

Piedmont Small Wetland Communities

Piedmont Ecoregion

This habitat type can include vernal pools, seeps, small depression ponds, ephemeral wetlands and beaver ponds. Some depressions may hold water for a significant portion of the year; others may be saturated for only a few months. All Piedmont wetland habitats are especially important as breeding sites for amphibian species. Small wetlands can also be important breeding habitat for crayfishes (*for more about crayfishes and other aquatic taxa, see the individual river basin sections*). Wading birds, waterfowl, and songbirds, too, may also use small wetland communities for nesting and feeding areas. (*Note: western Piedmont bog habitats are covered under the “Bogs and associated wetlands” section in the Southern Blue Ridge portion*).

Piedmont communities in this category include Upland Pool, Upland Depression Swamp Forest, and Low Elevation Seep (Schafale and Weakley 1990). Upland Pools are a rare habitat type in the Piedmont, dominated by wetland shrubs and herbs and are small depressions where water is ponded by an impermeable substrate. Tree species along the edge of these habitats may include black gum, water oak, red maple, and sweet gum. Shrubs may include buttonbush, blueberries, and swamp doghobble. Royal ferns, sedges, sphagnum, and other mosses are found in the herb layer. Upland Depression Swamp Forest occurs on poorly drained upland flats or depressions scattered throughout the Piedmont. These communities often have several tree species present (e.g., willow oak, red maple, sweet gum) with a sparse shrub layer such as blueberry, black haw, or arrowwood (Schafale and Weakley 1990). Low Elevation Seeps are found at the edge of floodplains or the base of slopes and are generally covered in a variety of herbaceous species (though usually lacking in sphagnum moss). Table 1 provides a list of priority species associated with this habitat for which there are conservation concerns.

Table 1. Priority species associated with piedmont small wetland communities.

Group	Scientific name	Common name	State status* (Federal status)
Birds	<i>Melanerpes erythrocephalus</i>	Red-headed Woodpecker	
	<i>Nyctanassa violacea</i>	Yellow-crowned Night-heron	
Amphibians	<i>Ambystoma maculatum</i>	Spotted Salamander	
	<i>Ambystoma opacum</i>	Marbled Salamander	
	<i>Ambystoma talpoideum</i>	Mole Salamander	SC
	<i>Ambystoma tigrinum</i>	Eastern Tiger Salamander	T
	<i>Eurycea guttolineata</i>	Three-lined Salamander	
	<i>Eurycea quadridigitata</i>	Dwarf Salamander	SC
	<i>Hemidactylium scutatum</i>	Four-toed Salamander	SC
	<i>Hyla gratiosa</i>	Barking Treefrog	
	<i>Hyla versicolor</i>	Northern Gray Treefrog	SR
	<i>Scaphiopus holbrookii</i>	Eastern Spadefoot	

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Group	Scientific name	Common name	State status* (Federal status)
Reptiles	<i>Clemmys guttata</i>	Spotted Turtle	
	<i>Thamnophis sauritus sauritus</i>	Common Ribbonsnake	
*Abbreviations SC Special Concern SR Significantly Rare			

Location And Condition Of Habitat

Piedmont wetland habitats are heavily impacted, and have been greatly reduced, by development, roads and drainage throughout the region. While often small in size, cumulatively these habitats provide critical breeding habitat for many amphibian species. The loss of ephemeral wetland communities in the Piedmont has strong ramifications for future amphibian populations. A map of this habitat is not provided due to scale and the seasonal nature of some of these communities.

Beaver ponds are a natural community, but result from modification of other community types. Beavers were extirpated in North Carolina by the late 1800s, due to the high demand for beaver pelts, but were reintroduced in 1939. Since that time, beaver recovery has been wildly successful, resulting in an increase in wetland habitat, but also an increase in complaints about beaver-caused damage to private property (e.g., flooding in agricultural areas). With stable beaver populations, beaver ponds can be maintained for decades. However, beaver-caused damage to trees and property has resulted in the destruction of many beaver dams. A reduction of beaver ponds will place more importance on man-made ponds as the primary habitat for many lentic aquatic species. Dead trees in beaver ponds are important foraging and nesting habitat for woodpeckers, such as the red-headed woodpecker, and for wood duck nesting.

Problems Affecting Species And Habitats

Problems affecting species and habitats include land use activities such as road construction and recreational activities. A brief discussion of these issues, as well as others that affect small wetland communities, follows.

