

by Dan Sparks, Cindy Chaffee, and Scott Sobiech

Fish Creek Preservation and Restoration

Like most midwestern streams, Fish Creek is threatened by pollution from certain land uses within its watershed. In its Fish Creek Bioreserve Project Strategic Plan, TNC identifies the primary threats as those that degrade water quality, water quantity, and habitat structure. Agriculture is the primary land use within Fish Creek's drainage. Wide-scale conversion of deciduous forests to intensive row crop production has led to increased erosion and water quality degradation from the runoff of soil particles and chemical pollutants (such as insecticides, herbicides, and fertilizers).

Mussels and the host fish upon which mussel glochidea (larvae) depend are especially vulnerable to such "non-point source" pollutants. Increased soil erosion results in stream bed siltation, which may directly smother some mussels or indirectly reduce population levels by degrading the habitat needed by their host fish. A loss of riparian vegetation decreases terrestrial and aquatic habitat structure, reduces shade (which may increase peak summer water temperatures), and increases stream bank erosion potential. A decline in native vegetation and wetlands also reduces groundwater recharge, which can further reduce

In September of 1993, a pipeline ruptured in a soybean field in DeKalb County, Indiana, and diesel fuel filtered through field tiles into a small drainage ditch and, finally, into Fish Creek.

Fish Creek is a tributary of the St. Joseph River in extreme northeastern Indiana and northwestern Ohio. It encompasses approximately 30 miles (48 kilometers) of primary stream channel and 90 miles (145 km) of tributaries and drainage ditches. The spill spread downstream into Williams County, Ohio, polluting the most sensitive sections of the creek.

Immediately after the spill, biologists observed dead fish, macroinvertebrates, mussels, turtles, frogs, snakes, muskrats (*Ondatra zibethicus*), wood ducks (*Aix sponsa*), and belted kingfishers (*Ceryle alcyon*). Numerous dead mussels of three species were collected as a result of the oil spill. The ladyfinger (*Elliptio dillitata*) suffered the highest mortality, followed by the kidneyshell (*Ptychobrancus fasciolaris*). One individual of an endangered mussel, the clubshell (*Pleurobema clava*) also was found dead in the spill zone. This accident was a tremendous blow to a rich ecosystem that appears to be hovering on the threshold between sustainable, good water quality/ecological integrity and a slide towards environmental degradation.

Fish Creek supports 43 species of fish and 31 species of mussels, including 3 endangered species: the white cat's paw pearly mussel (*Epioblasma obliquata perobliqua*), northern riffleshell mussel (*Epioblasma torulosa rangiana*), and clubshell mussel (*Pleurobema clava*). The salamander mussel (*Simpsonaias*

ambigua), rayed bean (*Villosa fabalis*), and purple lilliput (*Toxolasma lividus*), considered species of concern, also are found in Fish Creek. The white cat's paw, according to the most recent scientific records, continues to survive nowhere else but in Fish Creek (Hoggarth 1990). In recognizing the values of Fish Creek, The Nature Conservancy (TNC) calls it "... the best remaining example of the unique riverine community that once characterized the western Lake Erie basin" (TNC, 1993; Unsworth and Snell, 1994).

Following the oil spill, the Fish and Wildlife Service, along with partner agencies, conducted a Natural Resource Damage Assessment, initiated with funding by the Oil Spill Liability Trust Fund, to determine the effects on fish and wildlife resources. A Memorandum of Agreement among the Department of the Interior, Indiana Department of Environmental Management, Indiana Department of Natural Resources, Ohio Environmental Protection Agency, and Ohio Department of Natural Resources, was developed to establish a unified approach to conducting the oil spill damage assessment.

Activities such as dredging/sediment removal or sediment agitation were considered but rejected as restoration options because they would have further injured the already imperiled mussel fauna. Faced with the possibility of implementing a lengthy and costly damage assessment, the natural re-

source trustees and the parties responsible for the oil spill agreed to focus on identifying restoration efforts that would most directly benefit the endangered mussel species (see sidebar). In January 1995, the Arco Pipe Line Company and Norco Pipeline, Inc., agreed to place \$2,507,500 into a Court Registry Account to compensate for the serious environmental injuries caused by the oil spill and for the natural resource trustee council to prepare and implement a restoration plan.

Development of the Fish Creek Restoration Plan was completed in February 1997. It focused on five main objectives: enhancing mussel recovery, improving water quality, protecting (and in some cases enhancing or restoring) the riparian corridor, conducting public outreach plans, and monitoring restoration plan success. To date, restoration plan successes include the identification of seven fish species that serve as mussel hosts, reforestation of over 350 acres (140 hectares) of riparian zones and bottomlands, and acquisition of 103 acres (41 ha) containing almost a mile (1.6 km) of Fish Creek. Many more great things are anticipated for Fish Creek in the near future, including helping a local community expand its park to restore and protect a natural corridor along Fish Creek, assisting farmers with the purchase of no-till farming equipment to reduce erosion, and restoring wetlands on several privately held lands. The trustees are hopeful that efforts such as these will help to conserve the natural resources of Fish Creek for future generations.

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References

- Hoggarth, Michael. 1990. Recovery Plan for the White Cat's Paw Pearly Mussel. U.S. Fish and Wildlife Service.
- The Nature Conservancy. 1993. Fish Creek (Indiana, Ohio) Bioreserve Project: Strategic Plan - Draft. Indiana Field Office.
- Unsworth, R.E., and E.W. Snell. 1994. Preliminary Economic Evaluation of Natural Resource Damages to Fish Creek, draft memorandum reporting on the preliminary economic evaluation.

stream flows during periods of little rain.

In Fish Creek, the entire historically reported mussel community and almost all of the original fish community remain in the system at some level, and recruitment is evident for most species.

(below) Fish creek

Photo by Dr. G. Thomas Watters

(inset) White cat's paw mussel

Ohio Division of Wildlife photo

