Fish Community Trend Scores: 1984-1997

Legend: 1997 Brush Cr.; 1984 Brush Cr.; 1997 Lick Cr.; 1984 Lick Cr.; 1997 Prairie Cr.; 1984 Prairie Cr.

(IBI vs RIVER MILE chart — Exceptional, Good, Marg. Good, Fair, Poor, Very Poor; Flow)

Prairie Creek ICI Trends: 1984 - 1997

ECBP Ecoregion | HELP Ecoregion; (ECBP=36); WWH Criterion (HELP=34); Bryan WWTP

Legend: 1997 ICI; 1984 qual. ICI; 1997 qual. ICI

Lick Creek ICI Trends: 1984 - 1997

Legend: 1984 ICI; 1997 ICI; 1997 narr. ICI; (ECBP=36); WWH Criterion (HELP=34); Prairie Creek; ECBP Ecoregion; HELP Ecoregion
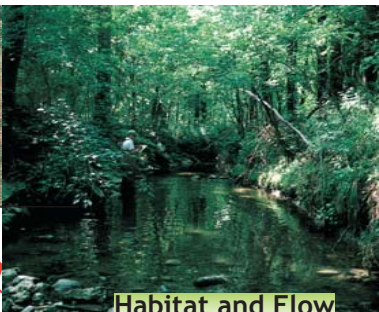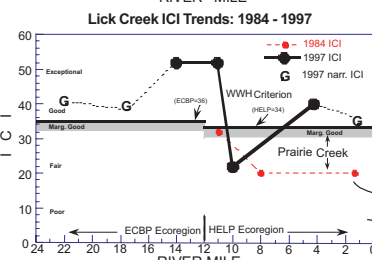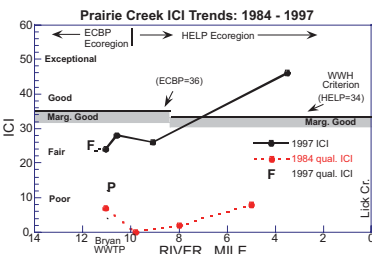
Biological Integrity

Ohio EPA uses a grading system to score biological integrity at various sites within a basin. The types and numbers of different fish, eating and breeding patterns, and the ability to survive in polluted conditions are some factors of biological integrity. Aquatic insects also reflect the health of the streams they reside in. Only a few types are tolerant of pollution. A healthy stream has a diverse array of life. Based on the types of animals in a stream, Ohio EPA is able to determine the health of the aquatic environment.

Nutrients and Pollution

Excessive nutrients (N, phosphorus, fecal matter) from agricultural runoff, overloaded or ill-operating WWTP's, and urban stormwater or unsewered runoff fertilize algal growth instream which disrupts the aquatic food web and lowers dissolved oxygen at night. Nutrient concentrations in Tiffin tributaries are contributing to stream water quality degradation. D.O. concentrations less than 4 mg/l, which can be lethal, occurred periodically in: Brush Creek (dst. from Archbold WWTP and E. Owl Creek confluence), Pigeon Run and Prairie Cr. (Bryan), E. Owl Cr., Mill Cr., Lick Cr., Deer Cr., and Lauber Hill Run.

Macroinvertebrates associated with poor/fair water quality or impacts are illustrated below: leeches, Physella snails. limpet snails, and flatworms. Others not shown were aquatic worms and red and nonred midges.

Fish that were associated with good water quality conditions and are more sensitive to pollution and habitat degradation were: most suckers, spotfin shiner, sand shiner, various darters, hornyhead chub, madtoms, orangespotted sunfish, northern pike, redfin shiner, rock bass, mottled sculpin, crappie and channel catfish (as shown on page).

Blackside Darter
Spotfin Shiner
Rock Bass
Brindled Madtom
Golden Redhorse

OhioEPA

Tiffin River:

The Tiffin River mainstem and selected tributaries were surveyed in 1992. Basin-wide survey work was conducted in 1997. Survey results are summarized in the surrounding figures and captions.

