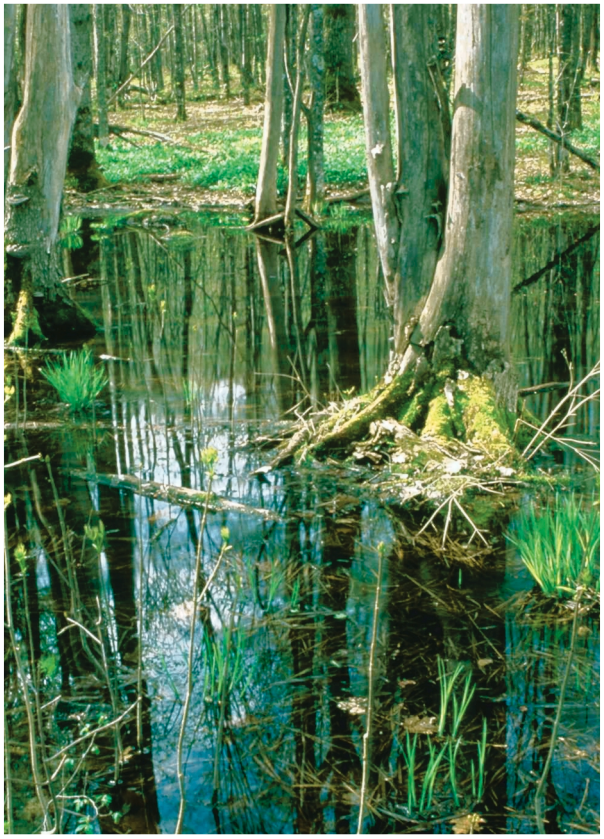
Ephemeral Wetlands

Brief Description

Ephemeral, or seasonal, wetlands are one of the most important and threatened habitats for Midwest herpetofauna. Ephemeral wetlands include vernal pools, floodplain pools, prairie potholes, limestone sinks, and other shallow depressions. Many of them are completely isolated from other bodies of water and may have water in them for only part of the year. That is why they are also called seasonal wetlands. Such wetlands once covered much of the Midwestern landscape. However, due to extensive ditching, draining, and tiling of the land for agriculture and development, widespread degradation or outright loss of much of this aquatic habitat has taken place.

Ephemeral wetlands are characterized by their tendency to completely dry out most summers only to fill up again the following fall, winter, or spring. As a result of this phenomenon, **fish are usually absent** or they occur in lower numbers. Consequently, amphibian predation by such fish is reduced or absent. Ephemeral wetlands are often small and isolated from other bodies of water, though temporary connections with other wetlands may be present as a result of temporary flooding. Because **many reptiles and amphibians that are associated with ephemeral wetlands are integrally linked to the surrounding upland habitat**, we also consider adjacent upland habitats, such as forests, when making management suggestions.



A. Sheldon

This wetland, though seasonal, provides breeding habitat for many amphibian species and a foraging area for many reptiles.

CRITICAL CONSIDERATIONS FOR EPHEMERAL WETLANDS

- Ephemeral wetlands can be successfully restored but have not been successfully created from scratch. Protect and restore remaining natural wetlands.
- Maintain natural water levels and fluctuations—this is what makes these wetlands unique and valuable.
- Avoid clearing or replacing natural native vegetation along the wetland edge, as it serves to provide habitat, protect water quality, and prevent erosion. A minimum of 50 feet is recommended, and more would be better.
- Above and beyond the wetland buffer, provide the adjacent upland habitat required by many wetland species. This should be 500 feet or wider if possible.

