



Issue Profile: Docks and Piers in Shorebird Feeding and Roosting Areas



Photo Credit: Lindsay Tudor

Maine Department of Inland Fisheries and Wildlife
September 2010

This report summarizes the issues associated with placement of docks and piers in shorebird feeding and roosting areas identified as Significant Wildlife Habitat under Maine's Natural Resources Protection Act [38 M.R.S.A.]. See also *Issue Profile: Migratory Shorebird Use of the Maine Coast* [MDIFW 2010] for more information on shorebird use of the Maine coast.

What is a shorebird?

Shorebirds are a diverse group of birds that include sandpipers, plovers, turnstones, knots, curlews, dowitchers, and phalaropes. This group does not include herons, gulls, or cormorants.

North America has the greatest diversity of shorebird species and largest numbers of shorebirds in the world. Thirty-eight shorebird species spend some portion of their annual life cycle in Maine.

Shorebirds are an important group for management consideration, because large numbers of these birds concentrate in discrete areas of coastal habitat where they are highly susceptible to disturbance, development, and environmental contaminants.

Why are we concerned about shorebirds in Maine?

Analyses of the International Shorebird Survey, Maritime Shorebird Survey, Arctic Shorebird Breeding Survey, and Breeding Bird Survey suggest **several shorebird species are experiencing significant downward population trends**. These species regularly use Maine staging areas including:

- Black-bellied Plover
- Semipalmated Sandpiper
- Least Sandpiper
- Short-billed Dowitcher
- Ruddy Turnstone
- Red Knot
- Dunlin

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Shorebird experts throughout the U.S. and Canada agree that the primary reason for shorebird declines is habitat loss from coastal development and human related disturbances.

In the 1970s, Maine supported 300,000 – 500,000 semipalmated sandpipers and tens of thousands of other shorebird species. Today, we are observing much lower numbers of migrating shorebirds in Maine habitats. Shorebird experts throughout the U.S. and Canada agree that the primary reason for these declines is habitat loss from coastal development and human-related disturbances.

In Maine, shorebirds are affected by many different threats. Conservation requires minimizing cumulative impacts. It is not our intention to regulate commercial fishing or stop development; however, the Significant Wildlife Habitat provision under the Natural Resources Protection Act [NRPA] allows us to implement protective measures to avoid and minimize many of the

threats shorebirds face in Maine, thus increasing their chances for a successful migration and return to Maine the following year.

What are shorebird feeding and roosting areas?

Shorebird feeding and roosting areas include a diverse array of habitats such as inland freshwater wetlands, riverine systems, grasslands, and coastal intertidal areas. Maine Department of Inland Fisheries and Wildlife [MDIFW] survey efforts have focused on coastal habitats.

Over 20 species of shorebirds depend on Maine coastal habitats to feed and rest during migration. These habitats which are used only during migration, are called “staging areas”. Staging areas provide migrating shorebirds with the food resources required to acquire the large fat reserves necessary to fuel their transoceanic migration to wintering areas. Shorebird staging habitats include both feeding areas where shorebirds congregate to feed and roosting areas which are used by shorebirds to rest when feeding areas are covered by water at high tide.

Shorebird feeding areas are areas of intertidal, unconsolidated shore, with a cobble, gravel, sand, or mud substrate, exposed between minimum low water and maximum high water. Shorebirds feed along the water line as mudflats are gradually exposed with the retreating tide. Just after high tide, shorebirds are concentrated very close to the upland edge on the first mud showing, and shorebirds will return to the same areas, which are the last mud available as the tide comes in. Shorebirds need to feed throughout the low tide cycle; therefore, the first and last mud available is critical to gaining the fat reserves they need. Shorebird feeding areas must have high densities of invertebrates, low disturbance, and be free of contaminants.



Photo Credit: Lindsay Tudor



Photo Credit: MaryEllen Wickett

Shorebird roosting areas are often sandy beaches, sand/gravel bars, rock ledges, or islands with little or no vegetation. Roosting areas provide migrating shorebirds with areas to rest and preen during high tide when feeding areas are inundated, thus reducing energy costs and maintaining a positive energy flow. Saltmarsh habitat often provides ditches, pools, and pannes where shorebirds can feed and rest throughout the tidal cycle.

