



Floodplain Forests

Habitat Stewardship Series

NEW HAMPSHIRE WILDLIFE ACTION PLAN

Recognizing floodplain forests

Over the years, New Hampshire's floodplain forests have been cleared for development due to their proximity to river systems, and plowed under for agriculture due to their rich and productive soils. Intact floodplain forests contain uncommon plants and animals and are important reservoirs of New Hampshire's biodiversity. Learn to recognize the habitat values of floodplain forests and what you can do to maintain and conserve these special habitats.



Floodplain forest

Floodplain forests usually occur in the low, flood-prone areas along rivers, typically less than 20 feet above the river channel. They are often associated with oxbows (pools that have become separated from the river channel), temporary wetlands that dry up in summer (vernal pools), open meadows of grasses and wildflowers, and dense shrub thickets. The periodic floods in these forests recycle sediment and nutrients, creating some of New Hampshire's richest soil deposits.

Types of floodplain forest in New Hampshire

Along the Connecticut, Merrimack and other large rivers, floodplain forests consist of silver maple trees and a rich groundcover of wildflowers and ferns that thrive following large-scale floods that are common in these areas. Along smaller rivers in central and southern New Hampshire, floodplain forests contain mostly red maple trees, along with black ash, black cherry and ironwood growing among vernal pools, oxbows, and shrub thickets. Less common trees such as swamp white oak, sycamore, American elm, eastern cottonwood, and river birch can also be found in floodplain forests in southern New Hampshire.

In northern New Hampshire and in the White Mountains, floodplain forests consist mainly of sugar maple and balsam fir. Due to the steeper topography in this region, these floodplains have quicker, faster floods, so the oxbows and vernal pools which are common along southern rivers are usually absent along northern rivers.



Why are floodplain forests important?

Floodplain forests are unique because of their periodic flooding. These regular disturbances, which deposit silt and sand along the banks of waterways, help create and maintain unique communities of plants that tolerate flooding and require nutrient-rich soils. Floodplain forests contribute many free ecological services to our society: they help filter pollutants to prevent them from entering streams, improve water quality, are critical in controlling erosion, and help buffer rivers against catastrophic flooding.

Floodplain forests as wildlife habitat

Floodplains are home to a diversity of wildlife. The damp soils create rich insect and amphibian breeding habitats, and these species in turn become prey for birds such as woodcock and barred owl, for mammals such as mink and raccoon, and for reptiles such as smooth green snake and wood turtle.

Research in the Connecticut River region has shown that spring flooding thaws the soils of floodplain forests earlier than soils in surrounding areas. This early thaw means that insects become available to birds (as food) earlier in floodplain forests, so birds will feed in, follow, and depend more heavily on floodplain forests than other forested habitats during the early spring migration.

Floodplain forests as corridors

Floodplains provide corridors that allow wildlife to move from one habitat to another, especially in urban areas where development has fragmented alternative travel routes for wildlife. The overhanging canopy in floodplain forests also helps maintain cool waterways in the summer, which helps species such as brook trout.

The impact of agriculture and human development

Human development of floodplain forests permanently eliminates habitat. Building and construction of paved roads may also separate wildlife populations, inhibit migration, create increased predation and promote collisions on roads. Paving areas of native floodplain forests lessens the water-storage capacity of the land, which can cause more frequent and catastrophic floods, with potentially drastic effects on wildlife, people, and communities downstream.

Agriculture also has a negative impact on floodplains, but a less permanent one than human development. Over time, agricultural fields may revert to forest, and in their current condition they provide a different kind of habitat (hayfield, cropland) used by many wildlife species.

The impact of dams

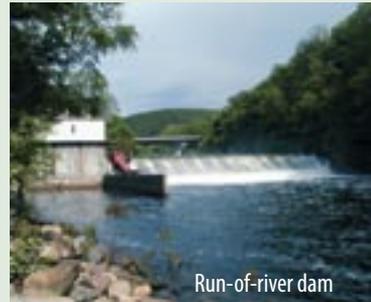
Dams on rivers prevent natural flooding, permanently altering the plant and wildlife communities of floodplain forests downstream. "Run-of-river" dams, which operate using available stream flow, not by storing water behind the dam, allow for normal flow except during periods of high water.

The impact of invasive plant species

Invasive plant species spread easily in the frequent disturbances created by flooding and tend to thrive in the rich soils of floodplain forests. Particularly problematic are Oriental bittersweet, Japanese knotweed, and black swallow-wort, which can outcompete existing native vegetation, strangle trees or eliminate the tree canopy. Invasive plants may also directly impact floodplain wildlife. Research shows that berries from invasive plants such as bittersweet and buckthorn are lower in nutrition—like junk food for birds—than berries from native shrubs.

