Rivers and Streams

Brief Description

C. Phillips

Rivers can be important transportation corridors as well as home to a number of aquatic herps.

Rivers and streams provide water for drinking and irrigating crops, and they often form important transportation corridors. Floodwaters from these systems are responsible for the deposition of large amounts of sediment, giving floodplains some of the richest topsoils in the world. In the Midwest, as in much of the United States, flooding from waterways has also caused severe damage to homes, businesses, and agriculture. Because of this, humans have attempted to control waterways to prevent flooding beyond their main channels. Further manipulations have been made to facilitate navigation. These measures have extensively altered these important ecosystems by removing habitat and impacting natural water fluctuations**. Rivers and streams provide crucial habitat for many species of reptiles and amphibians.** In this module, we will discuss the importance of flowing water, including intermittent streams, permanent streams, ditches, canals, and the adjacent vegetation and stream bank habitat. We will also highlight management strategies that would prove beneficial to the conservation of reptiles and amphibians in these areas.

Species Associated with Rivers and Streams

Many species of reptiles and amphibians rely on waterways and their surrounding habitat. A few species such as the Hellbender and Mudpuppy spend their entire lives in rivers or streams. Others, such as aquatic turtles like the Map Turtle, River Cooter, and Spiny Softshell, only leave to lay eggs. **The majority of species use rivers and streams intermittently throughout their lives.** Many species such as the Queen Snake, Green Frog, and Northern Water Snake forage along the banks of streams or use adjacent woodlands and other wetlands for the bulk of their activity. These species may never actually use the open water of the river itself. Others may use the waterways as dispersal corridors, allowing them to move safely from woodland to woodland.

E. O. Routman

If they are to persist, Hellbenders require clean, sediment-free water in the rivers where they live.

CRITICAL CONSIDERATIONS FOR RIVERS AND STREAMS

- Avoid clearing or replacing natural native vegetation along rivers and streams, 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.
- Do not alter natural river undulations, backwater areas, or sand and gravel bars.
- Leave logs, snags and other woody debris on site, and replace them if removed.

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Managing Rivers and Streams to Benefit Amphibians and Reptiles

River and stream habitat becomes degraded as the result of the removal and replacement of natural streamside vegetation. These are the areas of greatest value to many river species, so it is vital that steps are taken to protect those areas that remain. They are also sensitive to erosion, especially in areas with steep banks. **Avoid clearing vegetation in close proximity of the shoreline and surrounding areas. Vegetation within 50–75 feet of streams and rivers should not be disturbed.** This buffer should be even broader if possible. As discussed in the ephemeral and permanent wetlands modules, upland habitats around wetlands are critical to many wetland species. **Natural upland areas 500 feet or more in width provide the greatest benefit to wetland herps.**

Water quality is another primary concern in rivers and streams. Vegetative buffers help with reducing sediment load and pollution runoff. Avoid the use of chemicals such as herbicides along waterways and within the vegetative buffer. If invasive plant species are a concern, try using alternative control techniques, such as those suggested in the Toolkit module of this guide. If pesticides must be used, opt for targeted applications, such as using a wick, as opposed to broadcast spraying. Water quality can also be protected by removing or limiting discharge into streams and rivers. ATV and livestock access should also be limited as these activities may result in a reduction in streamside vegetation that may in turn lead to the destabilization and erosion of these areas.

J. Roe

Northern Water Snakes forage along stream and river banks. They will also hunt in adjacent forested areas.

Consider maintaining woody debris such as logs and snags that do not substantially occlude water flow. As well as minimizing erosion, these structures provide additional habitat for many species of reptiles and amphibians, such as turtles, and salamanders, such as Hellbenders.

Where possible, **limit the use of erosion control structures such as retaining walls or rip-rap** that limits or prevents access to the shoreline and adjacent habitat. Even moderately low retaining walls can prevent turtles from accessing the shoreline when they attempt to nest.

C. Phillips

Sand bars provide important nesting and basking sites for species such as Map and Softshell Turtles.

