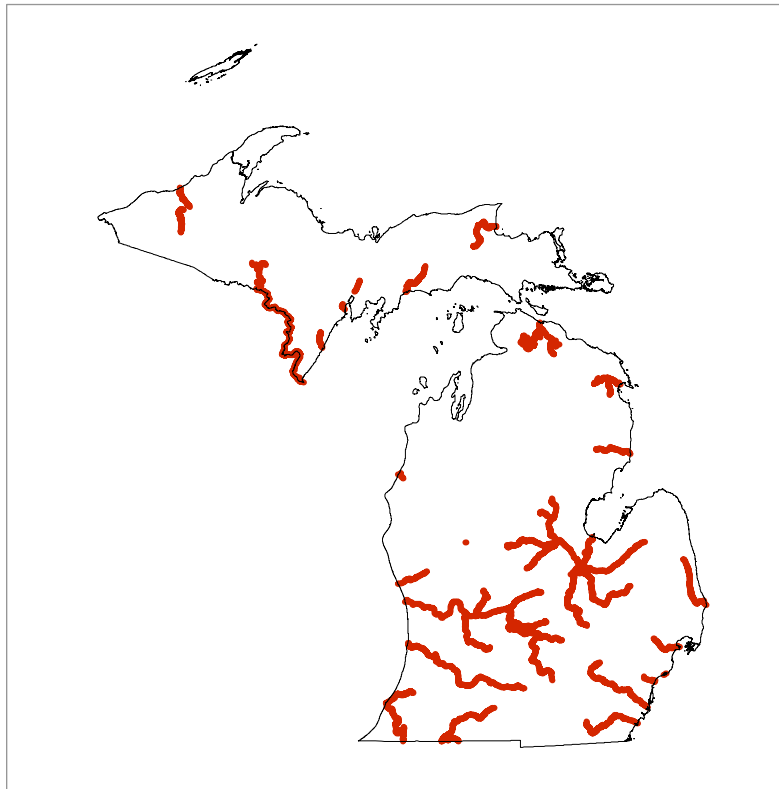


Warm Large River

A Brief Ecological Description of this Michigan River Type

Warm Large River segments are defined (by the Michigan Department of Natural Resources, Fisheries Division) as typically having drainage areas greater than 300 mi² and warm July mean water temperatures great than 69.8 °F. They generally occur downriver of **Warm-Transitional Small Rivers** and **Warm Small Rivers** where rivers grow to a size where July water temperatures become warm and very stable diurnally. **Warm Large Rivers** occur in landscapes of medium to fine textured geologies and flat to gentle topographic relief, where groundwater deliveries to stream channels are moderate to minimal. **Warm Large Rivers** are most common in southern Michigan.

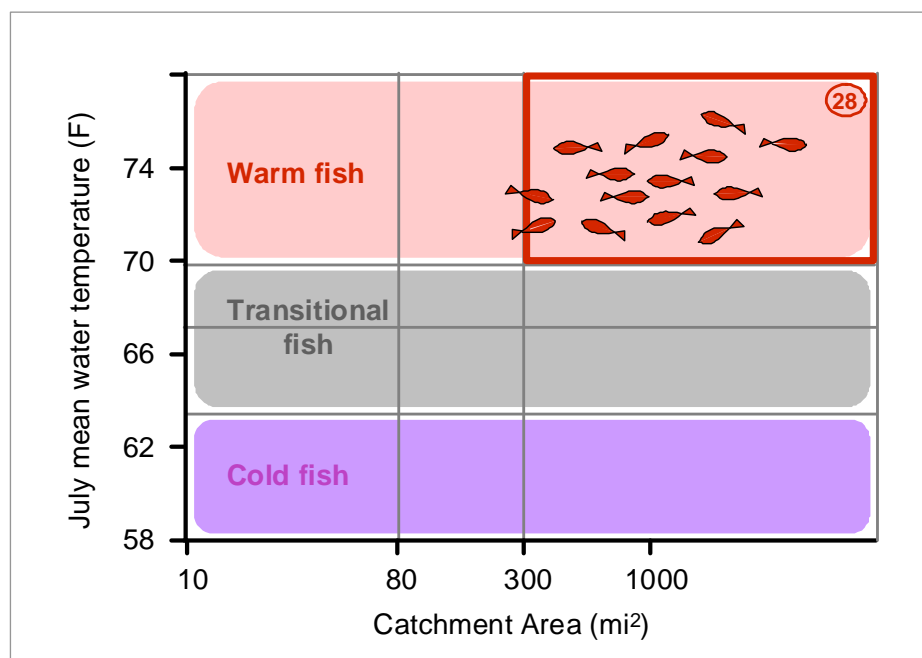
*Figure 1. Geographic distribution of **Warm Large River** segments in Michigan.*



Fish Species of **Warm Large Rivers**

The typical summer fish assemblage of a Michigan **Warm Large River** includes a wide variety (30-40) of fish species adapted to warm and diurnally stable temperatures (carps, shiners, minnows, suckers, redhorses, bullheads, catfishes, pikes, sunfishes, basses, darters, and walleyes).

*Figure 2. Michigan's **Warm Large Rivers** type highlighted (**red box**) on the environmental gradients of river segment drainage areas and July mean water temperatures. The typical number of characteristic fish species for this river type is shown **circled in red**. And the proportional makeup of the expected fish assemblage for this river type 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 **Warm Large Rivers**.
Warm fishes are **red font**.



channel catfish (www.wiscfish.org)



n. hog sucker (www.gwsphotos.com)



Spotfin shiner (K. Schmidt MN DNR)



stonecat (www.nativefish.org)



golden redbreast (www.fishbase.org)



shorthead redbreast (www.wiscfish.org)

tubercles



smallmouth bass (www.wiscfish.org)

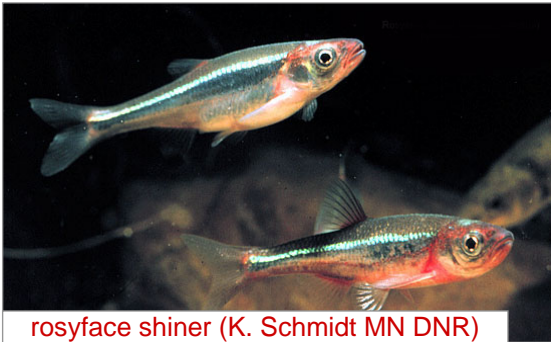


walleye (www.wiscfish.org)

rock bass (www.wiscfish.org)



Logperch (OH DNR)



rosyface shiner (K. Schmidt MN DNR)



northern pike (K. Schmidt MN DNR)

sand shiner (K. Schmidt MN DNR)



bluntnose minnow (www.nativefish.org)

Fish species characteristic of Michigan's **Warm Large 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 species are **red font**; thermally transitional species are **grey font**.

Flathead catfish
Channel catfish
Spotfin shiner
Mimic shiner
Golden redhorse
Common carp
Smallmouth bass
Silver redhorse
Black redhorse
Freshwater drum
Greater redhorse
Northern hog sucker
Brown bullhead
Stonecat
Shorthead redhorse
Walleye
Rock bass
Rosyface shiner
Sand shiner
Greenside darter
Logperch
Northern pike
Bluntnose minnow
Common shiner
Hornyhead chub
Rainbow darter
Blackside darter
White sucker

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

- Bailey, R. M., and G. R. Smith. 2002. Names of Michigan fishes. Michigan Department of Natural Resources, Fisheries Division, Ann Arbor.
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