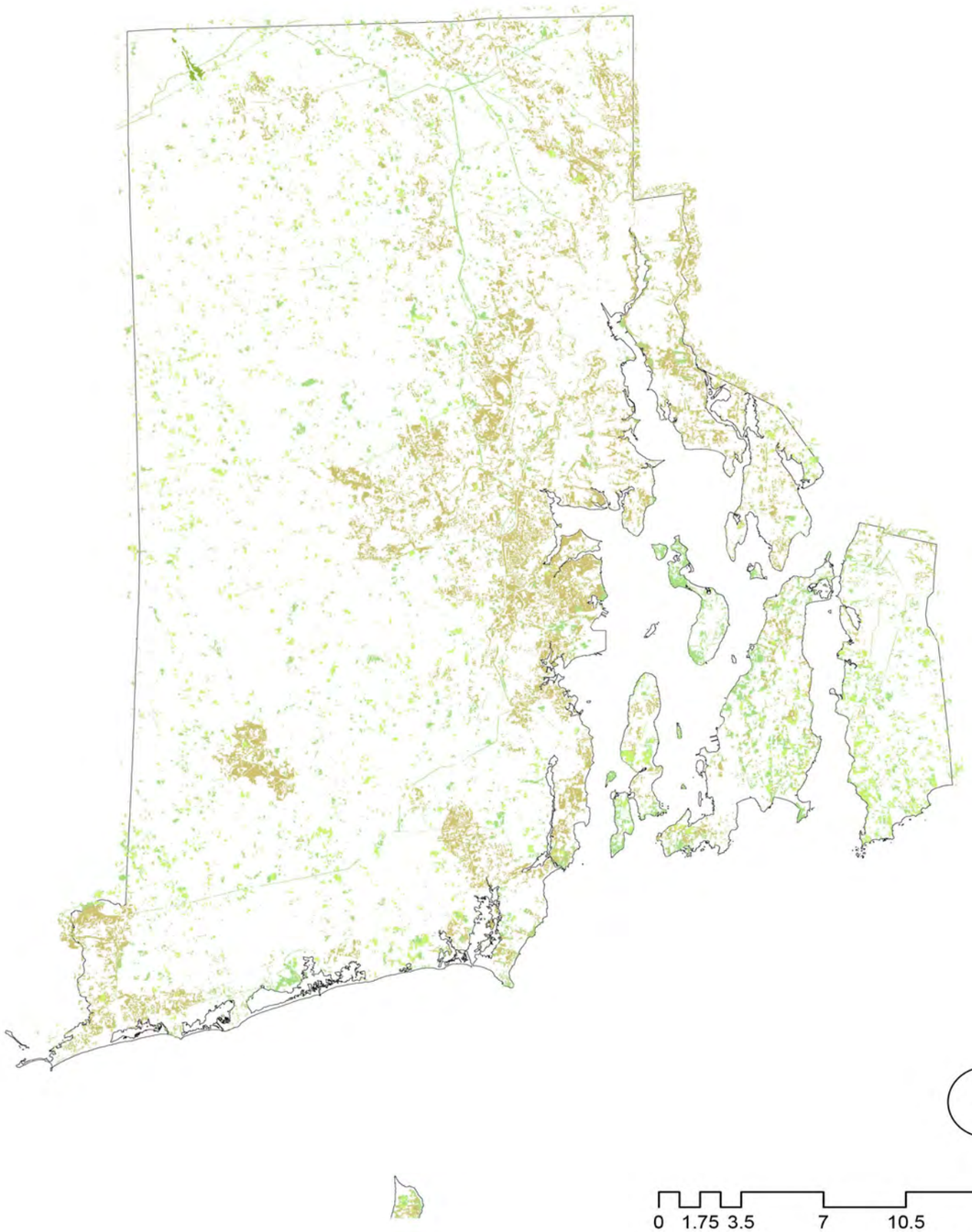
Black cherry

White ash

Red oak

MIDDLE-LAND FOREST HABITAT

- Hayfields/Pasture
- Ruderal Grassland/Shrubland
- Ruderal Forest
- Hemlock/Hardwood Forest



Hayfields/Pasture

Spotted pipsissewa

Ruderal Grassland/Shrubland

Trailing arbutus

Winter green

Ruderal Forest

Gray birch

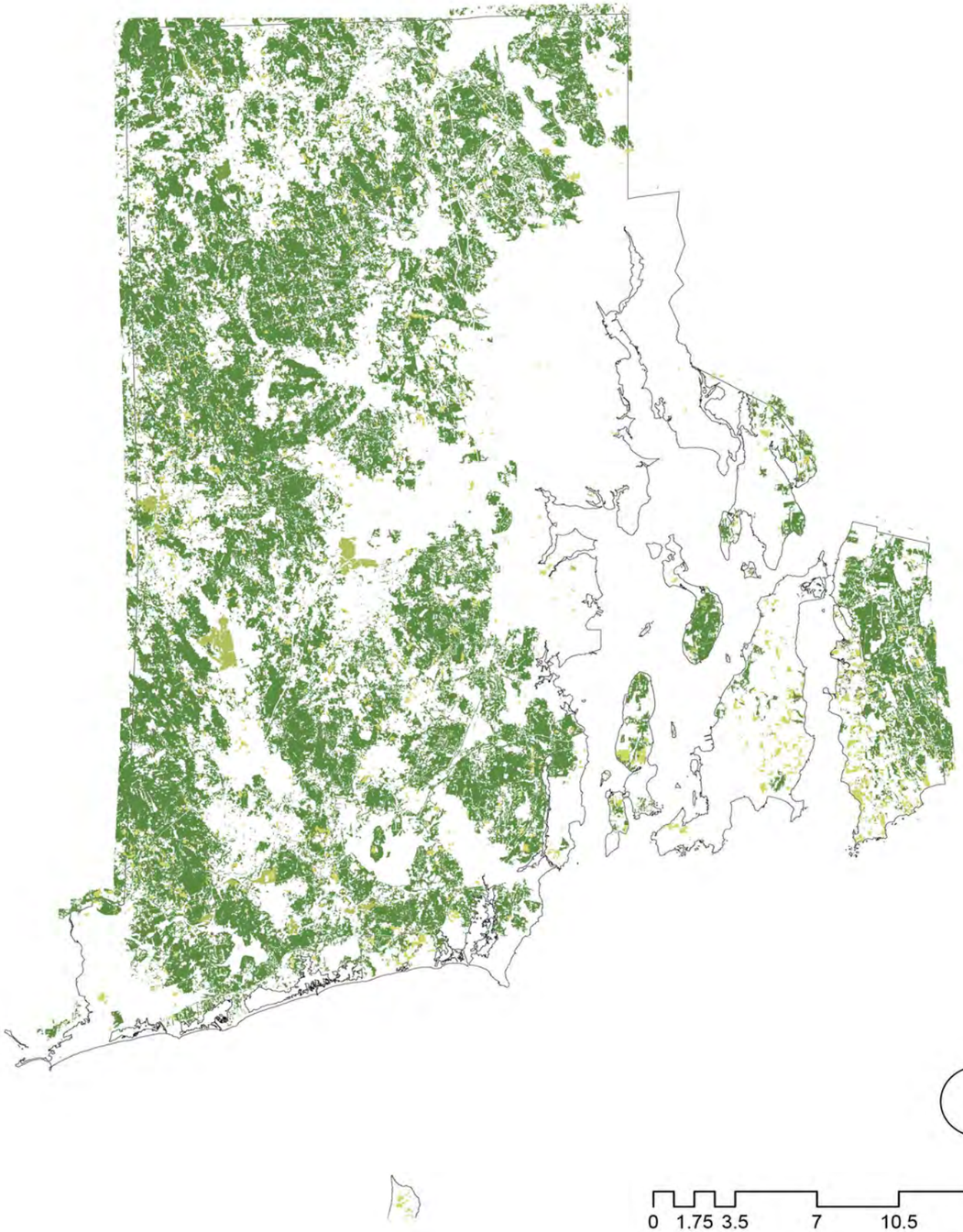
Hemlock/Hardwood Forest

Canadian hemlock

Black birch

UPLAND FOREST HABITAT

- Hayfields/Pasture
- Pitch Pine Woodland/Barrens
- Hemlock/Hardwood Forest
- Northern Hardwood Forest
- Oak Forest