Sand and gravel bars within rivers and streams should also be protected. These formations are created where frequent flooding regularly deposits sand and gravel in slower flowing areas of the stream. Sand bars occur in larger rivers that historically were wide with shallow waters. Gravel bars are found on smaller streams and rivers that, at least periodically, have more rapidly moving water, and compared to sand bars, are usually more vegetated with small trees and shrubs.

Sand and gravel bars provide important nesting habitat for many turtle species as well as offering optimal conditions for many aquatic and semi-aquatic reptile and amphibian species to thermoregulate. It is important to limit livestock and motorized vehicle access to these sensitive areas. In particular, camping and day use activities such as boat landing should be limited from May to July.

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B. Kingsbury

This channelized stream now has extensive woody debris and a natural forest buffer.

Several simple steps may be taken to restore the quality of river and stream habitat. The addition of woody debris to shorelines of wide areas, especially in highly channelized stretches, will not only help prevent sand and gravel bars from being washed downstream during flood events but will also provide additional suitable habitat for reptiles and amphibians. **The backwater areas of channelized streams and river beds, where water moves less rapidly, should be restored or improved wherever possible.** By maintaining these sections, the ability of the system to hold flood waters will be improved and less habitat damage will occur. It may also be possible for you to **provide and maintain suitable nest site areas**. This may require the creation of openings in the canopy above sandy sections of the shoreline. Continued maintenance of these areas at an early successional stage will help promote these areas as enduring nesting sites. Be aware of erosion risks—finer soils can be carried by surface runoff into streams. To avoid this problem, place the nesting areas outside of a vegetated buffer along the stream.

Consider creating holding ponds or planting grass filter strips where existing drainage into a channel is coming from highly agricultural lands. This will help reduce siltation and the movement of pesticides, excess nutrients, and heavy metals into the channel. It may also provide additional breeding sites for amphibians.

In areas where exotic plant species prevail or where the natural vegetation has been removed **attempts should be made to restore areas with native plant species**.

Integrative Management Ideas

The first step in constructing a management plan is to identify all waterways and associated surrounding habitat that exist on your property. **Try to include a buffer of at least 50–75 feet of unmanipulated upland habitat around streams and rivers**. A larger buffer would be better if you can afford it.

Try to maintain connectivity to other adjacent wetland habitats. These areas may include natural drainages or upland connections. By maintaining the connectivity between these habitats you will be providing important movement corridors for many species of amphibians and reptiles.

C. Phillips

Spiny Softshell Turtles spend their entire lives in rivers and streams and only leave to lay their eggs.

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Whenever possible, steps should be taken to keep cattle out of streams to reduce their impacts on water quality and the streambed. Cattle troughs or legally constructed overflow ponds adjacent to rivers (flood catchment basins) can provide adequate water for cattle. Streams should be fenced to exclude cattle and be placed outside of the vegetative buffer zone. This will add further value to the habitat while filtering runoff and reducing sediment and nutrient loading into the stream.

Many reptiles and amphibians are killed while trying to cross roads. **When adding new roads, consider placing them away from waterways.** If this is not possible, at critical crossing points, reduce existing speed limits and place informative signs to protect animals during peak amphibian and reptile migration periods. In some cases, closing roads during critical periods would be very beneficial, such as the May–July nesting period of turtles.

Wisconsin DNR

Livestock access to waterways should be controlled to reduce negative impacts on streamside vegetation and water quality.

A. Resetar

A healthy stream retains its natural undulations and vegetation, both in-stream and along the shore.

As mentioned earlier, try to **avoid applying chemicals in or near waterways**. It is best to maintain a buffer zone of at least 50–75 feet. Consider using other management techniques in place of herbicides or pesticides. If chemicals must be used, opt for selective spot or wick application over broadcast spraying.

Regularly monitoring the water quality in our waterways is also an important tool to help assess the effectiveness of your management efforts. The results can help guide your adaptive management plan as needed. By gathering water quality data on a regular basis you will be able to tell when something has gone wrong. Speak with your local Soil and Water Conservation District (SWCD) office for advice on how to do this.

This is the Rivers and Streams 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.