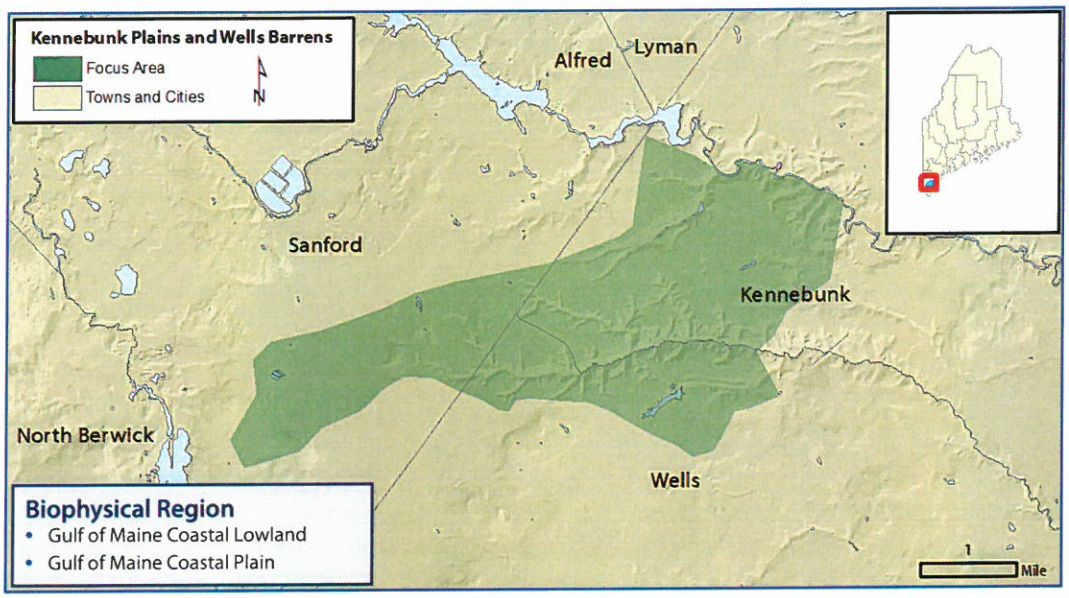
XIII. Beginning with Habitat

- Kennebunk Plains and Wells Barren Habitat Information
- Mount Agamenticus Habitat Information
- Wells and Ogunquit Marsh Habitat Information
- Beginning with Habitat Maps

Beginning *with* HABITAT

Focus Areas of Statewide Ecological Significance

Kennebunk Plains and Wells Barrens



WHY IS THIS AREA SIGNIFICANT?

Formed by the melting of glaciers about 14,000 years ago, this unique barrens complex is one of the top-priority areas for conservation in Maine. The Focus Area supports high-quality examples of four natural community types: sandplain grassland, pitch pine-scrub oak barrens, pitch pine-heath barrens, and red maple alluvial swamp forest. These natural communities support a large number of rare birds, reptiles, insects, and plants. Kennebunk Plains is notable for its grasslands, which are among the rarest natural communities in New England.

OPPORTUNITIES FOR CONSERVATION

» Work with willing landowners to permanently protect remaining undeveloped areas.
» Encourage town planners to improve approaches to development that may impact Focus Area functions.
» Use prescribed burns and careful mowing techniques to maintain populations of rare plants and animals.
» Educate recreational users about the ecological and economic benefits provided by the Focus Area.

For more conservation opportunities, visit the Beginning with Habitat Online Toolbox: www.beginningwithhabitat.org/toolbox/about_toolbox.html.

Photo credits, top to bottom: The Nature Conservancy, The Nature Conservancy, The Nature Conservancy, Margaret Pizer, Jonathan Mays

Rare Animals
Grasshopper Sparrow
Upland Sandpiper
Wood Turtle
Spotted Turtle
Northern Black Racer
Ribbon Snake

Rare Plants
Small Reed-grass
Upright Bindweed
Northern Blazing Star
Pale Green Orchis
White-topped Aster

Rare and Exemplary Natural Communities
Pitch Pine–Heath Barren
Pitch Pine–Scrub Oak Barrens
Red Maple–Sensitive Fern Swamp
Little Bluestem–Blueberry Sandplain Grassland

Significant Wildlife Habitats
Inland Wading Bird & Waterfowl Habitat
Significant Vernal Pools

Public Access Opportunity
» Kennebunk Plains Wildlife Management Area, MDIFW
» Kennebunk Plains Preserve and Wells Barrens Preserve, TNC

The Kennebunk Plains and Wells Barrens Focus Area provides habitat for rare species such as Blanding's Turtle (below left) and Pale Green Orchis (below right), and recreational opportunities for people (above). *The Nature Conservancy (above and below right), Jonathan Mays (below left)*

FOCUS AREA OVERVIEW

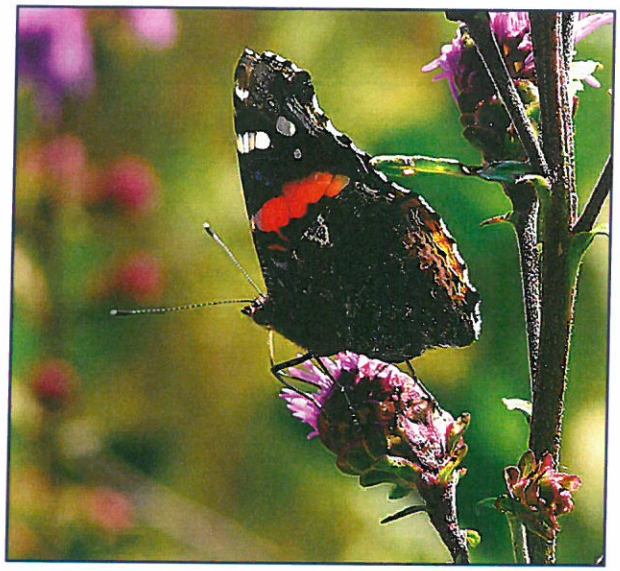
Kennebunk Plains and Wells Barrens together comprise one of the top-priority conservation areas in the state of Maine. This unique barrens complex was formed by the melting of glaciers about 14,000 years ago. Meltwater streams formed outwash plains of well-sorted sand and gravel. As a result, the soils have little capacity to hold water and nutrients, and the vegetation is subject to recurring drought and fire. The natural communities include plant and animal species adapted to these conditions. The Focus Area supports high-quality examples of four natural community types: sandplain grassland, pitch pine-scrub oak barrens, pitch pine-heath barrens, and red maple alluvial swamp forest. These natural communities support a large number of rare birds, reptiles, insects, and plants.

The topography of Kennebunk Plains and Wells Barrens is flat to gently rolling, dropping off steeply in the drainages of Branch Brook, which separates the two sites, and Cold Water Stream. The larger of the two sites, Kennebunk Plains is notable for its grasslands, which are considered to be one of the rarest and most threatened natural communities in New England. The grasslands have changed over time due to natural and anthropogenic causes. Historical human activities at the site have included Native American camps, logging, blueberry production, and limited agriculture, which have helped maintain the plains in an early successional stage.

Aerial view of Kennebunk Plains Pond. *The Nature Conservancy*

CHARACTERISTIC SPECIES

The complex of Kennebunk Plains and Wells Barrens supports populations of 14 rare plant and animal species. The grasslands harbor the state's only viable populations of northern blazing star. With more than one million stems, it is probably the world's largest population of this plant. Other rare plants include toothed white-topped aster (only 1 documented site in the state) and upright bindweed (only 4 documented sites in the state). The grasslands, together with the Sanford Airport, support the best mainland nesting population of grasshopper sparrows and provide nesting habitat for upland sandpipers. Other grassland-nesting species of note include the vesper sparrow and eastern meadowlark. The site is also only one of few known locations for the black racer snake in Maine. Two reptiles listed by the state as species of special concern—ribbon snake and wood turtle—also occur here. Two rare moth species have been observed on the Plains: the broad sallow and trembling sallow. Studies in the Focus Area found eight insect species never recorded elsewhere in the state.



A Red Admiral butterfly on Northern Blazing Star. *Margaret Pizer*

Grasshopper Sparrow. *Jonathan Mays*

Northern Blazing Star. *Jonathan Mays*

Spotted Turtle. *Jonathan Mays*

Red Maple–Sensitive Fern Swamp. *Jonathan Mays*

RARE AND EXEMPLARY NATURAL COMMUNITIES

Sandplain grassland occurs on sandy glaciofluvial deposits and is characterized by native bunch grasses mixed with ericaceous shrubs. It is an early successional stage of a pitch pine-scrub oak barrens. Characteristic plant species include northern blazing-star, little bluestem, poverty grass, woodland sedge, sand jointweed, stiff aster, lowbush blueberry, sweetfern, and bearberry. The flora of this community is fire adapted.

Pitch pine-heath barrens are open-canopy woodlands in which pitch pine dominates, without an extensive tall shrub layer. Scrub oak, if present, is at low cover. The extensive herb layer features lowbush blueberry and woodland sedge, with scattered bracken fern and forbs. Bryoids are virtually absent. The absence of tall shrubs gives these barrens a park-like appearance. This type occurs on well-drained to excessively drained soils on outwash plains. The flora of this community is also fire adapted.

Pitch pine-scrub oak barrens occur in patches around the margin of the grassland. Characteristic species include pitch pine, scrub oak, blueberry, and huckleberry. Like sandplain grasslands and pitch pine-heath barrens, the flora of this community is fire adapted and without periodic fire, it will eventually become a pine-oak forest.

Ecological Services of the Focus Area

- Protects a large underlying sand and gravel aquifer
- Provides a buffer to several headwater streams
- Significantly contributes to regional biodiversity

Economic Contributions of the Focus Area

- Destination for ecotourists
- Scenery of undeveloped plains raises local property values
- Recreational open space attracts walkers, blueberry pickers, and hunters

Red maple alluvial swamp occurs on the slopes adjacent to the plains, where laterally flowing groundwater emerges from layers of outwash soil in broad seeps. Characteristic species include red maple, cinnamon fern, skunk cabbage, and sedges.

Listed by the State of Maine as a species of special concern, the Eastern Ribbon Snake is among the rare animals found in the Focus Area.
Jonathan Mays

CONSERVATION CONSIDERATIONS

» Both the grasslands and the pitch pine-scrub oak barrens require periodic management to prevent succession to the more common oak-pine forest type. The Nature Conservancy currently conducts prescribed burns on the grasslands. Burning is supplemented with mowing in an effort to provide nesting habitat for grassland birds, to encourage reproduction of rare plants, and to reduce encroaching shrub cover. Burning is essential to the maintenance of the sandplain grassland community, as it reduces litter depth, increases the amount of bare ground available for seed germination, and provides a flush of nutrients to the normally depauperate soil. Although The Nature Conservancy has been able to use prescribed burning as a management tool on the grassland, they have yet to burn within the pitch pine-scrub oak barrens. Currently, this is due to the high priority placed on management of the grassland and nesting bird habitat. Future management may need to focus on the pitch pine-scrub oak barrens. Smoke management from prescribed burning may eventually become an issue. At present, the size of the site allows relatively good smoke dispersal. However, as additional homes are built in the vicinity of the site, this may become more of an issue.

» Known grasshopper sparrow nesting areas should be placed in long-term habitat protection, maintained as grasslands, and not converted to other land uses.

» Avoid mowing areas with nesting grasshopper sparrows between May 1 and August 5, especially since the sparrows may have a second brood in late summer. If mowing is essential prior to this date, mark nest sites or locations of young birds and leave patches of unmowed grass.

» Several additional smaller patches of pitch pine–heath barren and sandplain grassland community types exist in surrounding private lands. Further impacts to these natural communities should be minimized through local project review, and conservation of these areas should be encouraged.

» Pitch pine–heath barrens are quickly invaded by white pine, which can out-compete pitch pine in absence of fire. Landowners should be encouraged to manage for persistence of pitch pine through selective harvesting when possible.

» Mining is a potential threat because of deep sand and gravel deposits underlying both the Kennebunk Plains and Wells Barrens.

» The Kennebunk Plains and surrounding areas, including Cold Water Farms to the west of the Plains, have been rapidly developed for residential use in recent years. The largest impacts of development are likely to be increased recre-

ational use of the Plains, an increase in domestic dogs and cats within the grassland and associated impacts on ground-nesting birds, loss of barrens habitat, and increased concerns about smoke management during prescribed burns.

» Many of the sand roads throughout the sandplain are heavily traveled by ATVs and other vehicles. Most use is limited to the existing roads, but some areas, such as the slope leading into the Branch Brook drainage, are heavily eroded from vehicular use. In some instances, vehicles travel across the grassland, leaving deep ruts during spring and fall when soils may be excessively wet. In addition to damaging the vegetation, vehicle use during bird nesting season can have a detrimental impact on the productivity of grassland-nesting birds. Vehicles are prohibited from the roads at Kennebunk Plains from May 1 to September 1 due to nesting birds. Vehicle use of Wells Barrens Preserve is prohibited.

» Dumping is an ongoing problem on the Plains, particularly construction debris and appliances. The most heavily used area is the slope leading to the east-west arm of the CMP powerline. Personnel from the Kennebunk, Kennebunkport, and Wells Water District remove materials that they consider to be hazardous to the aquifer. The Kennebunk Conservation Commission and the Kennebunk Fish and Game Club sponsor an annual cleanup of the Plains. "No Dumping" signs have been posted at all road entrances.

» Dogs are allowed at Kennebunk Plains, but they must be leashed between May 1 and September 1. Many locals bring their dogs to the plains for exercise, training for hunting, or dogsled training. Cats from neighboring houses could potentially impact the bird population. Horses are allowed, but they must stay on existing roads and are prohibited between May 1 and September 1. These issues should be brought to the public's attention during outreach events. Pets and horses are prohibited at Wells Barrens Preserve.

