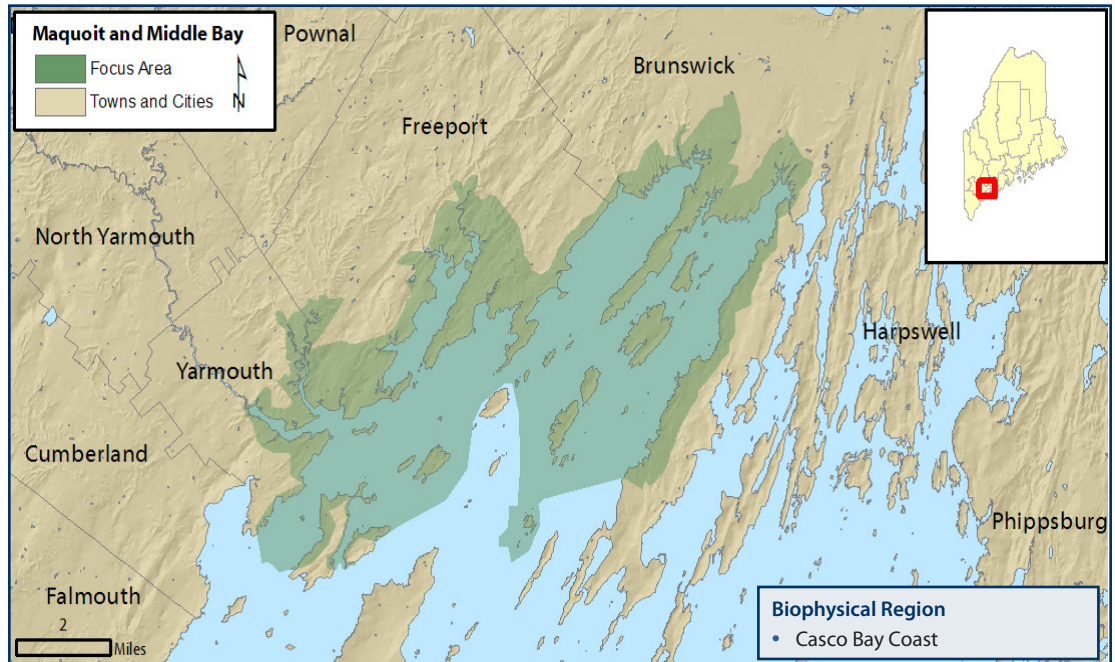


# Maquoit and Middle Bay



## WHY IS THIS AREA SIGNIFICANT?

The Maquoit and Middle Bay Focus Area includes several peninsulas, protected embayments and more than a dozen islands. *Spartina* saltmarsh, a rare natural community, inter-tidal mudflats, and eelgrass beds support rare animals as well as fish, invertebrates, waterfowl, wading birds, and other wildlife, including commercially valuable species.

## 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.
- » Encourage landowners to maintain enhanced riparian buffers.
- » Monitor and remove invasive plant populations.
- » Identify and restore tidal restrictions and undersized culverts.
- » 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](http://www.beginningwithhabitat.org/toolbox/about_toolbox.html).

*Photo credits, top to bottom: Steve Walker, MDIFW (photos 1-4), Garth McElroy (bottom photo)*

## Rare Animals

- Bald Eagle
- Saltmarsh Sharp-tailed Sparrow

## Rare Plants

- Wild Leek

## Rare and Exemplary Natural Communities

- Salt-hay Saltmarsh

## Significant Wildlife Habitats

- Inland Wading Bird and Waterfowl Habitat
- Tidal Wading Bird and Waterfowl Habitat
- Shorebird Area
- Seabird Nesting Island

## Public Access Opportunities

- » Wolf's Neck Woods State Park, Freeport
- » MDIFW Mere Point Boat Launch, Brunswick
- » MDIFW Wharton Point, Brunswick



*Steve Walker, MDFIW*

## FOCUS AREA OVERVIEW

The Maquoit and Middle Bay Focus Area extends from Harpswell Neck in the east to the lower Royal River at the village of Yarmouth in the west. This Focus Area includes the lower Royal River, the Cousins River, the Harraseeket River, Maquoit Bay, Merepoint Bay, Middle Bay, peninsulas such as Wolfe’s Neck and Merepoint Neck, and more than a dozen islands in the protected waters of these embayments.

The diversity of habitats within the Maquoit and Middle Bay Focus Area provide for an extraordinary array of ecological values. The Focus Area includes several saltmarshes located along the Royal River, the Cousins River, and at the head of Maquoit Bay. *Spartina* saltmarshes are considered a rare community type in Maine, although many examples occur on conservation land. Like many saltmarshes, the occurrences in Maquoit and Middle Bay were farmed for salt hay by early settlers. There are two major zones of vegetation within saltmarshes. The low marsh is located on the lower elevations that border the mudflats of the river and the drainage channels within the saltmarsh. This low marsh zone is dominated almost exclusively by saltwater cordgrass. There is a high marsh zone that is dominated by saltmeadow cordgrass and black grass with a mix of other typical saltmarsh species including goosetongue, seaside goldenrod, sea milkwort, and sea lavender. The Pratt

Brook/Cousins River saltmarshes are approximately 190 acres in size and extend west of Interstate 95.

