

14. RIPARIAN HABITAT MANAGEMENT

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“Riparian” is defined as the land along the bank of a river or lake. Riparian areas are ecosystems comprising streams, rivers, lakes, wetlands, banks, and floodplains that form a complex and interrelated hydrological system. Because of the diverse and dynamic nature of riparian ecosystems, they support a wide variety of plant and animal communities, including insects, reptiles, amphibians, fish, waterfowl, songbirds, bats, mink, and otter. Many species are dependent upon healthy riparian ecosystems.

An intact riparian area functions as both a *buffer* and a *corridor*. By providing habitat and filtering runoff, a riparian area buffers the water body from the impacts of adjacent land uses. Riparian areas also act as a travel corridor to provide movement and dispersal routes for wildlife and plants on your land. When planning riparian conservation and restoration strategies, you should consider both the buffer and corridor functions of riparian areas.

BUFFERS

Riparian areas are important not only for the plants and animals that inhabit them, but also for the influence they have on adjacent waters. Forested areas between the water and developed land maintain habitat suitable for riparian species. The downed wood, leaves, and other organic material that riparian areas contribute to aquatic systems are important components of the food base and habitat structure in Vermont’s water bodies. Fallen trees provide loafing areas for ducks, snakes, and turtles and important protective cover for fish. Mature trees and overhanging vegetation in riparian areas provide shade in the summer and insulate stream channels in the winter, moderating the effect of extreme temperatures. Coldwater species such as brook trout require water temperatures well below 70° F. While many of Vermont’s larger streams regularly exceed 80° F during warm summer months, small tributary streams often provide cool water refuge for fish and other aquatic organisms inhabiting these systems. Wide forested buffers along riparian areas are also crucial for absorbing and filtering overland runoff, thereby protecting water quality. Roots of trees and other woody vegetation bind soils and help to maintain stable stream banks, preventing excessive stream bank erosion and sediment buildup in aquatic habitats.

CORRIDORS

Forested riparian areas serve as travel and dispersal corridors for wildlife. They are vital connections that enable wildlife to move safely from one habitat to another to feed, breed, and nest, and for young to disperse and set up new territories. Many species of amphibians and turtles rely on stream and river habitats during the breeding season and then spend most of their lives in upland habitat, often at a considerable distance away. Larger wildlife species also depend on these areas for travel. A Vermont Fish and Wildlife Department study shows use of riparian corridors to be important for black bear movement, particularly at road crossings (Hammond, 2002).

In addition to the ecological values of riparian areas, they serve other important functions for our everyday life. These ecosystems protect water quality for drinking and recreation, protect property from flood and ice flow damage, and provide for recreation, aesthetics, and educational opportunities.

RECOMMENDED FOREST BUFFER WIDTHS FOR WILDLIFE

Naturally vegetated riparian buffer widths of 100 feet from the top of the stream bank often provide for many of the functions necessary to protect aquatic habitats on stable streams and rivers. However, a vegetated riparian area of more than 500 feet may be required to provide suitable habitat for most bird species. Some riparian dependent bird species, such as bald eagle, great blue heron, and wood duck, may require buffers 600 feet or wider. Table 14.1 provides additional information on buffer width needs for various wildlife groups.

Table 14.1
Buffer width needs for wildlife

WILDLIFE GROUP	BUFFER WIDTH (in feet)
Most wildlife	660
Hawks	330
Riparian mammals	100 to 330
Reptiles and amphibians	100 to 330 (> 1000' for some species)
Songbirds	200 to 660
Nesting waterfowl	300 to 600
Bald eagle, nesting heron, cavity nesting ducks	600
Cold water fisheries	100 to 300

In general, the larger or wider the buffer is, the more likely it is to have value to wildlife. It is unlikely that most buffers that can practically be implemented will meet the needs of all riparian obligate wildlife and riparian associated rare species. Thus, due consideration to wildlife habitat in upland forest management is essential for protecting riparian species. Larger streams and those which naturally meander will generally require larger buffers than small, steep, and stable stream channels. A wider riparian area provides better protection of water quality and aquatic habitats, generally contains a greater diversity of habitats within, and creates greater distance between the aquatic resource and surrounding human development, ultimately protecting both ecological and property interests.

BUFFER MANAGEMENT

The best way to protect both aquatic and terrestrial wildlife habitat functions within the riparian area is to maintain as much of it as possible in an *undisturbed, naturally vegetated state*. A diversity of natural vegetation (trees, shrubs, and so on) is far superior to cropland, lawn, or other heavily managed areas for supporting wildlife. Where alteration of the riparian area is unavoidable, it should minimize impacts to buffer functions and connection to adjacent habitats. Natural features within the riparian area that may be of particular value to wildlife should be

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Figure 14.1

Woody debris in stream channels provides cover and shade.

identified and safeguarded (see Table 14.2). Other general rules of thumb for riparian buffer management include:

- Exclude livestock and vehicles from the buffer except for designed stream crossings. Cows and other livestock can trample plants, promote erosion, and degrade water quality.
- Control invasive plants to promote establishment of native trees and shrubs (see **Chapter 17, Invasive Species Management**).
- Do not dispose of refuse in the buffer. Dumping leaves, grass clippings, and other yard refuse can kill existing vegetation and result in stream bank erosion due to the loss of stabilizing roots. Remove urban debris such as tires and old appliances.
- Leave natural woody debris in stream channels to create pools and provide cover and shade for fish and other aquatic organisms (see Figure 14.1). Logging debris is not considered natural debris as it may be in violation of Vermont Acceptable Management Practices.
- Minimize the use of stream crossings. Where stream crossings are unavoidable, bridges are preferred over culverts as they present less of a potential barrier to fish and wildlife movements. Stream crossings often require state or federal permits. Contact a state river management engineer if you are planning to cross a stream with a culvert or bridge, or plan to conduct any activity involving a stream or river. (See link in **Resources** for more information on using pesticides near water.)

Timber harvest is regulated by the *Acceptable Management Practices for Maintaining Water Quality on Logging Jobs in Vermont* which are intended to prevent discharges of sediment and petroleum products into surface waters. To further protect the broader functions provided by riparian areas, harvest of timber within or adjacent to riparian areas should be done with great care. Recommendations include the following:

Table 14.2

Natural features used by wildlife in a riparian area

NATURAL FEATURE	WILDLIFE SPECIES
Large dead standing trees	Hawks, osprey, and eagles use for nesting
Large cavity trees	Owls, wood ducks, hooded mergansers, and others use for nesting
Large dying trees	Bats roost under loose bark
Seasonal and vernal pools	Amphibians use for breeding
Understory tangles	Cover for many species
Large woody debris in streams	Turtles use for basking, fish for cover
Stream bank burrows	Weasels, otters, and muskrats make homes
Sandy soils with good sun exposure	Turtles use for nesting
Stone walls and rock piles	Snakes and small mammals use for cover/dens
Large overhanging trees	Flycatchers, kingfishers, osprey and other birds use as perches
Large stands of conifer trees	Deer use as wintering areas
Hollow trees and logs	Some mammals and birds use as dens
Fallen shaded logs	Some salamanders use as dens

- Locate logging trails and roads as far away from the waterway as possible to avoid erosion and any alteration to the stream flow.
- Maintain continuous and dense canopy along streams and ponds to maximize shading.
- Keep soil disturbance to a minimum and do not operate wheeled or tracked logging equipment when soils are wet. Consider harvesting during frozen conditions.
- Monitor for erosion before, during, and after harvesting. Look for cloudy water, algae growth, silt, or muck deposits on gravel streambeds, and new runoff channels or gullies. Suspend harvest or alter practices to minimize erosion if you see any of these signs.
- Try to spare nut- and fruit-producing trees for their wildlife value.
- In areas directly adjacent to the stream, leave dead or dying trees that may eventually enter the stream channel. In areas further from the stream, try to leave at least one to six snags or den trees per acre for those birds and mammals that rely upon them.
- Consider using vegetable-based, biodegradable oils and lubricants. These oils are non-toxic to fish. Keep fuel and maintain machinery well away from watercourses.

(For more information, consult “ANR Riparian Buffers and Corridors Technical Papers” at the link in **Resources**.)

Previously disturbed or degraded riparian areas may present opportunities for restoring wildlife habitat functions. For example, any work that removes pavement or lawn at the water’s edge and replaces them with a vegetated buffer of native trees and shrubs is likely to benefit wildlife as well as fisheries and provide other functions of riparian areas (see Figure 14.2). Simply creating a no-mow zone along the water’s edge will result in a naturally vegetated buffer over time.

If you desire quicker results or want to encourage certain plants through active revegetation, several experts — such as the Natural Resource Conservation Service, the Vermont Fish and Wildlife Department, local conservation commissions, and watershed associations — have expertise in this area and can provide guidance for effective riparian wildlife habitat restoration. These experts can help design the project, recommend beneficial plants, and direct you to sources for financial assistance for installing a riparian buffer. Their contact information can be found through the Vermont Fish and Wildlife Department website in **Resources**.



RESOURCES

Hammond, F. M. 2002. “The Effects of Resort and Residential Development on Black Bears in Vermont.” Final Report. Waterbury, VT: Vermont Fish and Wildlife Department, Agency of Natural Resources.

Vermont Agency of Natural Resources. “ANR Riparian Buffers and Corridors Technical Papers.” http://www.watershedmanagement.vt.gov/rivers/docs/Educational%20Resources/rv_RiparianBuffers&CorridorsTechnicalPapers.pdf

Vermont Forest, Parks and Recreation. Vermont Acceptable Management Practices. <http://www.vtfpr.org/watershed/ampprog.cfm>

Vermont Fish and Wildlife Department. Contacts for Other Organizations. <http://www.vtfishandwildlife.com/links.cfm>

Department of Environmental Conservation. Water Crossing Permits. http://www.anr.state.vt.us/dec/waterq/permits/htm/pm_streamcrossing.htm

U. S. Department of Agriculture. Natural Resource Conservation Service. <http://www.nrcs.usda.gov/wps/portal/nrcs/site/national/home/>



Figure 14.2
Riparian planting project along
Barton River. *Courtesy of Paul Hamelin.*