Wild blueberries in bloom. *Jonathan Mays*

Visitors enjoy a field of Northern Blazing Star in the Focus Area. *Margaret Pizer*

RARE SPECIES AND EXEMPLARY NATURAL COMMUNITIES OF THE FOCUS AREA

	Common Name	Scientific Name	State Status*	State Rarity Rank	Global Rarity Rank
Animals	Grasshopper Sparrow	*Ammodramus savannarum*	E	S1	G5
	Upland Sandpiper	*Bartramia longicauda*	T	S3	G5
	Wood Turtle	*Clemmys insculpta*	SC	S4	G4
	Spotted Turtle	*Clemmys guttata*	T	S3	G5
	Northern Black Racer	*Coluber constrictor*	E	S2	G5
	Ribbon Snake	*Thamnophis sauritus*	SC	S3	G5
Plants	Small Reed-grass	*Calamagrostis cinnoides*	SC	S3	G5
	Upright Bindweed	*Calystegia spithamaea*	T	S2	G4
	Northern Blazing Star	*Liatris scariosa*	T	S1	G5
	Pale Green Orchis	*Platanthera flava*	SC	S2	G4
	White-topped Aster	*Seriocarpus asteroides*	E	S1	G5
Natural Communities	Pitch Pine–Heath Barren	Pitch Pine–Heath Barren		S1	G3G5
	Pitch Pine–Scrub Oak Barrens	Pitch Pine–Scrub Oak Barrens		S1	G2
	Little Bluestem–Blueberry Sandplain Grassland	Sandplain Grassland		S1	n/a
	Red Maple–Sensitive Fern Swamp	Red Maple Swamp		S4	G3G5

State Status*

- E — Endangered: Rare and in danger of being lost from the state in the foreseeable future, or federally listed as Endangered.
- T — Threatened: Rare and, with further decline, could become endangered; or federally listed as Threatened.
- SC — Special Concern: Rare in Maine, based on available information, but not sufficiently rare to be Threatened or Endangered.

**State status rankings are not assigned to natural communities.*

State Rarity Rank

- S1 — Critically imperiled in Maine because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres).
- S2 — Imperiled in Maine because of rarity (6–20 occurrences or few remaining individuals or acres) or because of other factors making it vulnerable to further decline.
- S3 — Rare in Maine (on the order of 20–100 occurrences).
- S4 — Apparently secure in Maine.
- S5 — Demonstrably secure in Maine.

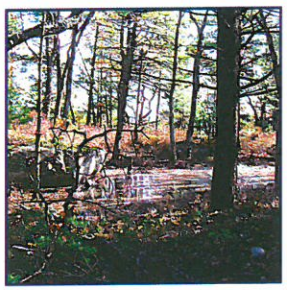
Global Rarity Rank

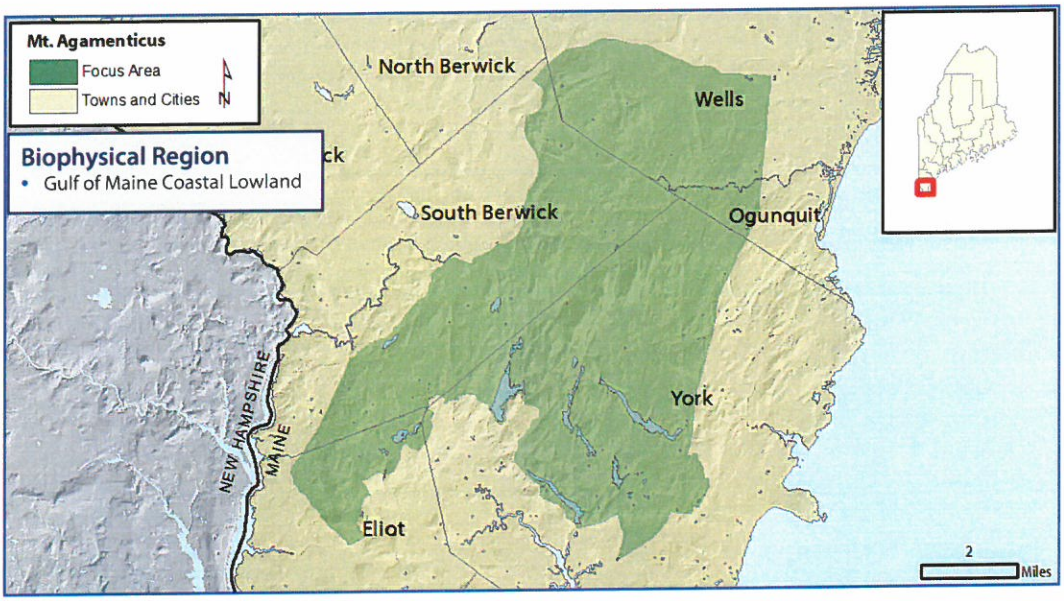
- G1 — Critically imperiled globally because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because some aspect of its biology makes it especially vulnerable to extirpation.
- G2 — Globally imperiled because of rarity (6–20 occurrences or few remaining individuals or acres) or because of other factors making it vulnerable to further decline.
- G3 — Globally rare (on the order of 20–100 occurrences).
- G4 — Apparently secure globally.
- G5 — Demonstrably secure globally.

Beginning with HABITAT

Focus Areas of Statewide Ecological Significance

Mt. Agamenticus





WHY IS THIS AREA SIGNIFICANT?

The Mt. Agamenticus Focus Area comprises and is one of the largest remaining expanses of undeveloped forests in coastal New England. The uplands and wetlands around Mt. Agamenticus are inhabited by 12 animal species and 21 plant species that are considered rare in Maine. Many of these rare species are at the northern limit of their distribution range and are more abundant south of the Maine border. Similarly, some natural communities that occur in the Focus Area are restricted primarily to southern New England. The forest that extends northward from Mt. Agamenticus features Maine's only chestnut-oak woodland.

OPPORTUNITIES FOR CONSERVATION

» Minimize fragmentation of habitat with development designs that optimize open space.
» Continue using signs along roads to warn people about turtle crossings.
» Use strategic open-space planning to maintain functional connections for wildlife among habitats.
» Work with willing landowners to permanently protect remaining undeveloped areas.
» Use forest management methods and design developments that protect vernal pools and the amphibians that depend on them.
» Monitor for and remove invasive species.

For more conservation opportunities, visit the Beginning with Habitat Online Toolbox: www.beginningwithhabitat.org/toolbox/about_toolbox.html.

Photo credits, top to bottom: The Nature Conservancy, The Nature Conservancy, Margaret Pizer, The Nature Conservancy, J. Albright

Rare Animals
Spotted Turtle
Wood Turtle
Blanding's Turtle
Brown Snake
Ribbon Snake
Northern Black Racer
Spring Salamander
New England Cottontail
New England Bluet
Ringed Boghaunter Dragonfly
Swamp Darter
Scarlet Bluet

Rare Plants
Wild Leek
Slender Blue Flag
Mountain Laurel
Spicebush
Broadbeech Fern
Pale Green Orchis
Chestnut Oak
Tall Beak-rush
Sassafras
Swamp Saxifrage
Featherfoil
White Wood Aster
Upright Bindweed
Atlantic White-cedar
Spotted Wintergreen
Sweet Pepperbush
Flowering Dogwood
Eastern Joe-pye Weed
Columbia Water-meal
Alga-like Pondweed
Smooth Winterberry Holly

Rare and Exemplary Natural Communities
Atlantic White Cedar Swamp
Chestnut Oak Woodland
Pocket Swamp
Leatherleaf Bog
Grassy Shrub Marsh
Sandy Lake Bottom
Pitch Pine Bog
Red Maple Swamp
White Oak–Red Oak Forest

Significant Wildlife Habitats
Inland Wading Bird & Waterfowl Habitat
Deer Wintering Area
Significant Vernal Pools

The forests and wetlands of Mt. Agamenticus are home to numerous rare animals and plants. *The Nature Conservancy*

FOCUS AREA OVERVIEW

The Mt. Agamenticus Focus Area extends from York Pond in Eliot northeast through the Tatnic Hills area in Wells. The Focus Area includes rugged terrain, several lakes and ponds, and numerous small wetlands that together comprise the largest contiguous block of lightly developed land in southern York County and one of the largest remaining areas of undeveloped forest in coastal New England. Mt. Agamenticus is the most outstanding feature in the area, both topographically and ecologically. Other prominent physical features are Horse Hill, Second and Third Hills, Chick's Brook watershed, Chase's Pond, Folly Pond, Middle Pond, Bell Marsh, Warren Pond, Welch's Pond, Round Pond, and York Pond.

The area's numerous upland and wetland areas are ecologically significant because they host plant and animal species that are living at the northernmost limit of their geographic ranges. In Maine, for example, at least three animal and 20 plant species occur only in this extreme southern portion of the state. Many additional species found in the Focus Area occur only sparingly farther northward. Natural communities reflect this pattern as well. For example, the Atlantic white cedar swamp, hemlock-hardwood pocket swamp, and pitch-pine bog that occur in this area are all restricted to southern Maine. The only remaining intact chestnut-oak woodland community in the entire state extends north from Mt. Agamenticus through Third Hill.

Public Access Opportunities

» Mt. Agamenticus Wildlife Management Area

» York Pond Lot

The Focus Area has one of the richest concentrations of vernal pool habitat in the state, supporting state-listed Blanding's and spotted turtles in concentrations rarely encountered elsewhere.

Of the 21 rare plant species known to occur in the Mt. Agamenticus area, 14 are considered rare in Maine because the state represents the northeastern limit of their range. They are much more common to the south and west. The Mt. Agamenticus area, in particular, is the northern limit for a few of these species, such as large beak-rush (*Rhynchospora macrostachya*) and flowering dogwood (*Cornus florida*).

Two rare plant species found in the Focus Area—wild leek (*Allium tricoccum*) and alga-like pondweed (*Potamogeton confervoides*)—do not reach the edge of their geographic range in Maine. However, wild leek is uncommon in Maine because it lives only in nutrient-enriched hardwood forests, while alga-like pondweed occurs only in shallow, soft-water ponds.

The Nature Conservancy

The largely undeveloped expanse of forests in the Mt. Agamenticus region is important for maintaining water quality. York and Kittery Water Districts have been acquiring lands to ensure and protect drinking water supplies for the residents of York and Kittery. Over the past century, the Districts have acquired 4,445 acres of land in the area of Mt. Agamenticus.

Ecological Services of the Focus Area

- Protection of water quality in numerous streams, ponds, and aquifers
- Source habitat for many wildlife species in rapidly developing landscape

Economic Contributions of the Focus Area

- Acreage for timber management
- Public open space for surrounding communities with benefits to land values
- Tourism and recreation (hiking, biking, and wildlife watching)

CONSERVATION CONSIDERATIONS

» Minimize fragmentation of habitat through development designs that optimize open space.

» Continue using signs along roads to warn people about turtle crossings.

» Use strategic open-space planning to maintain functional connections for wildlife among habitats.

» Work with willing landowners to permanently protect remaining undeveloped areas.

» Close adherence to Best Management Practices for forestry (see Forestry Endangered and Threatened Species Guide) and development activities near vernal pools will ensure the protection of these wetlands and the amphibians that depend on them.

» The integrity of wetland habitats depends on proper maintenance of hydrology and water quality. Intensive logging, clearing, soil disturbance, new roads, and development on buffering uplands can result in greater runoff, sedimentation, and other non-point sources of pollution that harm wetlands and aquatic systems.

» Preserving natural communities and other sensitive features can be achieved best by maintaining the integrity of the larger natural systems in which these features occur. Conserving the larger systems helps ensure both common and rare natural features will persist in this part of the state.

» Conservation planning for the uplands should include set-

ting aside some areas from timber harvests.

» It is important for off-road vehicles to stay on existing authorized trails and remain out of all wetlands.

» With expected changes in climate over the next century, plant and wildlife species will shift their ranges. Maintaining landscape connections between undeveloped habitats will provide an imporant safety net for biodiversity as species adjust their ranges to future climate conditions.

» Invasive plants and aquatic organisms have become an increasing problem in Maine and a threat to the state's natural communities. Disturbances to soils and natural vegetation and introductions of non-native species to terrestrial and aquatic habitats can create opportunities for colonization. Landowners and local conservation groups are encouraged to become aware of the potential threat of invasives, of methods to limit establishment, and/or of appropriate techniques for removal. For more information on invasive plants visit: http://www.maine.gov/doc/nrimc/mnap/features/invasives.htm.