Shorebird roosting areas must be located above the high water mark and be free of disturbance. Ideally, shorebird roosts are located in close proximity to feeding areas. Roosting habitats must have minimal human and animal disturbance.

Why are shorebird feeding and roosting areas important?

Most shorebird species nest across the Canadian arctic and subarctic regions. Shorebirds start their southern migration shortly after nesting. Adults arrive at Maine staging areas beginning in July and continue through mid August. Juveniles, without the aid of their parents, arrive in mid August through September. Shorebirds feed on marine invertebrates found on mudflats and salt marsh pannes.

An individual bird stays on a staging area between 10 - 20 days. In that short period of time, that bird must double its body weight to acquire the fat reserves needed to fuel the next leg of their migration, a nonstop flight over the Atlantic Ocean to South America [2,000 miles or more]. Once over the ocean, they are committed to migration; if they do not have the reserves to reach South America, they plummet into the sea or may reach their wintering areas in such poor condition that they die shortly after arriving.

Banding studies have shown that shorebirds exhibit strong site fidelity to specific staging areas, a behavior that makes them extremely vulnerable to altered or degraded habitats. Maine shorebirds stage only in Maine. More specifically, Casco Bay birds stage only in Casco Bay; Cobscook Bay birds stage only in Cobscook Bay.

If habitats deteriorate in one watershed, shorebirds will try and tough it out in familiar habitats, struggling to accumulate the nutrient reserves they need to continue their migration, rather than seek out other staging habitat further down the coast. They simply do not have the time to make these adjustments.

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The Maine Department of Inland Fisheries and Wildlife [MDIFW] has documented over 700 areas where shorebirds feed and roost during migration through Maine, however only 81 roosts and 100 feeding areas have met our criteria as Significant Wildlife Habitat [SWH] for migrating shorebirds coast wide. These areas are exceptional habitats and are critical for the well-being of eastern North American shorebirds.

What are the issues associated with docks and piers in SWH shorebird feeding and roosting areas?

There are several issues associated with docks in shorebird feeding and roosting areas of concern to MDIFW:

- **Shading:** shorebirds will not forage under or near structures;

- **Erosion and sedimentation:** erosion and sedimentation diminish invertebrate concentrations;
- **Leaching and spilling of chemicals:** some chemicals can interfere with shorebird metabolism and navigational abilities;
- **Access/perches for predators:** predators take advantage of these vantage points to increase their ability to prey on shorebirds;
- **Physical alteration of habitat:** most alterations affect either the quantity or quality of the habitat, or both; and
- **Increased human activity:** human disturbances can reduce the amount of time shorebirds feed in an area, thus reducing their ability to prepare for nesting and migration.

Behavioral studies have shown that shorebirds will not forage under or near docks and piers. Accumulation of docks in a cove will render the cove no longer functional for feeding shorebirds due to associated disturbances and habitat alterations. Shorebirds need to feed throughout the entire low tide cycle; shoreline docks prohibit their feeding on the first and last mud available on either side of the high tide.

Researchers conclude that shorebirds are impacted by human activities occurring within 300 feet of feeding or roosting birds, therefore **when reviewing a proposed dock, the total impact includes the footprint of the structure (direct impact to the habitat) plus a 300-foot buffer to minimize impacts to the birds due to human disturbance.**

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Docks in a shorebird feeding area.

Photo Credit: Lindsay Tudor



Peregrine Falcon hunting from a pier

Photo Credit: Kirk M. Rogers Photography

How can impacts to shorebird feeding and roosting areas from docks and piers be minimized?

The remainder of this report summarizes the issues that MDIFW considers important to avoid or minimize impacts from docks and piers to Significant Wildlife Habitat shorebird feeding and roosting areas.

- **Dock Length**

Studies have shown that with increasing dock length wildlife diversity decreases. Since shorebirds do not feed or roost under a dock or within close proximity of a dock, the longer the dock the greater the impact to the feeding and roosting area. Docks that bisect 75% or more of the area between the mean high water mark and mean low water mark of the feeding area are generally considered to have a severe impact to the site. Docks that bisect 50-75% of the area between the mean high water mark and mean low water mark of the feeding area are generally considered to have a strong impact to the site.

