Cool (or Warm-transitional) Small River
A Brief Ecological Description of this Michigan River Type

Cool Small River segments are defined (by the Michigan Department of Natural Resources, Fisheries Division) as typically having drainage areas between 80 mi² and 300 mi² and cool July mean water temperatures between 67.1ºF and 69.8ºF. These systems occur in two situations: 1) where Cold Stream or Cold-transitional Stream headwaters grow to a river size where upriver warming of the river’s water mass cannot be offset by modest groundwater deliveries to the channel; thus they warm slightly; or 2) where modest groundwater deliveries to the channel occur part way down a river that began as Warm Stream headwaters. Cool Small Rivers occur in landscapes of fine and medium textured geologies and gentle topographic relief, where groundwater deliveries to stream channels are moderate. Cool Small Rivers are generally found in the transitional regions between colder and warmer stream regions and are widespread across the Upper Peninsula where summer air temperatures remain cool.

Figure 1. Geographic distribution of Cool Small River segments in Michigan.
Fish Species of Cool Small Rivers

The typical summer fish assemblage of a Michigan Cool Small River includes 20-25 fish species: most adapted to transitional temperatures (chubs, daces, suckers, bullheads, and burbots). July diurnal temperature fluctuations are modest, allowing several warm-adapted fishes to be supported (chubs, shiners, minnows, pikes, sunfishes, and darters).

Figure 2. Michigan’s Cool Small Rivers type highlighted (green box) on the environmental gradients of river segment catchment area and July mean water temperature. The typical number of characteristic fish species for this river type is shown circled in green. And the proportional makeup of the expected fish assemblage is shown by the number of colored fish icons representing each of three thermal preference zones.
Photos of some fish species characteristic of Michigan’s **Cool Small Rivers**. Warm fishes are **red font**; thermally transitional fishes are **gray font**.

- **rock bass** ([www.wiscfish.org](http://www.wiscfish.org))
- **northern pike** (K. Schmidt MN DNR)
- **rainbow darter** (OH DNR)
- **blackside darter** (K. Schmidt MN DNR)
- **common shiner** ([www.gwphotos.com](http://www.gwphotos.com))
- **white sucker** ([www.gwsphotos.com](http://www.gwsphotos.com))
- **longnose dace** ([www.fishbase.org](http://www.fishbase.org))
- **creek chub** ([www.gwsphotos.com](http://www.gwsphotos.com))
- **w. blacknose dace** (K. Schmidt MN DNR)
Fish species characteristic of Michigan’s Cool Small Rivers. This is a generalized, potential species list for an “average” river site; samples from any specific site are expected to be a variable subset of this list. Fish species are listed in descending order of their preferred mean July temperature, based on Michigan river surveys (Zorn et al. In press). Warm fishes are red font; thermally transitional fishes are gray font.

Northern hog sucker
Brown bullhead
River chub
Rock bass
Greenside darter
Logperch
Northern pike
Bluntnose minnow
Common shiner
Hornyhead chub
Rainbow darter
Blackside darter
Green sunfish
Grass pickerel
Burbot
White sucker
Black bullhead
Johnny darter
Longnose dace
Creek chub
Western blacknose dace


Literature on Michigan River and Stream Fish Assemblages
and their Relationship to Summer Water Temperatures