Spotted Turtle, Jonathan Mays

RARE SPECIES AND EXEMPLARY NATURAL COMMUNITIES OF THE FOCUS AREA

	Common Name	Scientific Name	State Status*	State Rarity Rank	Global Rarity Rank
Animals	Spotted Turtle	*Clemmys guttata*	T	S3	G5
	Wood Turtle	*Clemmys insculpta*	SC	S4	G4
	Blanding's Turtle	*Emydoidea blandingii*	E	S2	G4
	Northern Black Racer	*Coluber constrictor*	E	S2	G5
	Ribbon Snake	*Thamnophis sauritus*	SC	S3	G5
	Swamp Darter	*Etheostoma fusiforme*	SC	S1	G5
	Brown Snake	*Storeria dekayi*	SC	S3	G5
	New England Cottontail	*Sylvilagus transitionalis*	SC	S2	G4
	Spring Salamander	*Gyrinophilus porphyriticus*	SC	S3	G5
	Scarlet Bluet	*Enallagma pictum*	n/a	n/a	G3
	New England Bluet	*Enallagma laterale*	SC	S1	G3
	Ringed Boghaunter Dragonfly	*Williamsonia lintneri*	E	S1	G2
Plants	Wild Leek	*Allium tricoccum*	SC	S2	G5
	White Wood Aster	*Aster divaricatus*	T	S2	G5
	Upright Bindweed	*Calystegia spithamaea*	T	S1	G4G5
	Atlantic White-cedar	*Chamaecyparis thyoides*	SC	S2	G4
	Spotted Wintergreen	*Chimaphila maculata*	E	S1	G5
	Sweet Pepperbush	*Clethra alnifolia*	SC	S2	G5
	Flowering Dogwood	*Cornus florida*	E	S1	G5
	Eastern Joe-pye Weed	*Eupatorium dubium*	T	S1	G5
	Featherfoil	*Hottonia inflata*	T	S1	G4
	Smooth Winterberry Holly	*Ilex laevigata*	SC	S2	G5
	Slender Blue Flag	*Iris prismatica*	T	S2	G4G5
	Mountain Laurel	*Kalmia latifolia*	SC	S3	G5
	Spicebush	*Lindera benzoin*	SC	S3	G5
	Broadbeech Fern	*Phegopteris hexagonoptera*	SC	S2	G5
	Pale Green Orchis	*Platanthera flava*	SC	S2	G4
	Alga-like Pondweed	*Potamogeton confervoides*	SC	S3	G3G4
	Chestnut Oak	*Quercus montana*	T	S1	G5
	Tall Beak-rush	*Rhynchospora macrostachya*	E	S1	G4
	Sassafras	*Sassafras albidum*	SC	S2	G5
	Swamp Saxifrage	*Saxifraga pensylvanica*	T	S2	G5
	Columbia Water-meal	*Wolffia columbiana*	T	S2	G5
Natural Communities	Atlantic White Cedar Swamp	Atlantic White Cedar Swamp		S2	G3
	Chestnut Oak Woodland	Chestnut Oak Woodland		S1	n/a
	Pocket Swamp	Hemlock–Hardwood Pocket Swamp		S2	n/a
	Leatherleaf Bog	Leatherleaf Boggy Fen		S4	n/a
	Grassy Shrub Marsh	Mixed Graminoid–Shrub Marsh		S5	n/a
	Sandy Lake Bottom	Pipewort–Water Lobelia Aquatic-Bed		S5	n/a
	Pitch Pine Bog	Pitch Pine Bog		S1S2	n/a
	Red Maple Swamp	Red Maple–Sensitive Fern Swamp		S4	n/a
	White Oak–Red Oak Forest	White Oak–Red Oak Forest		S3	G5

State Status*

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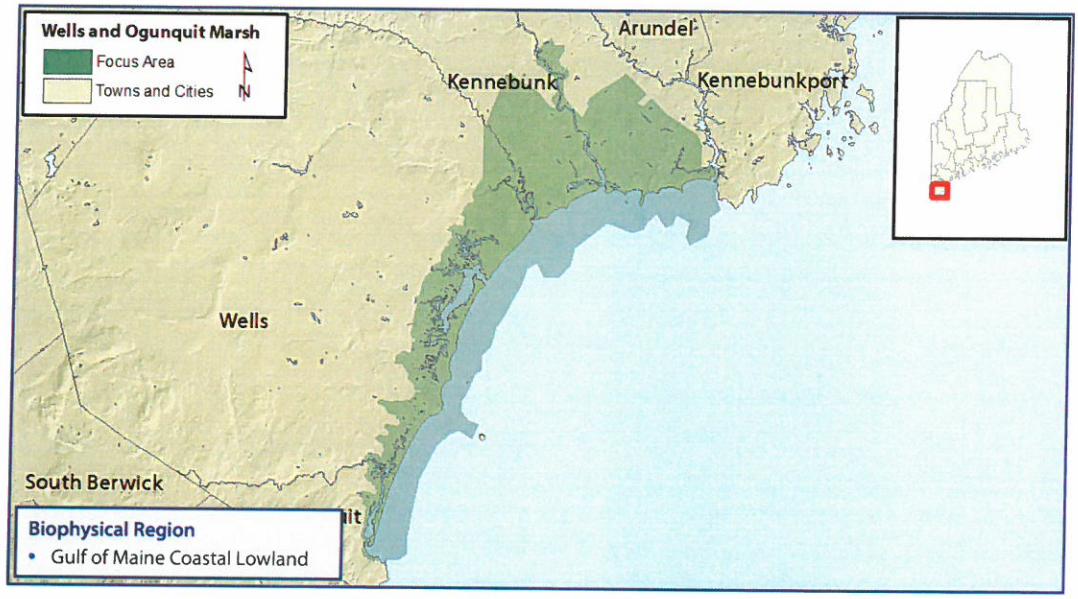
Beginning with HABITAT

Focus Areas of Statewide Ecological Significance

Wells and Ogunquit Marsh



WHY IS THIS AREA SIGNIFICANT?

The Wells and Ogunquit Marsh are the second largest salt marsh complex in Maine. They include extensive areas of undisturbed habitat and support several rare and exemplary natural communities and ecosystems along with a number of rare, threatened and endangered species. Much of the coastline within the Focus Area has been identified as important Tidal Waterfowl and Wading Bird Habitat and as Shorebird Area.

OPPORTUNITIES FOR CONSERVATION

» Work with willing landowners to permanently protect remaining undeveloped areas.
» Conserve upland natural communities as part of the greater marsh ecosystem.
» Monitor and remove invasive plant populations.
» Maintain the sites natural hydrology and identify and restore tidal restrictions and undersized culverts.

For more conservation opportunities, visit the Beginning with Habitat Online Toolbox: www.beginningwithhabitat.org/toolbox/about_toolbox.html.

Rare Animals
Piping plover
Least tern
Saltmarsh Sharp-tailed Sparrow
Spot-winged Glider
Citrine Forktail

Rare Plants
Saltmarsh false-foxglove
Beach wormwood
Saltmarsh bulrush
Pygmyweed
Spongy arrow-head
Pale green orchis
Beach plum
American sea-blite
Sassafras
Dwarf glasswort
Slender blue flag

Rare and Exemplary Natural Communities
Brackish tidal marsh
Freshwater tidal marsh
Pitch pine bog
Coastal dune-marsh ecosystem
Tidal marsh estuary ecosystem
Dune grassland
Spartina saltmarsh

Essential Wildlife Habitats
PipingPlover/Least Tern

Significant Wildlife Habitats
Tidal Wading Bird and Waterfowl Habitat
Inland Wading Bird and Waterfowl Habitat
Shorebird Area
Deer Wintering Area

Photo credits, top to bottom: Maine Natural Areas Program (Top 2 photos), Maine Department of Inland Fisheries and Wildlife, Maine Natural Areas Program, Wells National Estuarine Research Reserve

Dune Grassland, Ogunquit Beach, Maine Natural Areas Program

FOCUS AREA OVERVIEW

The Wells and Ogunquit Marsh are the second largest salt marsh complex in the state. They support extensive areas of relatively undisturbed habitat and a wide array of wildlife including a large number of rare plants and animals. The Focus Area extends from the south end of Ogunquit Beach north to just beyond the mouth of the Mousam River. It includes all tidal marshes east of Route 1 along with upland buffers where available. The Focus Area also includes a large fresh water wetland complex and adjacent forests roughly bounded by the Little River, the Mousam River, and Route 1. The Focus Area is not intended to include the various highly developed areas along this segment of the coast, rather it is intended to include wetlands and uplands where there is an opportunity for practical conservation. The boundary line is a guide showing the area within which additional conservation projects could help sustain the long term health of these habitats.

RARE AND EXEMPLARY NATURAL COMMUNITIES

The Focus Area includes high quality examples of two types of ecosystems and five types of natural communities. An ecosystem is a group of natural communities and their environment, occurring together over a particular portion of the landscape, and held together by some common physical or biotic feature.

The two ecosystems in the Focus Area, Coastal Dune-Marsh Ecosystem and Tidal Marsh Ecosystem, are both comprised of suites of natural communities that are influenced by tides and marine geomorphology.

Spartina Saltmarsh: The most abundant community type is Spartina saltmarsh, or salt hay saltmarsh. Spartina salt marshes occur along the Ogunquit, Webhannet, Little, and Mousam Rivers. These large areas are dominated by expanses of saltmeadow cordgrass, smooth cordgrass, and black-grass. Shrubs are generally absent from the majority of the marsh and are more often found along the upland edge or on small raised islands within the marsh. Saltmeadow cordgrass gives a low meadow-like appearance throughout these marsh systems. On slightly higher elevations in the marsh black-grass is dominant, and along creeks or at slightly lower elevations smooth cordgrass is dominant. Salt pannes are abundant and often support widgeon grass. The peat substrate of the marsh is likely several meters thick.

Brackish Tidal Marsh: These marshes are found near the upper end of tidal influence along coastal rivers. They support both freshwater and brackish water species, often in bands corresponding to tidal exposure. Tall rushes and bulrushes

often predominate over extensive mid-elevation flats; at the lower elevations, rosette-forming herbs, such as lilaeopsis and tidal arrowhead, may be common on the mudflats. Near the high tide line, there may be a fairly narrow zone of muddy gravel or rock shore sparsely vegetated with low herbs, including some rare species such as Long's bitter-cress or water-pimpernel. Sweetgale and poison-ivy are often present at the upper fringes of the marsh, at or above the tidal reach.

Freshwater Tidal Marsh: These marshes are also found near the upper end of tidal influence along coastal rivers. They differ from brackish marshes in that they are above the intrusion of salinity. These marshes are dominated by patchy stout herbs, typically a mixture of wild rice, softstem bulrush, pickerelweed, and sometimes cat-tails. Mixed in with the tall herbs are lower forbs including several rare species. Some marshes may have mudflats dominated by forbs and low vegetation in patches among the graminoids; many have a very narrow band of low forbs near the high-tide-upland interface. Species found in brackish marshes, such as chair-maker's rush, may be in these marshes as well; but at least some obligate freshwater plants will also be present: pickerelweed, common arrowhead, sweet flag, and northern water-plantain, for example.

Dune Grasslands: These communities typically occur on dune formations in coastal areas. They are dominated almost exclusively by dune grass with very few other thinly scattered species. Dune grass is the anchor that helps keep the highly exposed sand dune formation in place. Dune grass needs actively accreting sand to survive and will die off if not stimulated to grow by shifting sand. Generally, the very front and back areas of the dunes are transition areas that support a small number of other characteristic plant species. Much of the original dune grassland occurring along this section of the coast is now heavily developed. Dunes and fore dune areas are essential habitat for the Federally Threatened piping plover and the State Endangered least tern. All the remaining viable areas of dune grassland should be preserved and managed as sensitive natural areas.

Pitch Pine Bog: A Pitch pine bog natural community is also included within the Focus Area. This type of bog is a sparsely forested peatland in which the dominant tree species are pitch pine and red maple. This community type is restricted to extreme southern Maine and usually occurs in relatively small patches of 20 to 40 acres. The shrub layer indicates the more southerly affinities of the pitch pine bog community type, with maleberry, nannyberry, and highbush blueberry being common. Cinnamon fern is the most abundant plant in the herb layer. Peat or sphagnum mosses cover the ground and form the substrate. The pitch pine bog at this site is located adjacent to the upland on the east side of the Little River in the vicinity of Crescent Surf Beach.

Ecological Services of the Focus Area

- Nutrient export to marine food webs
- Major migratory stopover for myriad bird species
- Cleans water running off land prior to discharge into ocean
- Nursery for juvenile fish and shellfish

Economic Contributions of the Focus Area

- Attracts tourism for wildlife observation, paddling, hunting, and angling
- Acts as protective buffer for storm surge
- Supports local marine resource industries
- Provides scenic vistas that raise property values
- Valuable open space for local residents

RARE SPECIES

Several rare animal species are known from the area, including **piping plover** (*Charadrius melodus*) and **least tern** (*Sterna antillarum*). Both of these bird species are dependent on undisturbed dunes and fore dune areas for nesting and consequently for survival. Wide spread development of coastal areas throughout New England has limited habitat for these species. Over two thirds of Maine's 30 miles of beaches have been lost as nesting habitat for piping plovers and least terns because of construction of jetties, seawalls, and high-density housing. Least terns were listed as Maine's first Endangered species in 1982 and piping plovers, also listed as Federally Threatened, were listed as state Endangered in 1986. All areas that currently support nesting or brood raising activities for these species should be managed to insure their long-term survival.

The saltmarshes prevalent throughout the Focus Area provide breeding habitat for a number of migratory bird species including the rare **saltmarsh sharp-tailed sparrow** (*Ammodramus caudacutus*). The saltmarsh sharp-tailed sparrow is a secretive species with very narrow habitat requirements found only in coastal saltmarshes of the eastern United States. This sparrow makes its nest on or near to the ground in shrubs and marsh grass and it forages in the saltmarsh vegetation. Suitable habitat for the saltmarsh sharp-tailed sparrow is declining throughout its range.

Eelgrass beds forms extensive underwater meadows in shallow bays and coves, tidal creeks, and estuaries of the Focus Area. Eelgrass is a flowering plant that reproduces by seed and by vegetative growth. Eelgrass beds are among the most productive plant communities in the world. They serve as a nursery habitat, and feeding area for many fish, waterfowl, wading birds, invertebrates, and other wildlife, including commercially valuable fish and shellfish. Eelgrass reduces water pollution by absorbing nutrients, and it dampens wave energy and slows currents, which helps stabilize sediments and buffer shorelines. Because of its important ecological functions, loss of eelgrass beds can result in reduced fish and wildlife populations, degraded water quality, and increased shoreline erosion.