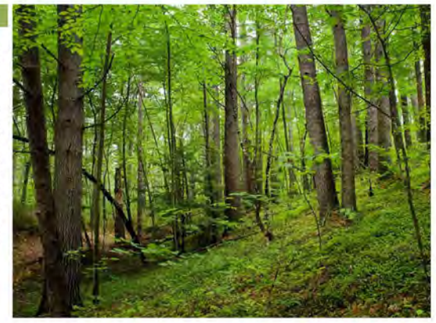
Hayfields/Pasture

Pipsissewa

Pitch Pine Woodland/Barrens

Pitch pine

Hemlock/Hardwood Forest



American beech

Newengland beech

Northern Hardwood Forest

Sugar maple

Yellow birch

Oak Forest

Chestnut oak

Scarlet oak

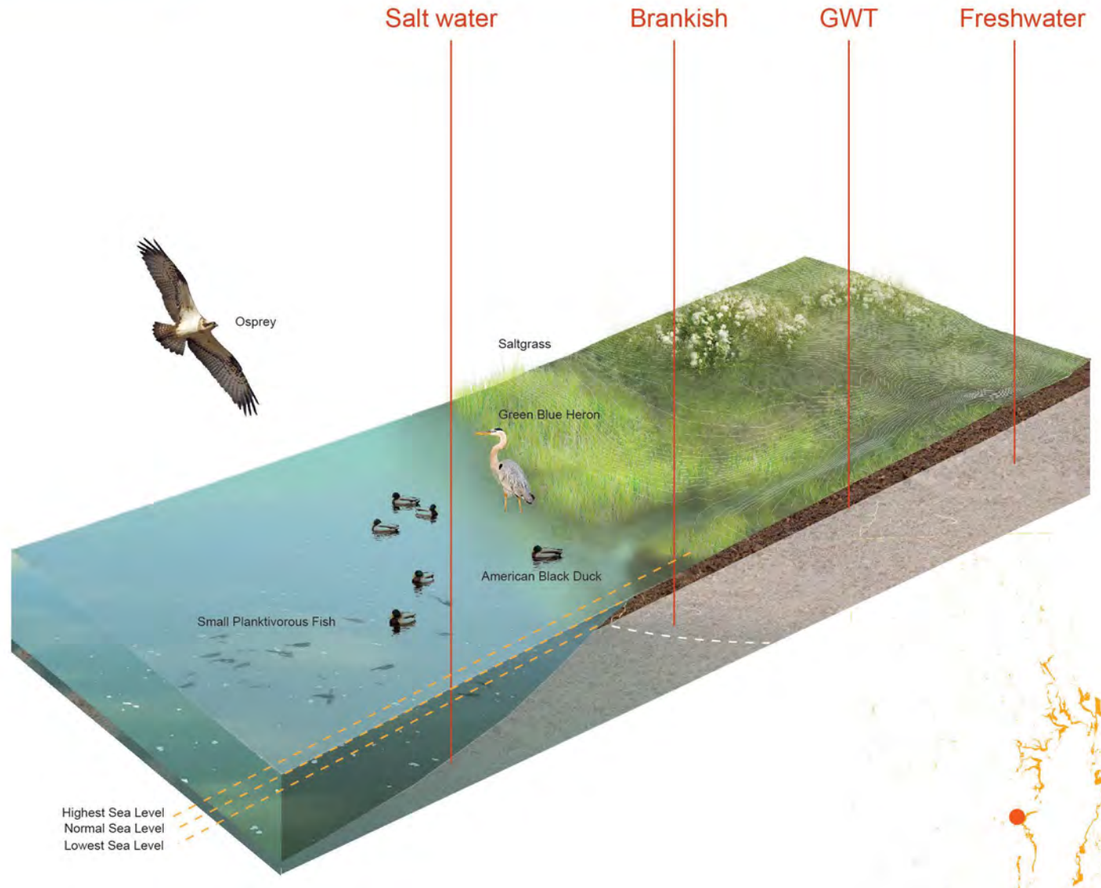
-WETLAND HABITAT

"Wetlands are areas where water covers the soil, or is present either at or near the surface of the soil all year or for varying periods of time during the year, including during the growing season. Water saturation largely determines how the soil develops and the types of plant and animal communities living in and on the soil. Wetlands may support both aquatic and terrestrial species. The prolonged presence of water creates conditions that favor the growth of specially adapted plants and promotes the development of characteristic wetlands soils."

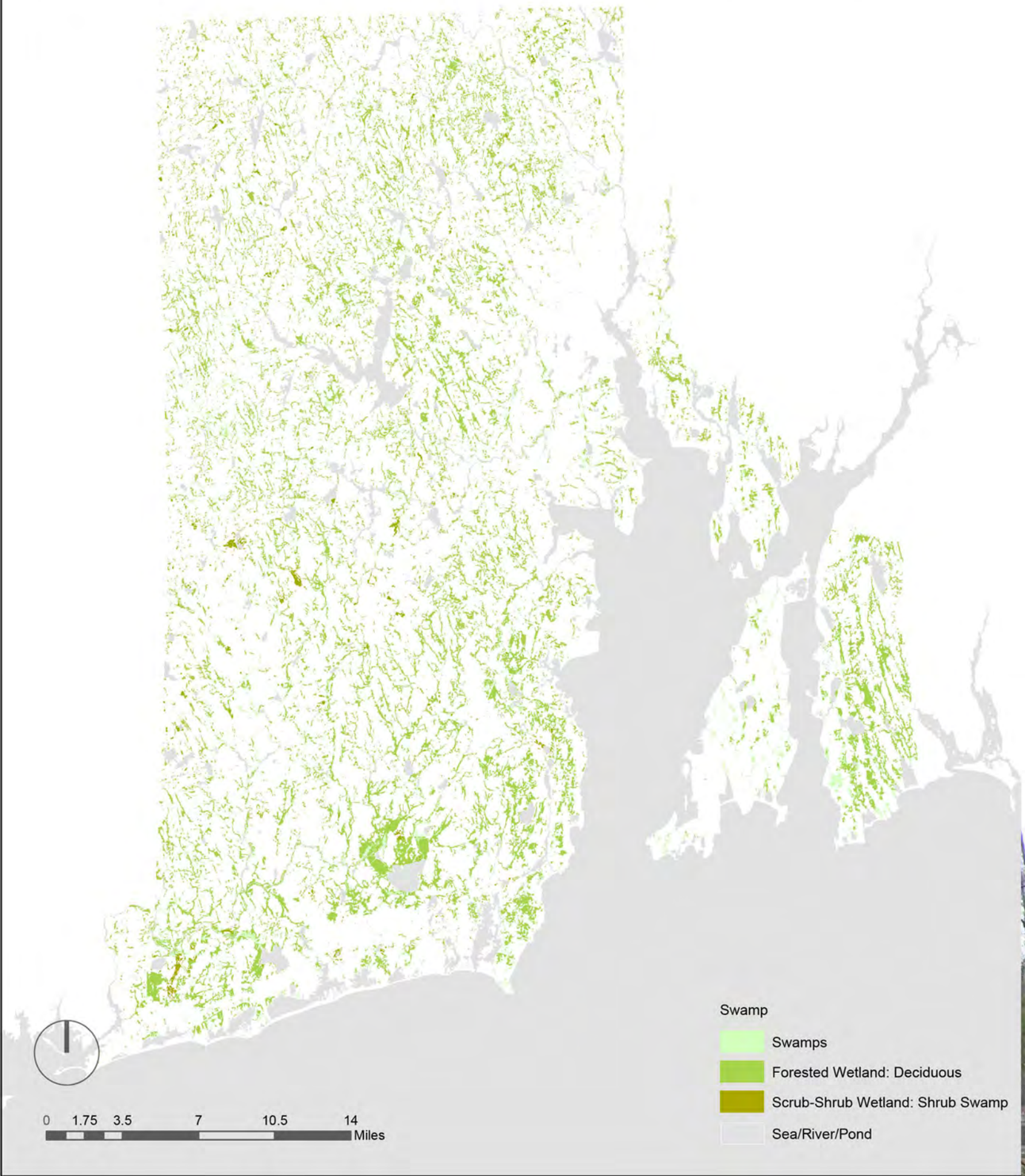
-- EPA, America's Wetlands: Our Vital Link Between Land and Water

