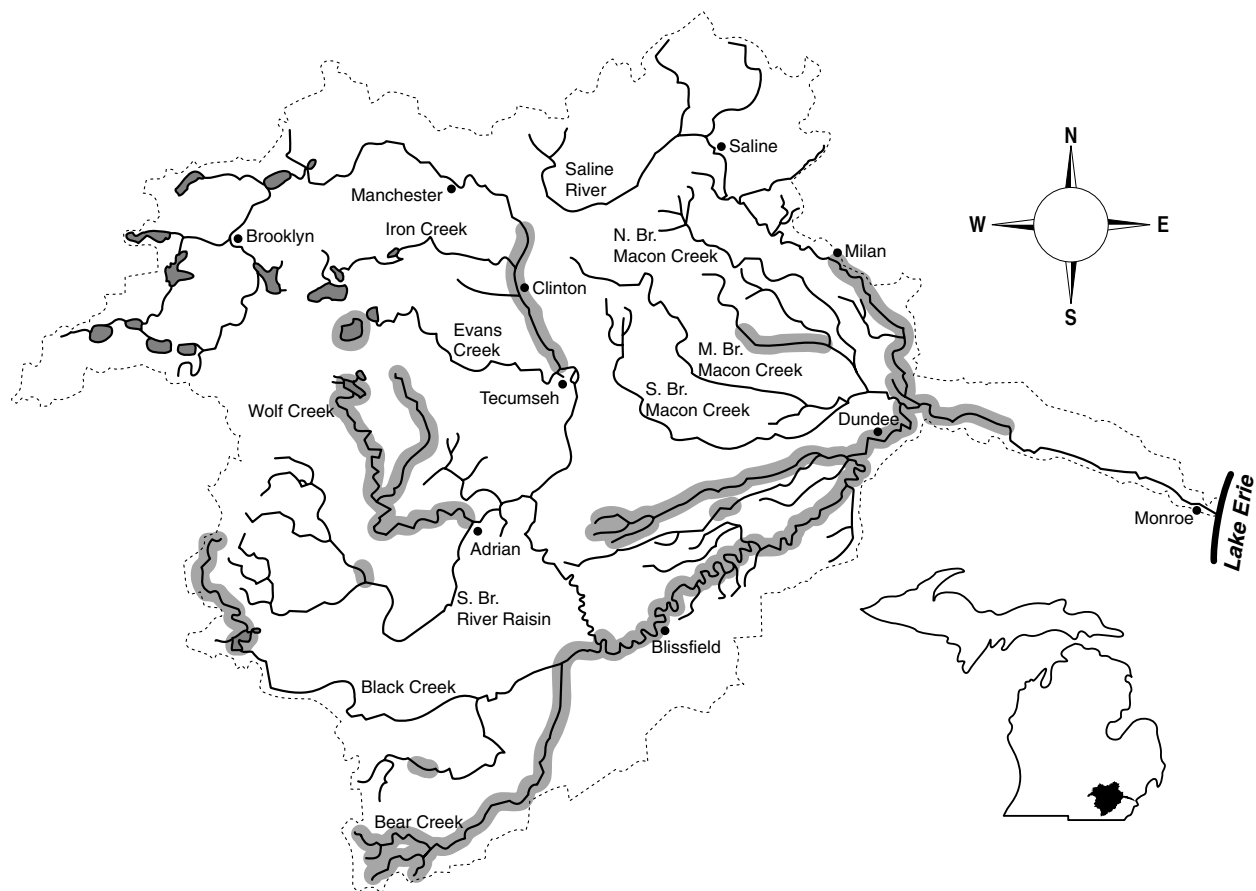


Black bullhead (*Ameiurus melas*)

Habitat:

- feeding - turbid water
 - silt bottom
 - low gradient small to medium streams, pools, and headwaters of large rivers; also in lakes and impoundments
 - can tolerate very warm water and very low dissolved oxygen
- spawning - nest in moderate to heavy vegetation or woody debris and under overhanging banks

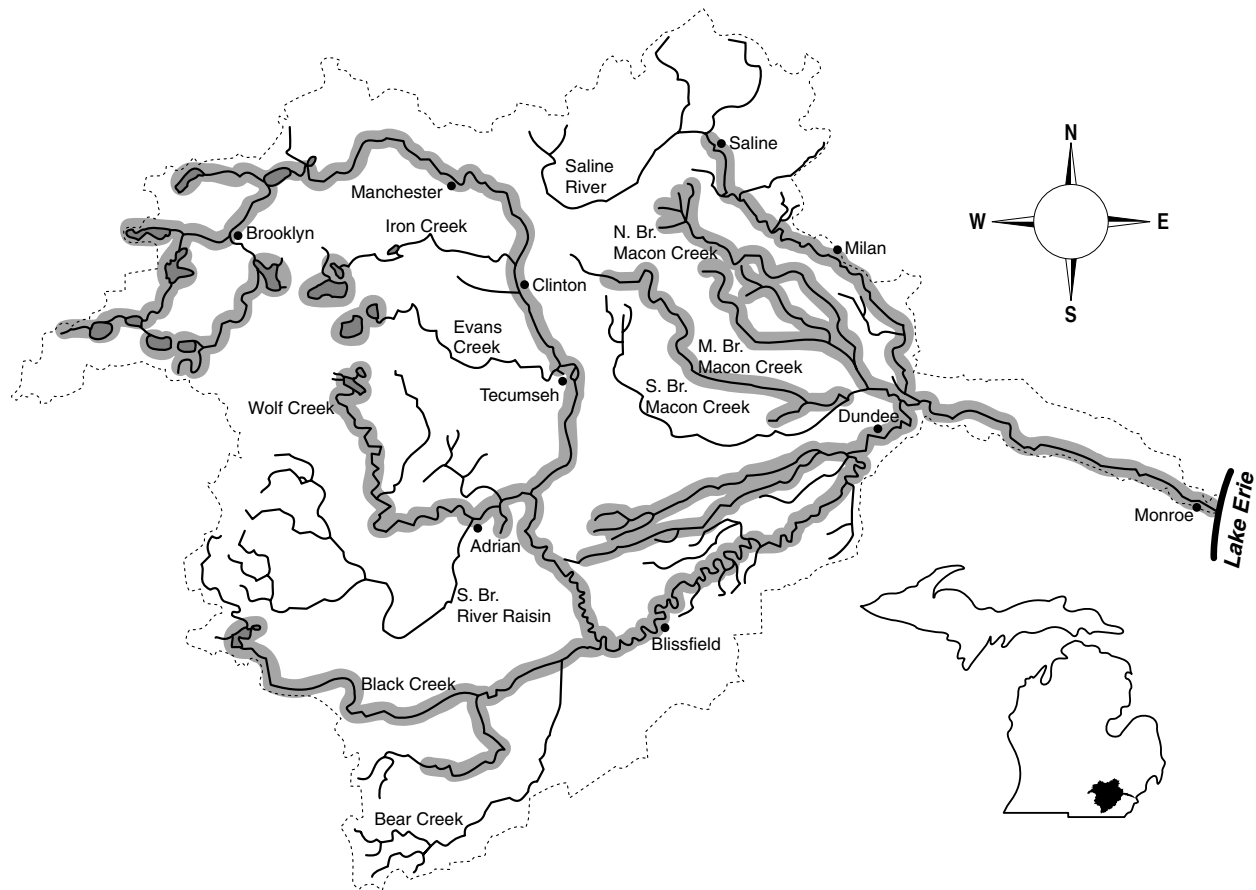


Yellow bullhead (*Ameiurus natalis*)

Habitat:

