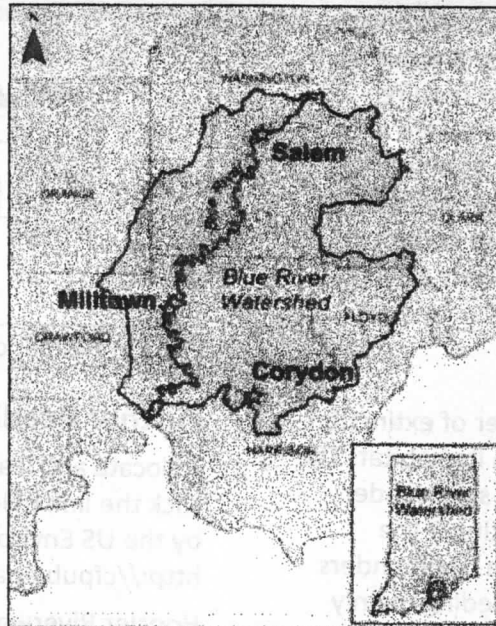


Watershed

Watershed

A **watershed** is the area of land where all of the water drains into the same place. Watersheds can be composed of creeks, streams, rivers, ponds, lakes, wetlands, groundwater and oceans. Most water will begin its long journey far from where it ends up. For example, the Blue River Watershed is a part of the Ohio River Basin, which makes up 5,800 square miles in Indiana (see image right). In the continental United States, there are 2,110 watersheds. Every living organism needs water in order to survive. Many factors influence water and its quality, whether they be a factory polluting a river upstream, agricultural farms using poor practices that affect the nearby stream, or urban families investing in rain barrels to conserve water.



Ohio River Basin and Blue River Watershed Map

organic nitrogen, phosphorus and pesticides, into the watershed.

- **Leaching:** The natural process by which chemicals, minerals, animal waste or pharmaceuticals are washed out of the soil and enter the groundwater. **Groundwater** is the water that fills the empty spaces beneath the soil. After pesticides are sprayed on crops they can leach or move through the soil and into groundwater, which, ultimately, ends up throughout the watershed.

One way to control the effects of erosion and sedimentation is by planting more trees near streams and rivers. Removing natural vegetation or buffers would increase the effects of erosion and sedimentation. Converting acres into crops takes away the land's natural ability to stabilize soil, resulting

Water Quality

Water quality is the measure of the chemical, biological, and physical characteristics of water in relation to a standard of use, such as drinking water for humans or proper habitats for amphibians. Water quality can be affected by multiple factors.

- **Soil erosion and sedimentation:** These are the primary sources of pollution in Indiana. Erosion and sedimentation results from poorly managed construction and logging sites, as well as non-environmentally conscious agricultural practices. **Erosion** occurs when the topsoil is removed from the land's surface. **Sedimentation** results in soil particles being carried by water and deposited somewhere else, which follows the land. Together, erosion and sedimentation can transport unwanted nutrients and pollutants, such as

in additional erosion of the land. Many agricultural practices, such as tilling, can increase erosion and sedimentation. Farmers can adopt **no-till farming**, which leaves the soil undisturbed and increases the amount of water and nutrients available while decreasing erosion. Other positive impacts include the proper disposal of chemicals and oils, and applying the proper amount of fertilizer on your lawn to reduce leaching. For more information on ways you can help improve the water quality in your watershed, visit: www.helpthehellbender.org.

Indicator Species

In ecology, scientists may focus research on certain species that serve as suitable **indicator species**. An indicator species is an organism whose presence, absence and abundance reveals a specific environmental condition. Assessing the presence or absence of an indicator species can help determine the

health of a watershed and aid in diagnosing a problem. Amphibians serve as important indicator species in aquatic habitats because of their unique life history traits.

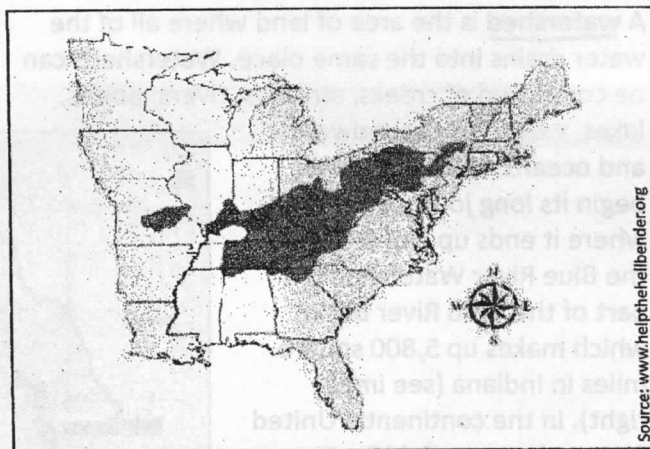
Amphibians as Indicator Species

Amphibians are unique among vertebrates in that they have a two-stage life cycle. Amphibians require water (or at least moist conditions) to reproduce. Amphibian eggs are not protected by a shell like reptiles and birds, but are encased in a jelly-like sac. Amphibian eggs deposited in water will readily absorb contaminants or pollutants in the surrounding environment. After hatching, most amphibian larvae are aquatic (e.g., tadpoles) and require weeks or years to develop into adults. Some amphibians, however, never leave the water. In these species, breathing occurs primarily through gills or through the skin. During each of these aquatic stages, poor water quality can negatively affect amphibians.

Eastern Hellbenders

One particular amphibian is in danger of extinction because of the poor water quality in its habitat. The Eastern Hellbender is a fully aquatic salamander that can grow up to 2 feet long, making it the largest salamander in North America. Hellbenders are top predators in their habitat, feeding mainly on crayfish. These long-lived salamanders rely on cool, shallow, fast-flowing and pristine streams and rivers. High water quality is important to Hellbenders because they can easily absorb pollutants through

their skin. Unfortunately, Hellbender populations are declining, likely because of human impacts on water quality. Scientists are now working to restore low populations through captive breeding, educational programs, increased protection and collaboration through universities and government programs. These efforts also will depend on increasing water quality to support the growing populations.



Eastern Hellbender Distribution Map

Further Reading

To locate and learn facts about your local watershed, click the link below to visit "Surf Your Watershed" by the US Environmental Protection Agency: <http://cfpub.epa.gov/surf/locate/index.cfm>

Hoosier Riverwatch:

www.hoosierriverwatch.com

North America's Giant Salamander, the Eastern Hellbender: www.helpthehellbender.org