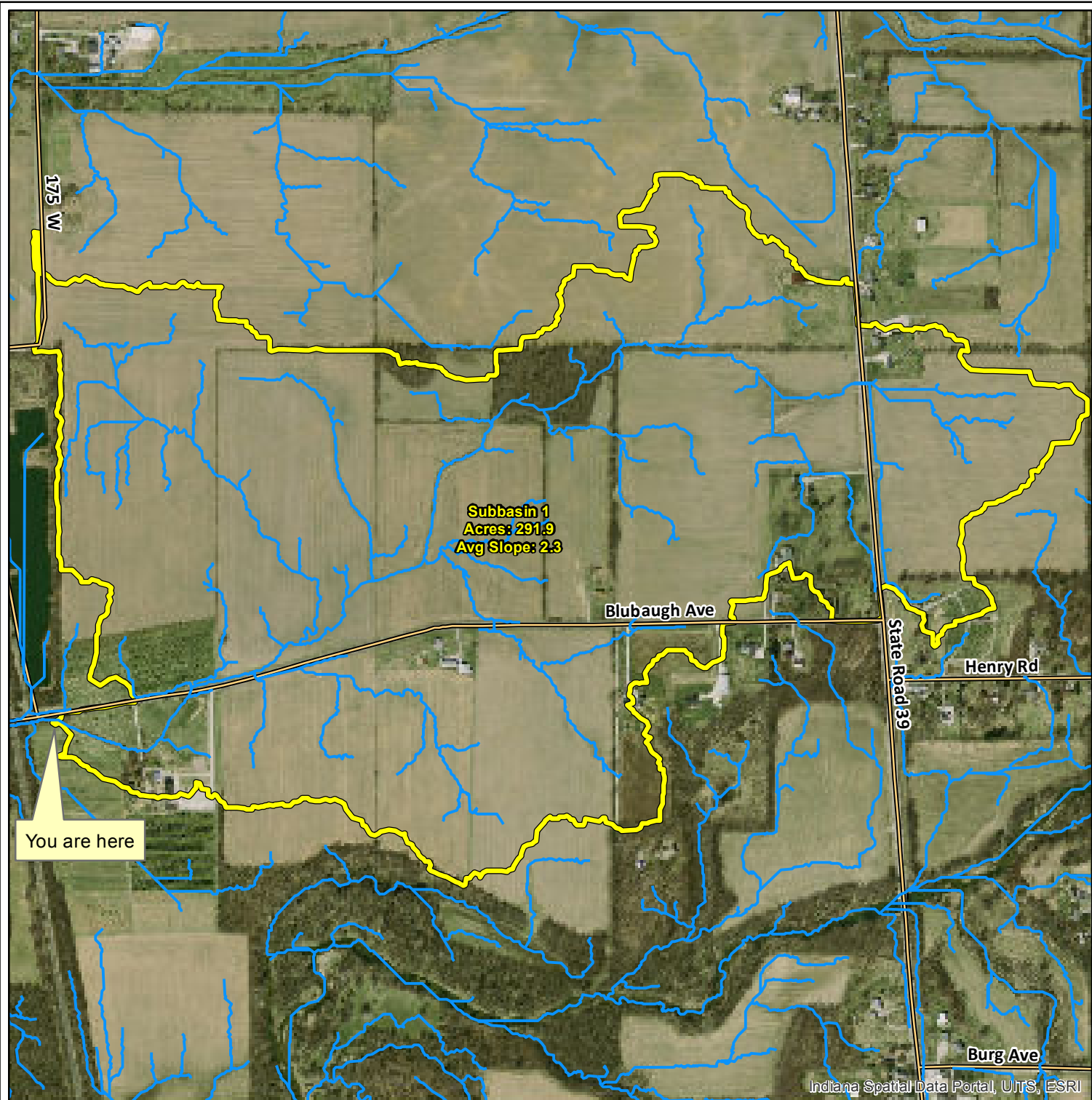
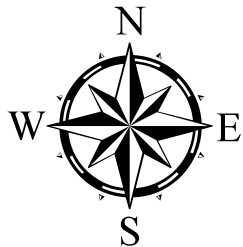




1 inch = 773 feet



Stream Drainage Area= 291.9 Acres
Watershed Slope= 2.3%

Legend

- Stream Drainage Area
- 2017_FFA_Streams



United States
Department of
Agriculture

TREE FARM Stream Watershed

Boone Co. SWCD, Indiana
Section _____, T _____, R _____

	Date
Designed _____	_____
Drawn _____	_____
Checked _____	_____
Approved _____	_____
Title _____	_____

Sheet _____ of _____

Appendix D - Chemistry Ranges, Averages and Q-Values

Chapter 4 listed values representing the likely ranges into which your chemical data results may fall. These ranges were taken from the 2012 Monitoring Water In Indiana: Choices for Nonpoint Source and Other Watershed Projects or also known as the Environmental Indicators Manual. This manual can be accessed at, <https://engineering.purdue.edu/watersheds/monitoring/MonitoringWaterinIndiana.2012.1.pdf>. Data from existing monitoring sites in Indiana have been compiled to provide a range. These ranges are provided to help you have a better idea of what is found in Indiana streams and lakes. This section relied on IDEM Fixed Station Data, compiled by IDEM staff or at Purdue University. In addition, the Indiana water quality standards for rivers are included for each applicable parameter.