- feeding - clear flowing water
- heavy vegetation
- low gradient streams, lakes, and impoundments
- tolerant of low oxygen

spawning - nest under a stream bank or near stones or stumps



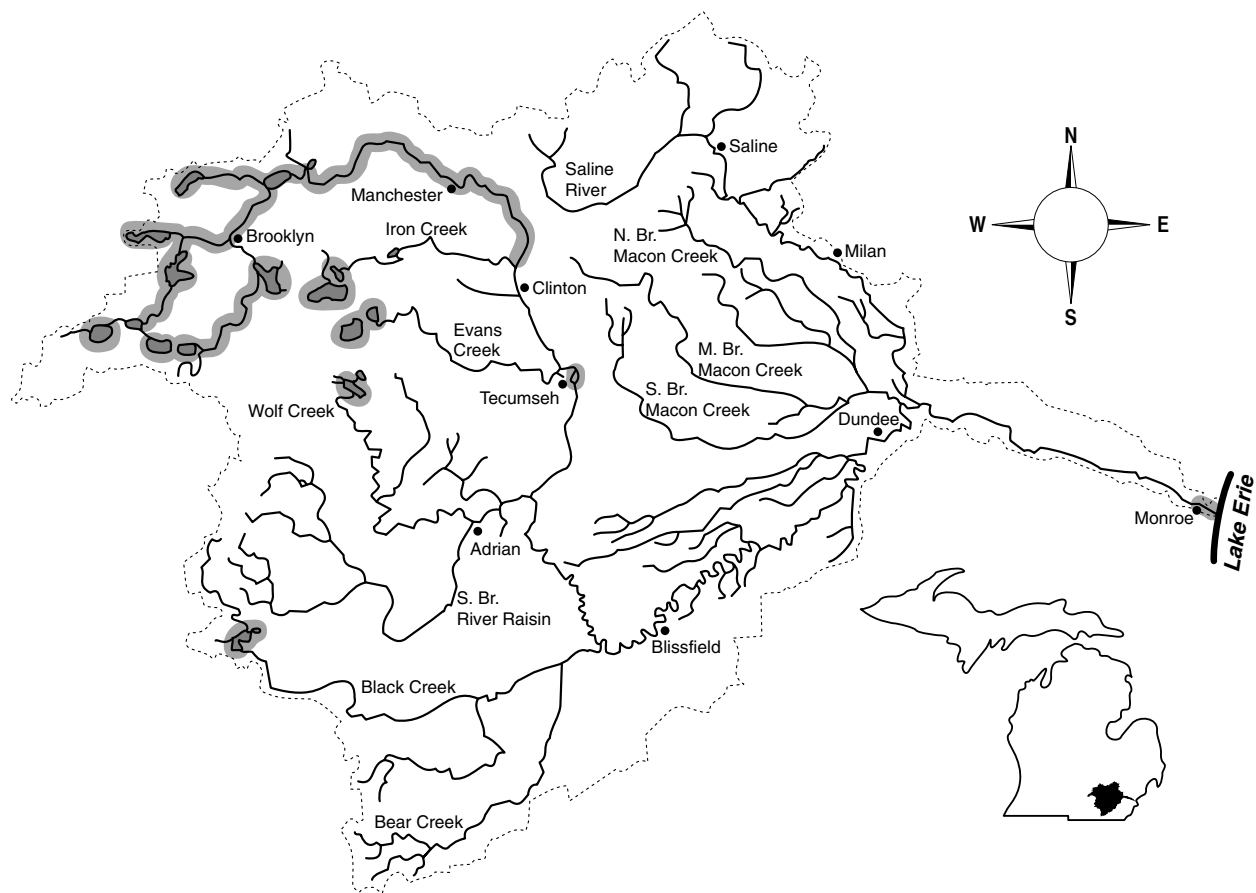
Brown bullhead (*Ameiurus nebulosus*)

Habitat:

- feeding - larger streams and rivers, lakes and impoundments
- clear cool water with little clayey silt
- moderate amounts of aquatic vegetation
- sand, gravel, or muck substrate
- not tolerant of turbid water
- tolerant of warm water and low oxygen

spawning - nest in mud or sand substrate among rooted aquatic vegetation
usually near a stump, tree, or rock

winter refuge - in muddy bottoms

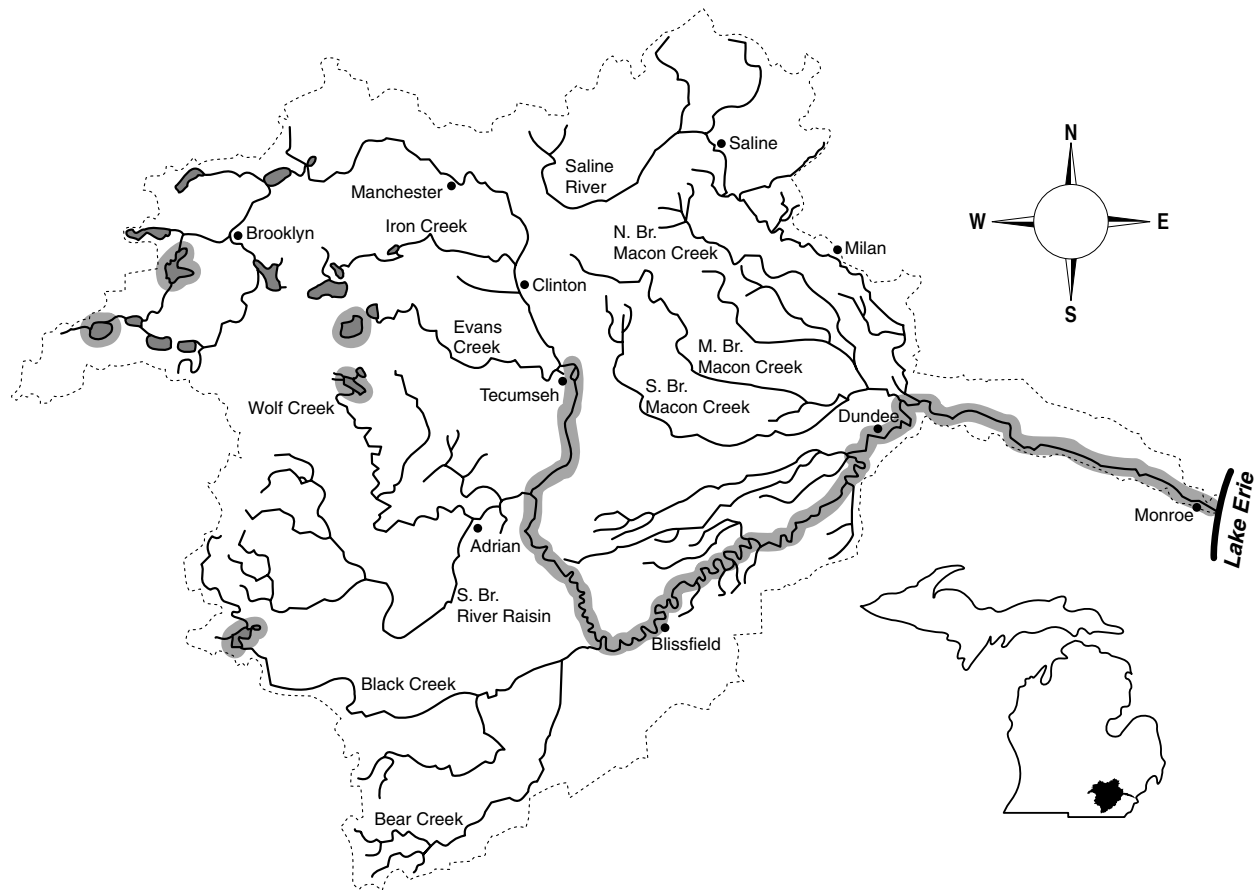


Channel catfish (*Ictalurus punctatus*)

Habitat:

- feeding - moderately-clear, deeper waters of rivers, lakes, and impoundments
 - sand, gravel, or rubble substrate
 - low to moderate gradient

- spawning - secluded semi-dark areas such as holes, under banks, log jams, or rocks