Northern Pike

Mud Creek near mouth
Oxbow St. Park & Wildlife Area

Map labels

M I C H. / OHIO

Fulton Co. Fayette
Harrison Lk.
Deer Cr.
New Bean Cr.
Old Bean Cr.
Mill Cr.
Williams Co.
Clear Cr.
Bates Cr.
Lauber Hill Run
fingernail clam
Macroinvertebrates associated with good water quality in the Tiffin R. Basin are illustrated on river map. Others were minnow mayflies, Tanytarsini midges, and riffle beetles.
West Unity
Walnut Run
Leatherwood Creek
caddisflies
Tiffin River
Brush Cr.
Pettisville
ARCHBOLD
Owl Cr.
Beaver Cr.
"Eastern" Owl Cr.
Henry Co.
BRYAN
Pigeon Run
Coon Cr.
Miller Cr.
flathead mayfly
Crooked Cr.
Lick Creek
Little Lick Cr.
Prairie Cr.
Tiffin River
Dry Cr.
Lick Creek
Mud Cr
Defiance Co.
Lost Cr.
Webb Run
Tiffin River
Maumee R
DEFIANCE
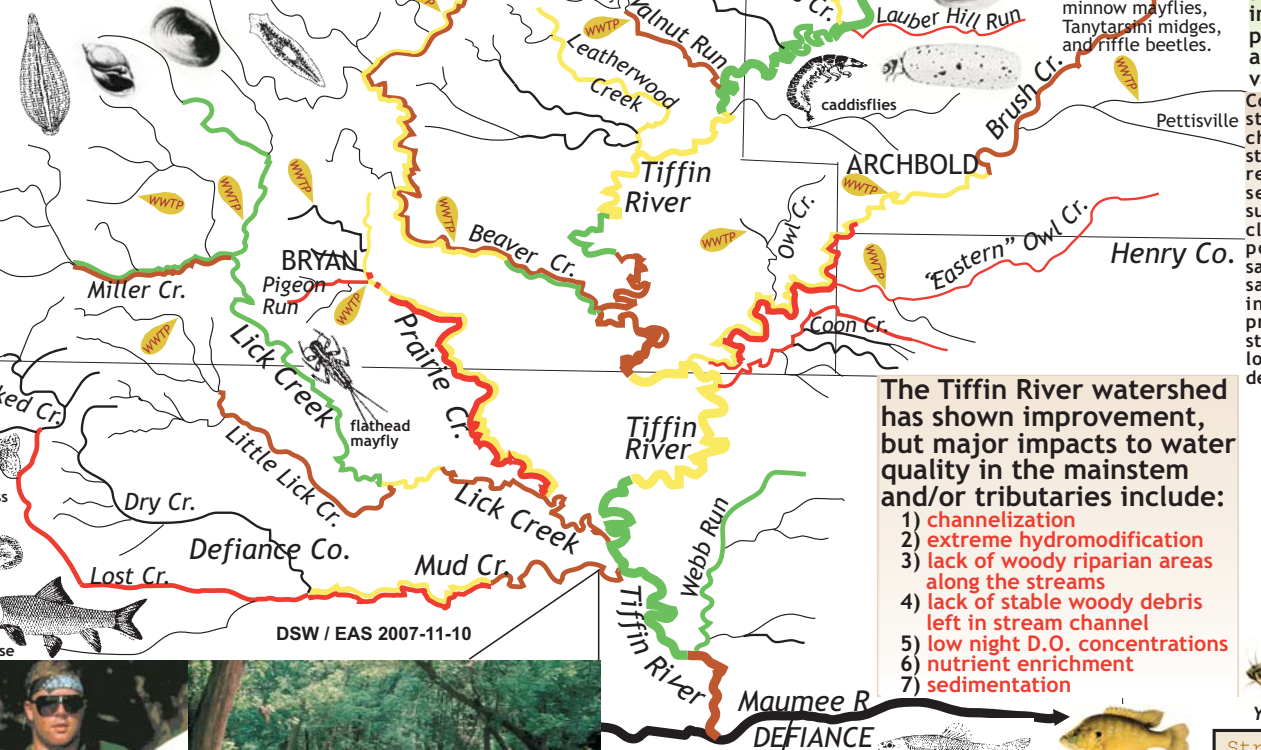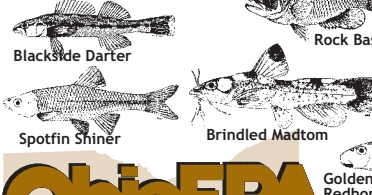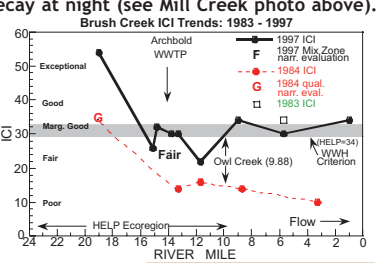
DSW / EAS 2007-11-10