Coastal salt marshes occur along coastlines and are influenced by tides and often by freshwater runoff, rivers, or ground water. Salt marshes are the most prevalent types of tidal marshes and are characterized by salt-tolerant plants such as smooth cordgrass, saltgrass, and glasswort. Salt marshes have one of the highest rates of primary productivity associated with wetland ecosystems because of the inflow of nutrients and organics from surface and/or tidal water. Tidal freshwater marshes are located upstream of estuaries. Tides influence water levels but the water is fresh. The lack of salt stress allows a greater diversity of plants to thrive. Cattail, wild rice, pickerelweed, and arrowhead are common and help support a large and diverse range of bird and fish species, among other wildlife.

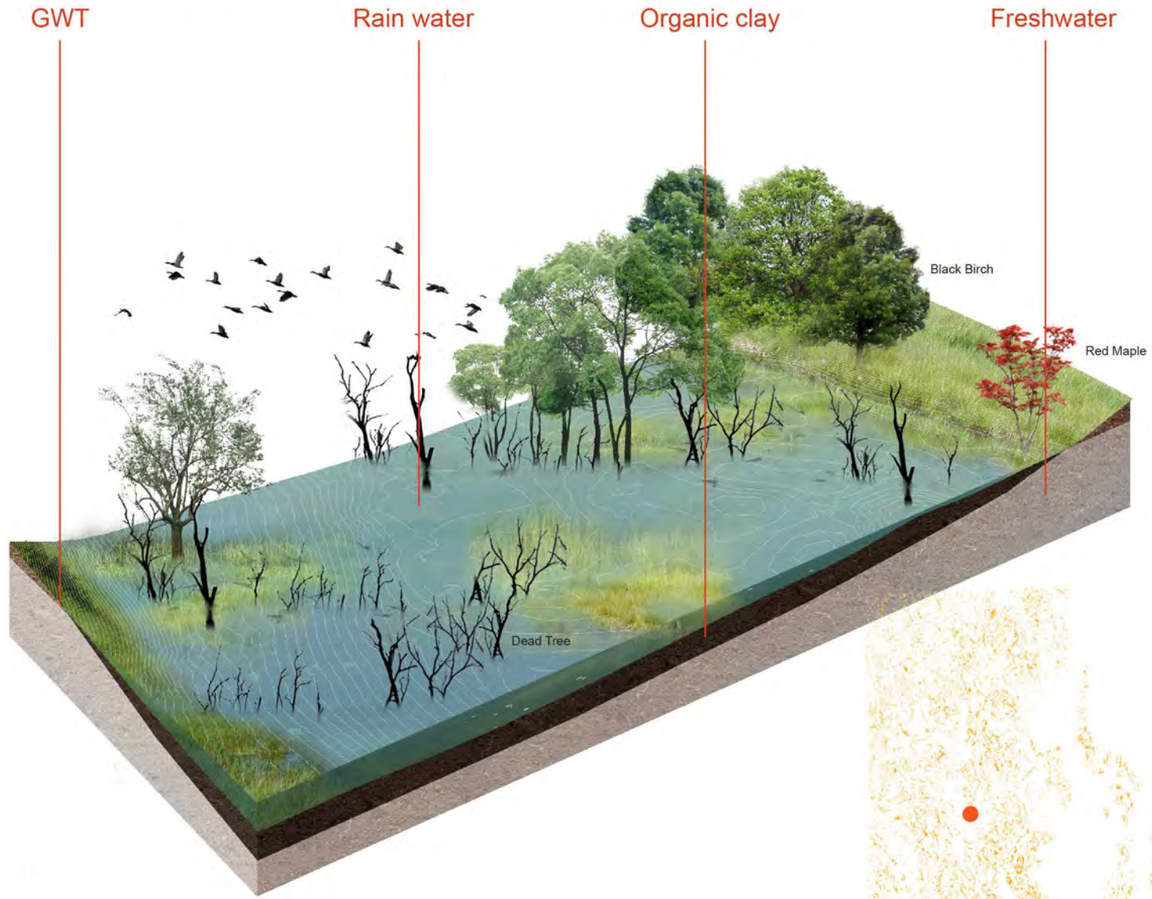
Salt Coastal Marsh



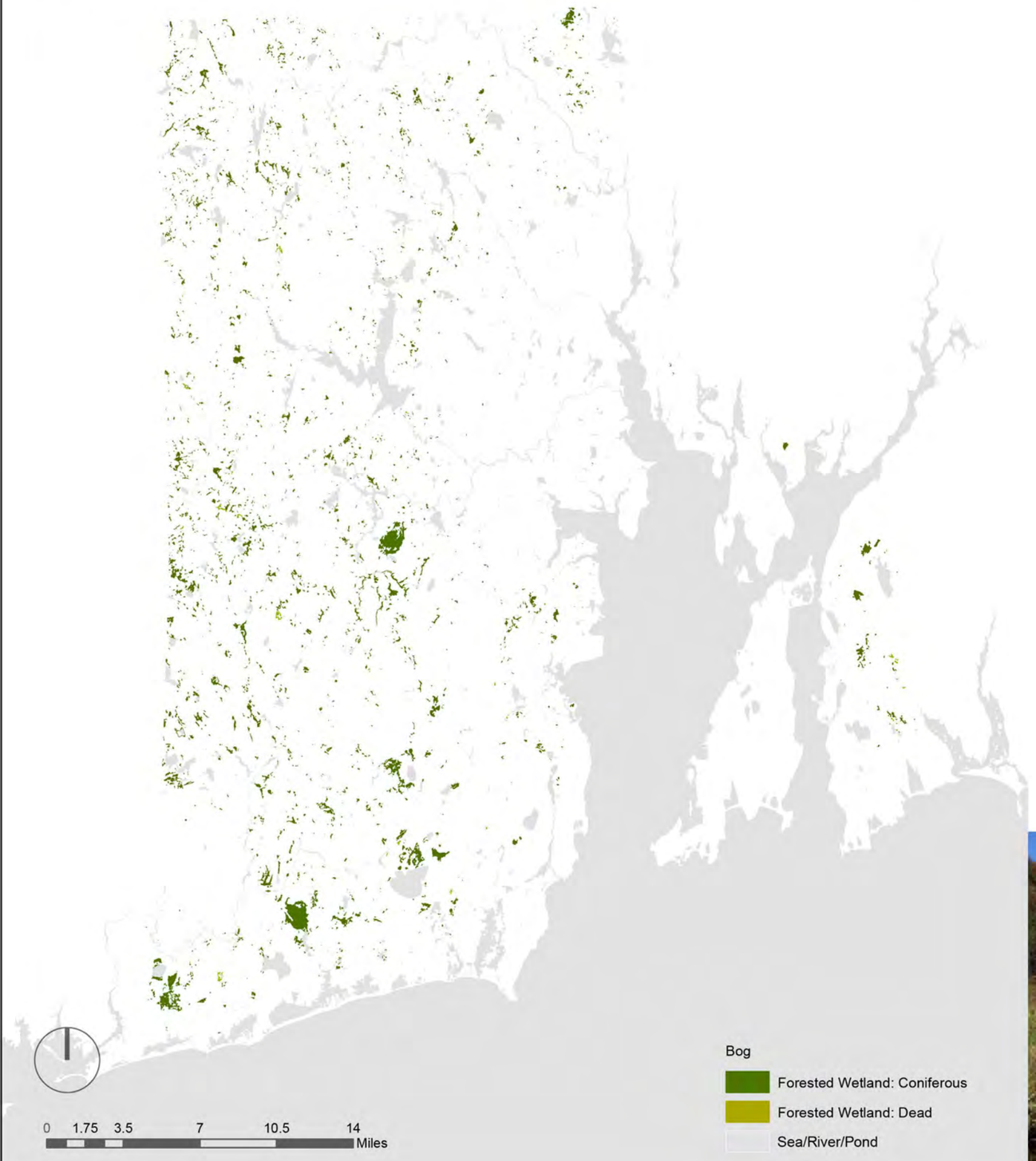
Swamps are fed primarily by surface water inputs and are dominated by trees and shrubs. Swamps occur in either freshwater or saltwater floodplains. They are characterized by very wet soils during the growing season and standing water during certain times of the year.

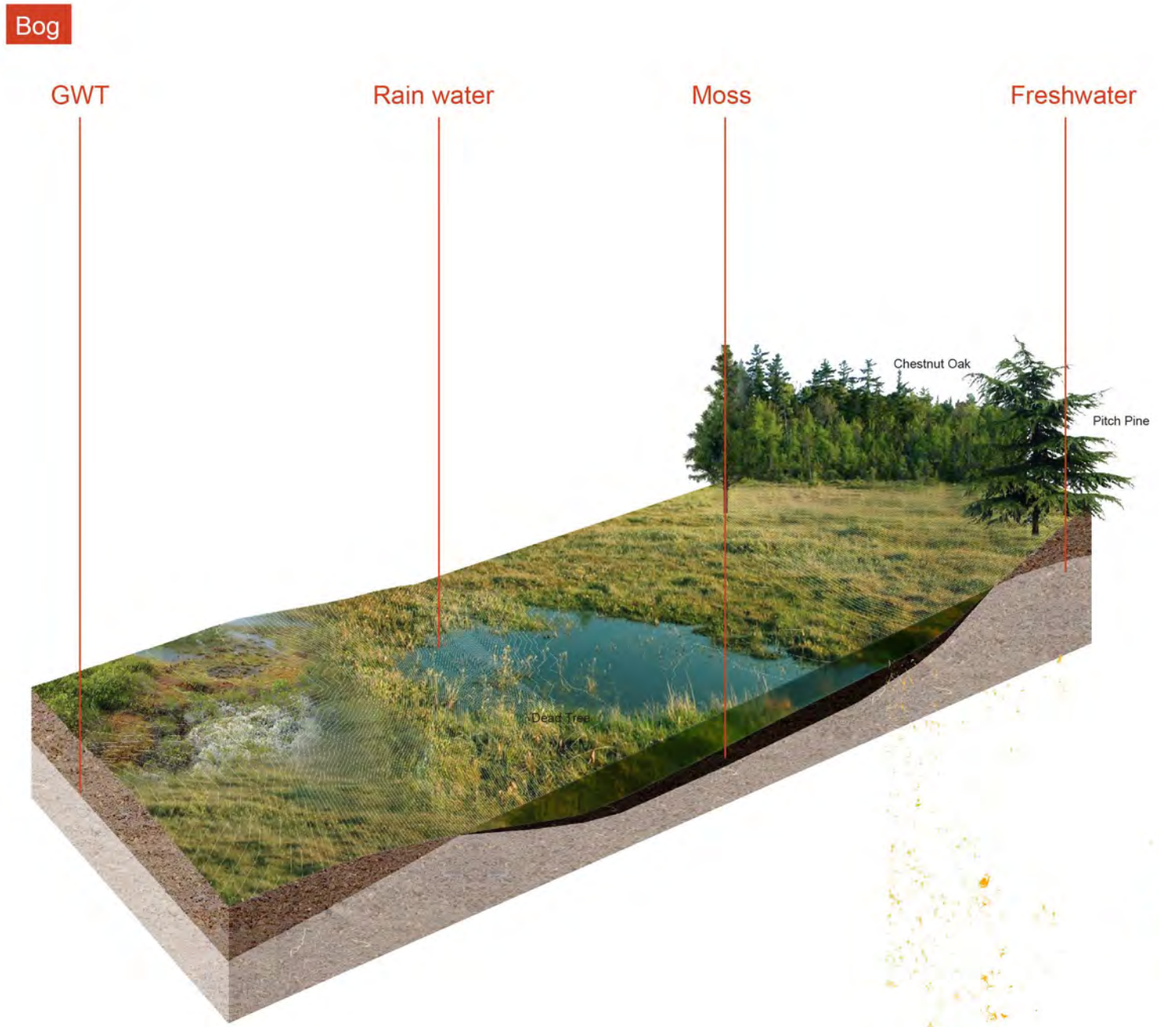


Freshwater Swamp



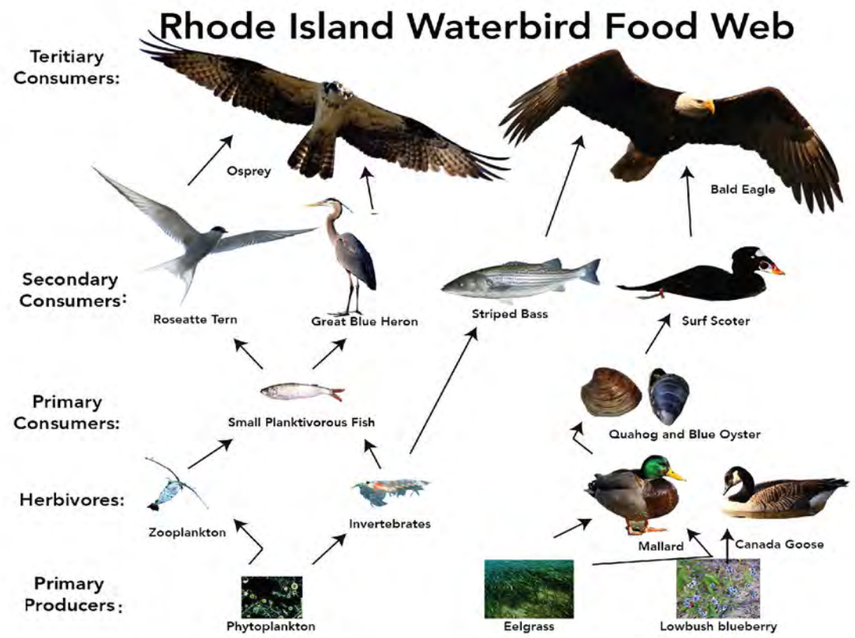
BOGS are freshwater wetlands characterized by spongy peat deposits, a growth of evergreen trees and shrubs, and a floor covered by a thick carpet of sphagnum moss. These systems, whose only water source is rainwater, are usually found in glaciated areas of the northern United States.