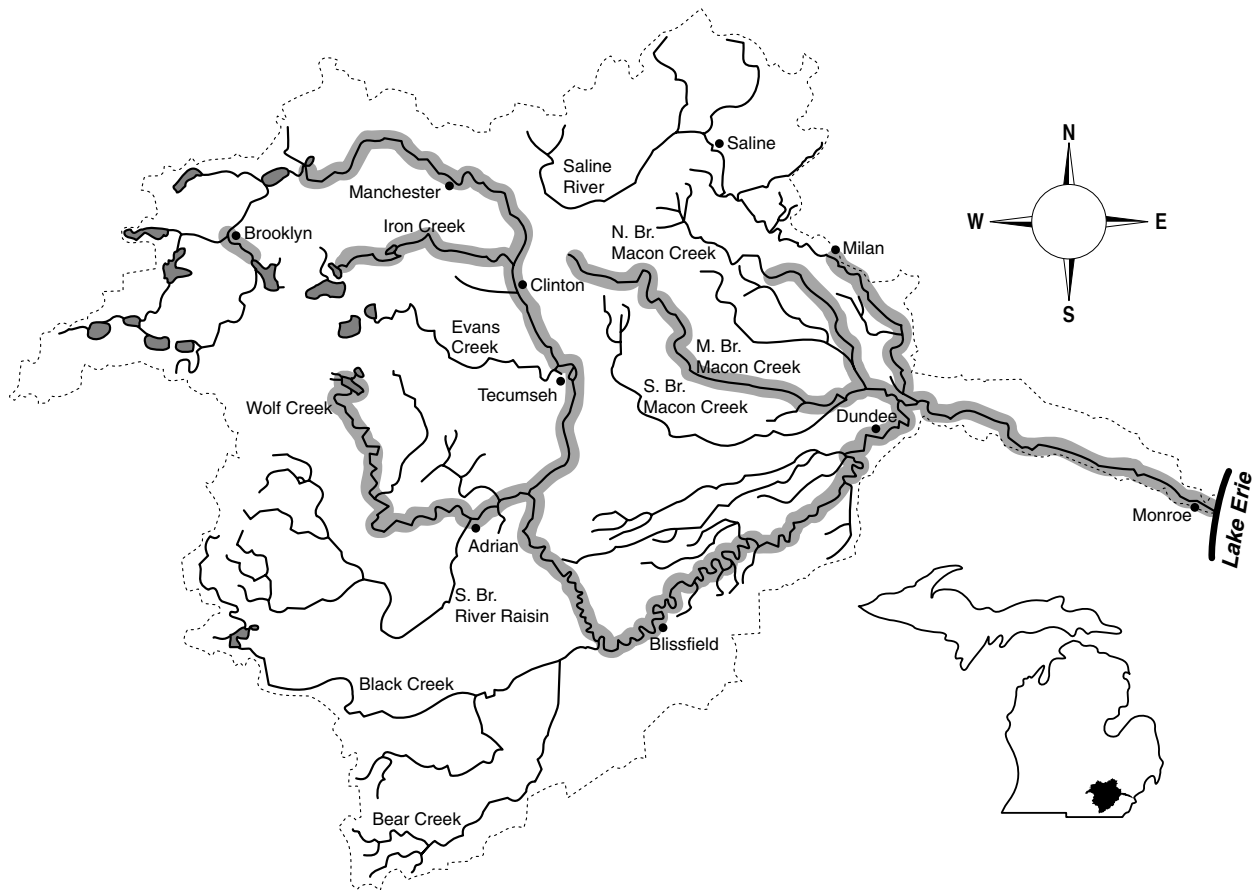


Stonecat (*Noturus flavus*)

Habitat:

- feeding - consistent low to moderate gradient flowing water
- rocky riffles of larger streams and smaller rivers
- not tolerant of silt
- tolerant of low oxygen and pollution

- spawning - eggs deposited beneath stones
- shallow rocky areas of streams or lakes

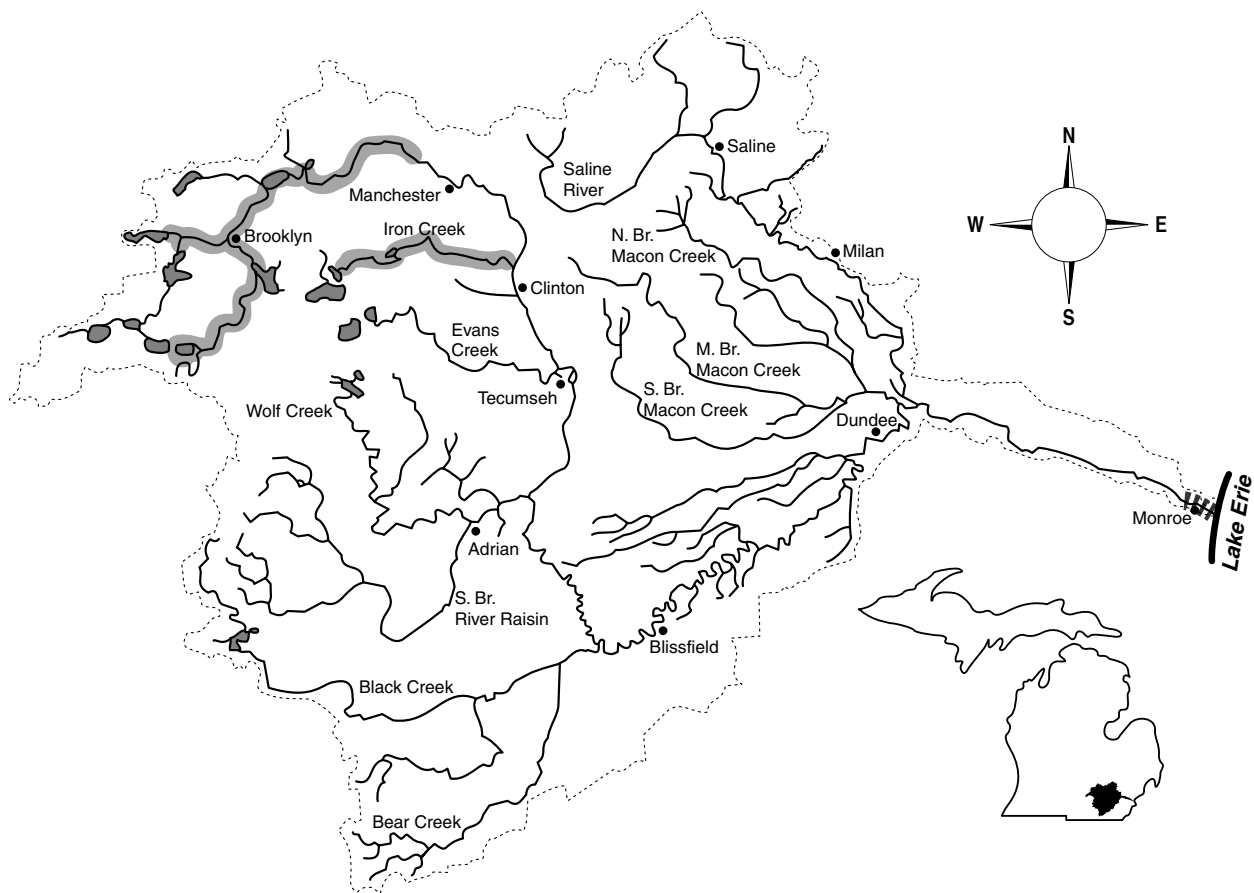


Tadpole madtom (*Noturus gyrinus*)

Habitat:

- feeding - vegetative cover in low-moderate current waters
- muddy substrate with extensive vegetation
- clear waters of streams, rivers, and lakes

- spawning - mostly in rivers, sometimes shallows of lakes
- nests in dark cavities (ex: beneath boards, logs, crayfish burrows)

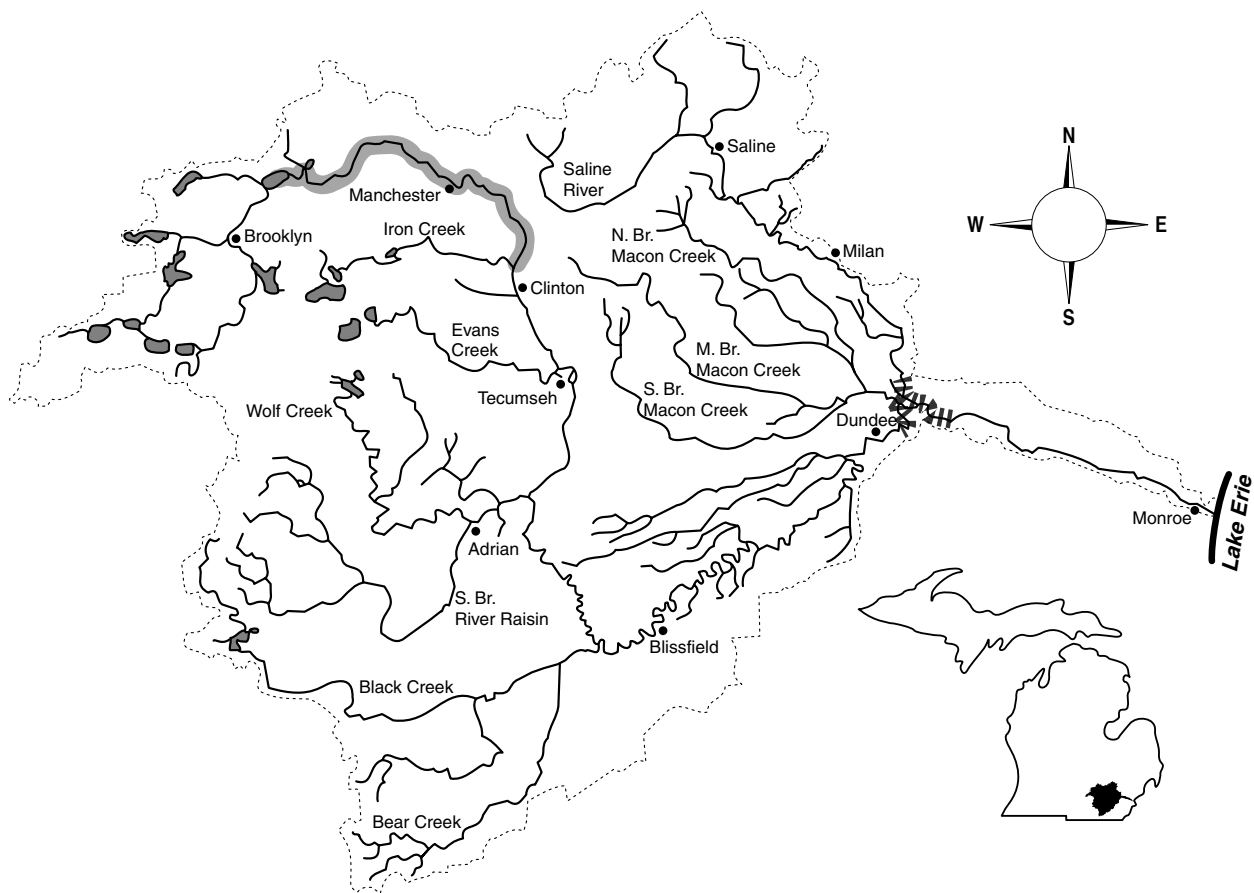


Brindled madtom (*Noturus miurus*) - special concern

Habitat:

- feeding - low gradient streams or pools of higher gradient reaches
- sand or organic debris substrate - no clayey silts
- in riffles of sluggish or moderate flow if sand is present

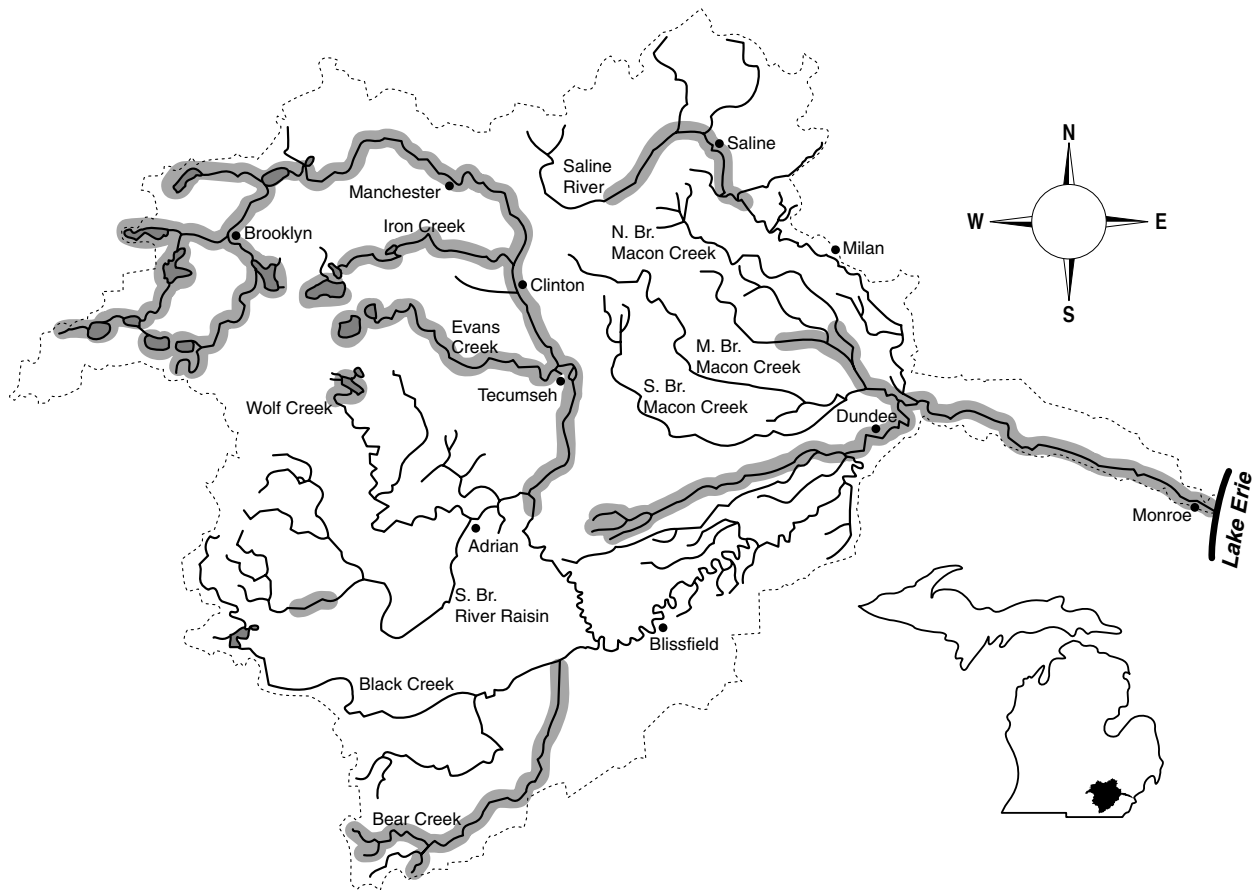
- spawning - silt or mud substrate
- emergent vegetation



Grass pickerel (*Esox americanus vermiculatus*)

Habitat:

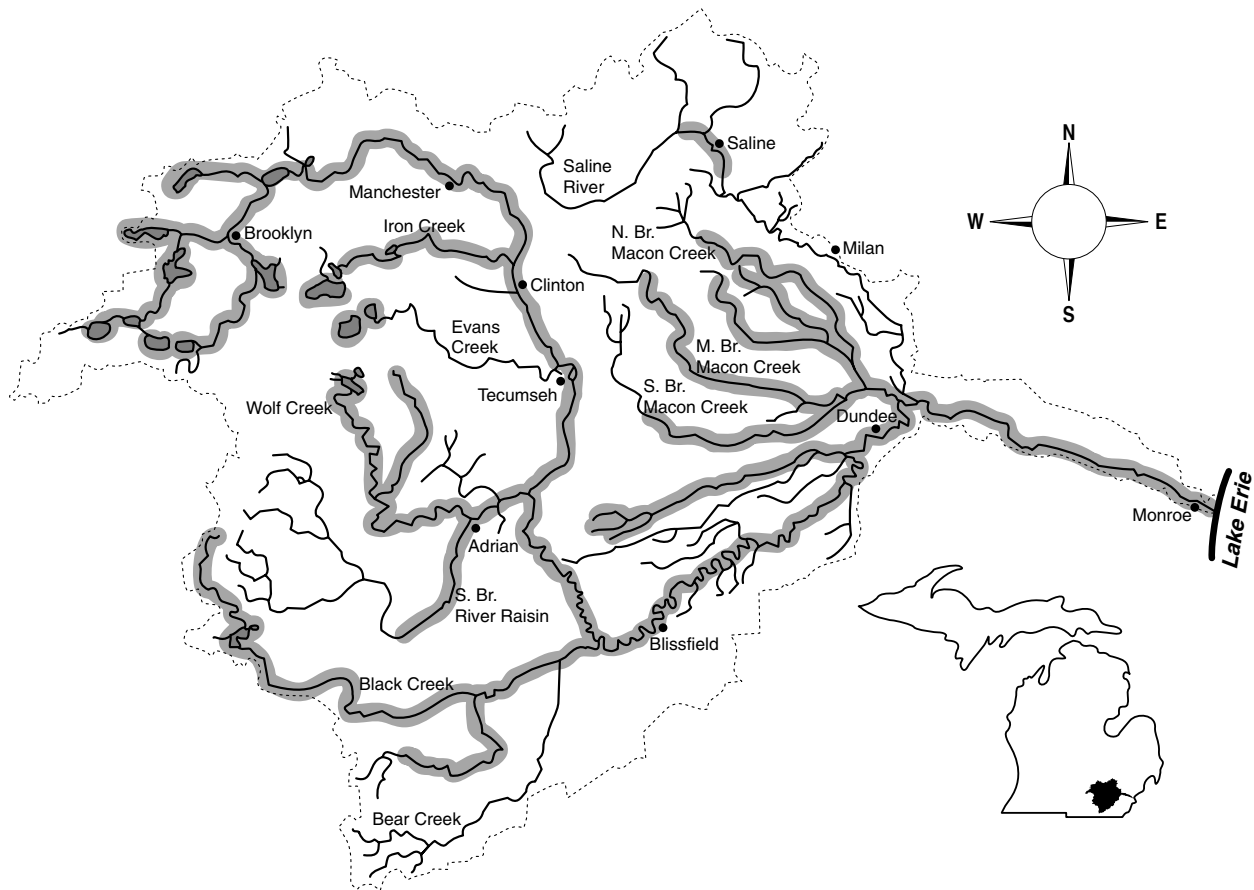
- feeding - juveniles: along shore
 - adults: in deeper portions of streams, rivers, lakes, and impoundments
 - clear water, little current, dense vegetation
 - tolerates low oxygen concentrations
- spawning - broadcast spawner over submerged vegetation