Upper Mill Cr. (photo)

Habitat and Flow

Habitat quality is the key to healthy aquatic communities. Intact physical stream habitat, with a woody riparian corridor (photo above), helps bind up nutrients, filter out silt, sediment, & other solids, and absorb/slow water from storm runoff. An intact shady canopy keeps stream cooler and slows instream algal production. Good instream habitat and intact corridors provide more habitat - niches for fish, aquatic insects, mussels, & also for various birds, reptiles, & amphibians.

Conversely poor habitat, such as shadeless streams with a continuous single-shaped channel exposed to the sun with flashy stormwater flows due to no riparian water retention, can readily erode and allows sedimentation to bury available rocky surfaces & fill the bottom with mostly sand, clay, or silty substrates. No deep stream pools are usually present (filled with sand or silt), and stream structure stays the same with little diversity. Nutrient inputs into the stream readily increase algal production in open canopy (no shade on stream) with highly fluctuating and lethally low D.O. concentration from biochemical decay at night (see Mill Creek photo above).

The Tiffin River watershed has shown improvement, but major impacts to water quality in the mainstem and/or tributaries include:

1) channelization
2) extreme hydromodification
3) lack of woody riparian areas along the streams
4) lack of stable woody debris left in stream channel
5) low night D.O. concentrations
6) nutrient enrichment
7) sedimentation

Brush Creek ICI Trends: 1983 - 1997

Legend: 1997 ICI; 1997 Mix Zone narr. evaluation; 1984 ICI; 1984 qual. narr. eval.; 1983 ICI; Archbold WWTP; Owl Creek (9.88); (HELP=34) WWH Criterion; HELP Ecoregion; Flow

Chemical Water Quality

Ohio EPA tests stream water and the treated wastewater discharged by facilities. The amount of nutrients, oxygen-depleting substances, bacteria, metals and other pollutants in a sample can be used to identify pollution sources and evaluate water quality. A few streams were evaluated with chemical data only.
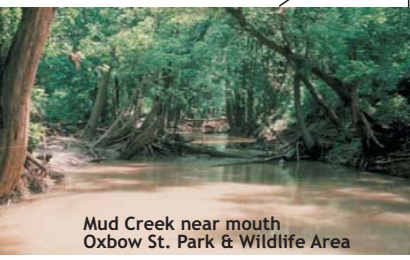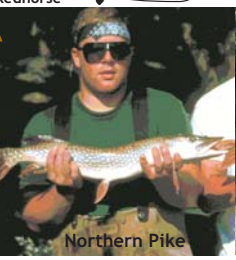
Yellow Bullhead

Intolerant fish predominately present in impacted stream reaches were: bluntnose minnows, white suckers, green sunfish, carp, stonerollers, fathead minnows, yellow bullhead and creek chubs.

Bluntnose Minnow
Green Sunfish
Common Carp

Stream Health

- Exceptional
- Very Good
- Good
- Marginally Good
- Fair
- Poor
- Not Studied