Suitable wintering habitat for harlequin ducks is located in the near shore areas. **Harlequin ducks** *(Histrionicus histrionicus)* are small diving sea ducks with striking blue, white, black, and chestnut plumage. About 1000 birds from southeastern Canada winter in Maine, mostly in small flocks on rough coastal waters and exposed rocky shores. They forage by diving into foaming surf to glean marine invertebrates. Harlequins have an extremely low reproductive potential compared to other waterfowl. Harlequin ducks were listed as State Threatened in 1997.

Important shorebird roosting and feeding areas are located along several of the Focus Areas beaches and marshes. **Shorebird Areas** are important stopover sites for migratory shorebirds that use the beaches and intertidal mudflats as staging areas, feeding on the high concentrations of intertidal invertebrates and resting on the sandy beaches and gravel bars above the high tide line before embarking on their long (sometimes 2,000 or more miles) migrations to their wintering areas. Nearly all of the shoreline has been mapped as **Tidal Wadingbird and Waterfowl Habitat** and provides important feeding, nesting habitat to a variety of species.

Other significant features within the Focus Area include 12 rare plant species (see table for list). The majority of the rare plants are species with ranges that extend from the south barely extending into Maine. Some of them such as **salt-marsh false-foxglove** *(Agalinis maritima)* and **dwarf glasswort** *(Salicornia bigelovii)* are restricted to tidal salt marshes and may have a relative high level of protection due to the large area of salt marsh already in conservation ownership within the focus area. However, others are freshwater wetland species and many specific sites for them are not in conservation ownership. Rare plants dependent on coastal freshwater wetlands include **slender blue flag** *(Iris prismatica)*, **smooth winterberry** *(Ilex laevigata)*, and **pale green orchis** *(Platanthera flava var.herbiola)*. These populations are vulnerable to wetland alterations that could occur with encroaching development. The state Endangered **beach plum** *(Prunus maritima)* has been documented within the Focus Area. This species occurs in the dry thickets behind sand dunes and has been lost from most of the sites where it has been previously documented due to development. This species is on the verge of being extirpated from the state.

Webhannet Marsh, Maine Natural Areas Program

Public Access Opportunities

» Rachel Carson National Wildlife Refuge, USFWS

» Laudholm Farm, MBPL

CONSERVATION CONSIDERATIONS

» Nearly all areas mapped as exemplary natural communities are contained within existing conservation lands. Many of the areas supporting rare plant species are not contained within conservation lands.

» Natural communities still occurring on the uplands adjacent to the salt marshes in the Focus Area including upland forests, pine barrens, shrub swamps, forested swamps, and sand dunes should be conserved as part of the greater ecosystem of the marsh. Long-term preservation of the biodiversity of a high value natural area such as this will be best achieved by retaining as much of the surrounding natural landscape as possible.

» Whenever possible a vegetative buffer should be established and protected around the perimeter of all salt marsh community types. The tidal marshes and the life they support are not independent of the landscape in which they occur. A buffer of 250 feet or more will serve to limit impacts from adjacent development, help prevent erosion, provide habitat needed by numerous species that depend on the

marsh, limit opportunities for colonization of invasive species, and prevent reckless impacts from off road vehicle use.

» The integrity of the tidal marshes and the processes and life forms they support are dependent on the maintenance of the tidal hydrology in as much a natural condition as possible. The hydrology of the tidal marshes, and subsequently sedimentation patterns, have been and are currently being impacted by culverts which restrict tidal flow on several creeks and by past ditching. Partial tidal restriction from culverts causes increased fresh water influence (reduced salinity) in the upper marsh and a subsequent increase of oxygen. Increased oxygen leads to deterioration of the upper marsh through decreases in peat elevation and shifts in plant species. Water crossing structure repair, maintenance and installation projects should follow guidelines for aquatic species passage in order to avoid further fragmentation of aquatic and riparian habitats and unintended tidal restriction.

» Marshes and swamps in the Focus Area have been disturbed by numerous road and railroad crossings. Disturbances to soils and natural vegetation in or adjacent to the marshes can create opportunities for colonization by invasive plant species. Local groups with an interest in the marshes should be made aware of the potential threat of invasive plants and keep an eye out for them before they become well established.

» Eelgrass is sensitive to losses due to disease, storms, pollution, nutrient enrichment, dredging, shellfishing, ice damage, propeller damage, sediments, and runoff. Because of its important ecological functions, loss of eelgrass beds can result in reduced fish and wildlife populations, degraded water quality, and increased shoreline erosion.

» Widespread loss, degradation, and fragmentation of coastal saltmarshes along the eastern seaboard are the biggest threats to the saltmarsh sharp-tailed sparrow. Habitat preservation and restoration are the most important factors for conserving this species.

» Shoreline development and subsequent habitat degradation are potential threats to Maine small populations of Horseshoe Crab. Though generally overlooked as a resource, Horseshoe Crabs in Maine are very vulnerable to depletion from any harvesting activities. In 2003, taking and possession of Horseshoe Crabs became prohibited in Maine.

» All areas of sand dunes should be posted with signs indicating their fragile nature and regular crossing areas should be well defined and managed to prevent erosion of the dunes.

» Care should be taken to insure that boating in the channels and mouths of the various marshes does not cause erosion to the exposed soils along the marsh edge, and that excessive noise from boats and people do not disrupt normal patterns of wildlife behavior.

» No dredge spoils or other fill materials should be placed in any of the marshes.

» Consult with MDIFW and USFWS on any projects requiring a municipal or state permit in areas designated as Essential Habitat for the Endangered piping plover and least tern and the area covered by the Wells Beach Agreement (Wells and Drakes Island Beaches).

» Avoid or minimize any further development of beach and dune habitats.

» This area includes Significant Wildlife Habitat for waterfowl and wading birds, shorebirds, and wintering deer. Land managers should follow best management practices in and around Significant Wildlife Habitat. Contact MDIFW for more information.

» Current projections suggest sea level will rise at least 2 feet in the next century due to changing climate and warming temperatures. As sea levels rise, coastal habitats will begin to migrate inland. In areas where this inland migration is blocked by development these habitats will be lost. Conservation of low-lying, undeveloped uplands where coastal marshes, beaches, and other intertidal natural communities can migrate inland with sea level rise should be promoted.

Little River Marsh, Wells National Estuarine Research Reserve

RARE SPECIES AND EXEMPLARY NATURAL COMMUNITIES OF THE FOCUS AREA

	Common Name	Scientific Name	State Status*	State Rarity Rank	Global Rarity Rank
Animals	Piping plover	*Charadrius melodus*	E	S2B	G3
	Least tern	*Sterna antillarum*	E	S1B	G4
	Saltmarsh Sharp-tailed Sparrow	*Ammodramus caudacutus*	SC	S3B	G4
	Spot-winged Glider	*Pantala hymenaea*	SC	S2	G5
	Citrine Forktail	*Ischnura hastata*	SC	S1S2	G5
Plants	Saltmarsh false-foxglove	*Agalinis maritima*	SC	S3	G5
	Beach wormwood	*Artemisia campestris ssp. caudata*	SC	S1S2	G5T5
	Saltmarsh bulrush	*Bolboschoerus robustus*	SC	S2	G5
	Pygmyweed	*Crassula aquatica*	SC	S2S3	G5
	Smooth winterberry holly	*Ilex laevigata*	SC	S2	G5
	Slender blue flag	*Iris prismatica*	T	S2	G4G5
	Pale green orchis	*Platanthera flava var.herbiola*	SC	S2	G4T4Q
	Beach plum	*Prunus maritima*	E	S1	G4
	Spongy arrow-head	*Sagittaria calycina var. spongiosa*	SC	S3	G5T4
	Dwarf glasswort	*Salicornia bigelovii*	SC	S1	G5
	Sassafras	*Sassafras albidum*	SC	S2	G5
	American sea-blite	*Suaeda calceoliformis*	T	S2	G5
	Brackish tidal marsh	Brackish tidal marsh		S3	GNR
	Coastal dune-marsh ecosystem	Coastal dune-marsh ecosystem		S3	GNR
	Dune grassland	Dune grassland		S2	G4?
	Freshwater tidal marsh	Freshwater tidal marsh		S2	G4?
	Pitch pine bog	Pitch pine bog		S2	G3G5
	Spartina saltmarsh	Spartina saltmarsh		S3	G5
	Tidal marsh estuary ecosystem	Tidal marsh estuary ecosystem		S3	GNR

State Status*

E Endangered: Rare and in danger of being lost from the state in the foreseeable future, or federally listed as Endangered.

T Threatened: Rare and, with further decline, could become endangered; or federally listed as Threatened.

SC Special Concern: Rare in Maine, based on available information, but not sufficiently rare to be Threatened or Endangered.

**State status rankings are not assigned to natural communities.*

State Rarity Rank

S1 Critically imperiled in Maine because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres).

S2 Imperiled in Maine because of rarity (6–20 occurrences or few remaining individuals or acres) or because of other factors making it vulnerable to further decline.

S3 Rare in Maine (on the order of 20–100 occurrences).

S4 Apparently secure in Maine.

S5 Demonstrably secure in Maine.

Global Rarity Rank

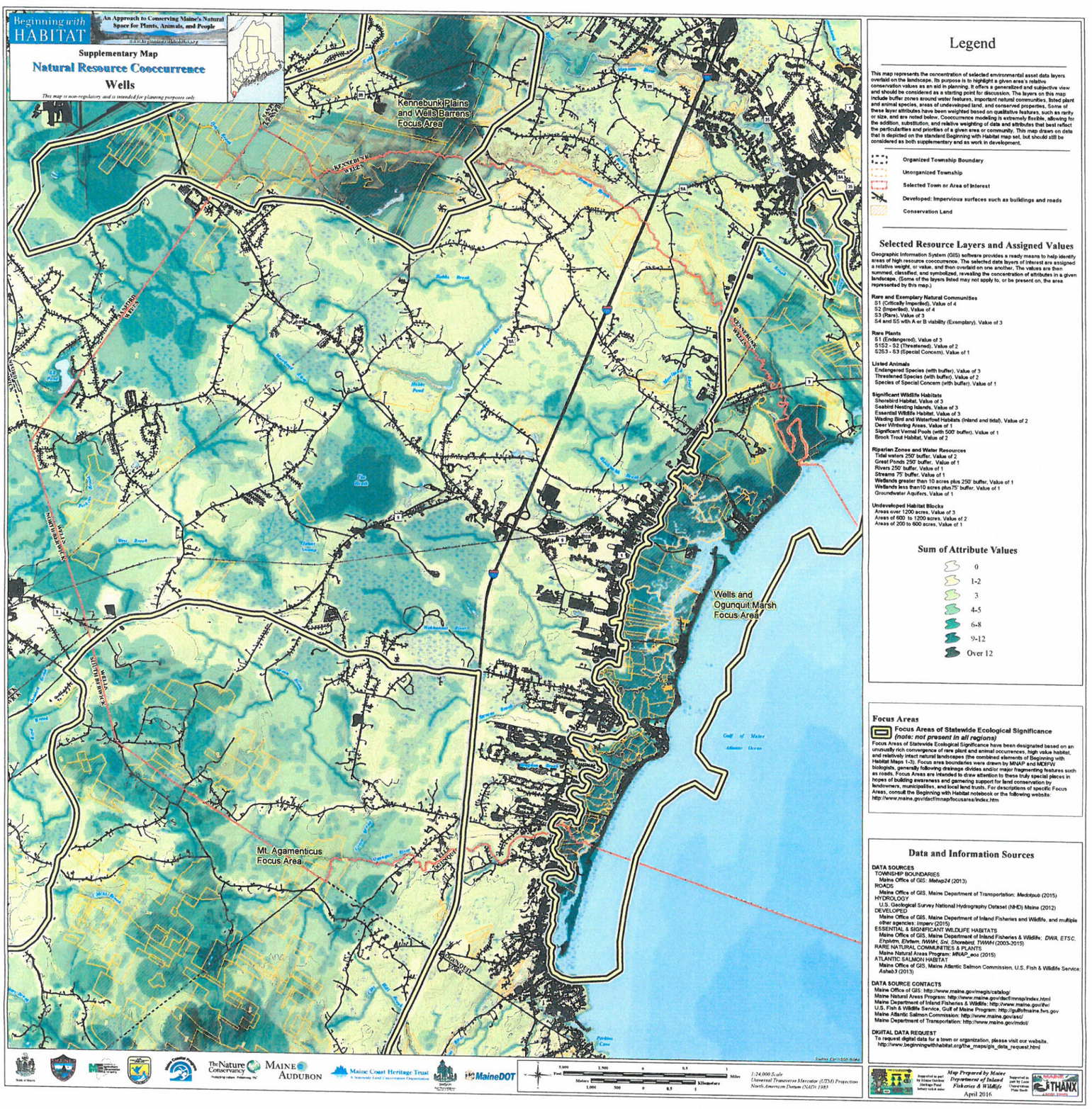
G1 Critically imperiled globally because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because some aspect of its biology makes it especially vulnerable to extirpation.

G2 Globally imperiled because of rarity (6–20 occurrences or few remaining individuals or acres) or because of other factors making it vulnerable to further decline.

G3 Globally rare (on the order of 20–100 occurrences).

G4 Apparently secure globally.

G5 Demonstrably secure globally.