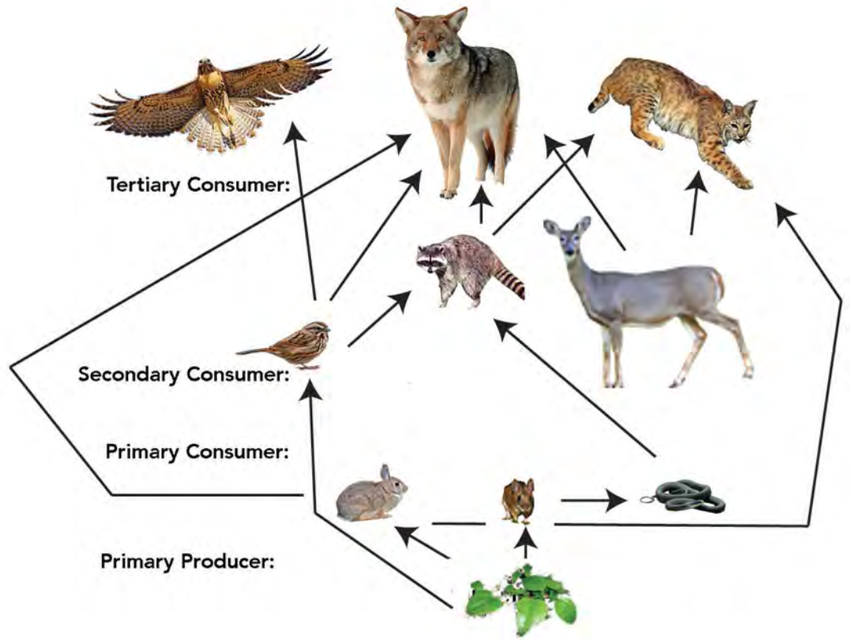




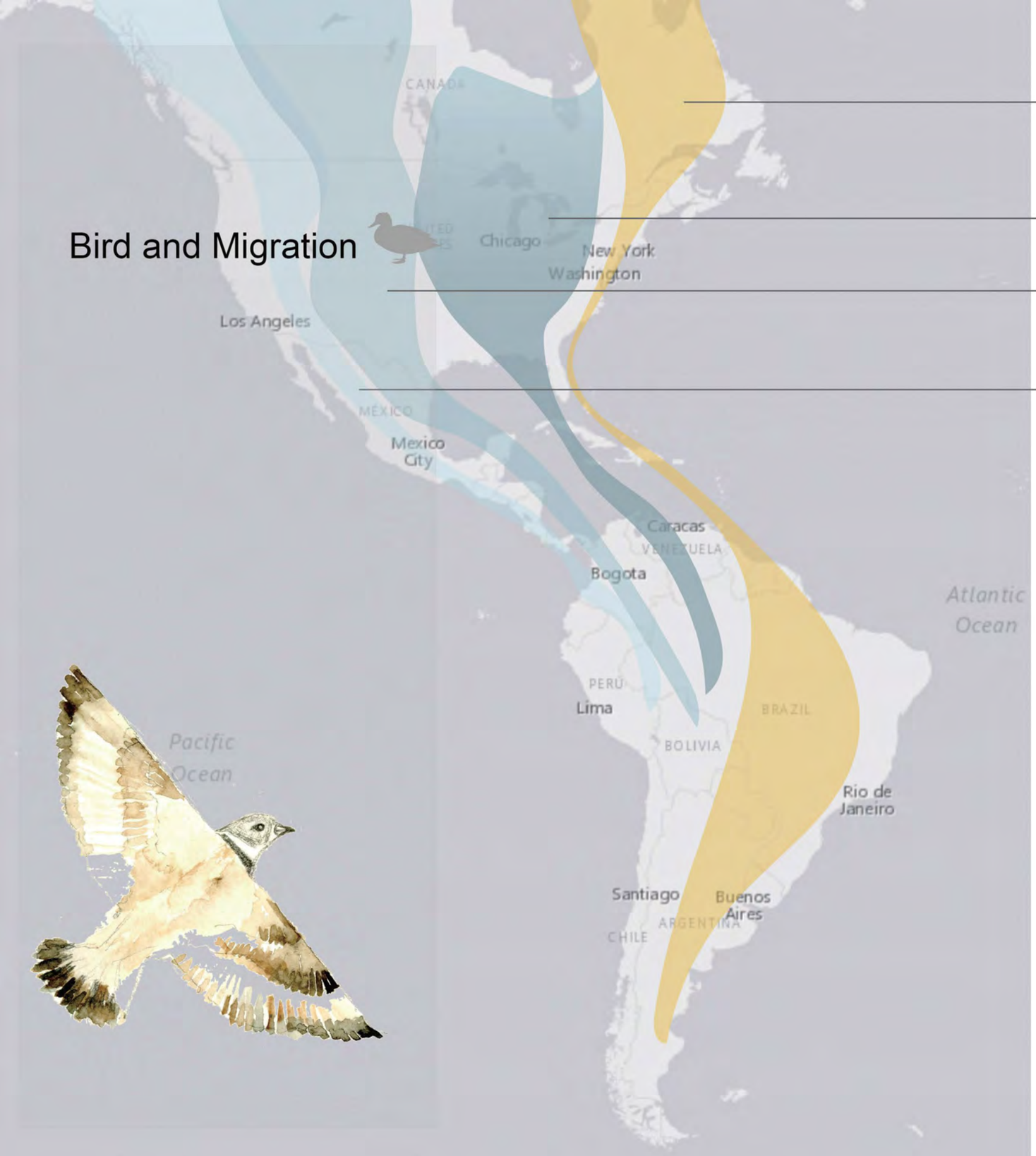
FOOD WEB

The linking of species in an ecosystem based on energy exchange, through consumption of either plant or animal matter, or the absorption of sunlight and nutrients. The food web is important because it determines habitat success, the ability of a habitat to sustain life, beyond the provision of shelter.