*Spartina* saltmarshes provide excellent spawning habitat for **diadromous fish**, species that use both marine and fresh-water habitats during their life cycle. The saltmarshes within Maquoit and Middle Bay may account in part for the high fish diversity in the lower Royal River. The Royal and Cousins Rivers both support seasonal runs of diadromous fish species, including alewives, shad, and smelt.

These saltmarshes provide breeding habitat for a number of migratory bird species, including the rare **saltmarsh sharp-tailed sparrow**, which has been documented at Cousins River saltmarshes and at the small saltmarsh at the head of Maquoit Bay. The saltmarsh sharp-tailed sparrow is a secretive species with very narrow habitat requirements found only in coastal saltmarshes of the eastern United States. They breed from southern Maine to the Delmarva Peninsula and winter in coastal areas from Massachusetts to Florida. Widespread loss, degradation, and fragmentation of coastal saltmarshes along the eastern seaboard are the biggest threats to this species. Habitat preservation and restoration are the most important factors for conserving the saltmarsh sharp-tailed sparrow.

**Eelgrass beds** are scattered throughout the Focus Area, with the largest ones located in upper Maquoit Bay and the mouth of the Harraseeket River. Others of notable size are located in the upper portion of Middle Bay and at the mouth of the Royal River. Eelgrass forms extensive underwater meadows in shallow bays and coves, tidal creeks, and estuaries. It is a flowering plant that reproduces by seed and by vegetative growth. Eelgrass beds are among the most productive plant communities in the world, and they are ecologically important because 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.

**Marine worms** are abundant in the intertidal flats of this region. The largest concentrations are found in upper Maquoit Bay, the mouth of the Harraseeket River, and in the broad coves on the northern side of Cousins Island. Marine worms in Maine include commercially harvestable bloodworms and sandworms. These worms live in muddy and sandy habitats along the coast that are also economically valuable for shellfish and ecologically critical as feeding grounds for migratory birds and other species. Although populations and landing numbers have fluctuated over the years, marine worm landings have declined overall since the 1950s.

Breeding populations of horseshoe crabs are found in three distinct areas: Middle Bay, the east shore of Maquoit Bay, and the Harraseeket River. **Horseshoe crabs** occur in protected sandy beach areas, nearshore shallow waters, intertidal flats, and deep bay waters from the Gulf of Maine to the Gulf of Mexico. Spawning occurs in late spring on protected sandy beaches at high tides of the new and full moon. Males arrive first and await the females who will lay up to 80,000 eggs in a spawning season, less than 10 of which will reach adulthood. Horseshoe crabs feed primarily on clams and worms, and in turn are fed upon by shorebirds (including the State Endangered least tern and the State Endangered and Federally Threatened piping plover), crabs, gastropods, many fish species, and sea turtles. Shoreline development and subsequent habitat degradation is a potential threat to Maine populations. Maine's small populations have generally been overlooked for commercial and pharmaceutical uses. If they were harvested for commercial purposes these small populations would likely be depleted. In 2003, taking and possession of horseshoe crabs became prohibited in Maine.

#### **Ecological Services of the Focus Area**

- Nutrient export to marine food webs
- Nursery for juvenile fish and shellfish
- Contributes to biodiversity by providing habitat to both rare and common species

#### **Economic Contributions of the Focus Area**

- Tourist destination for wildlife observation, paddling, hunting and angling
- Protective buffer for storm surge
- Supports local marine resource industries

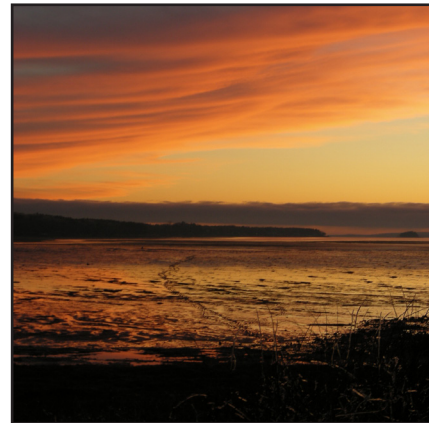
Soft-shell **clam flats** are plentiful, especially in the lower Royal and Cousins River drainages in Yarmouth. These productive flats yield large numbers of clams for both harvesters and wildlife.