Northern pike (*Esox lucius*)

Habitat:

- feeding - cool to moderately warm streams, rivers, lakes, and impoundments
 - vegetation in slow to moderate current
- spawning - submerged vegetation with slow current in shallow water

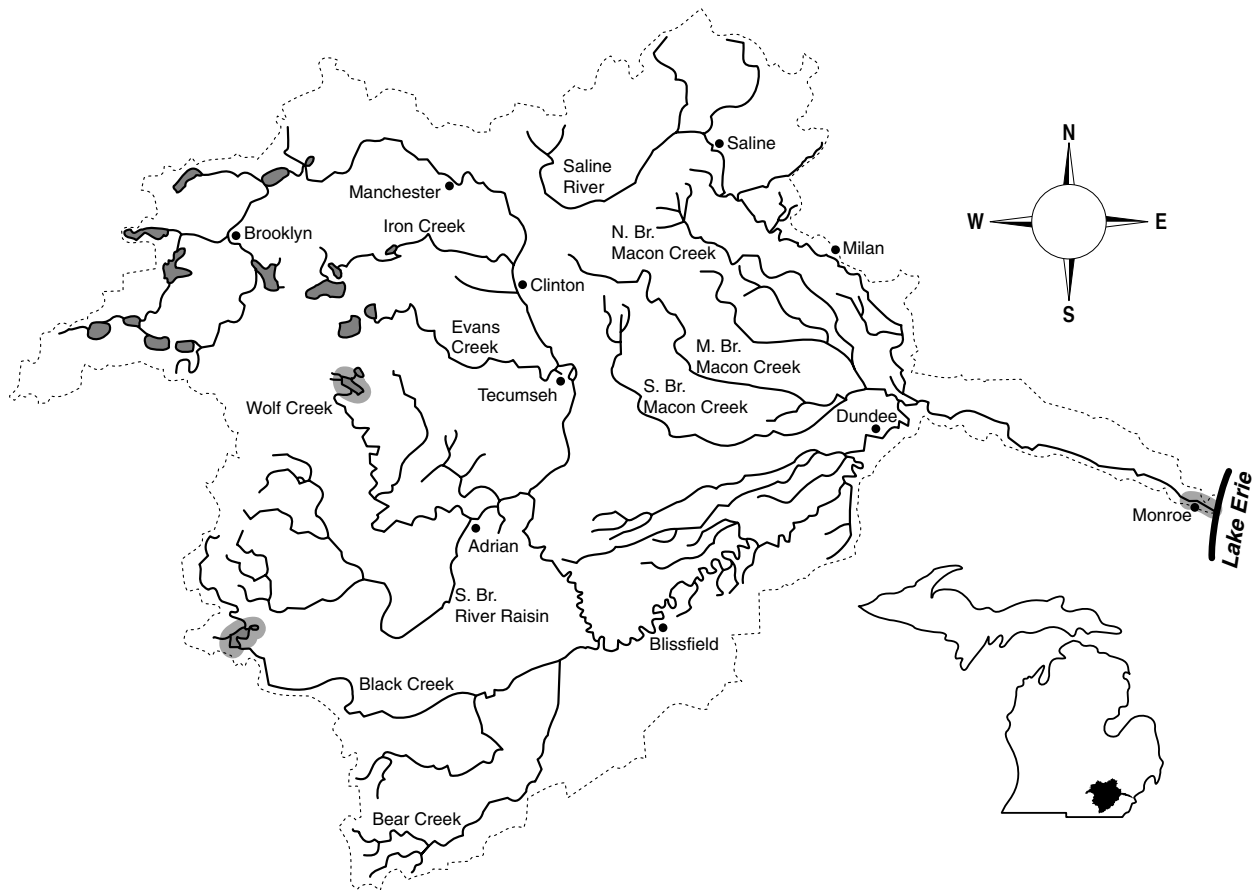


Muskellunge (*Esox masquinongy*)

Habitat:

- feeding - warm, heavily vegetated lakes, stumpy weedy bays, and slow heavily vegetated medium to large rivers
- shallow cool water
- tolerant of low oxygen

spawning - clear shallow waters (15-20") in heavily vegetated areas



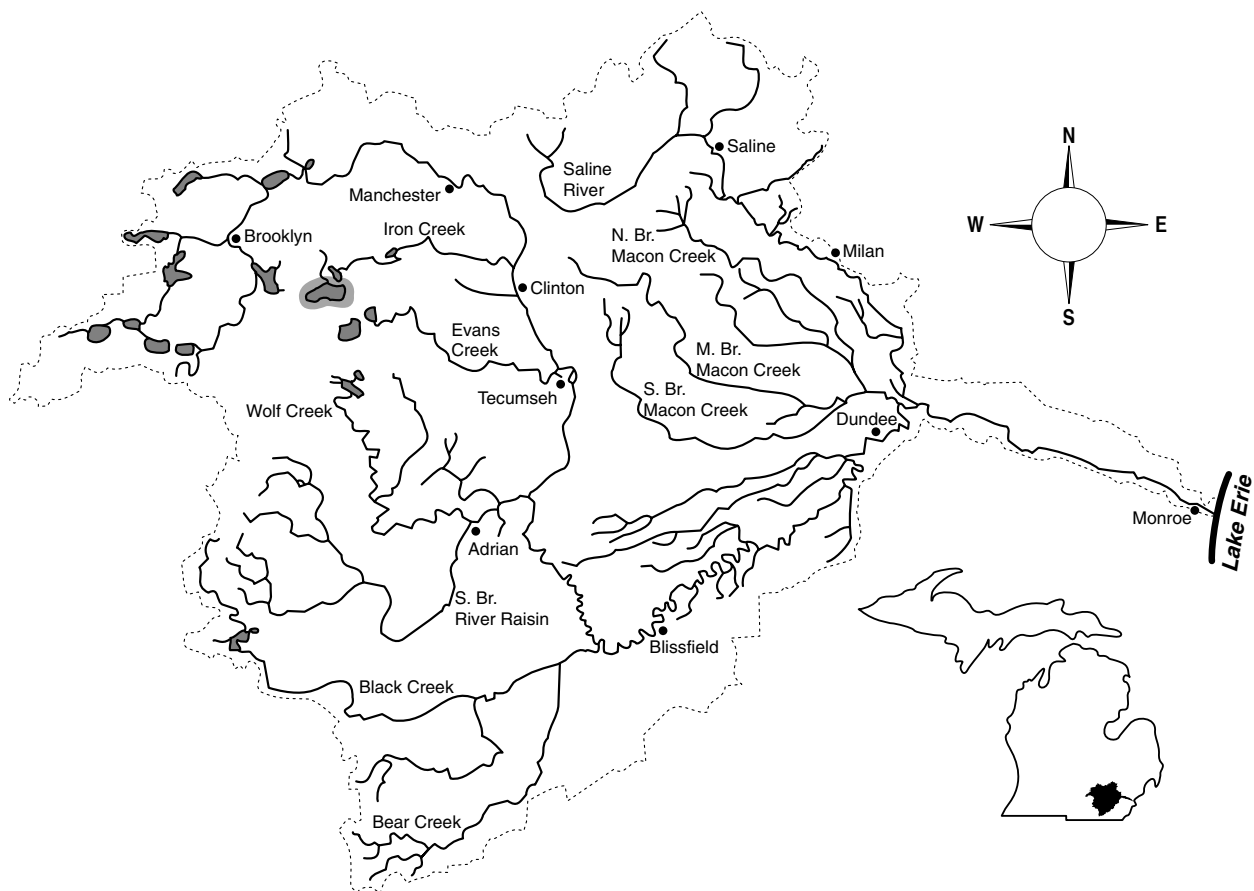
Tiger muskellunge (*Esox masquinongy* x *E. lucius*) - rare

Habitat:

feeding - intermediate between muskellunge and northern pike

spawning - hybrid species; muskellunge x northern pike

- occasionally produced in wild, but most often from hatcheries
- males are sterile, females may be fertile