Bird and Migration

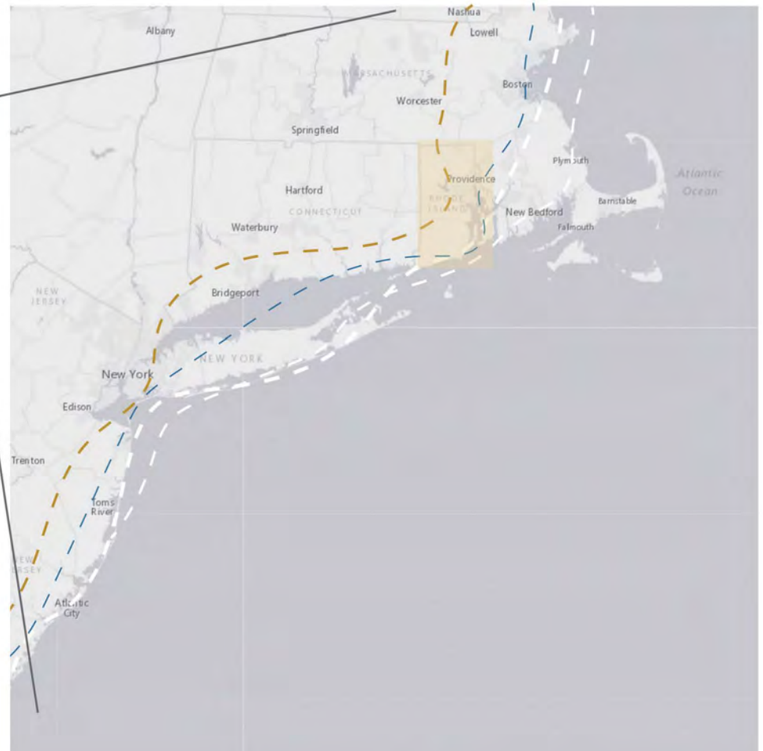


Atlantic Flyway

Mississippi Flyway

Central Flayway

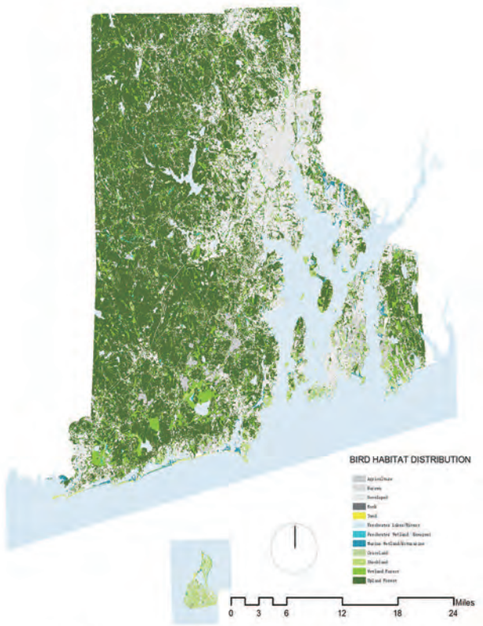
Pacific Flyway



There are four (4) major North American flyways that have been named the Atlantic, the Mississippi, the Central and the Pacific Flyways.

Except along the coasts, the flyway boundaries are not always sharply defined and both in the northern breeding, and the southern wintering, grounds there is more or less overlapping.

Rhode Island locates in the Altantic Flyway Area. Many bird Species' migration routes pass the state. Also, there are a huge amout of all-year round bird species in Rhode Island.



Habitat and Birds

Birds need habitat to survive. Exactly what type and how much depends on a species' food preferences, foraging strategies, and nest site requirements.[1]

Bird species respond to changes in habitat management scenarios, landscape patterns, and the dynamic ecosystems in which they persist.

Bird populations naturally fluctuate over time in response to changing habitat conditions and other factors present at their breeding, migration and wintering grounds

Most species use more than one habitat type to complete their annual and/or life cycles.

