

Natural Resources draft

IX. NATURAL RESOURCES

IX. A: Introduction

Orland's natural resources provide critical wildlife and fisheries habitat, are an essential part of Orland's rural character and help to sustain its quality of life—all of which makes Orland a special place to live and work. Natural resource conservation and thoughtful ordinances can ensure development occurs in appropriate areas, and that poorly-planned development in environmentally fragile areas does not become costly to the entire town—causing, for example, flooding or pollution of an important aquifer.

State Goal:

To protect the State's other critical resources including without limitation, wetlands, wildlife and fisheries habitat, sand dunes, shore land scenic vistas, and unique natural areas.

IX. B Summary of the 1998 Plan

Orland has many natural resources. On the one hand there is the varied landscape of lakes, river valleys, ridges, and low hills all providing a source of recreation and many scenic views. On the other hand is its wildlife. There are several high value waterfowl and wading bird habitats in town. Game species such as the white tail deer, black bear, and moose can be found in upland areas. And according to state records, there is one bald eagle nest. Orland is also one of the few known locations in Maine for the rams-head lady slipper plant, a member of the orchid family.

While there are no immediate threats to Orland's natural resources, there are few measures in place to protect them. It is notable that 71% of survey respondents said they favored measures in place to protect open space and wildlife habitat and 62% supported protection of scenic views. The first citizen workshop identified several natural resources as "community assets" including Great Pond Mountain, fisheries, and wildlife resources.

IX. C Key Findings for 2016

Orland is still rich with scenic and natural resources, which were cited in both the citizen meetings held in 2018 and by a significant number of respondents in the 2016 survey as being among Orland's biggest assets. Great Pond Mountain Conservation Trust has permanently conserved 4,500+ acres within the municipality since 2005. The Town's methods for protecting natural resources are found in the following current ordinances: Shoreland Zoning, Site Plan Review, Sub-division, Wind Power, Wireless Communication Tower.

Survey respondents overwhelmingly supported conservation of natural resources, including 90.1% for protection of drinking water aquifers, 84.4% for protecting fish habitat and fish

passage, 86.9% for important wildlife habitat, 84.7% for wetlands, and 78.8% for protecting scenic views. Two closely related opinions showed strong support for ordinances designed to achieve that end: 75% favored a land use ordinance to support conservation and 79.3% for development to be located in designated areas. Over 50% supported conservation easements purchased by the town or land trust. Overall, this represents a significant increase over 1998's 71% who favored such measures. Access to these natural resources such as boat ramps, walking/hiking/running paths and canoe/kayak launching sites received on average 56% support.

Whether protecting Orland's natural resources by ordinance is necessary is discussed in the Housing Chapter (III.C: Key Findings. and III.D: Analysis). It is noted that Orland's population is predicted to decline from the current 2225 to less than 2000 by 2034; its household size has decreased from 2.42 in 2000 to 2.25 in 2010. Because even the occupants of smaller households need housing, Orland could face an increase in housing units. While future development cannot be predicted with certainty, an increasing demand for housing land could place its natural resources at risk if protective zoning ordinances are non-existent.

IX. D Summary of Critical Natural Resources

Orland is blessed with a diverse natural landscape and rich natural resources. It's a hilly country with granite ridges, high hills and a mountain topping out at 1,028 ft., towering over eight clean lakes and ponds, trout-filled streams, wetlands and beaver meadows. Add productive farms and blueberry fields and large forested areas, and Orland supplies excellent habitat for ducks and deer, black bears and bobcats, and Maine's trademark animal, the moose. Herons and ducks ply the shallow mudflats on the Orland River, and migratory fish ascend the Narramissic River to find spawning grounds.

Orland's natural resources are critically important to its human residents and visitors too, providing rural character, scenic beauty, clean water, recreation and an economic benefit, as visitors come to enjoy lakes and ponds and conserved lands year-round.

Beginning with Habitat (BwH), Maine Department of Inland Fisheries and Wildlife (DIFW) and the Maine Natural Areas Program (MNAP) have provided maps and information as tools for planning development in town while conserving significant and high value plant and animal habitats and natural communities. To support plant and animal populations, high value habitat must exist in large enough blocks, and seasonal habitats must have connecting corridors so animals such as trout and deer can migrate from one area to another.

