

## Bagaduce River Focus Area

Brooksville, Castine, Penobscot, Sedgewick



### Description:

The Bagaduce River Focus Area stretches from the mouth of the Bagaduce River at Castine upstream through the Bagaduce Narrows where it branches to the north into Northern Bay and to the south into Snow Cove. Although only about 12 miles long, the Bagaduce River is one of the most productive estuaries in Maine because of its narrow constriction and broad coves. The tidal fluctuations within its protected waterways provide excellent conditions for a productive shellfishery. The intertidal flats beyond the Narrows include more than 800 acres of habitat for soft-shell clams, marine worms, and other invertebrates.

### **Wildlife and Wildlife Habitat**

The mudflats along the Bagaduce River provide important habitat for marine worms. **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.



*This aerial photo, taken in approximately spring 2004, shows the Bagaduce River between the towns of Brooksville and Castine.*

**Eelgrass beds** are abundant upstream of Bagaduce Falls in the waters of Snow Cove and in Northern Bay (especially from Johnson Point to Gravel Island). Eelgrass (*Zostera marina*) 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, helping to 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.

The Bagaduce River is one of few significant **horseshoe crab breeding sites** in Maine. The protected and slightly warmer waters of Snow Cove are attractive to horseshoe crabs as they breed on the shore of this waterway late each spring. Horseshoe crabs (*Limulus polyphemus*) 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.



*Mud flats provide important habitat for shellfish and shorebirds (Photograph by Denis Nault).*

**Diadromous fish**, species that use both marine and freshwater habitats during their life cycle, such as American eel, are found within the Bagaduce estuary.

**Tidal waterfowl and wading bird habitat** is abundant in the protected coves of the Bagaduce River. Northern Bay, Hatch Cove, Snow Cove, and the river from Tapley Cove to Bagaduce Falls all host significant resources for waterfowl. Migratory shorebirds frequent several areas within the Bagaduce Estuary to feed on their long journeys. The narrow inlets of Hatch Cove and Green Cove include some of the most valued foraging grounds on the downeast coast, as do the waters around Youngs Island and Battle Island.

There are a number of **bald eagle** (*Haliaeetus leucocephalus*) nesting locations in the Bagaduce River estuary. The islands in the northern arm of Northern Bay offer excellent nest sites for bald eagles as do the peninsulas up and downstream of Bagaduce Falls. Bald eagles nest along sea coasts, inland lakes and major rivers. Breeding habitat includes large trees, primarily old white pines, in close proximity (less than one mile) to water where food is abundant and human disturbance is minimal. Bald eagles, once abundant in Maine, were nearly extirpated throughout their range because of widespread use of environmental contaminants. Due to a wide variety of efforts, including designation of Essential Habitat to protect bald eagle nest sites through provisions of the Maine Endangered Species Act, bald eagles have now made a dramatic recovery. Because of Essential Habitat designation, all projects or activities funded and carried out by municipalities and state agencies within ¼ mile of eagle nests are reviewed by MDIFW. Problems for eagles still persist, however. Habitat loss, human disturbance at nest sites, environmental contamination, diminished water quality, and human-caused deaths and injuries are still primary conservation problems. 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.

***Rare Features Table for the Bagaduce River Focus Area***

Common Name	Latin Name	S Rank	G Rank	State Status
<b><i>Rare Animals</i></b>				
Bald eagle	<i>Haliaeetus leucocephalus</i>	S4	G4	T

***Other Mapped Coastal Habitats and Features:***

Tidal waterfowl and wading bird habitat	Eelgrass beds
Shorebird feeding and roosting area	Diadromous fish
Bald eagle essential habitat	Inland waterfowl and wading bird habitat
Horseshoe crab breeding sites	Deer wintering area
Marine worm habitat	Shellfish

**Protection Status:**

The shoreline along the Bagaduce River consists of a mixture of residential clusters and relatively unfragmented land. Very little land in the immediate vicinity of the Bagaduce is under conservation protection.

### **Conservation Considerations:**

- Excessive or poorly planned shoreline development can have adverse impacts on estuarine habitat through increased nutrient loads, siltation, and loss of a habitat buffer.
- 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.
- Physical barriers such as dams, culverts, and bridges can change tidal flows, alter salinity, modify drainage, prevent sediment movement, and impede animal movements.
- 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 worm landings have declined overall since the 1950s. In 1950, an average tide would yield 4,000 worms, but today that average is about 550 worms, often forcing diggers to take smaller worms that have not yet reproduced. Smaller worms should be left to mature and reproduce in order to rebuild or sustain the population. In addition, many of these smaller worms perish before they can be used for bait, and are unattractive to dealers. Marine worms are sensitive to losses from pollution and dredging, and diggers believe that intertidal mussel dragging is ruining worm habitat. A license is required to dig more than 125 per day.
- Shoreline development and subsequent habitat degradation are potential threats to Maine's small populations of horseshoe crab. Though generally 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.
- 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.

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<http://www.mainenaturalareas.org/>

### **STATE RARITY RANKS**

- S1** Critically imperiled in Maine because of extreme rarity (five or fewer occurrences or very few remaining individuals or acres) or because some aspect of its biology makes it especially vulnerable to extirpation from the State of Maine.
- 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.

**Note:** **State Ranks** are determined by the Maine Natural Areas Program.

### **GLOBAL RARITY RANKS**

- G1** Critically imperiled globally because of extreme rarity (five or fewer occurrences or very few remaining individuals or acres) or because some aspect of its biology makes it especially vulnerable to extirpation from the State of Maine.
- 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.

**Note:** **Global Ranks** are determined by The Nature Conservancy.

### **STATE LEGAL STATUS FOR PLANTS**

**Note:** State legal status is according to 5 M.R.S.A. § 13076-13079, which mandates the Department of Conservation to produce and biennially update the official list of Maine's endangered and threatened plants. The list is derived by a technical advisory committee of botanists who use data in the Natural Areas Program's database to recommend status changes to the Department of Conservation.

- 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 considered Threatened or Endangered.

