

# Caves and Springs

## *Brief Description*

When we look over the countryside, we are most aware of features such as forests, lakes, and agricultural fields. However, **in many areas across the Midwest, a number of subterranean elements such as caves are important parts of the landscape.** Over the millennia, water has been seeping through porous soil and gradually dissolving carbonate rocks such as limestone. The result of this geological process has been the creation of unusual surface and subterranean features such as springs and caves. The features most characteristic of caves include total darkness, very little soil (mostly rock), relative permanence (in contrast to more ephemeral environments like a forest), and comparatively constant environmental conditions (temperature, relative humidity, minimal air flow). The long history of isolation helps contribute to the uniqueness of each—no two caves are alike in their physical, environmental, or biological features.

**Springs are the surface exit points for water that has been traveling underground.** A specific set of subsurface features, such as rock formations or geologic faults, must be present in the landscape for a spring to form. While these subterranean features may be somewhat out of sight, they are closely tied to the land above. **Activities occurring on the surface can affect the subsurface and so we also need to consider these surface environments in management plans.**



J. Jensen

**Formed over the ages, caves are unique subterranean geologic features often “hidden” from the outside world.**

## *Species Associated with Caves and Springs*

The cave environment is a relatively “harsh” one. As you progress deeper into the system, light diminishes and food supply becomes scarce. Because of this, **the species that inhabit caves are highly specialized.** There are only a handful of amphibians that inhabit these areas for a great part of their life cycle, and the majority of these are salamanders. No reptiles live solely in caves. **The majority of amphibians that can be found in caves are more commonly observed near cave entrances or within the “twilight zone”** (the extent to where visible light reaches within the cave). Species more commonly found near cave entrances include the Pickerel Frog, Long-tailed Salamander, and Slimy Salamander.

### **CRITICAL CONSIDERATIONS FOR CAVES AND SPRINGS**

- Each cave is a unique, irreplaceable creation that should be protected from damage.
- Protect the water supply feeding the cave. This will help to safeguard water quality in the cave and the associated springs.
- Avoid clearing or replacing natural native vegetation around caves and springs, as this vegetation serves to provide habitat, protect water quality, and prevent erosion. A 50 foot natural buffer is recommended, and more would be better.
- Restrict human use of this habitat to the least sensitive areas. Keep livestock and vehicles out of seeps and springs.

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J. Jensen

A Long-tailed Salamander in the “twilight zone” of a cave.

The twilight zone of limestone caves, on the other hand, provides optimal habitat for the Cave Salamander. **Other species of reptiles and amphibians may use caves in a more opportunistic manner.** For example, some species of snakes, such as the Rat Snake and Timber Rattlesnake, may occasionally be found foraging around cave entrances, and Rat Snakes have been known to hibernate in caves.

**Springs and seeps provide important habitat for many species of reptiles and amphibians. Many animals that use them do so opportunistically,** but several species of salamanders, including the Long-tailed, Red, Spring, and Dusky Salamanders, are dependent upon the existence of springs and seeps. Box Turtles may forage in the shallow waters and rehydrate before further upland travels. Leopard

Frogs may also be found hunting insects in such areas, and many snakes such as Garter Snakes visit in search of the frogs. Of course, as water drains away from springs, it may contribute to a variety of wetlands and subsequently provide habitat for a diversity of wetland herps. We have highlighted these habitats and animals in the various wetland habitat modules of this guide.

## *Managing Caves and Springs to Benefit Amphibians and Reptiles*

**Caves must be vigorously defended from damage because they cannot be recreated.** It is important to realize that, of all the habitat types covered in this guide, caves and springs are the habitats most clearly that cannot be recreated if damaged or destroyed. For example, it is possible that after the clear-cutting of an area of forest, the forest will regenerate. However, once a cave has been filled in or polluted, its specific values have been irreversibly lost.

It is also important to recognize that **activities happening on the surface can affect the caves below and ultimately springs and other features downstream.** We must thus always consider surface environments when thinking about management measures for caves and springs. There are several factors paramount to the protection of cave and spring habitats. It is very important to **maintain the integrity of the water quality in the cave’s recharge area** (that part of a watershed that supplies water to the aquifer feeding the cave). The vegetation in this area is critical for protecting the quality of the water that seeps into the aquifer. Similarly, **vegetation around springs provides buffering from external impacts,** just as it does around any wetland. In addition to minimizing the effects of deforestation and clearing in the recharge area, chemicals must be used sparingly. Human and livestock access to these areas also needs to be controlled to protect the integrity of the habitat. Prohibiting dumping of trash, organic matter, or sewage in the recharge area and limiting construction of buildings, roads, or quarries in close proximity to the cave entrance or spring are essential to the long-term conservation of these unique habitats.

**Caves can be enhanced by stabilizing entrances.** In those cases where human access is intrusive, bat-friendly gates may be installed to control activity within the cave. These gates are designed to allow the safe passage in and out of animals living there and maintain the airflow and internal environment necessary for the survival of a diversity of cave life. Where feasible, **cave and spring restorations should focus on improved water quality.** This can be accomplished by restoring natural vegetative buffers around the cave entrance or the spring, removing dumped trash and debris, and rerouting sewage discharged into the cave or spring aquifer.



B. Kingsbury

The Slimy Salamander can be found near cave entrances.

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## *Integrative Management Ideas*

The conservation and maintenance of caves and springs is very important, not only for herps, but for humans as well. In many areas aquifers are used as town water supplies and as water sources for crop irrigation and livestock. The basic themes to consider are avoiding their destruction, buffering with vegetation, and protecting water quality. Given that most of the concerns with protecting caves, springs, and seeps focus on water, **many ideas for multiple use management for cave and spring habitat parallel similar recommendations for Ephemeral and Permanent Wetlands.** Thus, we refer you back to these modules for many management suggestions.

**Roads should be placed away from these areas and off-road vehicles prohibited from access.** This will protect these areas from direct damage and also from road runoff, which can be very detrimental. Similarly, **caves should not be used as refuse dumps. Any contaminants found in the refuse will leach into water exiting the cave. Livestock must also be prevented from getting into these areas.** The best option is to adequately fence these areas off. Opt for providing an alternative water source for livestock or provide access downstream.



J. Jensen

**Pickerel Frogs can be found near springs and also in cave entrances.**



J. Ozier

**Human traffic may also need to be controlled around caves and springs.** It is important to restrict access to nonsensitive areas. However, caves should not be sealed. Use of bat-friendly gates, allowing access only to organized caving clubs, and otherwise providing guided tours are the best options to ensure that people minimize their impact on sensitive caves.

**It is important to maintain a natural vegetative buffer around caves and springs.** If the general vicinity is being used for an activity requiring the clearing of vegetation, then leave a vegetative buffer around the sensitive area. Likewise, if timber is being harvested from the area, leave all or most of the vegetation around the cave or spring.

**Human activity in and around caves and springs needs to be controlled and limited to less sensitive areas.**



This is the Caves and Springs 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](http://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.