Beginning with Habitat provides five maps on its website featuring Orland's natural resources: http://www.beginningwithhabitat.org/the_maps/status-o.html. Maps available include: 1. Water Resources & Riparian Habitats; 2. High Value Plant & Animal Habitats; 3. Undeveloped Habitat Blocks; 4. Wetlands Characterization; 5. Natural Resource Co-Occurrence. Beginning with Habitat (BwH) is a collaborative program of federal, state and local agencies and non-governmental

organizations, and offers a habitat-based approach to conserving wildlife and plant habitat. The goal of the BwH program is to help local decision makers create a vision for their community, to design a landscape, and to develop a plan that provides habitat for all species and balances future development with conservation.

There are no State (Beginning with Habitat) Focus Areas in Orland, but Great Pond Mountain Conservation Trust (the land trust for northwestern Hancock County) has identified two focus areas here. In 2012/2013, GPMCT hired Ecologist Janet McMahon to identify and evaluate areas in the towns of Bucksport, Orland, Verona Island and Dedham that: 1. Provide large, undeveloped blocks of forest, important wildlife habitat and wildlife corridors; 2. Include a number of important natural resource values, from undeveloped shorelines, to aquifers, to productive farms, to snowmobile and hiking trails. In short, these are the largest wild and scenic areas left in these towns. GPMCT has narrative descriptions and maps of these areas available for municipal and regional planners to use.

Table 9.1: Orland Focus Areas, GPMCT

Focus Area Name	Acreage (Approximate)	Key Features
Great Pond Mountain Wildlands area	9,580 acres 4,630 acres are conserved	<ul style="list-style-type: none"> • Great Pond Mountain, a defining landmark in central Hancock County and a key recreational and scenic area • Undeveloped and pristine Hothole Pond and adjacent wetland, which is the largest significant waterfowl/wading bird habitat in n.w. Hancock County Scenic, lightly developed Craig Pond, with public access, beach, and exceptional cold water fishery • High value brook trout and other fish habitat in streams and ponds • Concentration of prehistoric archaeological sites
Meadow Brook area	4,820 acres 186 farmland acres partially inside the focus area are conserved by Blue Hill Heritage Trust (BHHT)	<ul style="list-style-type: none"> • Core part of a 10,440-acre un-fragmented habitat block (partly in Penobscot), which is second largest in n.w. Hancock Co. • Intact headwater stream network • Two large, significant waterfowl/wading bird habitats • Remote, undeveloped Little Pond • Connects to two Blue Hill Heritage Trust (BHHT) focus areas

IX. D. 1 Rare plants and Natural Areas

The Maine Natural Areas Program (MNAP) has mapped areas of Rare or Exemplary Natural Communities and Rare Plant locations in Orland, based on field surveys and aerial photos. These areas are featured on BwH maps.

According to MNAP, a number of Orland's mountains and higher hilltops host the Town's one Rare and Exemplary Natural Community: the Low-Elevation Bald (also known as Three-toothed Cinquefoil - Blueberry Low Summit Bald). A rank of S3 means it's rare in Maine. This mosaic of blueberry, lichens and other low shrubs and plants is found on bald hilltops (usually 600-1,500') mostly near the coast, from Mid-Coast to Downeast. It's the typical habitat of the smooth sandwort (*Minuartia glabra*), also with a State rank of S3.

Smooth sandwort has been documented to occur in Low Elevation Bald habitat on Great Pond, Mason, Hothole and Flying Moose Mountains, but probably occurs on other similar hilltops as well. Some of these sites are protected as part of the Great Pond Mountain Wildlands; others are privately owned. These hilltop sites tend to have good views, and heavy foot or vehicle traffic can damage these plants (though a small amount of disturbance seems to encourage them). This plant is one of Special Concern in Maine—meaning it's rare, but not threatened or endangered.

Orland's other rare plant is Acadian quillwort (*Isoetes acadiensis*), known to occur at the SE end of Alamoosook Lake, near where Gulch and Mill Brooks empty in. According to an MNAP fact sheet, this plant is known in only three Maine towns, and has a rank of S2—imperiled in Maine because of its rarity. This plant with a dense rosette of narrow leaves grows rooted in the gravelly bottom of the lake.