Beginning with HABITAT
An Approach to Conserving Maine's Natural Space for Plants, Animals, and People
www.beginningwithhabitat.org
Supplementary Map
Natural Resource Cooccurrence
Wells
This map is non-regulatory and is intended for planning purposes only.
Kennebunk Plains and Wells Barrens Focus Area
Wells and Ogunquit Marsh Focus Area
Mt. Agamenticus Focus Area
Legend
This map represents the concentration of selected environmental asset data layers overlaid on the landscape. Its purpose is to highlight a given area's relative conservation values as an aid in planning. It offers a generalized and subjective view and should be considered as a starting point for discussion. The layers on this map include buffer zones around water features, important natural communities, listed plant and animal species, areas of undeveloped land, and conserved properties. Some of these layer attributes have been weighted based on qualitative features, such as rarity or size, and are noted below. Cooccurrence modeling is extremely flexible, allowing for the addition, substitution, and relative weighting of data and attributes that best reflect the particularities and priorities of a given area or community. This map draws on data that is depicted on the standard Beginning with Habitat map set, but should still be considered as both supplementary and as work in development.
Organized Township Boundary
Unorganized Township
Selected Town or Area of Interest
Developed: Impervious surfaces such as buildings and roads
Conservation Land
Selected Resource Layers and Assigned Values
Geographic Information System (GIS) software provides a ready means to help identify areas of high resource cooccurrence. The selected data layers of interest are assigned a relative weight, or value, and then overlaid on one another. The values are then summed, classified, and symbolized, revealing the concentration of attributes in a given landscape. (Some of the layers listed may not apply to, or be present on, the area represented by this map.)
Rare and Exemplary Natural Communities
S1 (Critically Imperiled), Value of 4
S2 (Imperiled), Value of 4
S3 (Rare), Value of 3
S4 and S5 with A or B viability (Exemplary), Value of 3
Rare Plants
S1 (Endangered), Value of 3
S1S2 - S2 (Threatened), Value of 2
S2S3 - S3 (Special Concern), Value of 1
Listed Animals
Endangered Species (with buffer), Value of 3
Threatened Species (with buffer), Value of 2
Species of Special Concern (with buffer), Value of 1
Significant Wildlife Habitats
Shorebird Habitat, Value of 3
Seabird Nesting Islands, Value of 3
Essential Wildlife Habitat, Value of 3
Wading Bird and Waterfowl Habitats (inland and tidal), Value of 2
Deer Wintering Areas, Value of 1
Significant Vernal Pools (with 500' buffer), Value of 1
Brook Trout Habitat, Value of 2
Riparian Zones and Water Resources
Tidal waters 250' buffer, Value of 2
Great Ponds 250' buffer, Value of 1
Rivers 250' buffer, Value of 1
Streams 75' buffer, Value of 1
Wetlands greater than 10 acres plus 250' buffer, Value of 1
Wetlands less than 10 acres plus 75' buffer, Value of 1
Groundwater Aquifers, Value of 1
Undeveloped Habitat Blocks
Areas over 1200 acres, Value of 3
Areas of 600 to 1200 acres, Value of 2
Areas of 200 to 600 acres, Value of 1
Sum of Attribute Values
0
1-2
3
4-5
6-8
9-12
Over 12
Focus Areas
Focus Areas of Statewide Ecological Significance
(note: not present in all regions)
Focus Areas of Statewide Ecological Significance have been designated based on an unusually rich convergence of rare plant and animal occurrences, high value habitat, and relatively intact natural landscapes (the combined elements of Beginning with Habitat Maps 1-3). Focus area boundaries were drawn by MNAP and MDIFW biologists, generally following drainage divides and/or major fragmenting features such as roads. Focus Areas are intended to draw attention to these truly special places in hopes of building awareness and garnering support for land conservation by landowners, municipalities, and local land trusts. For descriptions of specific Focus Areas, consult the Beginning with Habitat notebook or the following website: http://www.maine.gov/dacf/mnap/focusarea/index.htm
Data and Information Sources
DATA SOURCES
TOWNSHIP BOUNDARIES
Maine Office of GIS: Metwp24 (2013)
ROADS
Maine Office of GIS, Maine Department of Transportation: Medotpub (2015)
HYDROLOGY
U.S. Geological Survey National Hydrography Dataset (NHD) Maine (2012)
DEVELOPED
Maine Office of GIS, Maine Department of Inland Fisheries and Wildlife, and multiple other agencies: Impery (2015)
ESSENTIAL & SIGNIFICANT WILDLIFE HABITATS
Maine Office of GIS, Maine Department of Inland Fisheries & Wildlife: DWA, ETSC, Ephstrm, Ephlem, IWWH, Sht, Shorebird, TWWH (2003-2015)
RARE NATURAL COMMUNITIES & PLANTS
Maine Natural Areas Program: MNAP_eoc (2015)
ATLANTIC SALMON HABITAT
Maine Office of GIS, Maine Atlantic Salmon Commission, U.S. Fish & Wildlife Service: Ashab3 (2013)
DATA SOURCE CONTACTS
Maine Office of GIS: http://www.maine.gov/megis/catalog/
Maine Natural Areas Program: http://www.maine.gov/dacf/mnap/index.html
Maine Department of Inland Fisheries & Wildlife: http://www.maine.gov/ifw/
U.S. Fish & Wildlife Service, Gulf of Maine Program: http://gulfofmaine.fws.gov
Maine Atlantic Salmon Commission: http://www.maine.gov/asc/
Maine Department of Transportation: http://www.maine.gov/mdot/
DIGITAL DATA REQUEST
To request digital data for a town or organization, please visit our website, http://www.beginningwithhabitat.org/the_maps/gis_data_request.html
The Nature Conservancy
Maine Audubon
Maine Coast Heritage Trust
MaineDOT
1:24,000 Scale
Universal Transverse Mercator (UTM) Projection
North American Datum (NAD) 1983
Map Prepared by Maine Department of Inland Fisheries & Wildlife
April 2016
THANX

Beginning with HABITAT

An Approach to Conserving Maine's Natural Space for Plants, Animals, and People

Primary Map 1

Water Resources & Riparian Habitats

Wells

This map is nonregulatory and is intended for planning purposes only

5,000 2,500 0 0.5 1
Feet Miles
Meters Kilometers
1,000 500 0 0.5 1

Scale: 1:24,000
Projection: UTM 19N
Datum: NAD 1983

LEGEND

This map depicts riparian areas associated with major surface water features and important public water resources. This map does not depict all streams or wetlands known to occur on the landscape and should not be used as a substitute for on the ground surveys. This map should be used as a planning reference only and is intended to illustrate the natural hydrologic connections between surface water features. Protecting riparian habitats protects water quality, maintains habitat connections, and safeguards important economic resources including recreational and commercial fisheries.

- **Selected Town or Area**
- **Organized Township Boundary**
- **Unorganized Township**
- **Developed** - Impervious surfaces including buildings and roads
- **Drainage divides** - These are the smallest hydrologic units mapped in Maine. They contain watershed boundaries for most ponds and rivers in Maine.
- **NWI Wetlands** - National Wetlands Inventory (NWI) uses aerial photographs to approximate wetland locations. NWI data is not a comprehensive mapping of wetland resources and typically under represents the presence of wetlands on the landscape. The presence of wetlands needs to be determined in the field prior to conducting activities that could result in wetland disturbance.
- **Riparian Habitat** - depicted using common regulatory zones including a 250-foot-wide strip around Great Ponds (ponds ≥10 acres), rivers, coastline, and wetlands ≥10 acres and a 75-foot-wide strip around streams. Riparian areas depicted on this map may already be affected by existing land uses.
- **Shellfish Growing Areas** - The Maine Department of Marine Resources maps growing areas for economically important shellfish resources. This map depicts softshell and hard clam resources in order to illustrate the relation of these resources to streams and shoreline areas vital to their conservation.
- **Brook Trout Habitat** - Streams and ponds, buffered to 100 feet, where wild Brook Trout populations have been documented, or managed to enhance local fisheries.
- **Public Water Supply Wells**
- **Source protection area** - Buffers that represent source water protection areas for wells and surface water intakes that serve the public water supply. Their size is proportional to population served and/or by the type of water supply system. These buffers range from 300 to 2,500 feet in radius.
- **Aquifers** - flow of at least 10 gallons per minute

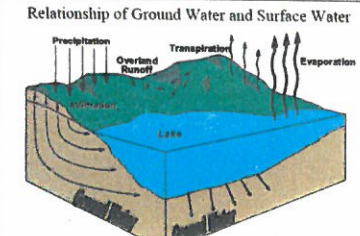
Regional View of Watersheds

A watershed includes all of the land that drains to a common waterbody. The areas within the watershed are linked ecologically by the water, sediment, nutrients, and pollutants that flow through them. For the purpose of mapping "hydrological units," watersheds are often grouped into larger drainages or divided into smaller ones depending on the map's scale. Drainage divides (shown on main map as yellow lines), are the smallest hydrological units and generally drain into small ponds, wetlands, or streams. These units are grouped into subwatersheds (HU12) and are represented on the inset map above by the yellow-brown outlines.

- **Main Map Extent**
- **Selected Town or Area**
- **Subwatersheds**

1 inch = 4 miles

Relationship of Ground Water and Surface Water



Precipitation is the source of all water. Surface water and ground water are related. Drinking water can come from either source. Ground contaminants can affect both. The relationship between ground water and surface water is part of the ***hydrologic cycle***. ***Precipitation*** that falls from the atmosphere as rain or snow reaches the land surface and recharges rivers, lakes, wetlands, and other surface bodies of water directly through ***overland runoff***. Surface water also seeps into the ground through ***infiltration*** and eventually reaches the ground water; or through ***evaporation***, returns to the atmosphere. Water evaporates from leaves and stems of plants through ***transpiration***.

Shoreland Zoning

Maine's Mandatory Shoreland Zoning Act is intended to protect water quality, conserve wildlife habitat, and preserve the natural beauty of Maine's shoreline areas. Successful implementation requires local awareness of and appreciation for surface water resources and effective enforcement of setback and buffer requirements.

At a minimum, Maine's shoreland zones include all land within:

- 250 feet of the high-water line of any pond over 10 acres, any river that drains at least 25 square miles, and all tidal waters and saltwater marshes;
- 250 feet of a freshwater wetland over 10 acres (except "forested" wetlands); and
- 75 feet of a stream that is either an outlet stream of a great pond, or located below the confluence of two perennial streams as depicted on a USGS topographic map.

Shoreland zoning encourages towns to provide greater protection to their local water resources by applying shoreland zone protections to additional resource types such as smaller streams and wetlands, and rare terrestrial features. For specific guidance regarding Maine's Mandatory Shoreland Zoning Act contact the Dept. of Environmental Protection Shoreland Zoning Unit: 207-287-3901 (Augusta), 207-822-6300 (Portland), 207-941-4116 (Bangor). www.maine.gov/dep/blwq/docstand/szpage.htm

Data Sources

DATA SOURCE INFORMATION
TOWNSHIP BOUNDARIES
Maine Office of GIS (2013); metwp24
ROADS
Maine Office of GIS, Maine Department of Transportation (2015); medotpub
HYDROLOGY
USGS National Hydrography Dataset (NHD) Maine (2012)
DEVELOPED
Maine Office of GIS, Maine Department of Inland Fisheries and Wildlife (2015); impervious_change_2015
NATIONAL WETLANDS INVENTORY
U.S. Fish & Wildlife Service (2015); NWI
SHELLFISH
Maine Department of Marine Resources; softshell_clams, hard_clams
RIPARIAN BUFFERS
Maine Office of GIS, Maine Natural Areas Program (2011)
WELLS, WELL BUFFERS
Maine Office of GIS, Maine Department of Human Services-Drinking Water Program (2011); wells, wellsbuf
AQUIFERS
Maine Office of GIS, Maine Geological Survey (2011); aquifer_polygons
DRAINAGE DIVIDES
Maine Office of GIS (1994); medrdvd
BROOK TROUT HABITAT
Maine Department of Inland Fisheries & Wildlife (2011)

DATA SOURCE CONTACT INFORMATION
Maine Office of GIS: http://www.maine.gov/megis/
Maine Natural Areas Program: http://www.maine.gov/doc/nrimc/mnap/index.htm
Maine Department of Marine Resources: http://www.maine.gov/dmr/
Maine Department of Transportation: http://www.maine.gov/mdot/
Maine Geological Survey: http://www.maine.gov/doc/nrimc/mgs/mgs.htm
Maine Department of Inland Fisheries & Wildlife: http://www.maine.gov/ifw/index.html

DIGITAL DATA REQUEST
To request digital data for a town or organization, please visit our website
http://www.beginningwithhabitat.org/the_maps/gis_data_request.html

Supported in part by Maine Outdoor Heritage Fund lottery ticket sales

Map Prepared by Maine Department of Inland Fisheries & Wildlife
April 2016

Supported in part by Loon Conservation Plate Funds

The Nature Conservancy
Maine Audubon
Maine Coast Heritage Trust
MaineDOT

Beginning with HABITAT

An Approach to Conserving Maine's Natural Space for Plants, Animals, and People

Primary Map 2

High Value Plant & Animal Habitats

Wells

This map is non-regulatory and is intended for planning purposes only.

1:24,000 Scale
Projection: UTM 19N
Datum: NAD 1983

LEGEND

Beginning with Habitat (BwH) is a voluntary tool intended to assist landowners, resource managers, planners, and municipalities in identifying and making informed decisions about areas of potential natural resource concern. This data includes the best available information provided through BwH's coalition partners as of the map date, and is intended for information purposes only. It should not be interpreted as a comprehensive analysis of plant and animal occurrences or other local resources, but rather as an initial screen to flag areas where agency consultation may be appropriate. Habitat data sets are updated continuously as more accurate and current data becomes available. However, as many areas have not been completely surveyed, features may be present that are not yet mapped, and the boundaries of some depicted features may need to be revised. Local knowledge is critical in providing accurate data. If errors are noted in the current depiction of resources, please contact our office. Some habitat features depicted on this map are regulated by the State of Maine through the Maine Endangered Species Act (Essential Habitats and threatened and endangered species occurrences) and Natural Resources Protection Act (Significant Wildlife Habitat). We recommend consultation with MDIFW Regional Biologists or MNAP Ecologists if activities are proposed within resource areas depicted on this map. Consultation early in the planning process usually helps to resolve regulatory concerns and minimize agency review time. For MDIFW and MNAP contact information, visit http://www.beginningwithhabitat.org/contacts/index.html.

