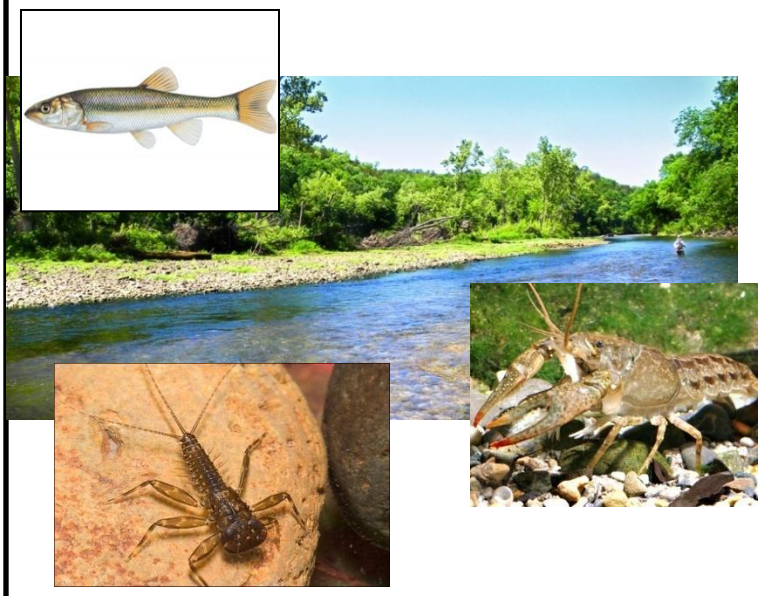
What makes a healthy stream?

A healthy stream is one that supports various native species of insects, crustaceans, and fish. The ability to support these species depends both on water quality and habitat availability. The Missouri Department of Natural Resources (DNR) uses a metric called the "Missouri Stream Condition Index" (MSCI) to assign a number which expresses the health of a stream and its ability to support life.

Stream Biodiversity

Ecologists who study the relationships between organisms and their environment generally believe :

- Greater diversity of organisms means a healthier stream ecosystem
- Diverse stream ecosystems have a higher number of different insect **taxa** - a biological term referring to a particular grouping of species
- Healthy stream ecosystems should have a similar number of insects from different taxa



Taxa (def.): Plural of taxon; a taxon is a group of organisms that scientists consider have common traits that make them different from other organisms. Scientists studying stream health look for such distinct insect taxa as Stoneflies, Mayflies, and Caddisflies

Missouri Stream Condition Index Score	Stream Health
≥16	Fully supports life
10-14	Partially supports life, impaired
4-8	Generally does not support life, impaired

Missouri Stream Condition Index (MSCI)

The MSCI is a numerical score ranging from 4-20 that expresses the health of a stream. Higher numbers indicate more biologically diverse, healthy streams. The number is calculated based on four different methods used by ecologists, each of which contribute a score of 1, 3, or 5 to the overall score. This 1, 3, or 5 number is based on how the streams compare to average values from reference streams around the state which have received minimal disturbance from humans. These undisturbed streams represent the best possible habitat and water quality. Criteria for each method are listed on the reverese page. Streams with a score of 14 or lower are considered impaired.

What methods are used to calculate the MSCI?

Method	What is Measured in a Stream	Purpose
Taxa Richness	Total number of insect taxa	A more diverse group of insect taxa means less pollution and a healthier stream.
Ephemeroptera/Plecoptera /Trichoptera Index	Number of insects in these three taxa (Stoneflies, Mayflies, and Caddisflies)	Insects in these taxa are more susceptible to pollution. If lots of these insects are present, the stream is likely to be less polluted.
Biotic Index	Average organic pollution tolerance of all insects present	If there are lots of insects present that don't tolerate pollution, then the stream is likely to have a healthy stream ecosystem. Conversely, if there are only organisms like leeches and black fly larvae, which tolerate pollution, the stream is more likely polluted.
Shannon Diversity Index	Distribution of insects between taxa	Healthier ecosystems have a similar number of insects from different taxa.

What about Hinkson?

The table below shows past measurements of the MSCI for Hinkson Creek sampled at various locations (Missouri DNR)

Site	Fall 2001	Spring 2002	Fall 2003	Spring 2004	Spring 2005	Fall 2005	Spring 2006	Spring 2012
Rogers Rd	12	16						18
Hinkson Creek Rd.	12	18	18	18	18	18		16
Hwy 63 Connector				17				16
Walnut St.	12	12	16	14	18	16		14
Broadway St.			16	16	16	12		16
Capen Park	16	12						16
Rock Quarry Rd.	17	14						16
Recreation Dr.					14	14		14
Forum Blvd.	18	14					16	
Twin Lakes	16	14					12	
Scott Rd.	14	14					16	

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Hinkson Creek is an urban stream. Is it possible for the stream to have the same water quality as undisturbed streams? What can we do to ensure Hinkson Creek remains as healthy as possible? These are the questions scientists and managers in the watershed are studying.

What do you think?