

As discussed in earlier chapters, historic development in Winslow has generally remained confined to the region between the Sebasticook and Kennebec Rivers. Lands east of the Sebasticook River and Outlet Stream, for centuries, remained largely rural and agricultural. Only in the past 20 years has significant suburban sprawl threatened that landscape. Yet, the threat is real, especially for critical natural resources.

“Critical natural resources” is a general term, basically encompassing significant geological, biological, or hydrological features. Geologically, these resources include such things as waterfalls, sand dunes, fragile high mountain areas, and rock outcrops. Biologically, some examples are significant and essential wildlife habitat and habitat for rare, threatened, and endangered species. Hydrologically, critical natural resources include features such as bogs, marshes, and swamps.

Critical natural resources are thus a wide variety of natural resources providing the backbone to their ecological system. By implication, a breakdown in critical natural resources leads to air and water pollution, decreased wildlife diversity, and overall environmental degradation. As our human footprint on the land increases, we further disturb these critical natural resources. For example, groundwater infiltration is significantly affected by human development patterns. The more impervious surface on the land, such as roads, homes, and driveways, the less clean and direct groundwater infiltration.

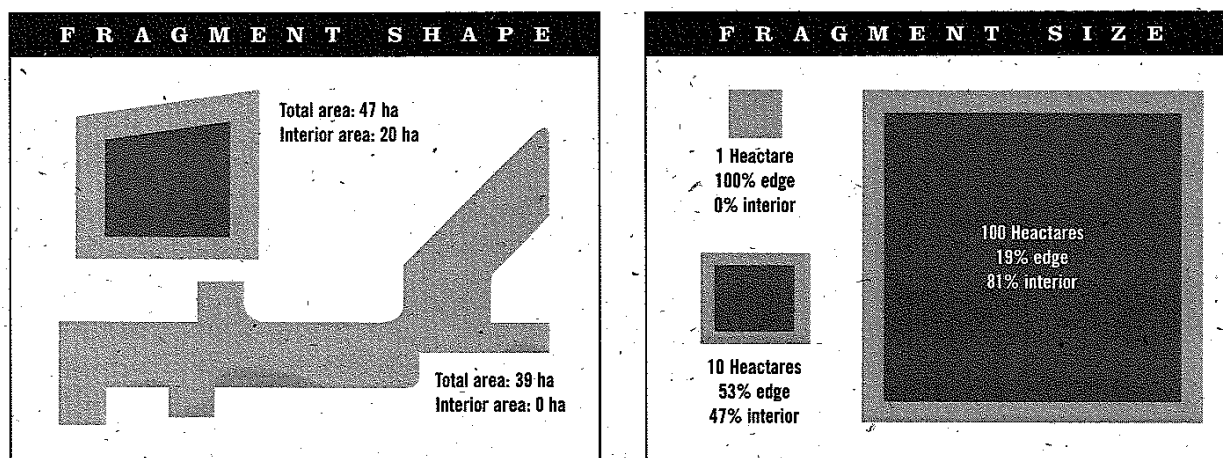
Significant Wildlife Habitat: Areas mapped or identified by the Maine Department of Inland Fisheries and Wildlife and protected under Maine’s Natural Resources Protection Act: state or federal endangered or threatened species habitat; deer wintering areas; seabird nesting islands; critical spawning and nursery areas for Atlantic salmon; significant vernal pools; high- and moderate-value waterfowl and wading bird habitat; and shorebird nesting, feeding, and staging areas. Permits are required for certain activities that occur in significant wildlife habitats.

Essential Wildlife Habitat: Areas providing physical or biological features essential to the conservation of an endangered or threatened species in Maine, such as nest sites or important feeding areas that may require special management considerations. Designation of Essential Habitat simply establishes a standardized review process within existing state and municipal permitting processes. Activities of private landowners are not affected by Essential Habitat designation unless they require a state or municipal permit, or are funded or carried out by a state agency or municipality, in which case they must be evaluated by the Maine Department of Inland Fisheries and Wildlife.

On a grand scale, the vast undeveloped Maine north woods ensure critical natural resource protection, allowing black bear, moose and bobcat to thrive. Though these animals do exist in central Maine, their scarcity, relative to northern Maine, is a direct result of human habitation. Some critical resources, such as rock outcrops, are individual locations. More commonly, however, a resource’s sustainability is directly related to

its size. The more fragmented a waterbody or forest becomes, the less able it is to support its natural inhabitants.

Development fragments habitat. Roads, utility corridors, buildings, parking lots, and any other human construct that breaks apart a natural habitat “fragments” that habitat.



Figures courtesy Maine Audubon Society, *Conserving Wildlife in Maine's Developing Landscape*, 2000, p. 4

Fragmented habitats have increased proportions of edge area. “Edge effects” on ecosystems are well-documented, and are basically all negative for native populations. Many predators, such as raccoons, foxes, and crows concentrate hunting along forest edges. Exotic and pest plant species invade edge habitats more easily than interior woods. Climate is also a factor, with edge-dominated patches having higher temperatures, more wind, and variable humidity.