IX. D. 2 Rare animals and Wildlife Habitats

Significant Wildlife Habitats in Orland have been mapped by DIFW and are protected under Maine's Natural Resources Protection Act. They include habitats for rare, threatened or endangered species and inland and tidal waterfowl and wading bird habitats. Maine's Natural Resources Protection Act requires a permit for most land use activities that involve working in, or disturbing soil within or adjacent to identified significant habitat. As of 2015, Orland had no state-documented occurrences of significant vernal pools, candidate deer wintering areas or shorebird staging areas—but this does not mean that no such areas exist in town. As of 2015, there were also no "Essential Wildlife Habitats" occurring in Orland for endangered or threatened species. See BwH maps for details.

Rare animals documented in Orland by MDIFW include the bald eagle and a freshwater mussel called the tidewater mucket.

Bald eagles have recovered in Maine and are no longer threatened or endangered, but remain a species of special concern. From one known nesting site on the Eastern Channel in 1998, we now have up to six nest sites documented in Orland. The USFWS bald eagle map tool showed three nest locations on Toddy Pond near Rte. 1, one on Alamoosook Lake and one in the Great Pond Mtn. Wildlands in 2013. They were not likely all in use. Since then, a second nest has been attempted on Alamoosook, and some nests have been destroyed by weather. Bald eagles are vulnerable to disturbance during the fledgling stage, and young birds who fall from the nest are often injured or go hungry. DIFW recommends staying at least 330 feet (100m) from an active eagle nest when walking, biking, paddling, boating, snowmobiling, camping, fishing or hunting during the breeding season, if your activity will be visible or audible from the nest. Construction or logging should remain 660 feet away.

The tidewater mucket (*Leptodea ochracea*), a state-threatened species with a rank of S2, occurs in Alamoosook Lake. It is a declining species throughout its range from Nova Scotia to Georgia, and exists in three Maine watersheds, including the Penobscot. Freshwater mussels often have one or more specific fish hosts for part of their life cycle; recent studies indicate this mussel uses white perch as a host, and possibly banded killifish and alewife (Kneeland 2006, Wick 2006).

A great blue heron rookery, also a declining species of special concern, has been documented in a wetland off the Front Ridge Road (Rte. 15).

In 2017, DIFW added bats to its list of endangered or special concern species. A number of these bats may summer in Orland or migrate through. Long-eared bats have been seen wintering in Orland.

Bird Species of Greatest Conservation Need which may occur in Orland include those in the table below. Maine is conducting a Breeding Bird Atlas from 2018-2022 which will identify which species are truly breeding in our area.

Table 9.2: Bird Species of Greatest Conservation Need

HABITAT / Bird Species		
FRESHWATER PONDS & WETLANDS		
American Bittern	Common Loon	Nelson's Sharp-tailed Sparrow
American Black Duck	Great Blue Heron	Pied-billed Grebe
American Woodcock	Marsh Wren	Willow Flycatcher

RIVERS & COASTAL WETLANDS		
Common Eider	Sanderling	Ruddy Turnstone
Greater Shearwater	Greater Yellowlegs	Semipalmated sandpiper
Willet		
FIELDS, FARMS & MARSHES		
Barn swallow	Field sparrow	Horned lark
Chimney swift	Vesper sparrow	Eastern Meadowlark
Eastern kingbird	Bobolink	Common nighthawk
CONIFEROUS WOODLAND		
Bay-breasted warbler	Red crossbill	Black-throated Green Warbler
Blackburnian Warbler	Cape May Warbler	Black-billed Cuckoo
Purple finch		
DECIDUOUS WOODLAND		
Barred owl	Great-crested flycatcher	Yellow-bellied sapsucker
Baltimore oriole	Rose-breasted grosbeak	Scarlet tanager
Black & White Warbler	Northern Parula Warbler	Black-throated Blue Warbler
Blue-gray Gnatcatcher	Chestnut-sided Warbler	Wood thrush
Eastern towhee	Northern flicker	Canada Warbler
Brown Thrasher	Veery	

Some of these birds, such as the bobolink, are grassland species, which are disappearing along with farmland and could be encouraged by careful management of hayfields for later cuttings. Others, such as the Blackburnian warbler, need larger trees and high canopy for nesting, and will return to forests managed for longer harvest rotations. Other birds of special interest include the Whippoorwill and Indigo Bunting.