1.http://www.birds.cornell.edu/AllAboutBirds/conservation/habitat/

BEACH/SAND/ ROCK

MARINE WETLAND

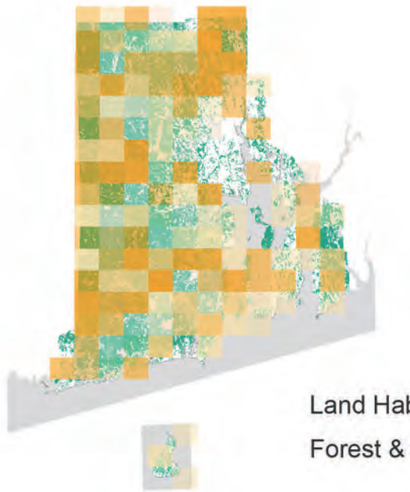
FRESHWATER WET-LAND

GRASSLAND

SHRUBLAND

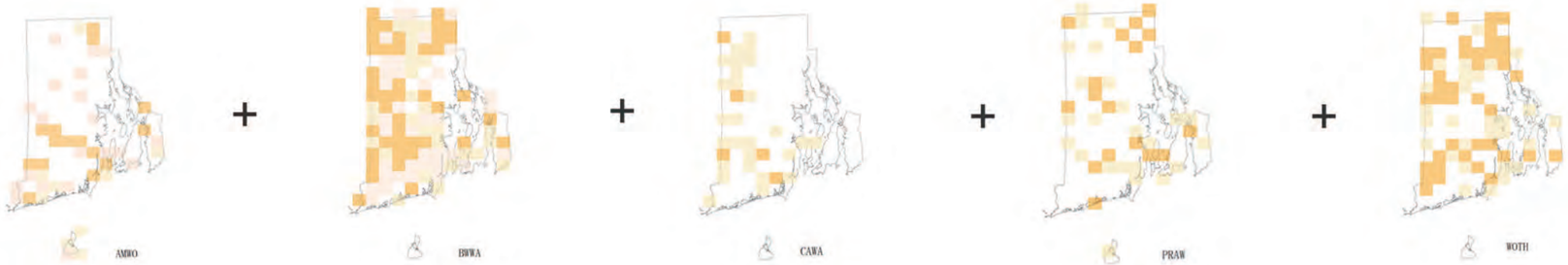
WETLAND FOREST

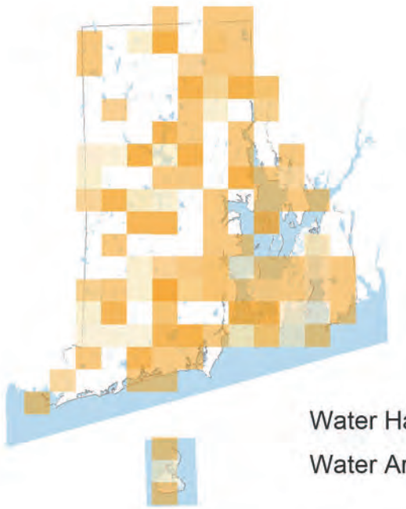
UPLAND FOREST



Land Habitat

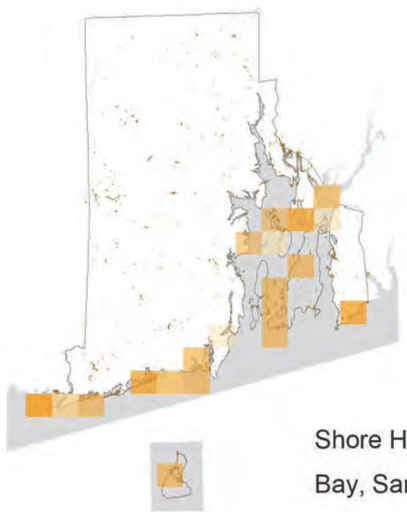
Forest & Shrublands





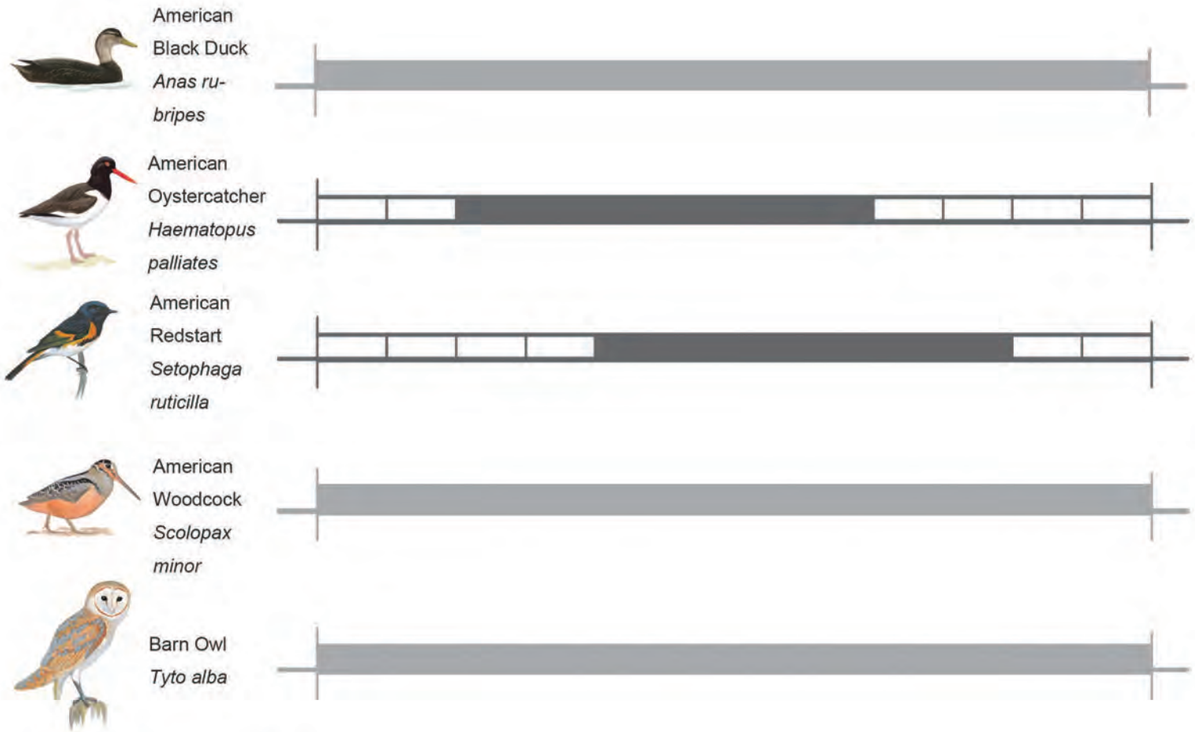
Water Habitat

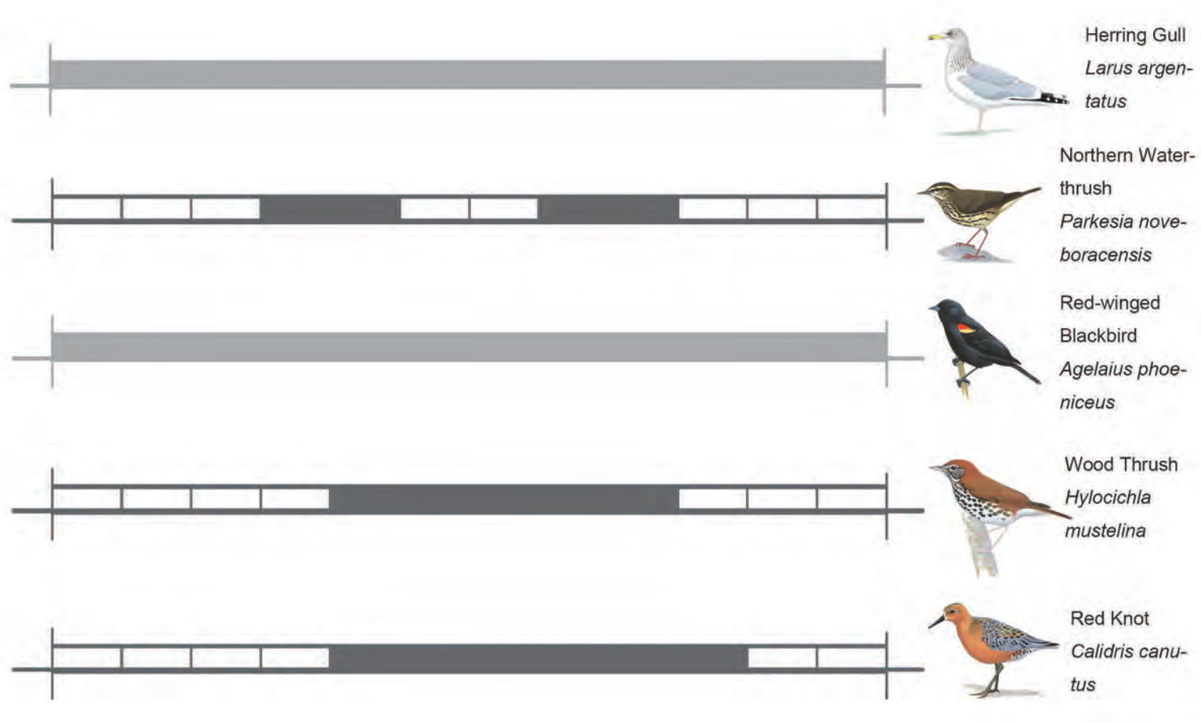
Water Area & Wetland



Shore Habitat

Bay, Sand & Rock Coast Area





Priority bird species in Providence

Year-round Bird (Light Grey)

In the area of Providence, some species do not migrate.

They are able to find adequate supplies of food throughout the winter.

Migration Bird (Dark Grey)

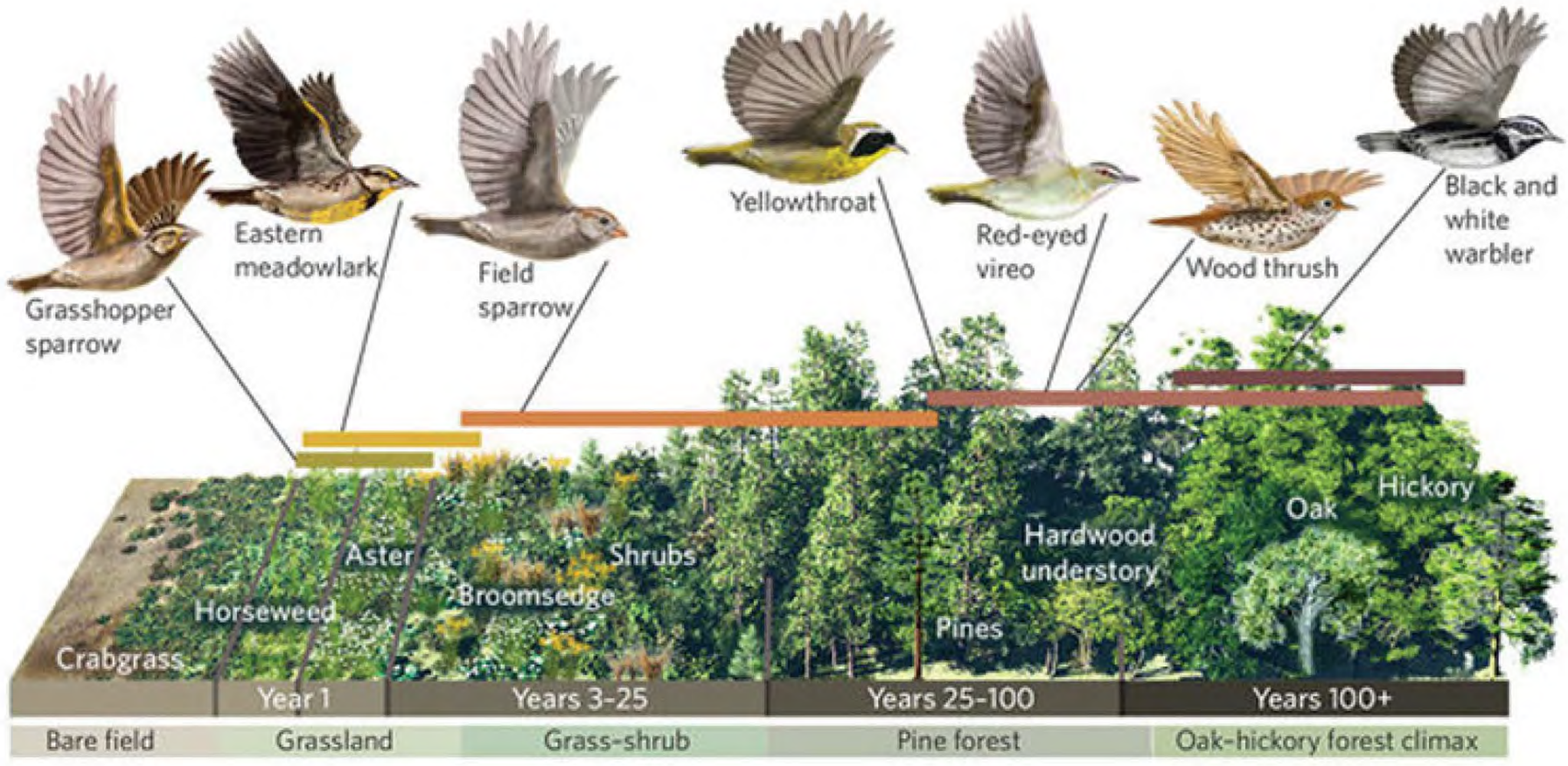
Birds that nest in the northern hemisphere (like in Providence) tend to migrate northward in the spring to take advantage of burgeoning insect populations, budding plants and an abundance of nesting locations. As winter approaches, and the availability of insects and other food resources drops,the birds move south again.