Opportunistic generalist species, such as blue jay and skunk, thrive in edge-dominated habitat. Other species, such as fisher and wood thrush, requiring more interior forest and wetland, decline. Humans often unknowingly exacerbate the problem by “encouraging” edge effects. For example, supplemental feeding and bird feeders tend to increase red squirrel and stray cat populations, both of whom prey upon native nesting bird species. Eventually, biodiversity of an ecosystem is compromised, and it simply becomes a matter of time before the “natural” environment is as homogeneous as the ubiquitous suburban cul-de-sacs. Native species populations decline over time when there are small and fragmented habitats.

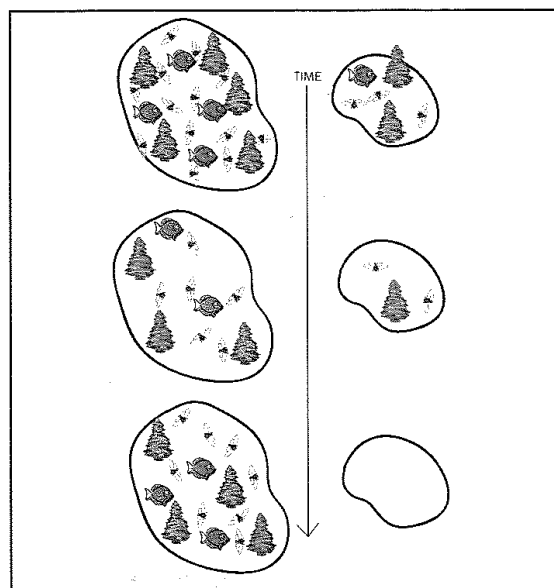


Figure courtesy Environmental Law Institute, *Conservation Thresholds for Land Use Planners*, 2003, p. 7

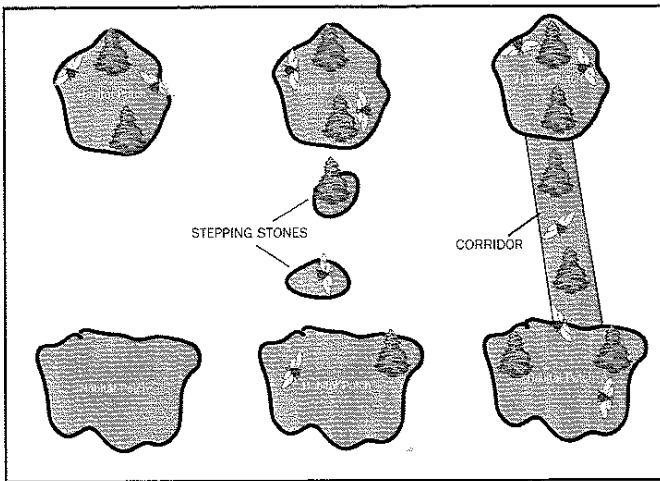
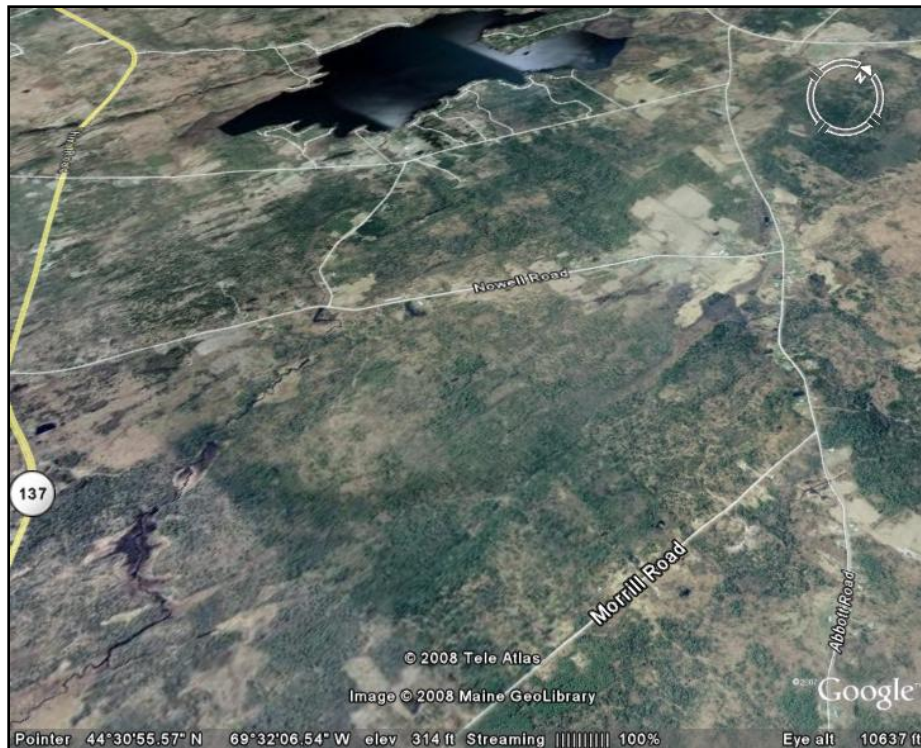