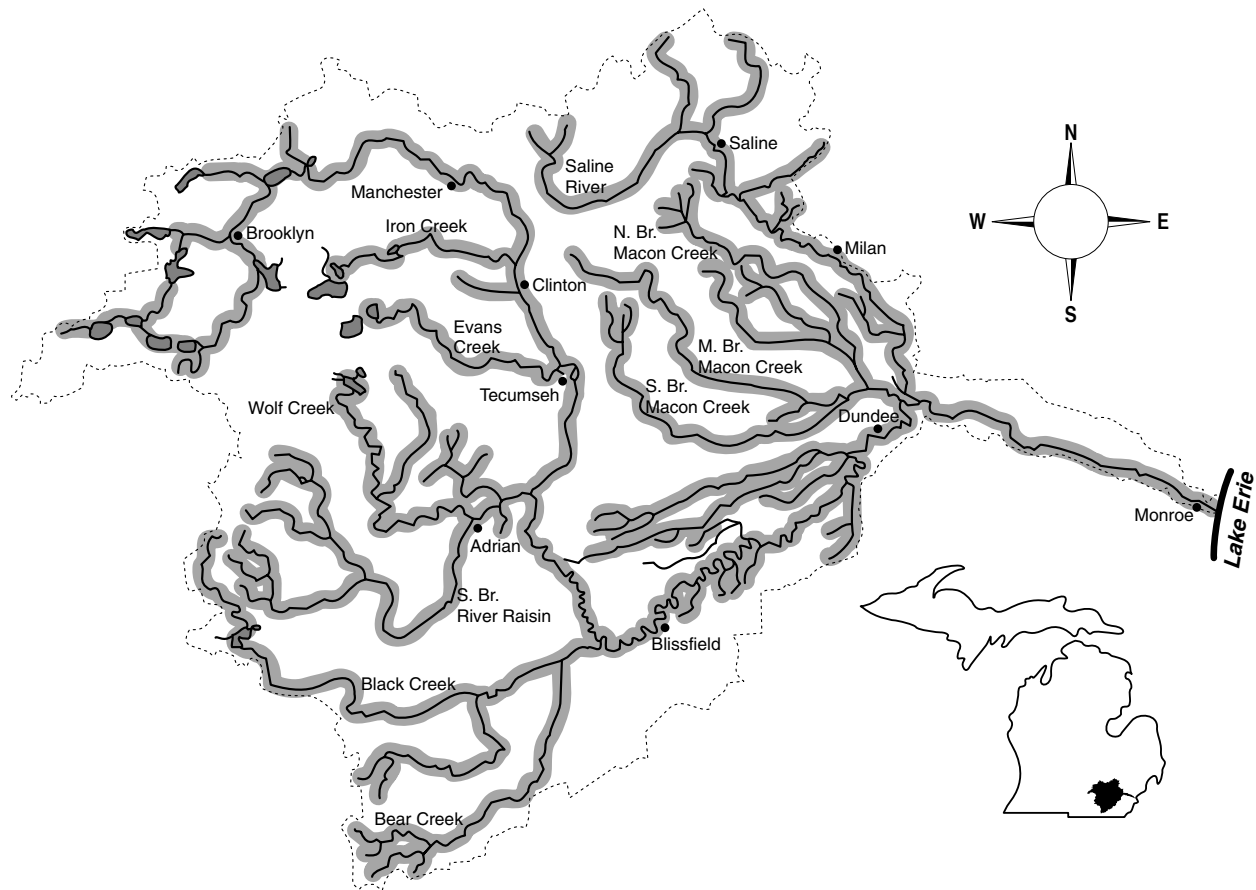


Central mudminnow (*Umbra limi*)

Habitat:

- feeding - undisturbed clear, low-gradient streams or rivers and lakes and impoundments
- organic debris, muck, or peat substrates
- aquatic vegetation

- spawning - floodplain areas, on vegetation

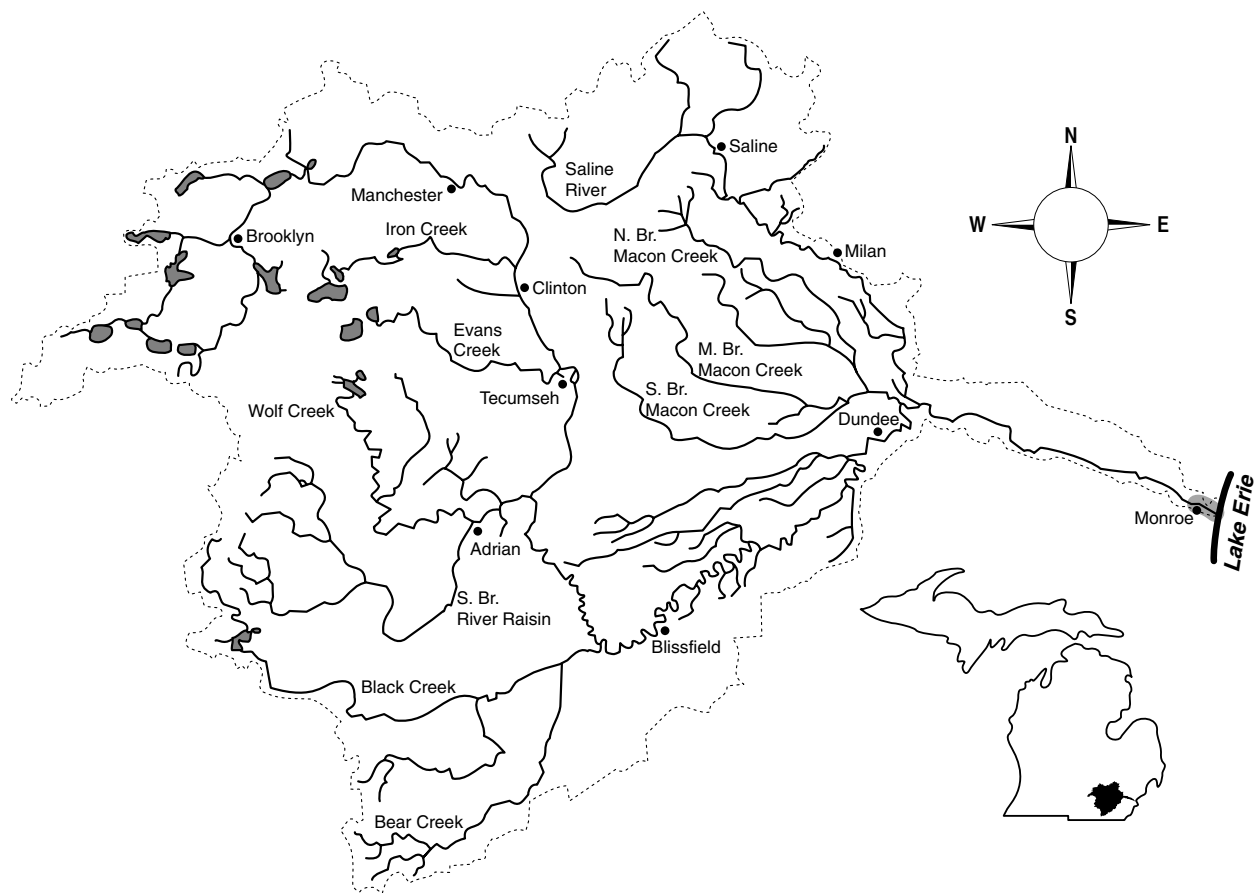


Rainbow Smelt (*Osmerus mordax*)

Habitat:

- feeding - midwater of lakes; 42-192 ft. in Lake Erie

- spawning - in streams or off-shore shoals in Lake Erie
 - gravel substrate
 - swift current