Stewardship Guidelines for floodplain forests

- Focus land conservation in areas rich in existing floodplain systems, such as:
 - Upper Ammonoosuc River (Coos County) - contains the most extensive boreal floodplain forests (balsam fir/sugar maple)
 - Middle Androscoggin River (Coos County) - contains the most extensive silver maple floodplain forests in the state
 - Lamprey River (Strafford County) - contains the most extensive minor river floodplain forests (red maple/shrubs) in the state
- Consider removing or modifying dams that alter the natural flood regimes of rivers. There are more than 5,000 dams in New Hampshire, many on private lands. If dams are removed or altered to become “run-of-river” dams, restored natural flows can help maintain floodplain plant communities and benefit migratory birds and fish, amphibians, reptiles, and invertebrates that depend on seasonal flooding.
- Reduce recreational trails and roads within floodplain forests. These roads and trails can impede wildlife movement between wetland and upland habitats, especially during spring and early summer, when birds, amphibians and reptiles breed and young disperse from the river or nearby vernal pools into the surrounding upland areas. Trails can also provide an avenue for invasive plants to enter floodplain forests.
- Monitor healthy floodplain forests to prevent new infestations of invasive plants. Where feasible, consider controlling populations of invasive plants, recognizing that control will be necessary both upstream and downstream to prevent ongoing re-infestation. The New England Wildflower Society (newfs.org), UNH Cooperative Extension (extension.unh.edu) and other organizations offer training in invasive species identification and control.
- Forest management in floodplain forests should aim to regenerate existing floodplain species such as silver maple, balsam fir/sugar maple, or red maple. This may be problematic, however, if dams have altered the flood regime in a forest. Existing trees may be relics of past flood regimes, and regenerating species such as silver or red maple in the new, drier conditions may be difficult.
- Limit overstory removal of trees in floodplain areas where invasive plant species are present. Creating canopy gaps by timber harvesting can encourage invasive plant species to invade the disturbed areas; limiting the amount of light reaching the ground within floodplain forests can help discourage the establishment or spread of invasive plants.
- Always consult a licensed New Hampshire forester before conducting a timber harvest on your property. Understand and follow all laws pertaining to the harvesting of trees near wetlands and waterbodies. Follow established Best Management Practices, and harvest timber near wetlands only when the soils are either frozen (winter) or very dry (summer).



Run-of-river dam



Oriental bittersweet - an invasive plant

Species Focus

of conservation concern

Cerulean Warbler

The cerulean warbler has been in decline over its entire range the last 40 years. The species is closely associated with floodplain forests. A stable but small population of cerulean warblers at Pawtuckaway State Park occupies a mixed red oak/red maple/white pine forest, and represents the northeastern-most known locality for this species in North America. Sparse sightings exist in other floodplain forests in New Hampshire. Keep an eye out for cerulean warblers near Mount Wantastiquet in Hinsdale/Chesterfield, the floodplains along the Blackwater River in Salisbury, and along the Ashuelot River in Hinsdale. Locating unknown populations of these birds and protecting floodplain forest habitats from development are important priorities for this species.



Cerulean Warbler

Northern Leopard Frog

The northern leopard frog is strongly associated with grassy floodplain areas along major rivers in the state, including the Merrimack, Connecticut and Androscoggin rivers. These amphibians require slow-moving water for breeding and dense, low vegetation as cover and feeding habitat. Landowners can help this species by protecting the open, grassy areas associated with agricultural lands along floodplains. Many areas have been developed or have reverted to forested habitats, resulting in declining numbers of northern leopard frogs.



Northern Leopard Frog

Red-Shouldered Hawk

Red-shouldered hawks inhabit mature forests, with a preference for floodplain forests and forested wetlands. Populations of these birds have increased since their 1986 listing as a threatened species in New Hampshire, and they are now listed as a species of special concern. However, fragmentation of forests, especially in southern New Hampshire, favors great horned owls and red-tailed hawks over red-shouldered hawks, who are more successful in large, unbroken blocks of mature forest. Where red-shouldered hawks have established a breeding territory, research shows they can occupy the same site for many years if habitat remains unfragmented by timber harvesting or development.



Red-shouldered Hawk

Wildlife found in floodplain forests

The wildlife species listed here are closely associated with floodplain forest habitats, but many other species will use floodplain forests at some time during the year. Be on the lookout for these and other species that use floodplain forests, and follow stewardship guidelines to help maintain or enhance floodplain habitats. Species of conservation concern--those wildlife species identified in the Wildlife Action Plan as having the greatest need of conservation--appear in **bold** typeface.

- **American black duck**
- Baltimore Oriole
- Belted kingfisher
- Blue-gray gnatcatcher
- **Cerulean warbler**
- **Eastern red bat**
- Green heron
- **Jefferson salamander**
- **Northern leopard frog**
- Otter
- Red-bellied woodpecker
- **Red-shouldered hawk**
- **Silver-haired bat**
- **Wood turtle**
- Yellow-throated vireo

Where to get help

If you have information about a wildlife species of conservation concern, contact NH Fish & Game's Wildlife Division at 603-271-2461. Contact the UNH Cooperative Extension Wildlife Specialist at 603-862-3594 for technical assistance for landowners or your community.

Publications and assistance on forestry and wildlife topics are available through the UNH Extension Educators in Forest Resources in each county. Contact information for each UNH Cooperative Extension office is provided below. Additional publications, contact information, resources, and web versions of all brochures in the Habitat Stewardship Series are available on the UNH Cooperative Extension website at: nhwoods.org.

Belknap County	603-527-5475	Grafton County	603-787-6944	Rockingham County	603-679-5616
Carroll County	603-447-3834	Hillsborough County	603-641-6060	Strafford County	603-749-4445
Cheshire County	603-352-4550	Merrimack County	603-225-5505	Sullivan County	603-863-9200
Coos County	603-788-4961				

Authorship

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About the Habitat Stewardship Series

Much of the land in New Hampshire is privately owned. These individuals are the primary stewards of our wildlife and forests, and also our clean water, scenic views, fresh air, natural and cultural heritage, and recreational resources. The Habitat Stewardship Series has been created to help landowners and land managers recognize the habitats critical for wildlife species at risk, and to illustrate the role private landowners can play in sustaining those species through conservation, management, and sound land stewardship.

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