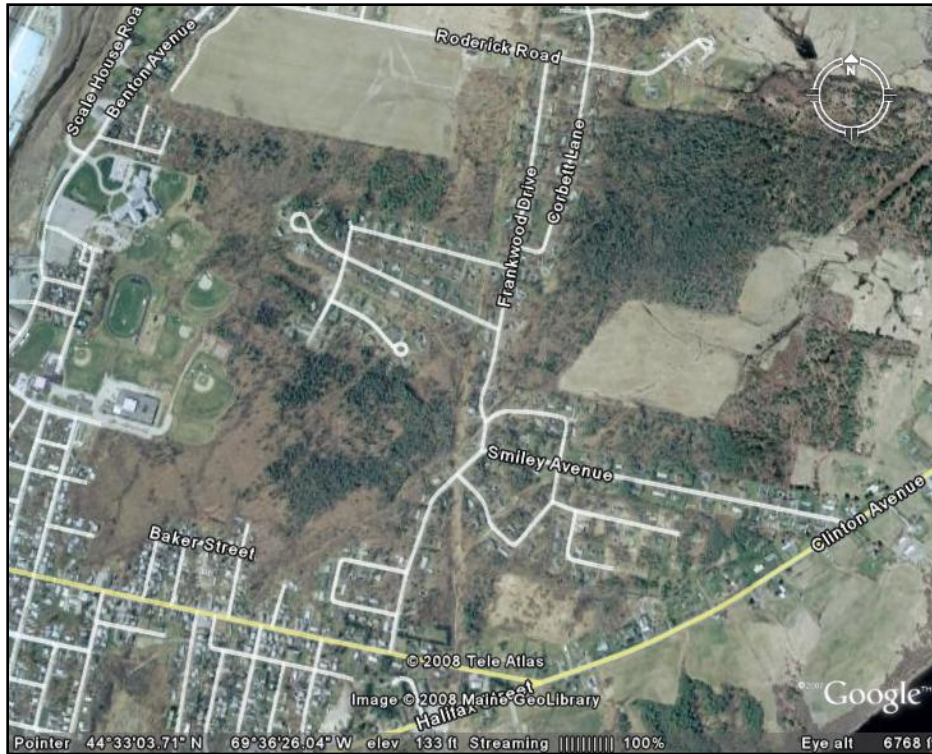
Figure courtesy Environmental Law Institute, *Conservation Thresholds for Land Use Planners*, 2003, p. 23

Fortunately, many organisms that require large interior forestlands for survival can also breed and feed adequately when small fragmented habitats are connected via “corridors” or “stepping stones.” These wildlife corridors, though mainly edge habitat, nonetheless allow for some foraging, seasonal migrations, and dispersal. Because there is some natural connection from one interior area to another, some native populations can survive by using many patches as a single large core.

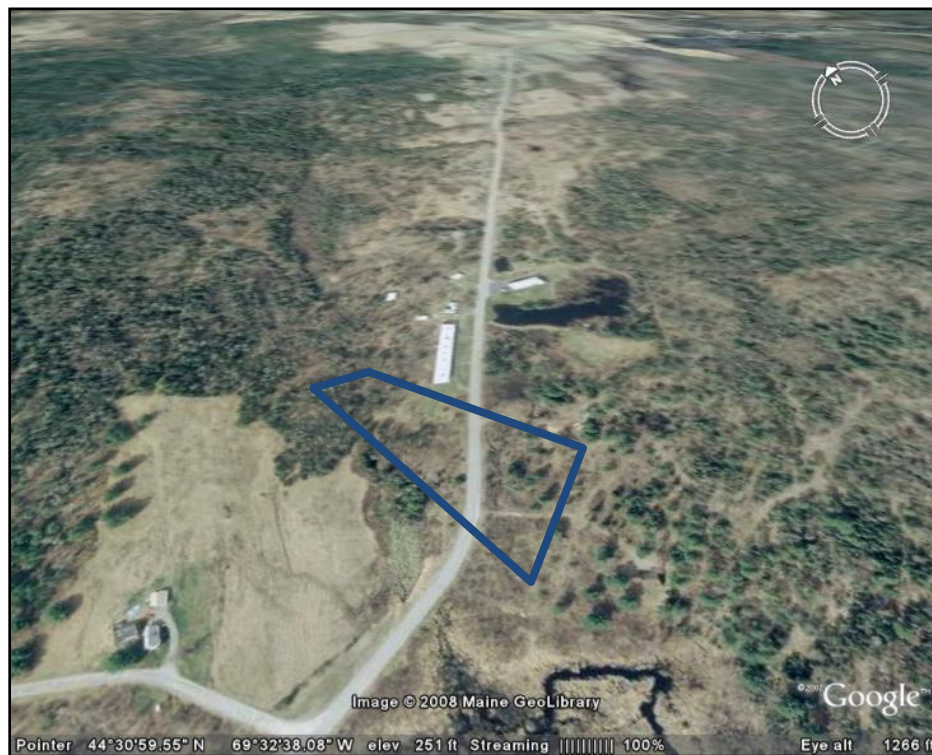
Winslow displays many of the characteristics discussed herein. Following are four aerial photos of regions in Winslow:



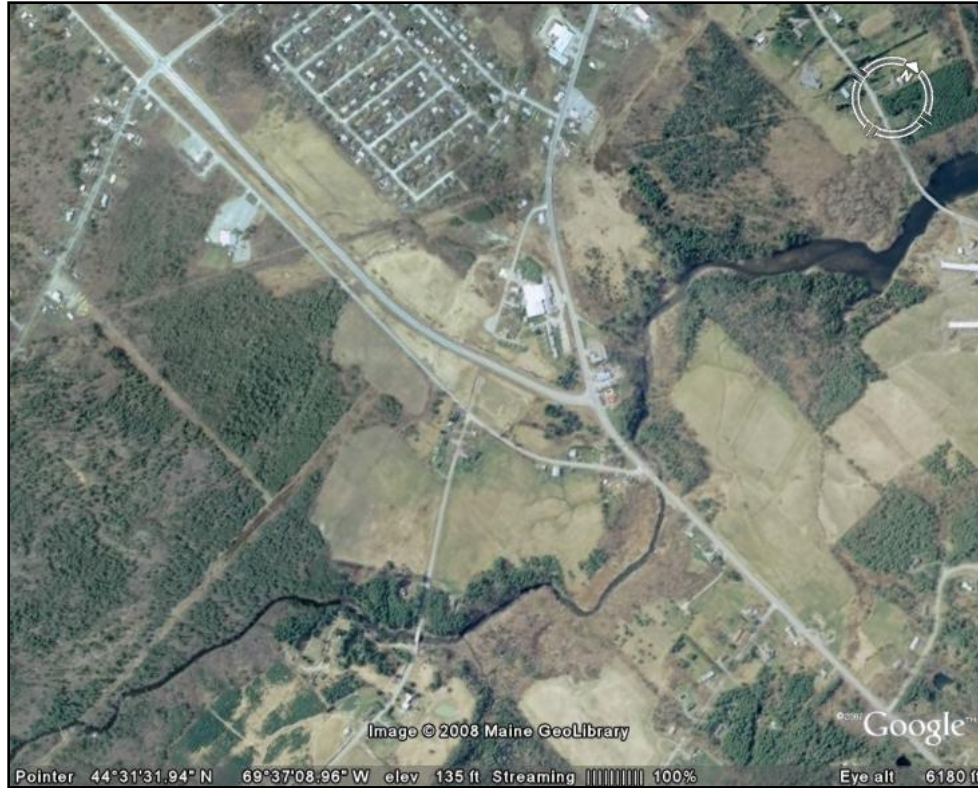
Undisturbed interior forest and wetland (note size relative to Pattee’s Pond)