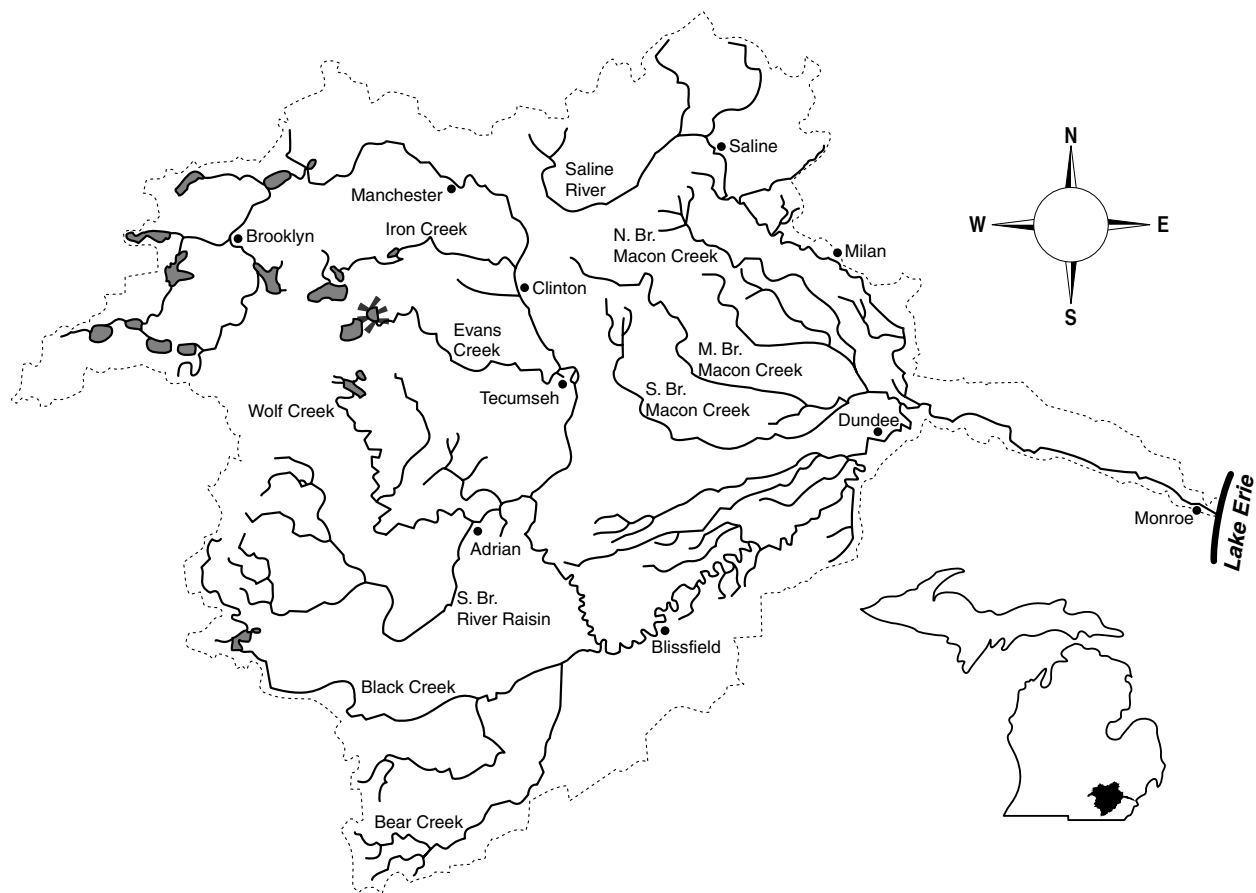
Cisco {Lake herring} (*Coregonus artedii*) - special concern

Habitat:

feeding - deep cool lakes, preferably oligotrophic

spawning - usually in lakes

- 3 to 6 feet of water with no vegetation
- often over gravel or stony substrate



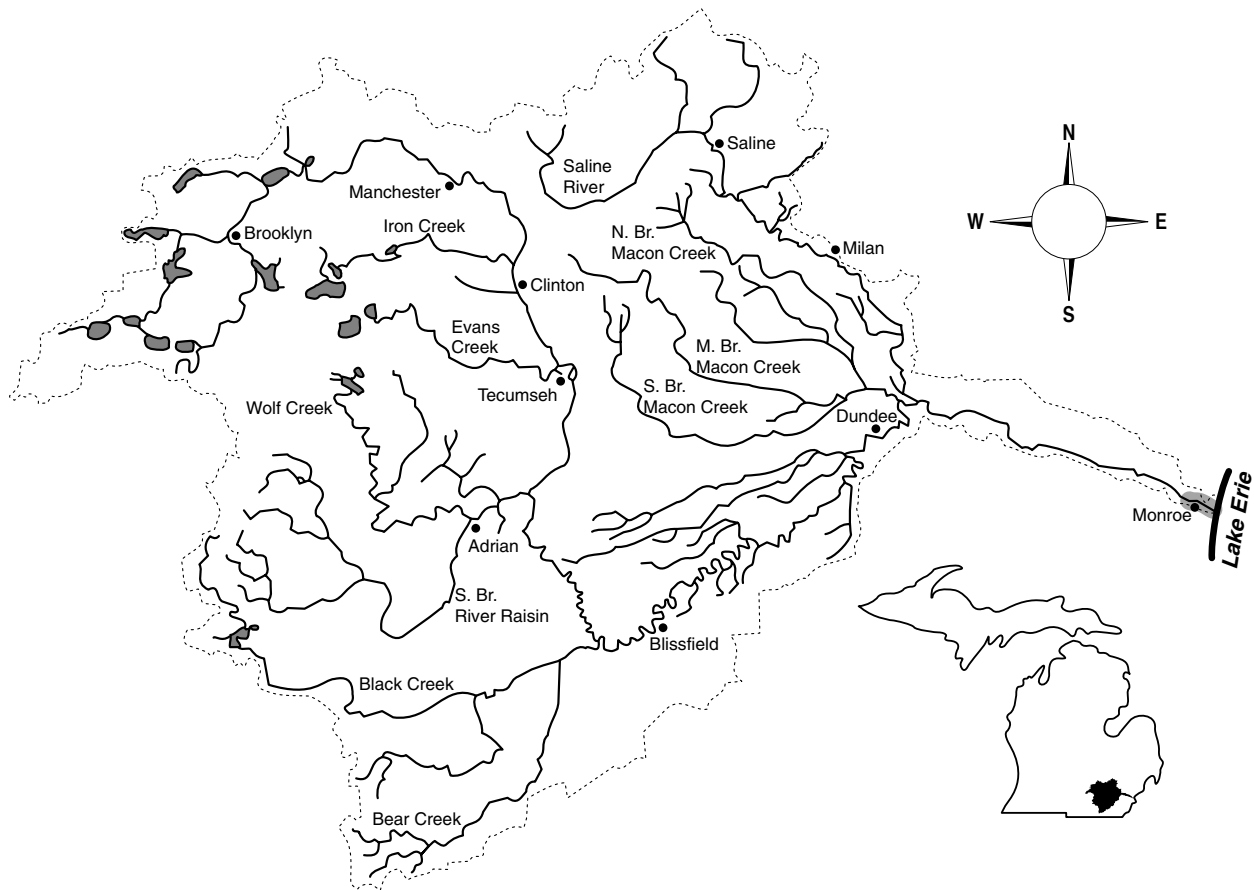
Lake whitefish (*Coregonus dupeaformis*)

Habitat:

feeding - cold deep lakes; Lake Erie

spawning - shallow water (<25 feet)

- hard or stony substrate

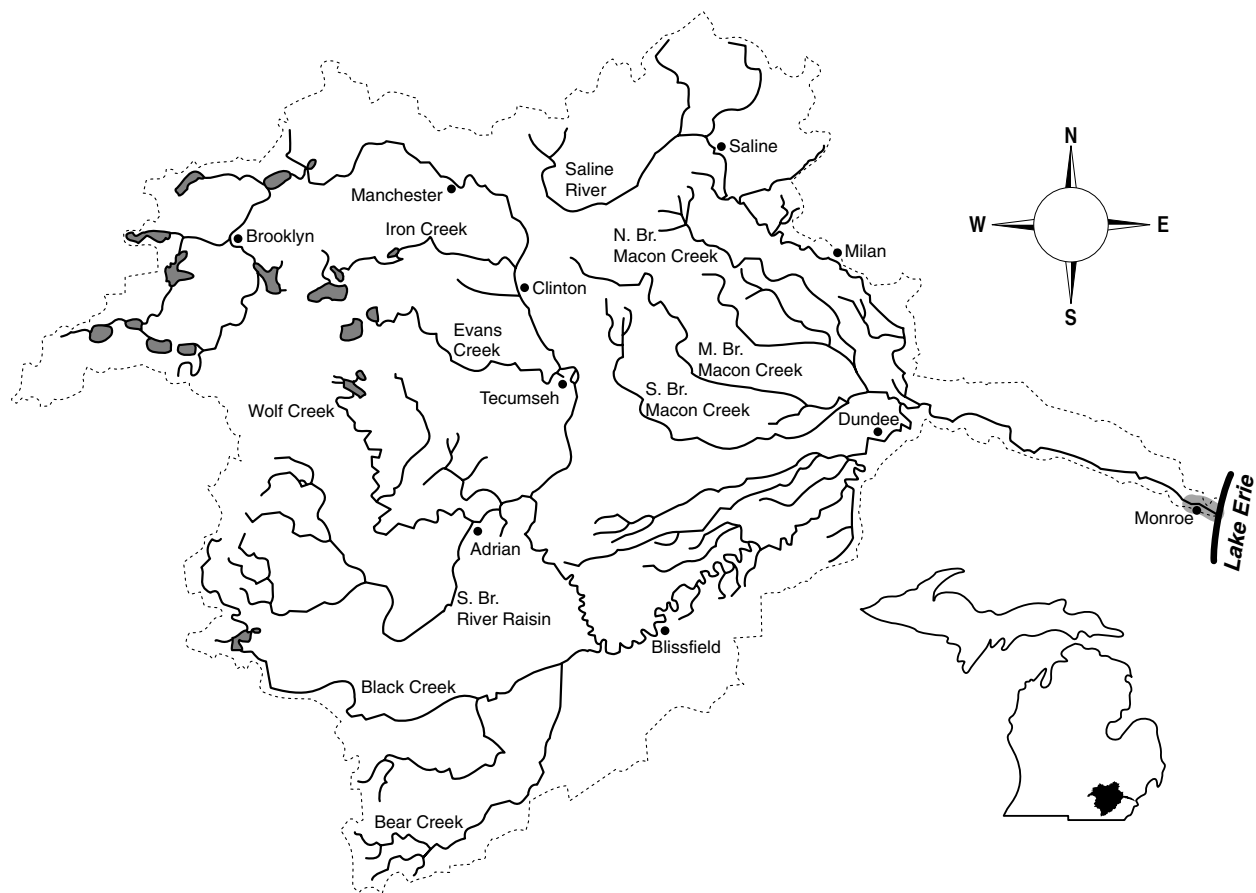


Coho salmon (*Oncorhynchus kisutch*)