Typical range for DO = Game fish
1.2 to 22.3 mg/L require more
than 5ppm
Indiana Average = 9.6 mg/L

State Water Quality Standard:
4.0 mg/L - 12.0 mg/L
Min: 6.0 mg/L in coldwater fishery streams
Min: 7.0 mg/L in spawning area of coldwater fishery streams

The maximum temperature rise at any time or place above natural temperatures shall not exceed State Water Quality Standard:

< 5° F (approximatively 2.8° C)
< 2° F (approximatively 1.1° C) for trout streams

Typical range for E. coli =
2 to 1,204 K colonies/100mL

Indiana Average = 210 colonies/100mL

State Water Quality Standard for total body contact recreation: <235 colonies/100 mL (single sample),
AND
< 125 colonies/100 mL (Geometric mean of 5 samples equally spaced over 30 days)

Typical range for NITRATE (NO₃)
= 0 to 36.08 mg/L

Indiana Average = 12.32 mg/L

EPA recommends 1.5 mg/L as the dividing line between mesoeutrophic and eutrophic streams.

Average = 2.9mg/L
Above 1 indicates humane influence

Typical range for Turbidity:
0 to 2150 NTU

Indiana Average = 15 NTU

U.S. EPA recommends 10.4 NTU

Good for Typical range for pH = 7.2 to 8.8
IN ponds
is 7.5-9.0

Indiana Average = 8.0

State Standard = between 6 - 9

Due to the state's limestone geology, Indiana surface waters will typically have a pH that is relatively basic (> 7).

Typical range for BOD₅ =
0.4 to 33 mg/L

Indiana Average = 2 mg/L

There are no state water quality standards for Orthophosphate.

Total Phosphate typical range:
(0 to 0.85 mg/L) and average (0.05 mg/L).

We generally expect orthophosphate to be less than total phosphate, since orthophosphate is but one component of total phosphate.

Chapter 4 - Chemical Monitoring

Chemical Parameters

Many types of chemical tests can be performed to assess varying aspects of stream water quality. However, volunteer monitoring programs are faced with both financial and technical limitations. Given these constraints, Hoosier Riverwatch trains volunteers to conduct eight of the chemical parameters considered by the National Sanitation Foundation to be most useful in determining stream water quality (as well as a few additional tests):

Dissolved Oxygen

pH

Biochemical Oxygen Demand

Orthophosphate

***E. coli* and Coliform Bacteria**

Water Temperature Change

Nitrate and Nitrite

Transparency/Turbidity

Riverwatch Chemical Testing Instructions

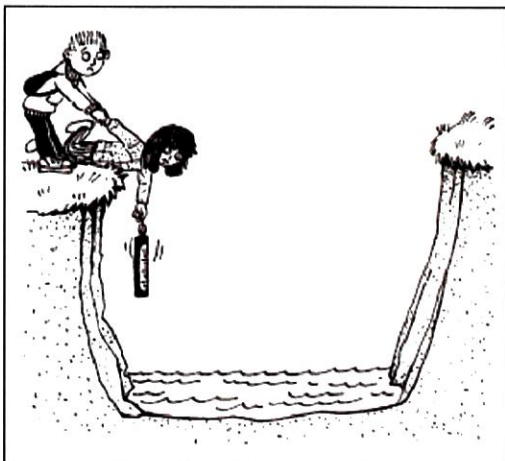
Hoosier Riverwatch does not require volunteers to use a standard set of equipment or methods for chemical testing. However, the majority of volunteer groups actively participating in the program have received equipment through the Riverwatch Equipment Application program. The chemical testing instructions provided are for the most common methods used by volunteer stream monitoring groups in Indiana. They are also the methods presented during Hoosier Riverwatch training sessions.

Tips on Collecting Water Samples

How you physically obtain the water sample depends on the size, depth, and banks of your stream. Most Hoosier Riverwatch volunteers sample wadeable streams. If you are wading, make sure that you collect water from a point upstream of where you are standing, being careful not to stir up any sediment. The sample must be collected in a clean container to avoid contamination. Collecting water directly from the stream with the container used for the chemical test is preferred. Lower your container down 3 to 5 inches below the surface of the water (or until your wrist is completely submerged) so that your sample is representative of the whole stream. Be sure to rinse your collection container three times with sample water before collecting your final sample.

Deep water or steep banks are dangerous (Figure 15). Depending upon conditions at your site, you may need to use alternative sampling techniques. If you have a bridge at the site, you may be able to lower a sampling container or bucket down to the stream. When sampling with a bucket and line, it is helpful to have a small (~6 oz.) weight fastened to the rim of the bucket to tip it over. At some sites, you may be able to sample with an extension rod or cup on a stick (see Appendix A) from the edge of the stream. Regardless of the method of collection, sample water should be collected from the *main stream flow*.

Figure 15



What not to do



Images from GLOBE 1997

www.idem.IN.gov/riverwatch