Orland has thousands of acres of freshwater wetlands, especially around Hothole Pond/Hothole Brook and in the Meadow Brook drainage (south of Gilpin Road). These areas provide state-documented (MDIFW) Inland Waterfowl and Wading Bird Habitat for ducks, herons, rails, osprey and many other birds. Other state-significant wetland areas occur along the Dead River (Hellbottom Swamp) and Alamoosook Lake, Gulch Brook (south of Cedar Swamp Road), along the Narramissic River and east of the Castine Road, where some of the brooks drain Penobscot's Great Heath. These wetlands are often created by beavers, and are home to muskrats, mink, otters, turtles, moose and other mammals. These areas also hold and filter stormwater runoff and recharge aquifers.

Tidal waterfowl and wading bird habitat is documented along the shores of the Orland River, where ducks, geese, sandpipers, gulls and other birds feed on small creatures exposed on tidal mudflats. For example, in 2012, the mudflat located just below the Orland Village Dam was documented as high-value Tidal Wading Bird and Waterfowl Habitat.

There are no state-significant vernal pools documented in Orland, but the Great Pond Mountain Wildlands contains several small ones, and GPMCT also holds a conservation easement on 72 acres between Mama Bear Road and Rocky Pond that contains a complex of vernal pools, one that could possibly qualify as state-significant. A large vernal pool also exists on the gravel isthmus on the east shore of Alamoosook Lake. Vernal pools are small, woodland breeding ponds used by spotted salamanders, wood frogs, fairy shrimp and other creatures each spring. They have no inlets or outlets, do not host fish, and usually dry out in the summer. They are vulnerable to destruction by development or heavy logging.

BwH also documents Deer Wintering Areas (places where heavy tree cover and forage encourages deer to "yard up" in winter), but these areas change every year due to logging and weather disturbances. As of 2019 there were no significant deer wintering areas documented in Orland.

IX. D. 3 Fishery Resources

Maine is one of the last strongholds in the US for native Eastern brook trout (*Salvelinus fontinalis*), and Orland is fortunate to have a number of lakes, ponds and streams with brook trout populations. While some are stocked (Narramissic River and Craig Pond), others have wholly native wild runs (Hothole Brook and tributaries in the Wildlands). According to DIFW, the Alamoosook subwatershed ranks highly for wild brook trout habitat. With its connection to the sea, Orland also has the potential to host sea-run brook trout.

According to DIFW, the best streams in Orland for brook trout include: Hothole Brook and tributaries, Hothole Stream, Gold Brook, Gott Brook, Atkinson Brook, Thompson Brook, Gulch Brook (also brown trout), Meadow Brook, and a Hart Pond tributary. Smaller tributaries are important cold water refugia and spawning habitat, while bigger streams are used seasonally.

Brook trout are a high-priority Species of Greatest Conservation Need (SGCN) in Maine’s State Wildlife Action Plan - Comprehensive Wildlife Conservation Strategy (Maine CWCS). Some of the biggest threats to brook trout in Maine include: competition with illegally introduced species like smallmouth bass or baitfish; degradation of habitat by development and agricultural runoff; and warming water temperatures due to climate change. Conserving cold, headwater streams and streamside habitat, preventing illegal stocking of bait and sportfish and improving fish passage between streams and lakes will help trout survive long-term.

“Fish Species of Greatest Conservation Need” which may be found in Orland waters (or where habitat exists, but is difficult to access due to the Village Dam) are:

Table 9.3: Fish Species of Greatest Conservation Need

Anadromous (born in freshwater, migrates to saltwater)		
Alewife	Atlantic salmon	Rainbow smelt
Sea lamprey	Sea-run brook trout	Atlantic sturgeon
Short-nosed sturgeon	Blueback herring	Striped bass
American shad		
Catadromous (born in saltwater, migrates to freshwater)		
American eel		
Freshwater		
Brook trout	Wild lake trout (togue)	
Estuarine (Narramissic River)		
Atlantic tomcod		

Biologist Greg Burr of DIFW reported that the most high-value lakes and ponds for fish in Orland as of 2016 are:

- Hart Pond – splake (stocked), togue (lake trout), brook trout
- Craig Pond – salmon, togue, brook trout (stocked)
- Alamoosook – bass, perch
- Toddy Pond – togue, bass, landlocked salmon (stocked), brown trout (stocked), splake (stocked)

According to the Maine Dept. of Marine Resources (documented in 2012, during the Orland Village Dam study), the Narramissic River watershed includes Critical Habitat for Atlantic salmon. While there is no active Atlantic salmon restoration program on the Orland/Narramissic River, there was a confirmed report of an adult sea-run salmon caught in the river below the Alamoosook Dam in December, 2010. The fish may have been trying to return to Craig Brook National Fish Hatchery. Besides Atlantic salmon, the Narramissic is an important migration route for alewives and blueback herring and American eels, and there are anecdotal reports of sturgeon being sighted in the river in recent years, having come over the dam at higher tides.