SUCCESSION

These plant and animal communities within these individual topographic classes are apt to change due to the natural processes of ecological succession. This process of evolution alters the resource distribution and habitat availability of biological communities.

PRIMARY SUCCESSION: "occurs in essentially lifeless areas—regions in which the soil is incapable of sustaining life as a result of such factors as lava flows, newly formed sand dunes, or rocks left from a retreating glacier."

SECONDARY SUCCESSION: "occurs in areas where a community that previously existed has been removed; it is typified by smaller-scale disturbances that do not clear the environment of life but only make the environment more heterogenous."



Biodiversity

Biodiversity is defined as "the variability among living organisms from all sources including, inter alia, terrerstrial, marine, and aquatic ecosystems and the ecological complex of which they are a part; this includes diversity within species, between species, and of ecosystems."

Why is Biodiversity important?

It important to our well-being, establishes our economy.

Could be the answer to future medical advances.

Provides us with valuable ecosystem services, such as clean water and air.

Allows for adaptation within communities against disturbance.

Allows for an increase in genetic variation, which is important for survival.

–Invasive Species

INVASIVE SPECIES: Invasive alien species - are animals, plants or other organisms introduced by man into places out of their natural range of distribution, where they become established and disperse, generating a negative impact on the local ecosystem and species.

Plants

Widespread and Invasive

Fanwort

Cabomba caroliniana

Asiatic Bittersweet

Celastrus orbiculatus

Autumn Olive

Elaeagnus umbellata

Japanese Honeysuckle

Lonicera japonica

Purple Loosestrife

Lythrum salicaria

Japanese Knotweed

Polygonum cuspidatum

Curly Pondweed

Potamogeton crispus

Restricted and Invasive

Tree of Heaven

Ailanthus altissima

Garlic Mustard

Alliaria petiolata

Porcelain-berry

Ampelopsis brevipedunculata

Wineberry

Rubus phoenicolasius

White Swallowwort

Vincetoxicum rossicum

Agreed are invasive but need more information

norway Maple

Acer platanoides

Japenese Barberry

Berberis thunbergii

Burning Bush

Euonymus alatus

Morrow and Bella Honeysuckle

Lonicera morrowii and Lonicera x Bella

Animals

Mute Swan

Cygnus olor

Asian clam

Corbicula fluminea

Endangered Species

ENDANGERED SPECIES: The classification provided to an animal or plant in danger of extinction within the foreseeable future throughout all or a significant portion of its range.

Plants

Sandplain gerardia

Agalinis acuta

Small Whorled pogonia

Isotria medeoloides

Swamp Cottonwood

Populus heterophylla

Canadian Burnet

Sanguisorba canadensis

Purple Clematis

Clematis occidentalis

Animals

Piping Plover

Charadrius melodus

Green sea turtle

Chelonia mydas

Leatherback sea turtle

Dermochelys coriacea

Shortnose sturgeon

Acipenser brevirostrum

Roseate tern

Sterna dougallii dougallii

Finback whale

Balaenoptera physalus

Humpback whale

Megaptera novaeangliae

Bibliography

1. Audubon Society. Accessed February 19, 2015. http://www.audubon.org
2. Kendall, Carol, USGS. "Food Web and its Function." http://wwwrcamnl.wr.usgs.gov/isoig/projects/fingernails/foodweb/definition.html. Accessed February 19, 2015.
3. Encyclopaedia Britannica. "Ecological Succession." Accessed February 20, 2015. http://www.britannica.com/EBchecked/topic/178264/ecological-succession
4. Environmental Conservation Online System. US Fish and Wildlife Service. Listed Species Believed or Known to occur in Rhode Island. Accessed March 1, 2105. http://ecos.fws.gov/tess_public/reports/species-listed-by-state-report?state=RI&status=listed
5. Enser, Richard W. "Rhode Island Ecological Communities Classification." Rhode Island Natural History Community. http://www.rinhs.org/wp-content/uploads/ricommclass.pdf
6. Environmental Protection Agency. Western Ecology Divison. "Ecoregions Maps and GIS Resources. Accessed February 19, 2015. http://www.epa.gov/wed/pages/ecoregions.htm.
7.Google "Ecosystem Interactions and Models." "Maritime Foodweb. photograph. Accessed February 19, 2015. http://webapp1.dlib.indiana.edu/virtual_disk_library/index.cgi/4274965/FID2292/HTMLS/ecosys/ecology/model1.gif
8. Google. "Nature: Art and Ecology" photograph. Nicolle Regge Fuller. Sayostudio.com. Accessed March 2, 2015.
9.Rhode Island Audubon Society. Accessed February 19, 2015. http://www.asri.org
The Rhode Island Natural History Survey. "Rare Native Animals of Rhode Island." Revise March 2006. Accessed February 19, 2015. http://www.rinhs.org/wp-content/uploads/ri_rare_animals_2006.pdf
10. Sibley, David Allen. The Sibley Field. New York, Alfred A. Knopf: 2003.
11.The National Wildlife Federation. "What is Biodiversity?" Accessed March 2, 2015. http://www.nwf.org/Wildlife/Wildlife-Conservation/Biodiversity.aspx
12. United States Fish and Wildlife Service. "Endangered Species." http://www.fws.gov/Midwest/endangered/glossary/index.html
13. Types Of Wetlands. "http://water.epa.gov/type/wetlands/outreach/upload/types_pr.pdf"
14. Richard W. Enser. "Rhode Island Ecological Communities Classification". Rhode Island Natural History Survey. 4 October 2011.
15. Steinkamp, Melanie. New England Mid-Atlantic Coast Bird Conservation Region (BCR 30) Implementation Plan. Modified June 23, 2008. Accessed February 22, 2015.
16. Distribution of Bird Species in Rhode Island; s44nbs96 (FGDC Metadata)
http://www.edc.uri.edu/rigis/xslt/metadata.htm?xmlfile=/spfdata/biota/birds.xml,xslfile=xsl/FGDC%20Plus.xsl
17. http://ebird.org/content/ebird/
18. State of Rhode Island Department of Environmental Management, Rhode Island Freshwater Lakes and Ponds: Aquatic Invasive Plants and Water Quality Concerns
19. RIISC, Rhode Island Natural History Survey Invasive Species List for Plants Present in the State, October 2013
20. http://www.birdnature.com/
21. Neil Jorgensen. "A Sierra Club Naturalist's Guide to Southern New England". Sierra Club Books. 1978