- **Number of existing docks within a feeding area**

If the feeding or roosting area has existing docks that impact 15% or more of the entire area [measuring each dock footprint plus 300 feet in all directions], the construction of additional docks is considered a severe impact to the site. If docks currently compromise 10% - 15% of the area, the construction of additional docks is considered a strong impact to the site.

- **Dock placement**

In relatively large feeding areas, or in feeding areas where there is little existing disturbance, it may be possible to place docks in certain locations within shorebird feeding areas with minimal impact to feeding shorebirds. Conversely, there are locations within a feeding area that would have severe impacts to shorebirds. These areas are described and mapped as First Mud/Last Mud High Use Areas.



Photo Credit: Lindsay Tudor

First Mud/Last Mud High Use Areas or “hotspots” are defined as discrete locations within a Significant Wildlife Habitat shorebird feeding area where mud is first exposed on the receding tide and last exposed on the rising tide and host a large percentage of the total number of shorebirds using the Significant Wildlife Habitat feeding area. It is in these upper flats that migrating shorebirds fulfill most of their energy needs. Upper flats may provide shorebirds with 4–6 hours of feeding during the 12 hour low tide cycle. Such areas are usually located within 50 feet of the shoreline and have documented larger concentrations of shorebirds than observed in other parts of the feeding area. Because of their close proximity to the shoreline, birds feeding in these areas are more susceptible to predation and human related disturbance.

Due to disturbance and visual obstruction, shorebirds will not forage under or near docks and piers. Therefore, dock placement within a “hot spot” can prohibit shorebird use of the “hot spot” area and may lower the integrity of the entire significant feeding area.

Note: not all shorebird SWH feeding areas have a mapped first mud/last mud high use area component, many feeding areas are only used when the tide is completely out and the entire flat is available for feeding.

How important is the feeding and roosting area to Maine's shorebird population?

When evaluating the impact of a dock or pier to a shorebird feeding or roosting area, MDIFW considers the importance of the shorebird feeding and roosting area for shorebird species that are state or federally listed as Endangered, Threatened, or Special Concern.

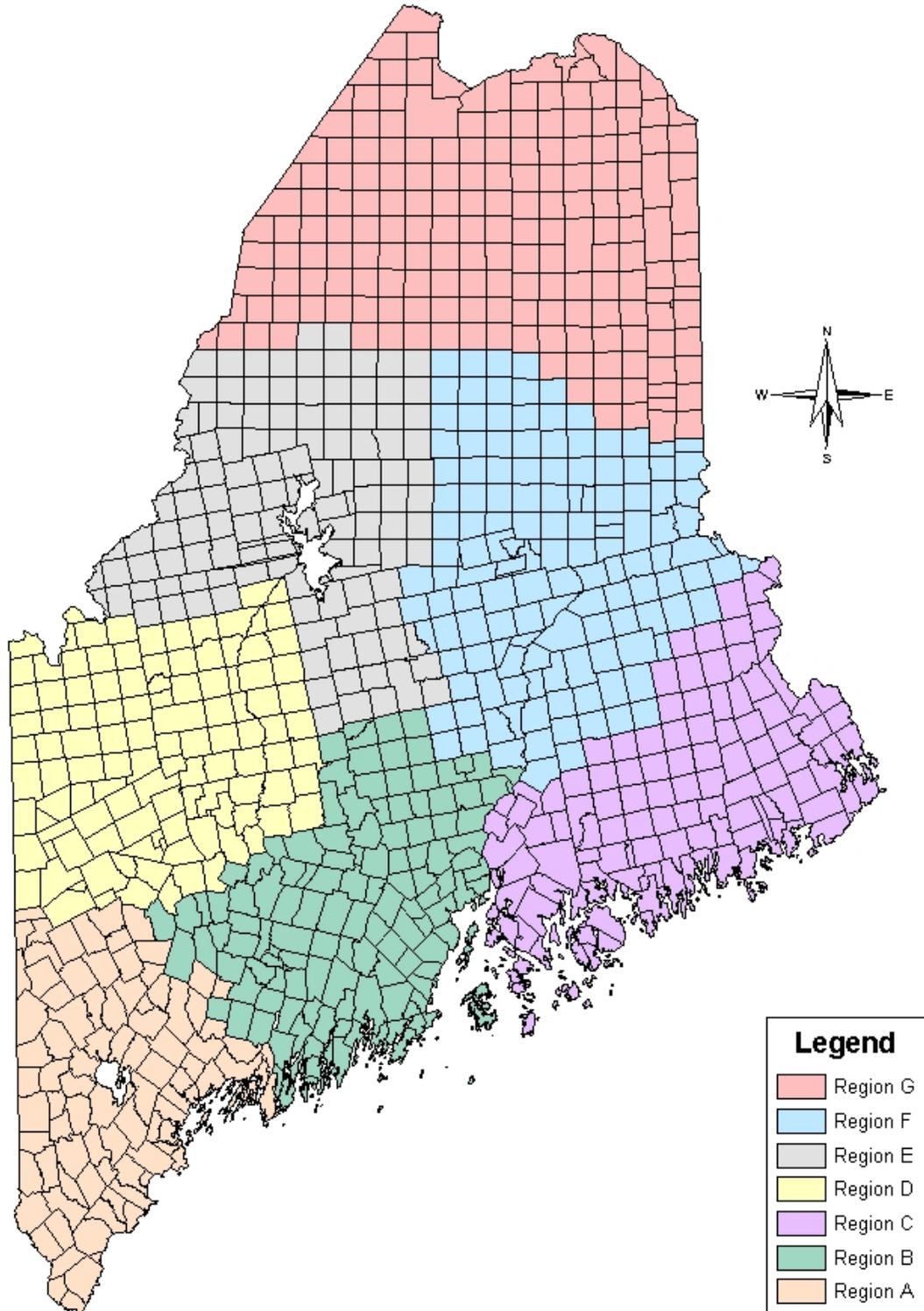
MDIFW also looks at the importance of the feeding and roosting area in relation to all shorebird SWH feeding and roosting areas within that watershed. If a single feeding area hosts 25% or more of all shorebirds feeding in that watershed, or 25% or more of a particular shorebird species documented in that watershed, the impacts of the project will be further scrutinized.