Threats to Fishery Resources

The Maine Stream Connectivity Work Group and Maine Office of GIS have created the Maine Stream Habitat Viewer, which shows the results of recent surveys of dams and road crossings across Maine. In Orland, the following results are available for public roads:

Table 9.4: Barriers to Fish Passage in Orland, 2017

Potential Barriers		
Atkinson Brook at Bald Mountain Road	Alamoosook Lake dam	Rte. 1 at Toddy/Hart Brook
Toddy Pond dam	Rte. 1 at Gulch Brook	Cedar Swamp Road at Gulch Brook
Orland Village Dam		
Complete Barriers		
Gilpin Road at Meadow Brook (to Little Pond)	Castine Road at two unnamed brooks (Great Heath drainage)	

According to the DIFW, improperly sized and installed culverts are a problem, particularly on smaller streams. These impede movement of fish and freshwater invertebrates, fragmenting

watersheds and causing local extinction of some species. Funding is now available to help towns evaluate crossings and replace bad culverts with more fish-friendly and longer-lasting solutions.

Other major threats are introduced fish. Pike and muskellunge are being illegally stocked around the state. As of 2016, they had not crossed the Penobscot River, but DIFW biologists expect them to. Largemouth and smallmouth bass are in Toddy Pond and Alamoosook Lake. Largemouths are more active, aggressive feeders year-round and tend to occupy shallower habitats and compete with the natives. These bass put a lot of pressure on native fish such as brook trout.

Maintaining a healthy fishery brings major economic benefits to the Town of Orland. In a 2015 DIFW study, aerial flights on several selected days, winter and summer, counted anglers on Orland's ponds. It was estimated each angler spent \$47/trip. The winter of 2015 was very cold and snowy, which may have had a negative impact on number of people fishing; in other years these numbers are likely higher. Total spending on fishing for 2015 is estimated at \$149,554.

Table 9.5: Anglers on Orland lakes & ponds, 2015

LAKE / POND	NUMBER OF ANGLERS	ESTIMATED SPENDING
WINTER		
Toddy Pond	843	\$39,621
Craig Pond	684	\$32,148
Heart Pond	82	\$3,854
Alamoosook Lake	No winter count	
SUMMER		
Toddy Pond	1058	\$49,726
Craig Pond	216	\$10,152
Heart Pond	16	\$752
Alamoosook Lake	283	\$13,301

IX. D. 4 Scenic Resources

Orland has many scenic views. The combination of hills, lakes, river valleys and blueberry fields assures a rich variety of views. Such views are an integral part of the town's rural character.

Some of the significant scenic views in Orland are:

1. View of Orland United Methodist Church and Narramissic River heading south on Rte. 1;
2. View of Toddy Pond heading north on Rte. 1;
3. View of Great Pond Mountain heading north on Rte. 1 as the mountain "disappears;"
4. View of Billy Goat Hill blueberry fields from Rte. 1 just north of Upper Falls Road intersection, traveling either direction but esp. north;
5. Views from the top of Great Pond Mountain and Flag Hill;
6. Views from Dodge Hill and Whites Mountain;
7. Views from Condon Hill; including Penobscot Narrows Bridge.
8. Great Pond Mountain Conservation Trust's Wildlands including:
 - a. Flying Moose Mountain
 - b. Hot Hole Mountain
 - c. Flag Hill
 - d. Oak Hill
 - e. Mead Mountain

IX. E Analyses:

IX.E.1 Threats to the community's critical natural resources

Threats to Orland's Natural & Scenic Resources not mentioned above include:

- Mercury pollution—Mercury hotspots located by the Penobscot River Mercury Study (completed in 2013) in the Orland River just below the Village Dam are leading to increasing mercury contamination above the dam, according to work done in 2015 (for the Orland Village Dam Alternatives Feasibility Study) by Dianne Kopec. The Mercury Study documented contamination in the lower Penobscot River watershed in black ducks, red-winged blackbirds, smelts and other species. (See Hg Final Report, 15 March 2016, Baseline Survey of Surface Sediment Total Mercury Concentrations, Narramissic River Maine. Submitted by Dianne Kopec, PhD, Consulting Biologist, in the appendix to the Orland Village Dam Alternatives Feasibility Study).
- Dams—Orland's three dams all have fish passage, but it is not sufficient to pass all species of fish wishing to use it. In particular, the Orland Village Dam's fish ladder has been inadequate to pass anything but alewives, and those only at higher tides. According to Maine DMR, they have only counted the number of acres of Alamoosook Lake habitat when calculating the number of alewives required to pass Village dam—despite the fact that alewives can reach Toddy Pond, Hothole Pond and beyond Orland's borders in the watershed. This may be leading to over-fishing in the watershed and underpopulation.

- Sprawl and second home development and roads lead to fragmentation of forest habitat, loss of wildlife corridors, more bridges and culverts, and more deer/car collisions
- Poor logging practices have led to even-aged, low-quality forests (of diseased beech) that support fewer bird and mammal species and produce less food; poorly built or damaged roads that cause soil runoff into brooks; and destruction of deer yards and vernal pools.
- Degraded camp roads, culverts and road crossings lead to siltation of fish habitat in streams and lakes, and phosphorus pollution that creates algae blooms. More frequent, heavier storms are exacerbating this problem.
- Craig Brook National Fish Hatchery is a point source of phosphorus pollution in Alamoosook Lake, and cannot at this time meet the newer state requirements for phosphorus discharge. Because the lake has normally flushed up to seven times a year, however, it hasn't been subject to algal blooms. This may change if summer temperatures rise and rainfall decreases.
- "Cultivated cropland, managed hay and blueberry fields, houses and lawns abutting lakes and streams contribute to nutrient loading if not adequately buffered. The impacts of pesticides and herbicides on ground and surface water are relatively well-understood. The herbicide hexazinone (Velpar) is widely used on commercial blueberry land in the region. Voluntary best management practices (BMPs) exist for hexazinone that recommend buffer widths, unsuitable terrain, calibration rates, and suitable spraying conditions." (McMahon Study, 2013)
- "Sand and gravel mining is an expanding industry in the region. The number of pits has increased markedly in the past decade, particularly over aquifers bordering Moosehorn Stream, Long Pond, and Meadow Brook. Development and road building in area towns appear to be fueling this increase. Most towns do not have effective mining and reclamation ordinances that can be easily enforced." (McMahon Study, 2013)
- Loons, waterfowl and eagles continue to be poisoned by lead sinkers and shot in local ponds and lakes.

IX. E. 2 Regulatory and non-regulatory measures the community has taken to protect critical habitat and important natural resources

The Town of Orland has generally protected critical habitat and natural resources through shoreland zoning and ordinances such as the Shoreland Zoning Ordinance, Site Plan Review Ordinance, Subdivision Ordinance and Wind Power Ordinance.

The Town's *Site Plan Review Ordinance* includes language protecting environmentally sensitive areas and natural drainages and requires appropriate measures to protect listed resources. The ordinance also requires stormwater management and erosion control, and has language designed to protect groundwater and surface water.

The *Subdivision Ordinance*, in its section entitled "Retention of Open Spaces and Natural or Historic Features", requires:

- . 1. If any portion of the subdivision is located within an area designated by the comprehensive plan as open space or greenbelt, that portion shall be reserved for open space preservation.
- . 2. If any portion of the subdivision is located within an area designated as a unique natural area by the comprehensive plan or the Maine Natural Areas Program the plan shall indicate appropriate measures for the preservation of the values which qualify the site for such designation.

The *Subdivision Ordinance* also makes provision for protection of significant wildlife habitat, and for land to be set aside for recreation and open space when deemed necessary.

The *Wind Power Ordinance* also requires protection of wildlife habitat and listed Scenic Resources, and erosion control.

The Town has no conservation commission or open space committee. It owns small parcels of public land in the form of parks, land around the Village Dam donated by Verso Corporation (last owner/operator of the Bucksport paper mill prior to 2014 sale), a hand-carry launch on the Narramissic River and fields and woods around Orland Community Center. Residents have many acres in Tree Growth and Open Space (see Forests and Ag).