Organized Township Boundary

Unorganized Township

Selected Town or Area of Interest

Developed: Impervious surfaces such as buildings and roads

Rare, Threatened, or Endangered Wildlife

Known rare, threatened, or endangered species occurrence and/or the associated habitats based on species sightings.

Consult with an MDIFW regional biologist to determine the relative importance and conservation needs of the specific location and supporting habitat. For more information regarding individual species visit our website, http://www.maine.gov/ifw/wildlife/species/endangered_species/state_list.htm, for species specific fact sheets.

The Federal Endangered Species Act requires actions authorized, funded, or carried out by federal agencies be reviewed by the U. S. Fish and Wildlife Service. If your project occurs near an occurrence of the Atlantic Salmon, Roseate Tern, Piping Plover, Canada Lynx, New England Cottontail, Furbish's Lousewort, or Small-whorled Pagonia contact the Maine Field Office, USFWS, 1168 Main St., Old Town, ME 04468.

Rare or Exemplary Plants and Natural Communities

Rare Plant Locations

Known rare, threatened, or endangered plant occurrences are based on field observations. Consult with a Maine Natural Areas Program (MNAP) Ecologist to determine conservation needs of particular species. For more information regarding rare plants, the complete list of tracked species and fact sheets for those species can be found at: http://www.maine.gov/doc/nrimc/mnap/features/plantlist.htm

Rare or Exemplary Natural Community Locations

The MNAP has classified and distinguished 98 different natural community types that collectively cover the state's landscape. These include such habitats as floodplain forests, coastal bogs, alpine summits, and many others. Each type is assigned a rarity rank of 1 (rare) through 5 (common). Mapped rare natural communities or ecosystems, or exemplary examples of common natural communities or ecosystems, are based on field surveys and aerial photo interpretation. Consult with an MNAP Ecologist to determine conservation needs of particular communities or ecosystems.

Essential Wildlife Habitats

Roseate Tern Nesting Area or
Piping Plover-Least Tern Nesting, Feeding, & Brood-Rearing Area

Maine's Department of Inland Fisheries & Wildlife (MDIFW, www.state.me.us/ifw) maps areas currently or historically providing habitat essential to the conservation of endangered or threatened species as directed by the Maine Endangered Species Act (12 MRSA, Chapter 925, Subchapter 3, Sections 12804 and 12806) and regulations (MDIFW Rules, Chapter 8.05). Identification of Essential Habitat areas is based on species observations and confirmed habitat use. If a project occurs partly or wholly within an Essential Habitat, it must be evaluated by MDIFW before state and/or municipal permits can be approved or project activities can take place.

Significant Wildlife Habitats

Candidate Deer Wintering Area

Forested area possibly used by deer for shelter during periods of deep snow and cold temperatures. Assessing the current value of a deer wintering area requires on-site investigation and verification by IF&W staff. Locations depicted should be considered as approximate only.

Inland Waterfowl / Wading Bird

Freshwater breeding, migration/staging, and wintering habitats for inland waterfowl or breeding, feeding, loafing, migration, or roosting habitats for inland wading birds.

Seabird Nesting Island

An island, ledge, or portion thereof in tidal waters with documented, nesting seabirds or suitable nesting habitat for endangered seabirds.

Shorebird Areas

Coastal staging areas that provide feeding habitat like tidal mud flats or roosting habitat like gravel bars or sand spits for migrating shorebirds

Tidal Waterfowl / Wading Bird

Breeding, migrating/staging, or wintering areas for coastal waterfowl or breeding, feeding, loafing, migrating, or roosting areas for coastal wading birds. Tidal Waterfowl/Wading Bird habitats include aquatic beds, eelgrass, emergent wetlands, mudflats, seaweed communities, and reefs.

Significant Vernal Pools

A pool depression used for breeding by amphibians and other indicator species and that portion of the critical terrestrial habitat within 250 ft of the spring or fall high water mark. A vernal pool must have the following characteristics: natural origin, nonpermanent hydroperiod, lack permanently flowing inlet or outlet, and lack predatory fish.

Maine's Natural Resources Protection Act

Maine's Natural Resources Protection Act (NRPA, 1988) is administered by the Maine Department of Environmental Protection (MDEP; http://www.maine.gov/dep/blwq/docstand/nrpapage.htm) and is intended to prevent further degradation and loss of natural resources in the state, including the above Significant Wildlife Habitats that have been mapped by MDIFW. MDEP has regulatory authority over most Significant Wildlife Habitat types. The regional MDEP office should be consulted when considering a project in these areas.

Atlantic Salmon Spawning/Rearing Habitat

Atlantic Salmon Rearing Habitat

Atlantic Salmon Spawning Habitat

Atlantic Salmon Limited Spawning Habitat

Mapped by Atlantic Salmon Commission (ASC) and US Fish & Wildlife Service (USFWS) from field surveys on selected Penobscot and Kennebec River tributaries and the Dennys, Ducktrap, East Machias, Machias, Pleasant, Narraguagus, and Sheepscot Rivers.

Data Sources

DATA SOURCE INFORMATION

TOWNSHIP BOUNDARIES
Maine Office of GIS: *Metwp24* (2013)
ROADS
Maine Office of GIS, Maine Department of Transportation: *Medotpub* (2015)
HYDROLOGY
U.S. Geological Survey National Hydrography Dataset (NHD) Maine (2012)
DEVELOPED
Maine Office of GIS, Maine Department of Inland Fisheries and Wildlife, and multiple other agencies: *Imperv* (2015)
ESSENTIAL & SIGNIFICANT WILDLIFE HABITATS
Maine Office of GIS, Maine Department of Inland Fisheries & Wildlife: *DWA, ETSC, Ehplvtrn, Ehtern, IWWH, Sni, Shorebird, TWWH* (2003-2015)
RARE NATURAL COMMUNITIES & PLANTS
Maine Natural Areas Program: *MNAP_eos* (2015)
ATLANTIC SALMON HABITAT
Maine Office of GIS, Maine Atlantic Salmon Commission, U.S. Fish & Wildlife Service: *Ashab3* (2013)

DATA SOURCE CONTACT INFORMATION

Maine Office of GIS: http://www.maine.gov/megis/catalog/
Maine Natural Areas Program: http://www.maine.gov/doc/nrimc/mnap/index.html
Maine Department of Inland Fisheries & Wildlife: http://www.maine.gov/ifw/
U.S. Fish & Wildlife Service, Gulf of Maine Program: http://gulfofmaine.fws.gov
Maine Atlantic Salmon Commission: http://www.maine.gov/asc/
Maine Department of Transportation: http://www.maine.gov/mdot/

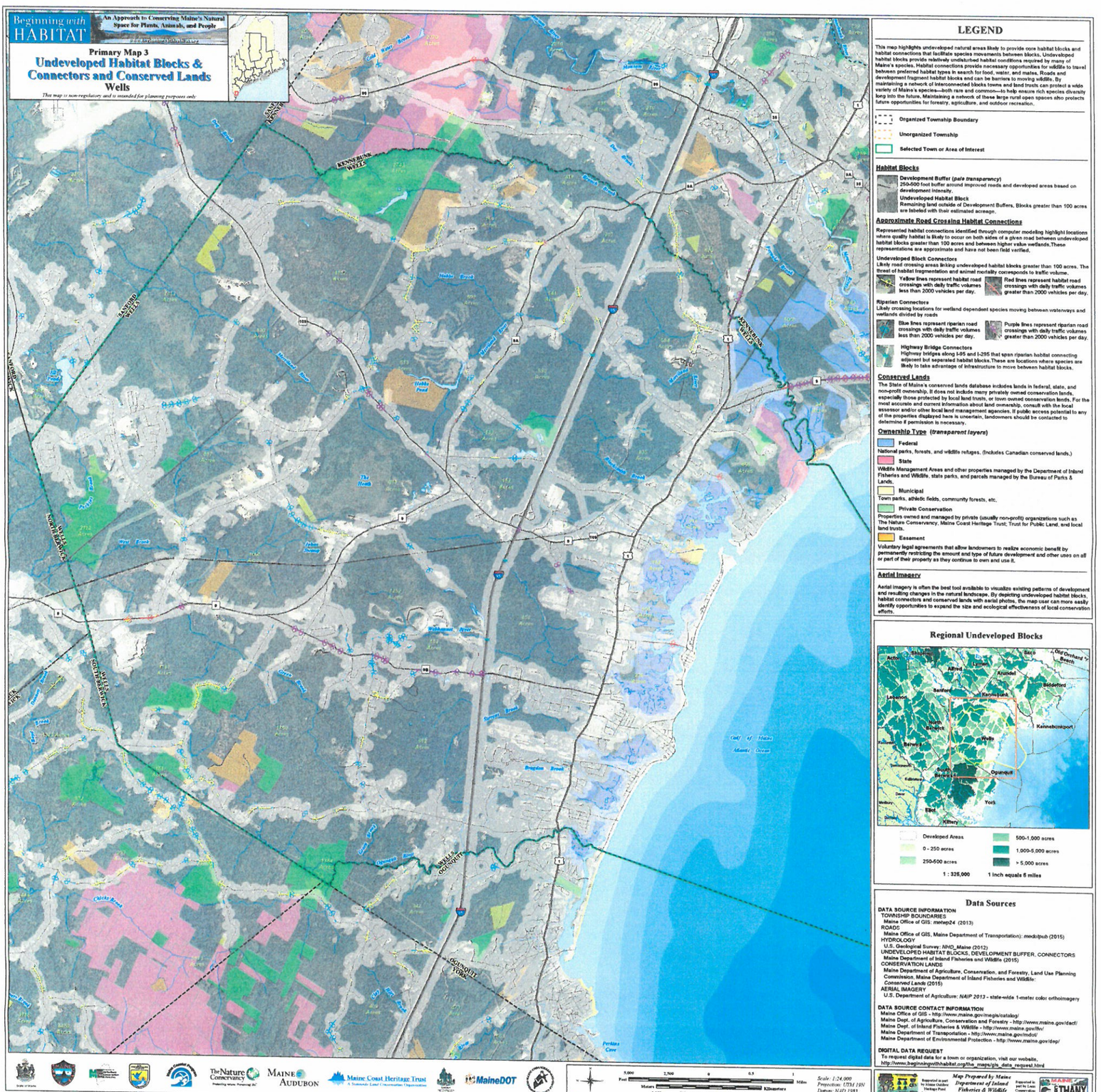
DIGITAL DATA REQUEST

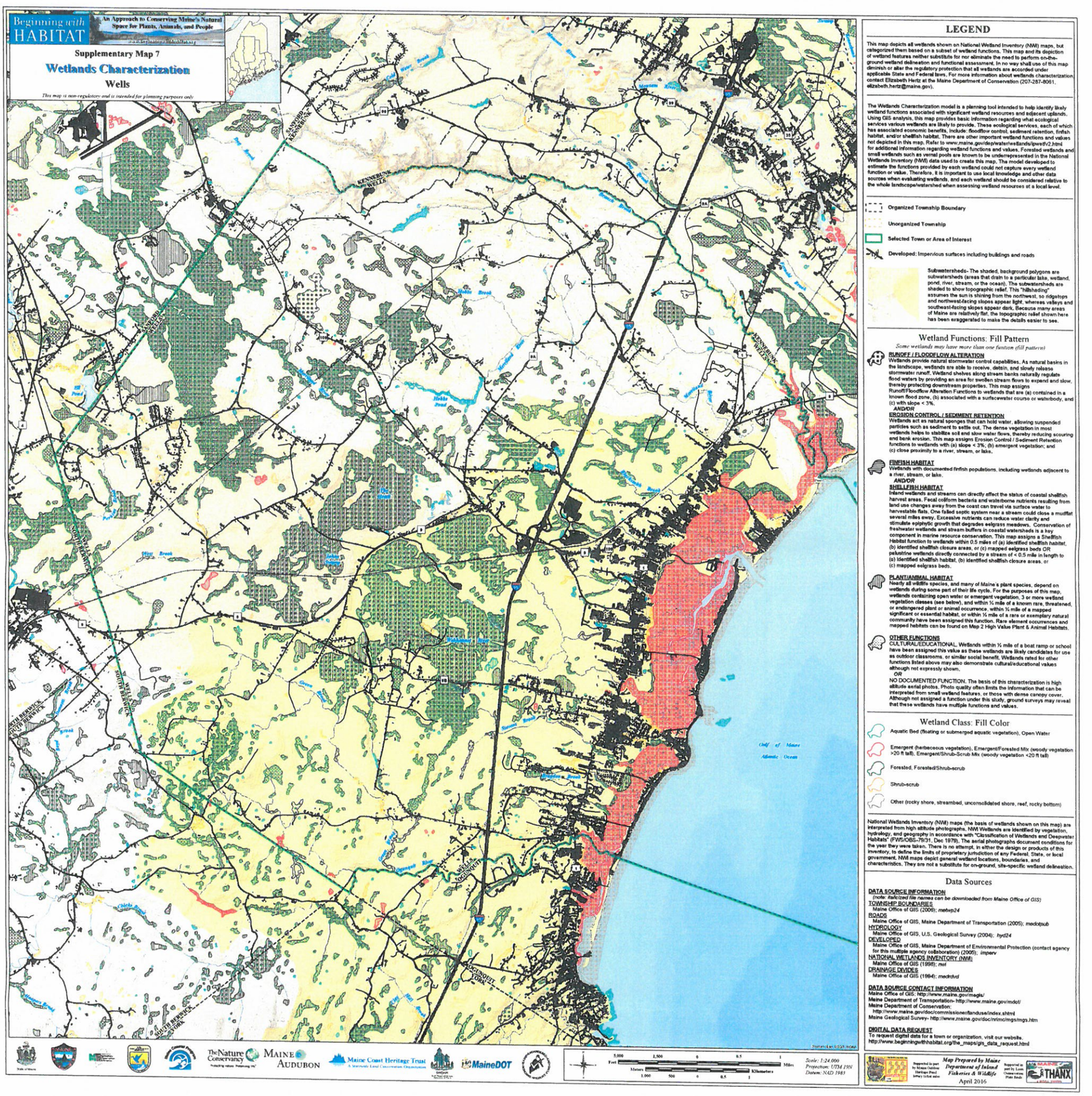
To request digital data for a town or organization, please visit our website.
http://www.beginningwithhabitat.org/the_maps/gis_data_request.html