Photo Credit: Jonathan Mays

For more information contact your MDIFW Regional Wildlife Biologist [see attached map and staff directory].

Maine Department of Inland Fisheries and Wildlife - Administrative Regions



MDIFW Wildlife Biologists

Region A - RR #1, 358 Shaker Road, Gray, ME 04039

Scott Lindsay
Regional Wildlife Biologist
scott.lindsay@maine.gov
207-657-2345 x 110

Judy Camuso
Assistant Regional Wildlife Biologist
judy.camuso@maine.gov
207-657-2345 x 109

Region B – 270 Lyons Road, Sidney, ME 04330

Keel Kemper
Acting Regional Wildlife Biologist
keel.kemper@maine.gov
207-547-5319

Kendall Marden
Wildlife Biologist
kendall.marden@maine.gov
207-547-5324

Region C – P.O. Box 220, Route 1A, Jonesboro, ME 04648

207-434-5927

Thomas Schaeffer
Regional Wildlife Biologist
thomas.schaeffer@maine.gov

Richard Bard
Assistant Regional Wildlife Biologist
richard.bard@maine.gov

James Hall
Assistant Regional Wildlife Biologist
james.hall@maine.gov

Region D – 689 Farmington Road, Strong, ME 04983

Charles Hulseley
Regional Wildlife Biologist
charles.hulseley@maine.gov
207-778-3324 x 25

Robert Cordes
Assistant Regional Wildlife Biologist
robert.cordes@maine.gov
207-778-3324 x 24

Region E – P.O. Box 551, Greenville, ME 04441

207-695-3756

Douglas Kane
Regional Wildlife Biologist
douglas.kane@maine.gov

Scott McLellan
Assistant Regional Wildlife Biologist
scott.mcllellan@maine.gov

Region F – 73 Cobb Road, Enfield, ME 04493

207-732-4132

Mark Caron
Regional Wildlife Biologist
mark.caron@maine.gov

Allen Starr
Assistant Regional Wildlife Biologist
allen.starr@maine.gov

Region G – P.O. Box 447, Ashland, ME 04732

207-435-3231

Richard Hoppe
Regional Wildlife Biologist
richard.hoppe@maine.gov

Arlen Lovewell
Assistant Regional Wildlife Biologist
arlen.lovewell@maine.gov