Fragmented habitat

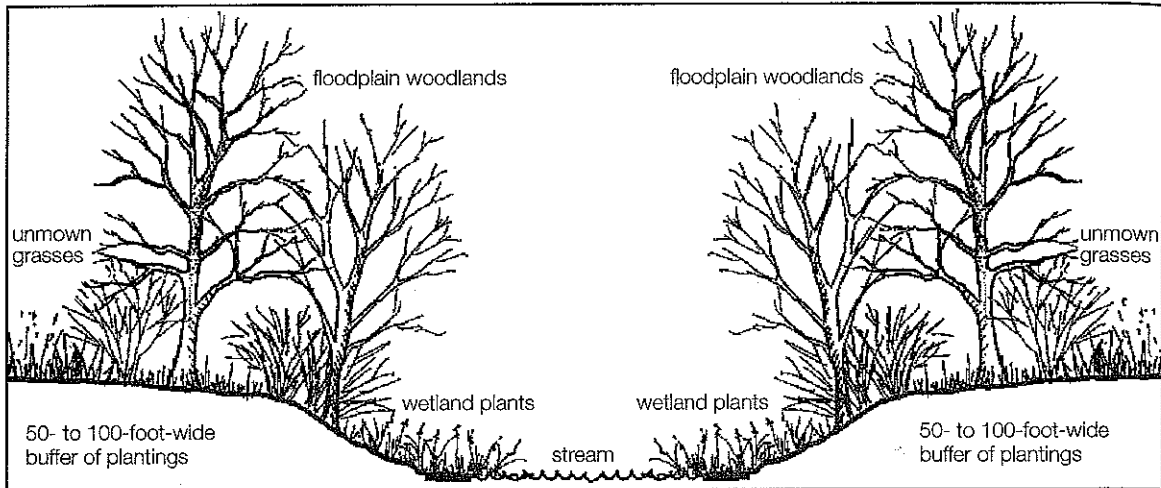


Wildlife Corridor



Riparian corridor along Outlet Stream

Riparian corridors, and the riparian buffers that support the corridors, hold unique capabilities. Although generally a small proportion of the landscape, riparian areas are ecological hotspots that support a disproportionately high number of wildlife species and provide a wide array of environmental functions and values. The support of high levels of species diversity and ecological processes in these areas is due in part to regular disturbance events, like floods, as well as climatic and topographic variation, in addition to the availability of water and nutrients. Riparian areas are transitional ecosystems adjacent to flowing water, such as rivers, streams, and wetlands. A riparian buffer is a band of vegetation, preferably native and typically woods, that prevents the riparian area from degrading. Riparian buffers can help regulate riparian microclimate and provide necessary shading for the in-stream growth and reproduction of aquatic life; stabilize stream banks and prevent channel erosion; provide leaf litter and woody debris, which are important sources of food and energy for fish and aquatic invertebrate communities; remove or regulate sediment, nutrients, or other pollutants such as pesticide; moderate flood damage; and provide wildlife habitat.



Typical riparian buffer

Figure courtesy ICMA, *The Practice of Local Government Planning*, 2000, p. 110

A unique subset of wildlife corridors is road crossings. Roads, more than any other human construct, fragment habitat and contribute to critical natural resource loss. Roads bring development, including the associated noise and habitat destruction. Runoff from roads concentrates pollutants in roadside areas, further damaging habitat beyond the actual road footprint. Wildlife-vehicle collisions are the number one human cause of wildlife mortality in the United States. Imagine if someone built a road separating your bedroom and kitchen. For moose, their “kitchens” are the ponds where they eat aquatic plants in the summer. Moose “bedrooms” are the uplands where they rest with their young. Unfortunately, these two “rooms” are often separated by roads. Road crossings are essential for maintaining a healthy ecosystem.



Note that in the Winslow road crossing above, the culvert includes fencing to guide animals into the wildlife underpass. Fencing is an important corollary to the actual underpass, further reducing wildlife-vehicle collisions.

The State of Maine recognizes the value of critical natural resources. Beginning with Habitat is a State-initiated habitat-based landscape approach to assessing wildlife and plant conservation needs and opportunities. The goal of the program is to maintain sufficient habitat to support all native plant and animal species currently breeding in Maine by providing each Maine town with a collection of maps and accompanying information depicting and describing various habitats of Statewide and national significance found in the town. The maps and data are compiled through a cooperative effort of agencies and organizations, including the Maine Department of Inland Fisheries and Wildlife, Maine Natural Areas Program, Maine Audubon Society, Maine State Planning Office, United States Fish and Wildlife Service, Maine Cooperative Fish and Wildlife Research Unit, Southern Maine Regional Planning Commission, The Nature Conservancy, and Wells National Estuarine Research Reserve. The Winslow Code Enforcement Officer has a copy of all Beginning with Habitat maps and data, both paper and electronic versions.

The Beginning with Habitat map entitled “High Value Plant & Animal Habitats” contains both general natural resources and individual species locations. From amongst the Beginning with Habitat resources, and local information, Critical Natural Resources worthy of special protection should be identified. At a base level, all endangered and threatened species are Critical Natural Resources. In Winslow, there are no species appearing on the federal endangered or threatened list. However, one state endangered and four state threatened species exist in Winslow. The Maine Endangered Species Act applies only to animals – plants are not included in the legislation. A state endangered species is any species of fish or wildlife that has been determined by the Commissioner of the Maine Department of Inland Fisheries and Wildlife to be in danger of extinction throughout all or a significant portion of its range. A state threatened species is any species of fish or wildlife that has been determined by the Commissioner of the Maine Department of Inland Fisheries and Wildlife as likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Although an endangered species is by definition more impaired than a threatened species, there are no state regulatory policy differences between the two categories. The town of Winslow contains the following state endangered and threatened species:

Sedge Wren (State Endangered)

The sedge wren is a small, brownish bird, roughly 3 ¾ inches long. The back and crown are brown with fine streaks of dark brown and tan. The chin, throat, and belly are white. Like other wrens, it tends to hold its short tail at an upward angle. The sedge wren is differentiated from the more common marsh wren by the buff color under the tail (the marsh wren's is white) and a streaked crown (the marsh wren's is uniformly brown). Sedge wrens breed in freshwater meadows dominated by grasses and sedges, and in grassy, upland borders of freshwater marshes dominated by sedges. However, they are somewhat fickle in selecting breeding sites, and a site that is used one year may not be used the next. Sedge wrens are very dependent on the water level at the nest site, preferring little if any standing water. Since sedge wrens change sites so frequently, a large number of sites with suitable habitat are needed to ensure continued reproductive success of the species.