The waters of the lower Royal and Cousins rivers are excellent feeding areas for migratory shorebirds, as are sections of the Harraseeket River and upper Maquoit Bay. A significant portion of the waters of this Focus Area are mapped as **Waterfowl and Wading Bird Habitat** and many waterfowl overwinter in the larger bays. Upper Goose Island in the lower portion of Middle Bay supports one of the largest heron rookeries in New England. There is one **Seabird Nesting Island** within the Focus Area. Seabird Nesting Islands provide nesting places for a wide range of seabirds that may include terns, puffins, guillemots, razorbills, Leach's storm petrels, and eider ducks.

There are several known nesting sites for **bald eagles** in this Focus Area, including Williams Island and Sow and Pigs in the lower portions of Maquoit Bay, and Fogg Point at the mouth of the Royal/Cousins Rivers. Bald eagles nest along sea coasts, inland lakes and major rivers. Once abundant in Maine, bald eagles were nearly extirpated throughout their range because of widespread use of environmental contaminants. Due to a wide variety of efforts, bald eagles have now made a dramatic recovery. Management will continue to ensure that declines of the past are not repeated, and that habitat and a clean environment persist to promote population growth and expansion. Bald eagles and their nests are protected by the USFWS under the Bald and Golden Eagle Protection Act.

## CONSERVATION CONSIDERATIONS

- » Excessive and poorly planned shoreline development can have adverse impacts on estuarine habitat through increased nutrient loads, siltation, and loss of a habitat buffer.
- » Nutrient loading can occur from improperly functioning septic systems or from runoff from lawns as well and can result in clam flat closures. Failing septic systems should be replaced and landowners should be encouraged to maintain and landscape their properties in a manner that will limit runoff and adverse impacts to the adjacent estuarine habitat.
- » Seawalls and other shoreline stabilization techniques (e.g. riprap) can disrupt sediment inputs from natural erosion processes resulting in alterations to the sediment structure. This can adversely affect species composition and the productivity of mudflats
- » Eelgrass is sensitive to losses due to disease, storms, sediments, ice damage, dredging, shellfishing, propeller damage, pollution, nutrient enrichment, runoff, jet skis, and inboard and outboard motors. In 1931-1932, a wasting disease decimated 90% of the eelgrass in the North Atlantic. Mussel dragging can pose severe and long lasting threats to eelgrass beds; it takes an average of 11 years for eelgrass in dragged areas to grow to 95% cover in undisturbed beds. Eelgrass is a key indicator for assessing nitrogen loading as it will rapidly decline due to shading by algae overgrowth.
- » Barriers to diadromous fish passage threaten productive fisheries and in turn may have impacts on other species like bald eagles that feed on them. Dam removal or the installation of man-made fishways can help to alleviate this threat.
- » Marine worms in Maine include commercially harvestable bloodworms and sandworms. These worms live in muddy and sandy habitats along the coast that are also economically valuable for shellfish and ecologically critical as feeding grounds for migratory birds and other species. Although populations and landing numbers have fluctuated over the years, marine worm landings have declined overall since the 1950s.
- » Shoreline development and subsequent habitat degradation are potential threats to Maine small populations of Horse-shoe Crab. Though generally been overlooked as a resource, Horseshoe Crabs in Maine are vulnerable to depletion from any harvesting activities. In 2003, taking and possession of Horseshoe Crabs became prohibited in Maine.
- » 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 the saltmarsh sharp-tailed sparrow.
- » Physical barriers such as dams, culverts, and bridges can change tidal flows, alter salinity, modify drainage, prevent sediment movement, and impede animal movements. 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.
- » Water quality changes such as changes in salinity, temperature, turbidity, or physical properties of the water can negatively affect habitat for species.
- » Point and non-point sources of pollution can change faunal communities in tidal communities. Oil spills can destroy or significantly disrupt functioning systems.
- » Direct alteration of habitat through filling, dredging, dragging, or other major human disturbances can alter floral and faunal communities and disrupt complex food webs.
- » Disturbances to soils and natural vegetation in or adjacent to saltmarshes can create opportunities for colonization by invasive plant species. Local groups with an interest in the marsh should be made aware of the potential threat of invasive plants and keep an eye out for them before they become well established.
- » Towns should strive to maintain important habitat areas identified by MDIFW in low density, rural settings by identifying these areas in comprehensive plans.
- » This area includes Significant Wildlife Habitat for tidal waterfowl and wading birds and seabirds. Land managers should follow best management practices in and around Significant Wildlife Habitat. Vegetation removal, soil disturbance and construction activities may require a permit under the Natural Resources Protection Act. 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.



Steve Walker, MDIFW

RARE SPECIES AND EXEMPLARY NATURAL COMMUNITIES OF THE FOCUS AREA

	Common Name	Scientific Name	State Status*	State Rarity Rank	Global Rarity Rank
Animals	Bald eagle	<i>Haliaeetus leucocephalus</i>	SC	S4B,S4N	G5
	Saltmarsh sharp-tailed sparrow	<i>Ammodramus caudatus</i>	SC	S3B	G4
Natural Communities	Salt-hay Saltmarsh	Spartina Saltmarsh		S3	G5

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.