- *Roads* - Increased road densities are correlated with declines in amphibian diversity and abundance (Vos and Chardon 1998, Findlay *et al.* 2001, Fahrig *et al.* 1995). Roads can cause heavy mortality for reptiles and amphibians and can effectively isolate breeding populations, or separate wetland habitats from upland habitats that are used during non-breeding portions of amphibian and reptile life cycles.
- *Water quality* - Increases in impervious surfaces causes excess stormwater runoff and pollution from point and non-point sources, which degrades water quality. Most amphibians are highly sensitive to changes in water quality.

- *Drainage* - Some wetland communities are drained for agriculture or development, causing direct habitat loss. Loss of ephemeral wetland habitats severely impacts amphibians (Bailey *et al.* 2004).
- *Alteration of hydrology* - Cutting ditches through wetlands can alter their hydrology and habitat quality. Excess stormwater runoff can also change wetland hydrology.
- *Introduction of fish, bullfrogs, and other predatory species* - Ephemeral and isolated wetlands are very valuable to amphibians because they typically do not support fish and other predators of amphibian eggs. The introduction of fish, bullfrogs, and other predatory species can devastate the breeding effort of amphibians in small wetlands.
- *Timber harvest* - Clearcutting near ephemeral wetlands causes higher solar radiation and an increase in probability of wetlands drying out; also, timber harvest may introduce weedy plant invasions of wetlands.
- *All Terrain Vehicles* - The excessive use of all terrain vehicles (ATVs) and other recreational vehicles can cause significant damage around wetland communities. ATVs can cause soil disturbance, increase erosion and sedimentation, elevate vehicle related mortality rates, and cause noise-related disruptions of faunal activities (Bailey *et al.* 2004).

Species And Habitat Conservation Actions and Priorities For Implementation

A high priority should be placed on protecting wetlands and adjacent uplands through acquisition or easement. Seasonal wetlands must have sufficient surrounding habitat in order to support the life history requirements of amphibian and reptile populations. Every effort should be made to maintain continuous gradients between wetland and upland sites; roads, agriculture, or forestry operations between complementary sites may render them ineffective at supporting amphibian and reptile populations (Bailey *et al.* 2004). Land trusts can be a valuable partner in this effort.

Wetland restoration efforts should focus on restoring the natural hydrology, water quality, and plant communities of degraded wetlands, and on creating new ephemeral wetlands in suitable locations. The Natural Resources Conservation Service's Wetlands Reserve Program provides a good tool for promoting wetland conservation on private lands. Several sources of information are available (Biebighauser 2002, Thompson and Luthin 2004, EPA 1993) to assist in constructing and restoring wetlands. The Ecosystem Enhancement Program will likely play a key role in wetland protection and restoration in North Carolina.

There is great need to promote the adoption of agricultural and forestry best management practices that reduce run-off, erosion, and pollution. The federal Farm Bill and other cost share programs provide incentives for land stewards to adopt these practices. Technical guidance manpower is needed to proactively promote and facilitate participation in these programs.

Beaver ponds can be a nuisance to landowners when they flood farm fields or commercial timber. Several techniques have been developed to minimize beaver damage while maintaining some benefit from impounded waters. The Beaver Management Assistance

Program administered by US Department of Agriculture Wildlife Services offers assistance with lethal and non-lethal beaver management. Perhaps an even more effective way to mitigate beaver damage suffered by landowners is through property tax incentives. Strategies to promote techniques for managing beaver damage that minimize the loss of quantity and quality of beaver ponds should be explored.

Strategies for the effective removal of introduced aquatic predators must also be developed, and a mechanism for identifying and prioritizing sites for removals worked out.

Priority Research, Survey, And Monitoring

- **Surveys**

- Identify the location of key small wetland communities in the Piedmont.
- Initiate distribution surveys for all amphibian species associated with small wetland communities, but especially the mole salamander, eastern tiger salamander, dwarf salamander, and four-toed salamander.
- Gather better information about the status and distribution of more common species associated with Piedmont wetland habitats (e.g., three-lined salamander, common ribbonsnake).
- Determine woodpecker use of dead trees in beaver ponds.

- **Monitoring**

- Determine population trends and persistence of small wetland breeding amphibian populations, particularly mole salamander, eastern tiger salamander, dwarf salamander, and four-toed salamander.

- **Research**

- Focus habitat use studies on bats and small mammals to clarify how small mammals and bats use these wetlands; little is known about the value of small wetland communities in the Piedmont for those groups.
- Study the efficacy and practicality of “toad tunnels” and other wildlife crossings that allow passage under roadways and help maintain connectivity between wetland metapopulations.
- Determine minimum upland buffers required to sustain at-risk amphibian populations.
- Explore management strategies to eradicate undesirable species, such as bullfrogs, from wetlands.

Supporting References

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