Photo courtesy Maine Endangered Species Program

Bald Eagle (State Threatened)

The bald eagle vies with the golden eagle as the largest bird of prey in Maine. Mature bald eagles have a wingspan of 7 feet and weigh from 9-13 pounds. Nests are often used for many years in succession, with sticks being added every year. Nests used for multiple years can grow to 20 feet deep, weighing several tons. In freshwater habitats, such as Winslow, the bald eagle diet consists of 90% fish. For nesting, birds look for quiet waterfront areas or nearby woodlands. Though some local residents have seen multiple nest sites, state officials have only been able to document one nest site, in north central Winslow near the confluence of Pattee's Pond Brook and the Sebasticook River. This nest site is also the only designated Essential Wildlife Habitat in Winslow, and due to this designation, all development funded or conducted by the State or a municipality within ¼ mile of the actual nest must be reviewed by the Department of Inland Fisheries and Wildlife.



Bald Eagles in park next to Winslow Town Office
Photo courtesy Frank Stankevitz

Tidewater Mucket (State Threatened)

The Tidewater Mucket is a medium-sized (usually less than 3-inch) freshwater mussel that superficially resembles a marine clam. Its shell is rounded or oval in outline, and is usually yellowish or greenish-brown tinged with bronze or reddish-yellow. This species can be confused with the yellow lampmussel, which is of similar shape and coloration but lacks the bronze tinge. The Tidewater Mucket prefers coastal lakes, ponds, and slow-moving portions of rivers, and will tolerate impoundments. The two known locations in Winslow are on the Sebasticook River, at the Benton-Winslow border and at the confluence with the Outlet Stream. Freshwater mussels, including the Tidewater Mucket and Yellow Lampmussel, breed in late summer. The following spring, the female releases thousands of larvae. The larvae can only survive a short while on their own, and must quickly encounter a suitable host fish. They then attach to the fish's fins or gills (without apparent harm to the fish) for a period of weeks or months before transforming into a tiny mussel and dropping off to settle in the bottom.



Photo courtesy Maine Endangered Species Program

Yellow Lampmussel (State Threatened)

The Yellow Lampmussel is a large (up to 4 ½ inch) freshwater mussel that superficially resembles a marine clam. Its shell is oval-shaped and distinctly yellow, occasionally with faint green rays. This species typically prefers medium to large rivers, but in Maine is often found in lakes and ponds, and will tolerate impounded sections of rivers. Known locations of the Yellow Lampmussel include in the Sebasticook River at the Benton-Winslow border and in the Kennebec River at its confluence with Messalonskee Stream.



Photo courtesy Maine Endangered Species Program

Brook Floater (State Threatened)

The Brook Floater is a medium-sized (less than 3 inch) freshwater mussel with a kidney-shaped shell. Growth ridges are marked by concentric ridges. It is yellowish, greenish, or covered with dark greenish rays in juveniles. The exterior becomes brownish with rays partially obscured or almost black in adults. Brook Floaters require free-flowing rivers and streams with high water quality and are very sensitive to habitat degradation and changes in their environment. The single location of Brook Floaters in Winslow is in the Sebasticook River along the Benton-Winslow border.



Photo courtesy Pennsylvania Natural Heritage Program

Although the Maine Endangered Species Act applies only to animals, the Maine Natural Areas Program (under the jurisdiction of the Commissioner of the Department of Conservation) maintains an “official” list of endangered and threatened plants in Maine. This is a list of native plant species whose populations within the state are highly vulnerable to loss. Endangered plants are rare and in danger of being lost from the state in the foreseeable future. Threatened plants are rare and with further decline could become endangered. Plants are not protected by state legislation in the same way as animals, and are therefore reliant upon local policies for their survival. Winslow does not contain any endangered plants, but the following two threatened plants do exist in town:

Horned Beak-rush

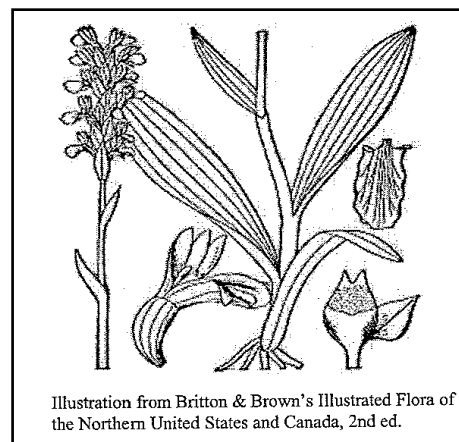
The Horned Beak-rush is a rare plant typically found on riverside seeps, rich ledges, and sphagnum bogs. It flowers July through August, and fruits in August. The single-seeded fruit is capped by a tubercle. The fruit is 1.7 to 2.1 mm long and subtended by six, retorsely barbed perianth bristles. In Winslow, the Horned Beak-rush is found along the Kennebec River, just south of the Waterville-Winslow Bridge.



Illustration from Britton & Brown's Illustrated Flora of the Northern United States and Canada, 2nd ed.