Supported in part by Maine Outdoor Heritage Fund lottery ticket sales

Map Prepared by Maine Department of Inland Fisheries & Wildlife
April 2016

Supported in part by Loon Conservation Plate funds


Beginning with HABITAT
An Approach to Conserving Maine's Natural Space for Plants, Animals, and People
Primary Map 3
Undeveloped Habitat Blocks & Connectors and Conserved Lands
Wells
This map is non-regulatory and is intended for planning purposes only.
LEGEND
This map highlights undeveloped natural areas likely to provide core habitat blocks and habitat connections that facilitate species movements between blocks. Undeveloped habitat blocks provide relatively undisturbed habitat conditions required by many of Maine's species. Habitat connections provide necessary opportunities for wildlife to travel between preferred habitat types in search for food, water, and mates. Roads and development fragment habitat blocks and can be barriers to moving wildlife. By maintaining a network of interconnected blocks towns and land trusts can protect a wide variety of Maine's species—both rare and common—to help ensure rich species diversity long into the future. Maintaining a network of these large rural open spaces also protects future opportunities for forestry, agriculture, and outdoor recreation.
Organized Township Boundary
Unorganized Township
Selected Town or Area of Interest
Habitat Blocks
Development Buffer (pale transparency)
250-500 foot buffer around improved roads and developed areas based on development intensity.
Undeveloped Habitat Block
Remaining land outside of Development Buffers. Blocks greater than 100 acres are labeled with their estimated acreage.
Approximate Road Crossing Habitat Connections
Represented habitat connections identified through computer modeling highlight locations where quality habitat is likely to occur on both sides of a given road between undeveloped habitat blocks greater than 100 acres and between higher value wetlands.These representations are approximate and have not been field verified.
Undeveloped Block Connectors
Likely road crossing areas linking undeveloped habitat blocks greater than 100 acres. The threat of habitat fragmentation and animal mortality corresponds to traffic volume.
Yellow lines represent habitat road crossings with daily traffic volumes less than 2000 vehicles per day.
Red lines represent habitat road crossings with daily traffic volumes greater than 2000 vehicles per day.
Riparian Connectors
Likely crossing locations for wetland dependent species moving between waterways and wetlands divided by roads
Blue lines represent riparian road crossings with daily traffic volumes less than 2000 vehicles per day.
Purple lines represent riparian road crossings with daily traffic volumes greater than 2000 vehicles per day.
Highway Bridge Connectors
Highway bridges along I-95 and I-295 that span riparian habitat connecting adjacent but separated habitat blocks.These are locations where species are likely to take advantage of infrastructure to move between habitat blocks.
Conserved Lands
The State of Maine's conserved lands database includes lands in federal, state, and non-profit ownership. It does not include many privately owned conservation lands, especially those protected by local land trusts, or town owned conservation lands. For the most accurate and current information about land ownership, consult with the local assessor and/or other local land management agencies. If public access potential to any of the properties displayed here is uncertain, landowners should be contacted to determine if permission is necessary.
Ownership Type (transparent layers)
Federal
National parks, forests, and wildlife refuges. (Includes Canadian conserved lands.)
State
Wildlife Management Areas and other properties managed by the Department of Inland Fisheries and Wildlife, state parks, and parcels managed by the Bureau of Parks & Lands.
Municipal
Town parks, athletic fields, community forests, etc.
Private Conservation
Properties owned and managed by private (usually non-profit) organizations such as The Nature Conservancy, Maine Coast Heritage Trust, Trust for Public Land, and local land trusts.
Easement
Voluntary legal agreements that allow landowners to realize economic benefit by permanently restricting the amount and type of future development and other uses on all or part of their property as they continue to own and use it.
Aerial Imagery
Aerial imagery is often the best tool available to visualize existing patterns of development and resulting changes in the natural landscape. By depicting undeveloped habitat blocks, habitat connectors and conserved lands with aerial photos, the map user can more easily identify opportunities to expand the size and ecological effectiveness of local conservation efforts.
Regional Undeveloped Blocks
Developed Areas
0 - 250 acres
250-500 acres
500-1,000 acres
1,000-5,000 acres
> 5,000 acres
1 : 326,000
1 inch equals 5 miles
Data Sources
DATA SOURCE INFORMATION
TOWNSHIP BOUNDARIES
Maine Office of GIS; meheps24 (2013)
ROADS
Maine Office of GIS, Maine Department of Transportation); medcilpub (2015)
HYDROLOGY
U.S. Geological Survey; NHD_Maine (2012)
UNDEVELOPED HABITAT BLOCKS, DEVELOPMENT BUFFER, CONNECTORS
Maine Department of Inland Fisheries and Wildlife (2015)
CONSERVATION LANDS
Maine Department of Agriculture, Conservation, and Forestry, Land Use Planning Commission, Maine Department of Inland Fisheries and Wildlife:
Conserved Lands (2015)
AERIAL IMAGERY
U.S. Department of Agriculture; NAIP 2013 - state-wide 1-meter color orthoimagery
DATA SOURCE CONTACT INFORMATION
Maine Office of GIS - http://www.maine.gov/megis/catalog/
Maine Dept. of Agriculture, Conservation and Forestry - http://www.maine.gov/dacf/
Maine Dept. of Inland Fisheries & Wildlife - http://www.maine.gov/ifw/
Maine Department of Transportation - http://www.maine.gov/mdot/
Maine Department of Environmental Protection - http://www.maine.gov/dep/
DIGITAL DATA REQUEST
To request digital data for a town or organization, visit our website.
http://www.beginningwithhabitat.org/the_maps/gis_data_request.html
Map Prepared by Maine Department of Inland Fisheries & Wildlife
April 2016
Scale: 1:24,000
Projection: UTM 19N
Datum: NAD 1983
Wells
Kennebunk
Kennebunkport
Arundel
Biddeford
Saco
Old Orchard Beach
Acton
Alfred
Lyman
Sanford
Lebanon
North Berwick
Berwick
South Berwick
Eliot
York
Kittery
Ogunquit
Cape Neddick
Gulf of Maine
Atlantic Ocean
The Nature Conservancy
Maine Audubon
Maine Coast Heritage Trust
MaineDOT
MAINE ATHANX


Beginning with HABITAT
An Approach to Conserving Maine's Natural Space for Plants, Animals, and People
Supplementary Map 7
Wetlands Characterization
Wells
This map is non-regulatory and is intended for planning purposes only.
LEGEND
This map depicts all wetlands shown on National Wetland Inventory (NWI) maps, but categorized them based on a subset of wetland functions. This map and its depiction of wetland features neither substitute for nor eliminate the need to perform on-the-ground wetland delineation and functional assessment. In no way shall use of this map diminish or alter the regulatory protection that all wetlands are accorded under applicable State and Federal laws. For more information about wetlands characterization, contact Elizabeth Hertz at the Maine Department of Conservation (207-287-8061, elizabeth.hertz@maine.gov).
The Wetlands Characterization model is a planning tool intended to help identify likely wetland functions associated with significant wetland resources and adjacent uplands. Using GIS analysis, this map provides basic information regarding what ecological services various wetlands are likely to provide. These ecological services, each of which has associated economic benefits, include: floodflow control, sediment retention, finfish habitat, and/or shellfish habitat. There are other important wetland functions and values not depicted in this map. Refer to www.maine.gov/dep/water/wetlands/ipwet9/v2.html for additional information regarding wetland functions and values. Forested wetlands and small wetlands such as vernal pools are known to be underrepresented in the National Wetlands Inventory (NWI) data used to create this map. The model developed to estimate the functions provided by each wetland could not capture every wetland function or value. Therefore, it is important to use local knowledge and other data sources when evaluating wetlands, and each wetland should be considered relative to the whole landscape/watershed when assessing wetland resources at a local level.
Organized Township Boundary
Unorganized Township
Selected Town or Area of Interest
Developed: Impervious surfaces including buildings and roads
Subwatersheds- The shaded, background polygons are subwatersheds (areas that drain to a particular lake, wetland, pond, river, stream, or the ocean). The subwatersheds are shaded to show topographic relief. This "hillshading" assumes the sun is shining from the northwest, so ridgetops and northwest-facing slopes appear light, whereas valleys and southeast-facing slopes appear dark. Because many areas of Maine are relatively flat, the topographic relief shown here has been exaggerated to make the details easier to see.
Wetland Functions: Fill Pattern
Some wetlands may have more than one funtion (fill pattern)
RUNOFF / FLOODFLOW ALTERATION
Wetlands provide natural stormwater control capabilities. As natural basins in the landscape, wetlands are able to receive, detain, and slowly release stormwater runoff. Wetland shelves along stream banks naturally regulate flood waters by providing an area for swollen stream flows to expand and slow, thereby protecting downstream properties. This map assigns Runoff/Floodflow Alteration Functions to wetlands that are (a) contained in a known flood zone, (b) associated with a surfacewater course or waterbody, and (c) with slope < 3%.
AND/OR
EROSION CONTROL / SEDIMENT RETENTION
Wetlands act as natural sponges that can hold water, allowing suspended particles such as sediment to settle out. The dense vegetation in most wetlands helps to stabilize soil and slow water flows, thereby reducing scouring and bank erosion. This map assigns Erosion Control / Sediment Retention functions to wetlands with (a) slope < 3%, (b) emergent vegetation; and (c) close proximity to a river, stream, or lake.
FINFISH HABITAT
Wetlands with documented finfish populations, including wetlands adjacent to a river, stream, or lake.
AND/OR
SHELLFISH HABITAT
Inland wetlands and streams can directly affect the status of coastal shellfish harvest areas. Fecal coliform bacteria and waterborne nutrients resulting from land use changes away from the coast can travel via surface water to harvestable flats. One failed septic system near a stream could close a mudflat several miles away. Excessive nutrients can reduce water clarity and stimulate epiphytic growth that degrades eelgrass meadows. Conservation of freshwater wetlands and stream buffers in coastal watersheds is a key component in marine resource conservation. This map assigns a Shellfish Habitat function to wetlands within 0.5 miles of (a) identified shellfish habitat, (b) identified shellfish closure areas, or (c) mapped eelgrass beds OR palustrine wetlands directly connected by a stream of < 0.5 mile in length to (a) identified shellfish habitat, (b) identified shellfish closure areas, or (c) mapped eelgrass beds.
PLANT/ANIMAL HABITAT
Nearly all wildlife species, and many of Maine's plant species, depend on wetlands during some part of their life cycle. For the purposes of this map, wetlands containing open water or emergent vegetation, 3 or more wetland vegetation classes (see below), and within ¼ mile of a known rare, threatened, or endangered plant or animal occurrence, within ¼ mile of a mapped significant or essential habitat, or within ¼ mile of a rare or exemplary natural community have been assigned this function. Rare element occurrences and mapped habitats can be found on Map 2 High Value Plant & Animal Habitats.
OTHER FUNCTIONS
CULTURAL/EDUCATIONAL. Wetlands within ¼ mile of a boat ramp or school have been assigned this value as these wetlands are likely candidates for use as outdoor classrooms, or similar social benefit. Wetlands rated for other functions listed above may also demonstrate cultural/educational values although not expressly shown.
OR
NO DOCUMENTED FUNCTION. The basis of this characterization is high altitude aerial photos. Photo quality often limits the information that can be interpreted from small wetland features, or those with dense canopy cover. Although not assigned a function under this study, ground surveys may reveal that these wetlands have multiple functions and values.
Wetland Class: Fill Color
Aquatic Bed (floating or submerged aquatic vegetation), Open Water
Emergent (herbaceous vegetation), Emergent/Forested Mix (woody vegetation >20 ft tall), Emergent/Shrub-Scrub Mix (woody vegetation <20 ft tall)
Forested, Forested/Shrub-scrub
Shrub-scrub
Other (rocky shore, streambed, unconsolidated shore, reef, rocky bottom)
National Wetlands Inventory (NWI) maps (the basis of wetlands shown on this map) are interpreted from high altitude photographs. NWI Wetlands are identified by vegetation, hydrology, and geography in accordance with "Classification of Wetlands and Deepwater Habitats" (FWS/OBS-79/31, Dec 1979). The aerial photographs document conditions for the year they were taken. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, State, or local government. NWI maps depict only wetland locations, boundaries, and characteristics. They are not a substitute for on-ground, site-specific wetland delineation.
Data Sources
DATA SOURCE INFORMATION
(note: italicized file names can be downloaded from Maine Office of GIS)
TOWNSHIP BOUNDARIES
Maine Office of GIS (2006): metwn24
ROADS
Maine Office of GIS, Maine Department of Transportation (2005): medotroute
HYDROLOGY
Maine Office of GIS, U.S. Geological Survey (2004): hyd24
DEVELOPED
Maine Office of GIS, Maine Department of Environmental Protection (contact agency for this multiple agency collaboration) (2005): imperv
NATIONAL WETLANDS INVENTORY (NWI)
Maine Office of GIS (1998): nwi
DRAINAGE DIVIDES
Maine Office of GIS (1984): medrdvd
DATA SOURCE CONTACT INFORMATION
Maine Office of GIS: http://www.maine.gov/megis/
Maine Department of Transportation- http://www.maine.gov/mdot/
Maine Department of Conservation:
http://www.maine.gov/doc/commissioner/landuse/index.shtml
Maine Geological Survey- http://www.maine.gov/doc/nrimc/mgs/mgs.htm
DIGITAL DATA REQUEST
To request digital data for a town or organization, visit our website.
http://www.beginningwithhabitat.org/the_maps/gis_data_request.html
The Nature Conservancy
Maine Audubon
Maine Coast Heritage Trust
MaineDOT
5,000 2,500 0 0.5 1 Miles
1,000 500 0 0.5 1 Kilometers
Scale: 1:24,000
Projection: UTM 19N
Datum: NAD 1983
Map Prepared by Maine Department of Inland Fisheries & Wildlife
April 2016
THANK