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Species Associated with Ephemeral Wetlands

J. Roe

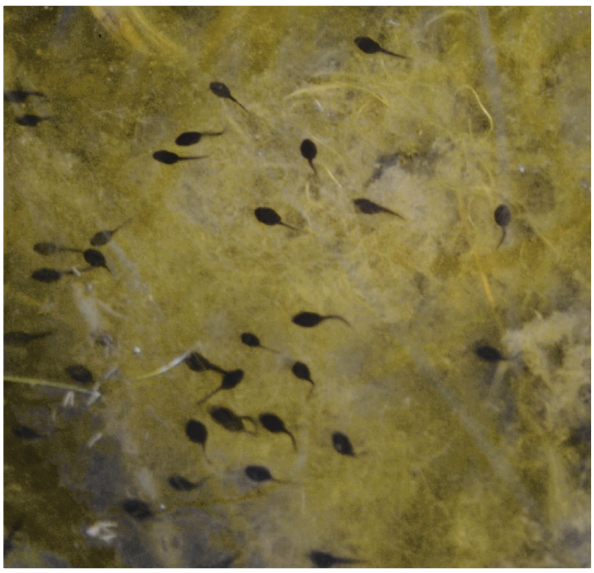
Tiger Salamanders move to ephemeral wetlands to breed, but return to the surrounding upland forests for the rest of the year.

Many species of reptiles and amphibians are highly dependent on ephemeral wetlands and will not occur in areas where such habitats are not available. The regular filling and drying of ephemeral wetlands, their shallow nature, and abundant invertebrate prey base make them highly desirable as breeding sites for numerous amphibians. Tiger Salamanders, Blue-spotted Salamanders, and Wood Frogs are species that rely on ephemeral wetlands for successful metamorphosis from larva to adult. **By selecting seasonal wetlands for breeding, the larval stages of these amphibians (tadpoles) avoid predation by fish, have access to abundant prey and complete development before the wetland dries.**

Some species of reptiles and amphibians, while not dependent on ephemeral wetlands, opportunistically use these habitats. Because breeding amphibians sometimes number in the thousands in these wetlands, Garter Snakes and Water Snakes, as well as Snapping Turtles and Mud Turtles, forage on the temporarily abundant prey.

Managing Ephemeral Wetlands to Benefit Amphibians and Reptiles

Ephemeral wetlands are one of the most important habitats to protect for reptiles and amphibians in the Midwest. **It is very important that remaining ephemeral wetlands be protected, enhanced, and restored to their natural state, all of which are feasible through a variety of management tactics. Constructing these types of wetlands from scratch, however, is very challenging.** Researchers have found that we still lack the capacity to create the naturally fluctuating water levels and soil qualities of ephemeral wetlands. Nevertheless, *restoration* is often quite feasible. Breaking existing drainage tiles, filling ditches, and even removing fill are often very successful methods for returning wetlands to near natural conditions. Please refer to the Alteration of Water Tables section of the Toolkit for more restoration ideas.



J. Roe

Toad tadpoles occur in large densities in ephemeral wetlands during spring and summer.

Integral to wetland protection and restoration is the maintenance of natural water-level fluctuations (hydroperiod). Remember that many amphibians rely on a specific hydrological regime to complete certain life-stages. For example, many amphibians require a minimum hydroperiod of 2.5 to 4 months and some will require five months to metamorphose (change into the adult form). Drainage of ephemeral wetlands by tiling and ditching or excavating wetlands to make them deeper alters natural water levels, and in turn, may negatively affect many species of reptiles and amphibians. As mentioned, restoring natural water fluctuations can often be as simple as filling old drainage ditches or breaking tiles.

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Protection and restoration of ephemeral wetlands includes avoiding or reducing chemical and sediment runoff into wetland basins from livestock or agricultural areas, as well as from roads. Degraded water quality can adversely affect developing amphibians and the species that prey on them, and sediment runoff can quickly fill isolated wetlands. By leaving portions of fields that border wetlands fallow and fencing areas that would limit livestock access, wetlands can be protected from such threats. If chemicals such as pesticides must be applied to adjacent agricultural fields, selective use away from wetlands is advised. **A buffer strip of natural vegetation between wetlands and agricultural areas of at least 50–60 feet is strongly recommended.**

B. Kingsbury

Ephemeral wetlands are important breeding areas for Blue-spotted Salamanders.

An often overlooked but extremely important feature of a "healthy" ephemeral wetland is the adjacent upland habitat. In fact, without the coordinated consideration of both wetland and surrounding upland habitats, implementing any other conservation strategies would likely be unsuccessful for many species. Many species use the surrounding uplands for activities such as hibernation and foraging. **Without suitable upland sites that are within their dispersal distance, some basic needs critical to survival may not be available**. It is thus imperative that intact, undisturbed upland surrounds wetlands. Investigators have found that an area 500 feet wide above the high-water mark may be the minimum required to protect many species. If it is not possible to leave this much area, then provide as much as conditions will permit.