Shining Ladies'-tresses

The Shining Ladies'-tresses is a rare plant found in alluvial or damp rocky shores and slopes, rich damp thickets and meadows. It flowers in June and July. This orchid has 3-5 erect, oblong, shiny green, basal leaves. Its short, compact floral spike has 3-4 ranks of flowers. A broad yellow spot on the protruding lip brightens the waxy white tubular flowers. The Shining Ladies'-tresses is also found along the Kennebec River, just south of the Waterville-Winslow Bridge.



Scenic Areas

A major component of critical natural resources is scenic views and areas. Allowing people to appreciate the resources surrounding them encourages concern for those resources, and likely preservation. As part of the process to produce this Comprehensive Plan, a scenic view survey was conducted. The end of this chapter contains a copy of the Scenic View Assessment Form, as well as tabulated results for returned surveys. There is also a map of major scenic locations in town.

Analysis and Key Issues

Arguably the best protection of critical resources is permanent protection in the form of public land purchase or conservation easement. Unfortunately, Winslow has neither major public lands nor private lands with easements (see the Public and Conservation Lands Map at the end of this chapter). Municipal officials should be working towards collaborative projects with existing organizations. The difficulty is that there are no local organizations, such as the Friends of Unity Wetlands or Belgrade Regional Conservation Alliance. This means that municipal officials must work with organizations that have a statewide interest, such as Maine Audubon or the Forest Society of Maine. These organizations may be willing to protect land in Winslow, but town officials will be competing for monies that could be spent throughout the state. Therefore, municipal officials must become aware of these organizations, and begin the process of convincing these statewide organizations to spend their precious grant monies on Winslow land. The Maine Land Trust Network is a good resource for obtaining contact information on land preservation organizations that could purchase land in Winslow.

The latest round of Maine's Land for Maine's Future program recently passed, so there is little hope for State assistance for land preservation in Winslow. Nonetheless, given the dearth of public lands, and wealth of critical resources, municipal officials should approach the State regarding potential preservation programs.

Winslow employs a full-time Code Enforcement Officer, who helps maintain an up-to-date codebook for the Planning Board, including Shoreland Zoning regulations. The town's ordinances, at minimum, follow state guidelines. However, state guidelines are relatively silent on development design. It is impossible to both allow human development and completely preserve critical natural resources. Nonetheless, as discussed earlier, certain techniques such as wildlife corridors and open space preservation greatly enhance the likelihood of critical natural resource sustainability.

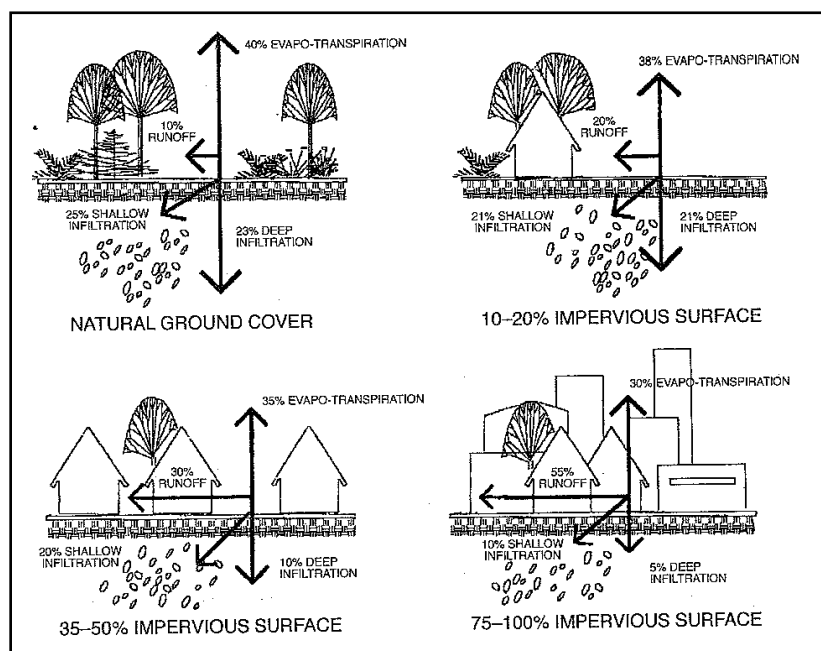


Figure courtesy ICMA, *The Practice of Local Government Planning*, 2000, p. 107

In the graphic above, shallow infiltration, providing water to critical hydrological features such as marshes and bogs, is reduced by over 50% with increased impervious surface. Encouraging or requiring less impervious surfaces during development can greatly enhance the probability of critical natural resource protection.

As documented by the Scenic View Inventory, there are many locations in town that highlight the unique qualities of Winslow. The beginning of this chapter also stated that sprawling development is threatening the town's resources, including the scenic views that appreciate those resources. With only 2 acre minimum lot sizes throughout the rural areas of

town, practically all road frontage has been developed, exacerbating habitat fragmentation and reducing public viewing opportunities.