Conserved lands in Orland are the Great Pond Mountain Wildlands (4,500 acres) owned by GPMCT, Craig Brook National Fish Hatchery (135 acres) owned by US Fish & Wildlife Service, and 74 acres of private land under conservation easement (Linscott) with GPMCT. Blue Hill Heritage Trust holds three farmland conservation easements on the Front Ridge in Orland totaling 186 acres. The state owns boat launches on Toddy and Heart Ponds. The boat launches and picnic areas on Alamoosook Lake and Craig Pond are owned by Craig Brook National Fish Hatchery.

IX. E. 3 Regional cooperation and partnerships to protect shared critical natural resources

Orland has a number of opportunities to partner with local and regional groups for natural resource protection. Great Pond Mountain Conservation Trust conserves land, water and wildlife habitat in the region, and can partner to help raise funds and implement land and water conservation and public land and water access improvements, as well as other natural resource enhancement projects. Department of Inland Fisheries and Wildlife (DIFW) suggests, for example, that towns partner with land trusts or other such organizations to buy riparian rights along brooks and rivers so anglers have public access to fish in their favorite spots.

There are several active lake associations in Orland, including Alamoosook Lake Association (ALA), Toddy Pond Association (TPA), and Craig Pond Association (CPA), affiliated with Maine Lakes Society and Lake Stewards of Maine. TPA and CPA currently have both paid and volunteer courtesy boat inspectors to check boats for invasive plants; ALA will begin a courtesy boat

inspection program in summer, 2019 with the help of a conservation grant. TPA and ALA have Invasive Plant Patrols conducting native and invasive plant surveys. All three associations have volunteer certified water quality monitors collecting data on water clarity and dissolved oxygen levels for Lake Stewards of Maine. TPA and ALA have worked with Hancock County Soil and Water Conservation District (HCSWCD) to conduct watershed surveys and receive DEP 319 grants to reduce runoff pollution from private and public properties and roads. Significant projects were undertaken on Alamoosook Lake (ending 2018) and Toddy Pond (ending 2016) through federal Department of Environmental Protection (DEP 319) grants, administered by HCSWCD. ALA and TPA have worked together since 2014 to prepare for Bucksport Mill LLC's uncertain future sale of the lakes' dams and water rights, and the potential ramifications if sold. The associations, while not representing all property owners on their respective lakes, have worked with the Bucksport mill owners in the past to ensure that the Lake Level Management Plan is being followed for the safety of shoreline property owners, protection of habitat for fish and wildlife, public access for recreation, and the reduction of soil erosion. By doing so they ensure that Maine laws and regulations are being followed.

Craig Brook National Fish Hatchery has a wealth of data on Alamoosook Lake and Craig Pond, and their Maine Fish & Wildlife Resource Conservation Office is a resource for fish habitat enhancement and dam/culvert removal and repair. US Fish & Wildlife Service's Ecological Services office also located at Craig Brook in 2016.

The Nature Conservancy, NOAA Fisheries Service, Hancock County Soil & Water Conservation District, Project SHARE, USFWS, DEP, DIFW and Maine Audubon have all been involved in recent projects in Orland, from the Orland Village Dam Study to replacement of culverts in the Wildlands, to a new bridge on the Happytown Road and a StreamSmart program at Alamoosook Lakeside Inn.

Bucksmills Rod & Gun Club has worked with DIFW to improve stocking in local ponds and hand out trash bags to Craig Pond anglers; and worked with GPMCT to offer hunting opportunities in the Wildlands, and public programs.

IX. E. 4 Local shoreland zone standards vs. neighboring communities and state guidelines

Orland last adopted a revised Shoreland Zoning Ordinance approved by the DEP Commission in April 2009. New guidelines which comply with the most recent state standards were approved and adopted at Town Meeting June 12, 2019.

Toddy Pond has frontage in neighboring Penobscot, Blue Hill, and Surry and Upper Patten Pond in both Surry and Ellsworth. Dead River, Narramissic River and Penobscot River's Eastern Channel have some Bucksport frontage, and Orland is across the Eastern Channel from Verona Island.

According to Code Enforcement Officer Luke Chiavelli, abutting towns use the same standards we do, and many have not updated their ordinances yet, either.