A. Resetar

Leopard Frogs prefer fishless wetlands for breeding.

Undisturbed uplands also function to "connect" isolated wetlands by serving as travel corridors. Maintaining the connectivity of ephemeral wetlands allows some species to travel between wetlands, which can be especially important when wetlands dry and individuals must seek other more permanent wetlands. Many species find open habitats (e.g., agricultural fields, grasslands) to be significant barriers to dispersal. **Planting native shrubs and trees can restore forested buffers and/or corridors.**

Remove non-native vegetation such as purple loosestrife from ephemeral wetlands. These plants may outcompete and replace native species. **Most amphibian populations would likely be devastated by stocking fish into ponds that go for years without drying or altering an ephemeral wetland to make it a permanent wetland for the purpose of stocking game fish.** Fish are very efficient predators of amphibian eggs and larvae, and research indicates that local extinctions of some amphibians often follow fish introductions.

Careful consideration of the placement and ephemeral use of roads may alleviate some of the related negative effects on amphibians and reptiles. Roads not only contribute to pollution runoff into ephemeral wetlands but also to direct mortality from vehicles. As most reptiles and amphibians travel slowly on land (e.g., turtles), they often cannot avoid approaching vehicles. Because of this, road placement should be away from wetlands and not divide forest habitats into smaller portions. Runoff of pollutants from roads into wetland habitat will also be minimized if a vegetated buffer zone of 50 feet or more is maintained between the road and the wetland.

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Integrative Management Ideas

The identification and maintenance of ephemeral wetlands, critical surrounding upland habitat, and functional corridors between them are important steps towards the management and conservation of these habitats for reptiles and amphibians. Try to include as much land as possible in your conservation plan, but if only limited land can be allocated, consider protecting higher quality areas; for example, protect those areas containing many wetlands within a continuous stretch of forest over the protection of wetlands separated by extensive agricultural or residential areas.

S. Ballard

Ephemeral road closures will help prevent vehicular fatalities during sensitive times such as salamander breeding and turtle nesting seasons.

If you desire to develop wetlands for stocking game fish or to attract waterfowl, consider creating them where ephemeral wetlands do not exist. Excavation or damming of ephemeral wetland basins to alter natural water levels and their fluctuation should be avoided. However, creating permanent wetlands apart from ephemeral wetlands may increase the overall diversity of reptiles and amphibians on your land, as there are some additional species that utilize permanent wetlands. **If you plan to construct a permanent wetland, it is best to do so in an area that has already been altered**, such as a farm field. This will help minimize the loss or conversion of more intact natural habitat.

If roads are needed on your property, consider routing them around wetlands outside of the recommended buffer distance and around the edges of forests. Should roads be needed near wetlands, perhaps seasonal road closures coinciding with times of overland movement, such as salamander breeding and turtle nesting, could mitigate road mortality. Additionally, placing informative signs near wetlands may increase the awareness of likely crossing points, warning vehicles to proceed with caution. A novel idea is the addition of wide underpasses as opposed to culverts in low points along roads. These "herp tunnels" may help amphibians and reptiles safely migrate by keeping them off the roads.

Keep in mind that maintaining habitats suitable for reptiles and amphibians associated with ephemeral wetlands will benefit countless other wildlife as well. Ephemeral wetlands are very important for a variety of plants and for foraging and nesting habitats for many bird species, including ducks, shorebirds, and songbirds, and invertebrates such as dragonflies. Contrary to the concerns of some, healthy ephemeral wetlands do not necessarily promote mosquito densities.

B. Kingsbury

Beaver activity can result in the creation of semi-permanent wetlands that may persist for years.

This is the Ephemeral Wetlands module of the PARC publication, "**Habitat Management Guidelines for Amphibians and Reptiles of the Midwest," ISBN # 0-9667402-1-1.** Please visit www.parcplace.org for further information or copies of the complete document, or visit http://herpcenter.ipfw.edu for a Web-based version of these materials.