Beginning with HABITAT

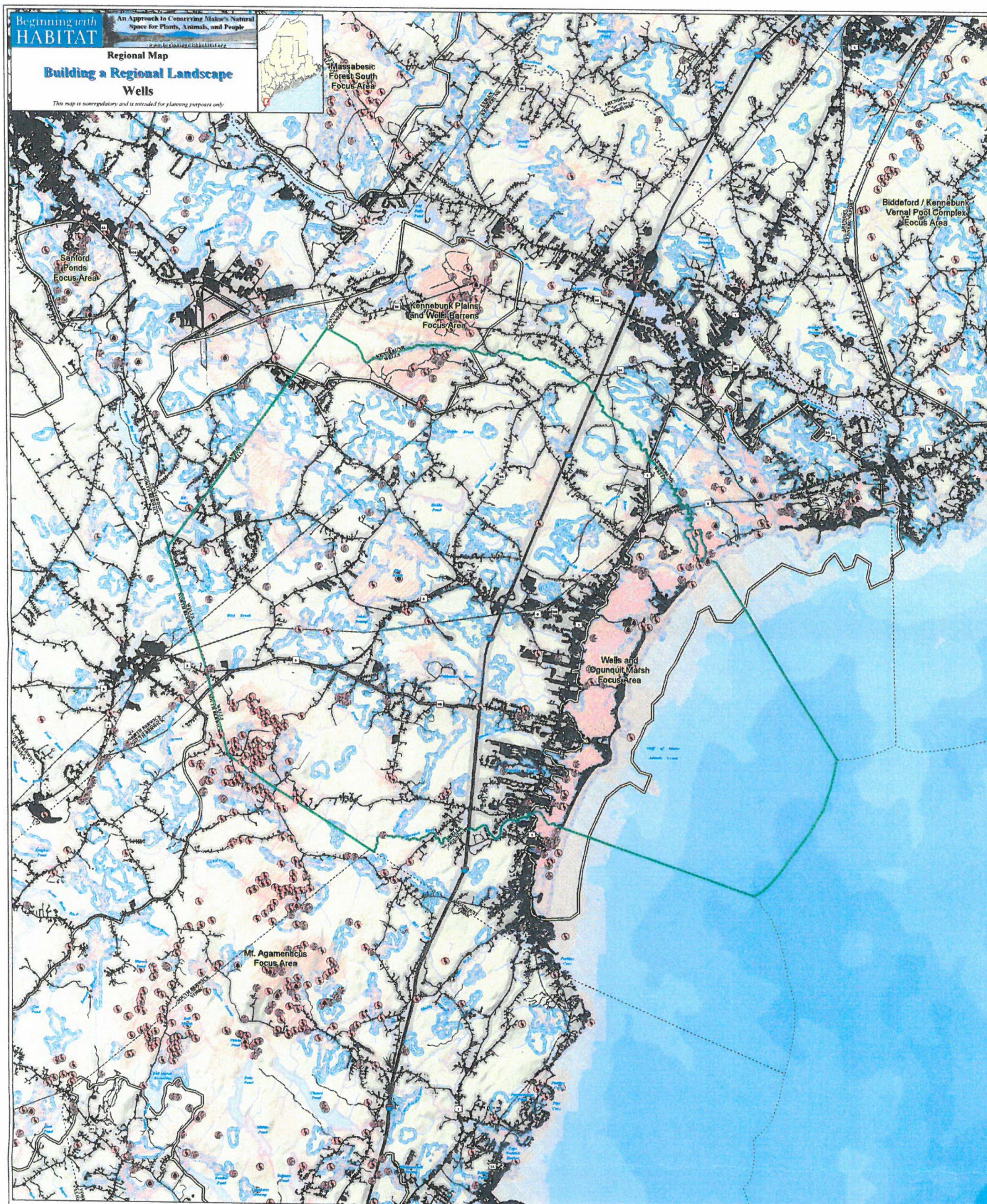
An Approach to Conserving Maine's Natural Space for Plants, Animals, and People

Regional Map

Building a Regional Landscape

Wells

This map is nonregulatory and is intended for planning purposes only



Scale: 1:40,000
Projection: UTM 19N
Datum: NAD 1983

LEGEND

The data presented here represents a compilation of core Beginning with Habitat map products. Comprehensive field surveys do not exist for all areas in Maine, so some important habitats may not be mapped. Habitat features on this map are based on limited field surveys, aerial photo interpretation, and computer modeling. Habitat data is updated regularly. Map users should consult with the Beginning with Habitat program to verify that data illustrated on this map is still current prior to utilizing it for planning decisions.

This regional map provides a landscape view of water resources, high value plant and animal habitats, and undeveloped habitat blocks. For more detailed information, please consult the 1:24,000 (town level) Beginning with Habitat "Water Resources and Riparian Habitats", "High Value Plant and Animal Habitats" and "Undevloped Habitat Blocks" maps. Availability of town level maps can be found at: www.beginningwithhabitat.org/the_maps/map_availability.html

- Organized Township Boundary
- Unorganized Township
- Selected Town or Area of Interest
- Developed Area of impervious surfaces including buildings and roads

MAP 1: Water Resources and Riparian Habitats

Riparian Buffer

Ponds ≥ 10 acres (Great Ponds), rivers, coastal waters, and wetlands ≥10 acres in size are surrounded by a 250 foot riparian buffer zone. Streams are surrounded by a 75 foot riparian buffer zone.

NWI Wetlands ≥ 10 Acres

The National Wetlands Inventory (NWI) uses aerial photographs from the mid-1980s to identify wetlands based on visible signs of wetland vegetation, hydrology, and geography. The NWI maps are not based on field wetland delineations and given the limits of aerial photo interpretation, do not depict all wetlands that occur. Ground verification should be used to determine actual wetland boundaries and NWI maps should be considered as only a planning tool to determine potential wetland locations.

MAP 2: High Value Plant and Animal Habitats

Essential Wildlife Habitats (MDIFW)

Maine's Department of Inland Fisheries & Wildlife (MDIFW, www.maine.gov/ifw) maps areas currently or historically providing habitat essential to the conservation of endangered or threatened species including roseate terns, piping plovers, and least terns as directed by the Maine Endangered Species Act. These regulated areas may require special management. Identification of Essential Habitat areas is based on species observations (occupancy). For more information about Essential Wildlife Habitats, go to www.maine.gov/ifw/wildlife/species/endangered_species/essential_habitat/introduction.htm. These habitat layers also may be downloaded from the Maine Office of GIS Data Catalog at http://apollo.ogis.state.me.us/catalog.

Significant Wildlife Habitats (MDIFW)

Maine's Natural Resources Protection Act (NRPA, 1988) was intended to slow further degradation and loss of Maine's natural resources. This act regulates activities within and adjacent to wetlands, streams, and other natural resources, but also regulates activities that could threaten the state's Significant Wildlife Habitats. Mapped Significant Wildlife Habitats include tidal and inland waterfowl/wading bird habitat, deer wintering areas, seabird nesting islands, shorebird areas, and significant vernal pools. For more information about NRPA, go to: www.maine.gov/dep/blwq/docstand/nrpapage.htm.

Natural Heritage Network Occurrences (Plants/Animals/Communities)

Plants- Observations of plants cataloged by the Maine Natural Areas Program (MNAP) that are rare in Maine. Locations have been field-verified within the last 20 years.

Animals- Observations of wildlife species that are endangered, threatened, or rare in Maine. Mapped by the Maine Deptartment of Inalnd Fisheries and Wildlife.

Communities- The MNAP has classified and distinguished 98 different natural community types that collectively cover the state's landscape. These include such habitats as floodplain forests, coastal bogs, alpine summits, and many others. Each type is assigned a rarity rank of 1 (rare) through 5 (common). Mapped rare natural communities or ecosystems, or exemplary examples of common natural communities or ecosystems, are based on field surveys and aerial photo interpretation. Consult with an MNAP ecologist to determine conservation needs of particular communities or ecosystems.

High Value Habitat for Priority Trust Species (USFWS)

This data layer portrays the highest value habitat from the Gulf of Maine Watershed Habitat Analysis, a habitat suitability model developed by the U.S. Fish & Wildlife Service (USFWS) Gulf of Maine Coastal Program. The analysis evaluated existing field data and scientific literature for 91 species of fish, wildlife, and plants important to USFWS in the Gulf of Maine watershed and ranked the landscape based on potential habitat for each species. This theme shows only the most important habitat (top 25%) for all species combined and excludes areas less than 5 acres. For more information about the Gulf of Maine Watershed Habitat Analysis please visit: http://www.fws.gov/GOMCP/identify.html and http://www.fws.gov/GOMCP/identify_gomwatershed_techrep.html

MAP 3: Undeveloped Habitat Blocks

Undeveloped Habitat Blocks (MDIFW)

Undeveloped habitat blocks are areas with relatively little development and that provide opportunity for meaningful habitat conservation. These areas remain mostly unfragmented and are likely to include habitat conditions of a quality that could be expected to support most terrestrial species known to occur in the given region. Undeveloped habitat blocks have been depicted on this map by removing areas within 250-500 feet, based on intensity, of all improved roads identified by the Maine Department of Transportation and all developed areas identified in the 2006 MELCD Land Use/Land Cover and 2005 Impervious Surface data.

Development Buffer (MDIFW)
(note: transparent layer)

Areas defined by a 250-500 foot, intensity based zone of influence around all improved roads identified by the Maine Department of Transportation and all developed areas identified in the 2006 MELCD Land Use/Land Cover and 2005 Impervious Surface data.

Focus Areas

Focus Areas of Statewide Ecological Significance
(note: not present in all regions)

Focus Areas of Statewide Ecological Significance have been designated based on an unusually rich convergence of rare plant and animal occurrences, high value habitat, and relatively intact natural landscapes (the combined elements of Beginning with Habitat Maps 1-3). Focus area boundaries were drawn by MNAP and MDIFW biologists, generally following drainage divides and/or major fragmenting features such as roads. Focus Areas are intended to draw attention to these truly special places in hopes of building awareness and garnering support for land conservation by landowners, municipalities, and local land trusts. For descriptions of specific Focus Areas, consult the Beginning with Habitat notebook or the following website: http://www.maine.gov/dacf/mnap/focusarea/index.htm

Data and Information Sources

DATA SOURCE INFORMATION

TOWNSHIP BOUNDARIES
Maine Office of GIS; *metwp24*
ROADS
Maine Office of GIS, Maine Department of Transportation; *medotpub, E911rds, railroutesys.*
HYDROLOGY
U.S. Geological Survey, *NHDH Maine*
DEVELOPED
Maine Office of GIS, Maine Department of Environmental Protection; *imperv*
FOCUS AREA BOUNDARIES
Maine Natural Areas Program
NATIONAL WETLANDS INVENTORY
U.S. Fish & Wildlife Service; *NWI*
RIPARIAN BUFFERS
Maine Natural Areas Program
HIGH VALUE PLANT & ANIMAL HABITATS
Maine Office of GIS, Maine Dept. of Inland Fisheries & Wildlife, Maine Natural Areas Program, U.S. Fish & Wildlife Service; *ehpvrtm, ehrtern, shorebird, iwwh, shorezone_iwwh, snl, forest91, fresh91, grass91, saline91, gomic7, dwa, svpbuffers*
PLANTS, ANIMALS, AND NATURAL COMMUNITIES
Maine Department of Inland Fisheries & Wildlife, Maine Natural Areas Program
UNDEVELOPED HABITAT BLOCKS, DEVELOPMENT BUFFER
Maine Department of Inland Fisheries & Wildlife

DATA SOURCE CONTACT INFORMATION

Maine Office of GIS: http://www.maine.gov/megis/
Maine Natural Areas Program: http://www.maine.gov/dacf/mnap
Maine Department of Inland Fisheries & Wildlife: http://www.maine.gov/ifw/
U.S. Fish & Wildlife Service: Gulf of Maine Coastal Program- http://www.fws.gov/GOMCP/
Maine Department of Transportation: http://www.maine.gov/mdot/

DIGITAL DATA REQUEST

To request digital data for a town or organization, visit our webiste. http://www.beginningwithhabitat.org/the_maps/gis_data_request.html

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Map Prepared by Maine Department of Inland Fisheries & Wildlife
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