by Craig Springer

Where There's A Weir, There's A Way Around It

The knee-deep, gelid Bark River cuts through Wisconsin forest, pouring into Lake Superior. Bugs dimple the water in a placid pool, and the rings fan out back into a calm. But it's a violent place. Coaster brook trout colored like church window glass rip the bugs like a sloppy kiss into their gullet and crush them. Geology brought the trout here; a poorly set road culvert blocked their upstream passage to spawn; the Fish Passage Program brought them back.

The wrinkles and rifts on planet Earth are the *prima facie* evidence of the geologic past. The continents drifted on a primal pond, crushing the crust like crackers as they bumped along. Plates of earth cleaved and heaved mountains of rock strata layered like cake toward the sky. Other plates of crust sank into the yawning subterranean.

Then came a cold crunch; ice better than a mile thick invaded from the north dipping as far down as Kansas. Glaciers polished much of the northern third of the United States. They brought with them and then left behind 10,000 years ago erratic boulders plucked from the Canadian bedrock, and fine till that farmers plow.

Glaciers made an extreme makeover; they re-routed ancient rivers, gouged the Great Lakes, and left fens to fill. The Missouri, Ohio and upper Mississippi rivers and the fish that naturally live in them are where they are for the ice long melted. Far away, the American Southwest was wetter and cooler then – trout habitats remain behind like relicts in mountain islands floating in a gulf of friable lowland desert dirt. A little fish called a redbelly dace, distinctively a Midwestern headwater stream fish, thrives in a tiny southwest Colorado mountain creek separated from its Missouri kin by prairie waters too warm for them – swimming evidence of another age.

The U.S. Fish and Wildlife Service's Fish Passage Program connects fish to habitat. It's voluntary, cost-effective, and creates instant results – more fish habitat.

Little streams in the Midwest tendril around folds in glacial moraines. Bigger streams vein through hills, and cut through lands so flat that they appear like planet Earth has no arc. The Earth's surface, sculpted as it was, imposed the physical and biological bounds of where fish species naturally live – and where they don't.

So, here we sit still adrift in the geologic timescale, post-Wisconsin glacier, in what ought to be called the Anthropocene epoch: since man has been on the scene, there's been an epic effect on where fish live. And that has been especially so since the age of industrialization.

With industry comes the need for energy, and water pulled by the convenience of gravity has provided it. Industry of all sizes necessitated damming or re-routing flowing water. And dams block fish – that's obvious. But even the smallest of stream-flow obstructions are problematic for fish, and that's not always so obvious.

They look bucolic on a calendar. But quaint antiquated mill ponds with millstones silenced from grinding the grist decades ago still block fish from upstream habitats.

Road crossings over the smallest of streams with poorly placed culverts block fish from access to areas upstream. The downstream end of a culvert perched too high above the stream bottom can keep minnows, darters, sunfish, suckers and salmon from leaping into needed habitat above the culvert. Low-water crossings over small streams seem innocuous, but thin water too shallow to swim isolates fish.

It takes no intellectual leap to see that the biggest of dams are figurative brick walls. Engineered edifices chug water through turbines for power consumed miles away. Below them, fish stack up for the want of a haunt all their own.

Fish need more than water alone. They need certain waters at particular times of the year, times of day, or times of their lives, to live out their lives as accustomed by nature.

Anyone who has turned on a TV has seen Pacific salmon slip through slim waters, shuddering their last. They've spawned their one and only time and die. They've gotten there through a gauntlet of angling, commercial fishing, predation and disease, through the ocean and over what seem like impenetrable falls in long reaches of rivers. Their decomposing bodies add nutrients to the stream that their spawn and other fish and plants will need. They can't do this in the face of barriers.

Green sunfish have no glamour. But, they too need connected habitats, not for their own well being alone, but for richness in habitat that their presence helps fulfill. Green sunfish – as are all of the sunfishes – are both

U.S. Air Force /Jerron Barnett

Bill Tate, U.S. Fish and Wildlife Service fish biologist, watches two Okaloosa darters. These fish have benefitted from the National Fish Passge Program, and now are reproducing in new habitats on the Eglin Air Force Base, Florida.

predator and prey throughout life. They are a tendon of sorts in small streams that bind the food chain from lower forms to higher forms. Without the sunfishes, upland streams are incomplete. Stream fish habitat segmented by barriers also make the sunfish species prone to hybridize. Green sunfish and longear sunfish co-exist, but in unnatural conditions they interbreed, and the offspring are neither species, vitalized by hybrid vigor. They out-grow and out-compete their parental species.

The reaching ecological effects of segmented habitat are many. But where there's a weir, there is a way to get fish over it. The U.S. Fish and Wildlife Service's Fish Passage Program dexterously does so.

The Fish Passage Program created in 1998 is voluntary, and non-regulatory. The U.S. Fish and Wildlife Service, partnered with private landowners and governments–local, state and federal–have removed obsolescent dams, installed fish ladders, placed fish screens on irrigation intakes, and improved roadway stream crossings. All of them had this in common: they opened up new habitat.

The Fish Passage Program provides a value-added service, an online Decision Support System available to anyone – consultants, transportation planners, biologists and anglers.

Anyone can participate in the Fish Passage Program. The U.S. Fish and Wildlife Service lends its fisheries science capabilities in its biologists and fish passage engineers, and pays about 35 percent of a project's costs, with partners paying the remainder. It's not a grant program, and there's no matching dollar requirement— an in-kind match like volunteer labor counts. Projects are picked through the U.S. Fish and Wildlife Service's 64 Fish and Wildlife Conservation Offices located across the country.

The past is prologue, they say. Geology predicted the present, and portends the future. The Fish Passage Program today is tomorrow's past remaking the future in fisheries conservation.

If you would like to learn more about the Fish Passage Program, visit www.fws.gov/fisheries/fwma/fishpassage; call the National Fish Passage Coordinator, Leslie Hartsell at 703-358-2195, or email her at leslie_hartsell@fws.gov. ✦