Though there are individual threatened and endangered species in Winslow, the key component of critical natural resource preservation is large habitat blocks (and corridors). Nature does not understand human-created political boundaries, and ecosystems cross municipal borders. It is incumbent upon Winslow officials to maintain positive relationships with neighbors to preserve areas such as the Sebasticook River (Benton), Outlet Stream (Vassalboro), Mud Pond watershed (China), and large forest blocks in eastern Winslow (Albion). The Pattee's Pond Association recently re-formed into a viable group of interested and energetic residents. Preserving critical natural resources also maintains water quality. Low impact development techniques, best management practices in farming, and sustainable forestry not only benefit the human industry, but also preserve critical natural resources. Development, agricultural, and forestry trade groups all exist, and should all be invited to discuss how best to move forward. Partnerships always prove more successful than individual efforts.

Another major factor in Winslow's future is removal of the Fort Halifax Dam. The Tidewater Mucket prefers slow-moving portions of rivers, and exists in the Sebasticook River, beyond the Fort Halifax Dam. Once the dam is removed, how will the Tidewater Mucket respond? Will other critical resources thrive in the new environment? Now is the time to build the partnerships that will monitor resource modifications following dam removal.

Policies

- The town should conserve critical natural resources in the community.
- The town should coordinate with neighboring communities and regional and state resource agencies to protect shared critical natural resources.
- The town should identify and encourage public access to scenic views in development plans.

Strategies

- ✓ Amend shoreland zoning standards to meet current state guidelines.

The Code Enforcement Officer should continue monitoring state legislation and recommend changes to Shoreland Zoning regulations as necessary.

- ✓ Designate critical natural resources as Critical Resource Areas in the Future Land Use Plan.

The Town's Essential Habitat area (Bald Eagle nest site) should be clearly marked on the town Zoning Map, for easy reference during development review. The Comprehensive Plan Implementation Committee should review the "High Value Plant & Animal Habitats" map published by Beginning with Habitat, and determine whether any other critical resources need to be added to the town Zoning Map. Any recommendations for map changes should be made to the Planning Board and Town Council by 2011.

- ✓ Require developers to look for and identify critical natural resources that may be on site and to take appropriate measures to protect those resources, including but not limited to, modification of the proposed site design, construction timing, and/or extent of excavation.

The Planning Board should modify the town's zoning regulations to require all development within a Critical Resource Area be reviewed by the Department of Inland Fisheries and Wildlife. Approval by the State need not be a requirement for local approval, but IF&W staff should have the opportunity to recommend modifications to the plan. The Planning Board should recommend Code changes to the Town Council by 2010.

- ✓ The Planning Board should incorporate maps and information provided by the Beginning with Habitat program into their review process.

Beginning with Habitat maps and information should be easily accessible to the Planning Board. The Planning Board should consult the maps during all development review, and if the development is proposed in a resource area, the Planning Board should speak with appropriate specialists at the State or locally to determine whether changes to the development proposal should be recommended.

- ✓ Adopt natural resource protection practices and standards for construction and maintenance of public roads and properties and require their implementation by the community's officials, employees, and contractors.

The Planning Board should consult with their counterparts in southern and coastal Maine to determine which practices work well at a municipal level.

The Planning Board should then recommend changes to the Town Council. Recommendations should be made to the Town Council by 2011.

- ✓ Initiate and/or participate in interlocal and/or regional planning, management and/or regulatory efforts around shared critical natural resources.

The Implementation Committee should identify those critical resources crossing municipal boundaries that warrant collaborative management. The Committee shall then recommend to the Planning Board that a regional resource management committee be formed with representatives from all stakeholders and municipalities. The recommendations to the Planning Board should be made by 2011.

The Implementation Committee should contact school personnel to discuss potential scientific studies of post-dam removal conditions, specifically to determine whether the Tidewater Mucket is lost along this stretch of river. The Implementation Committee should contact teachers by 2009.

- ✓ Pursue public/private partnerships to protect critical natural resources such as through purchase of land or easements from willing sellers.

The Planning Board and Town Council should invite Maine Audubon and the Forest Society of Maine to attend a meeting, discussing how the municipality and each organization can work collaboratively. A specific subject of the meeting should be the potential of acquiring wildlife corridor easements on private property. The meeting should take place in 2009.

- ✓ Distribute or make available information to those living in or near critical natural areas about applicable local, state, or federal regulations.

The Code Enforcement Officer should contact landowners in Essential Habitat Areas, and other critical areas identified by the Implementation Committee. The Code Enforcement Officer should make the landowners aware of the unique conditions on their property, and discuss development options based upon those conditions. The Code Enforcement Officer should speak with landowners by 2011.

- ✓ Identify scenic locations, and work with landowners to acquire/develop public views.

The Winslow Parks and Recreation Board should use the scenic views identified in this Comprehensive Plan to begin discussion of public access. The Parks and Recreation Board should approach landowners regarding public access and identification of views. The Parks and Recreation Board should begin discussing prioritization of public view access points in 2009.