Habitat:

- feeding - adults: Lake Erie
- young: shallow gravel substrate in cold streams, later into pools

- spawning - cold streams and rivers
- swifter water of shallow gravelly substrate

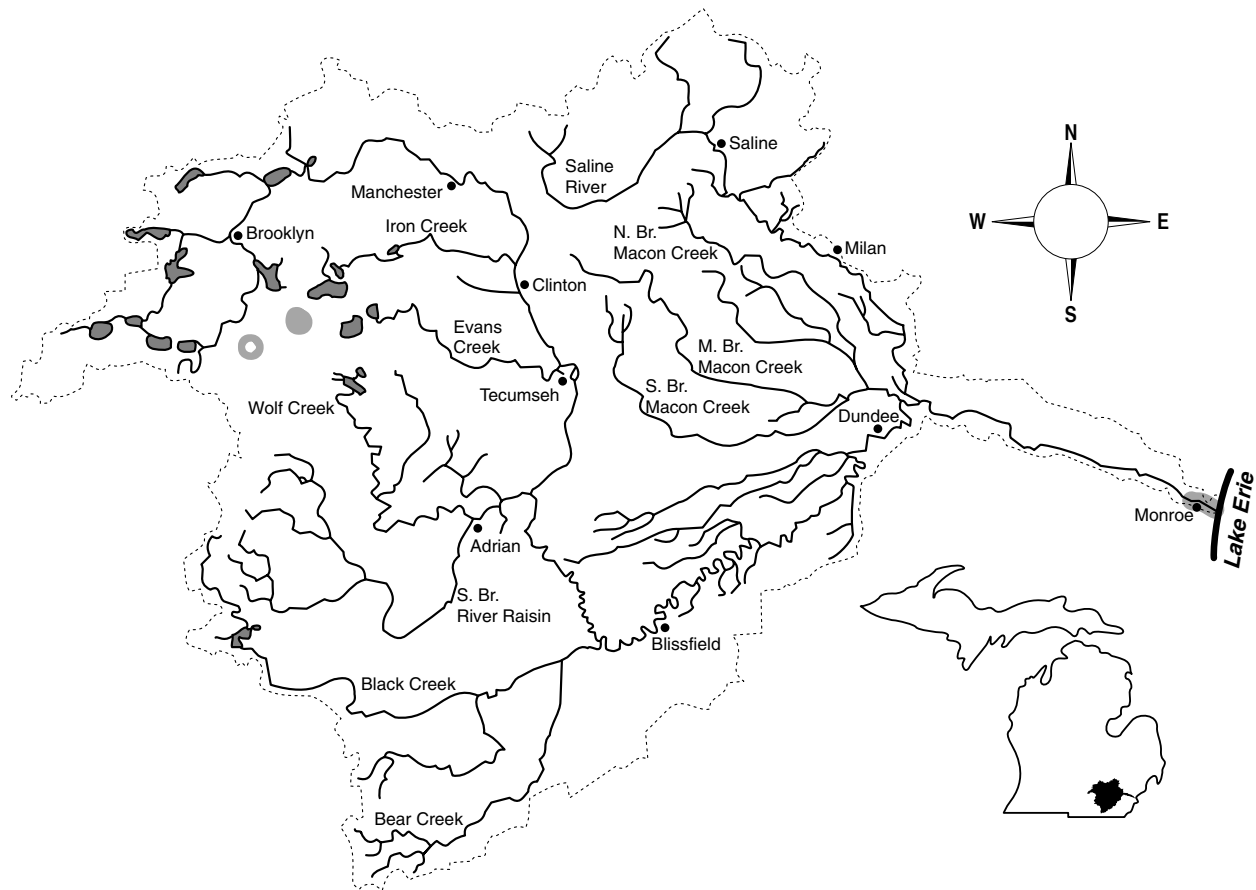


Rainbow trout (*Oncorhynchus mykiss*)

Habitat:

- feeding - cold clear water of rivers and Lake Erie
- moderate current

- spawning - gravelly riffles above a pool
- smaller tributaries

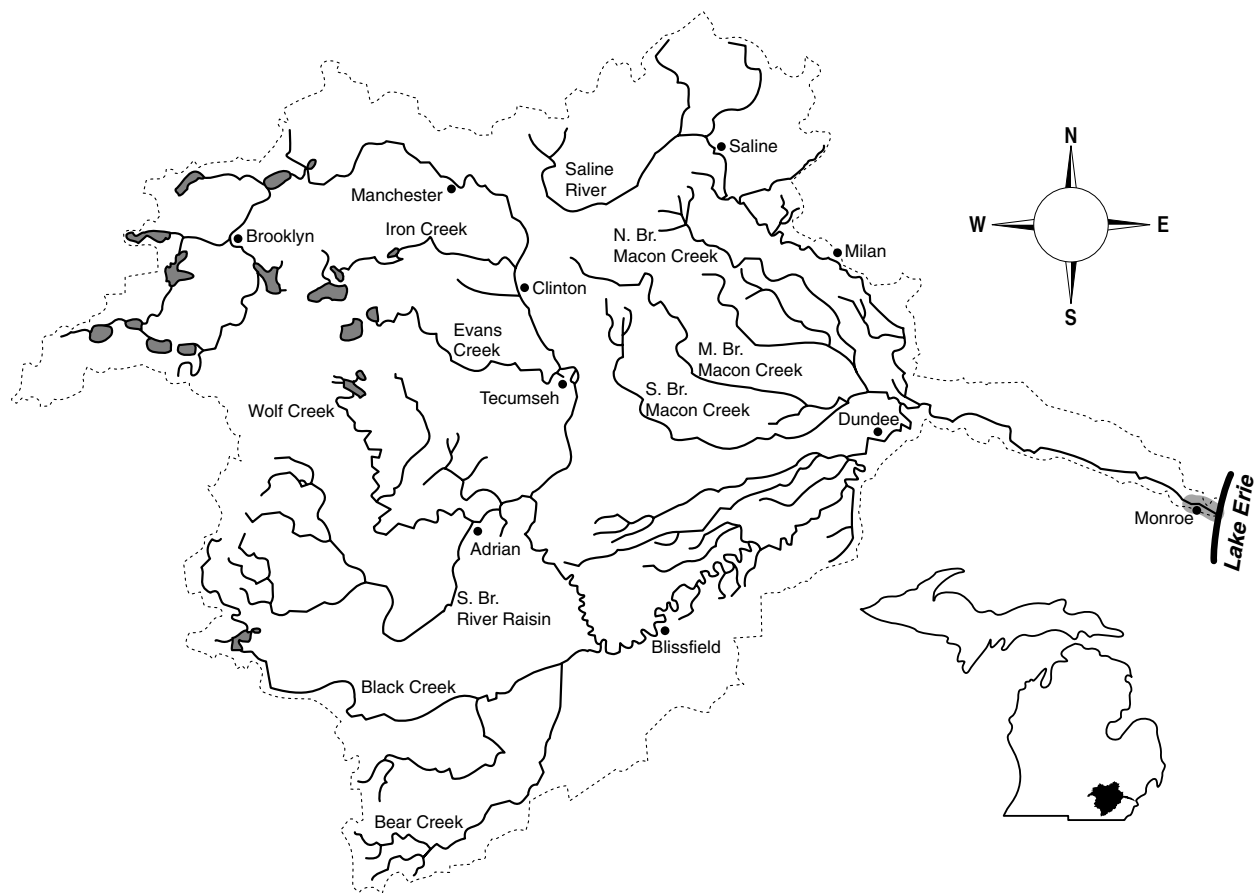


Chinook salmon (*Oncorhynchus tshawytscha*)

Habitat:

- feeding - adults: Lake Erie
- young: shallow gravel substrate in cool streams, later into pools

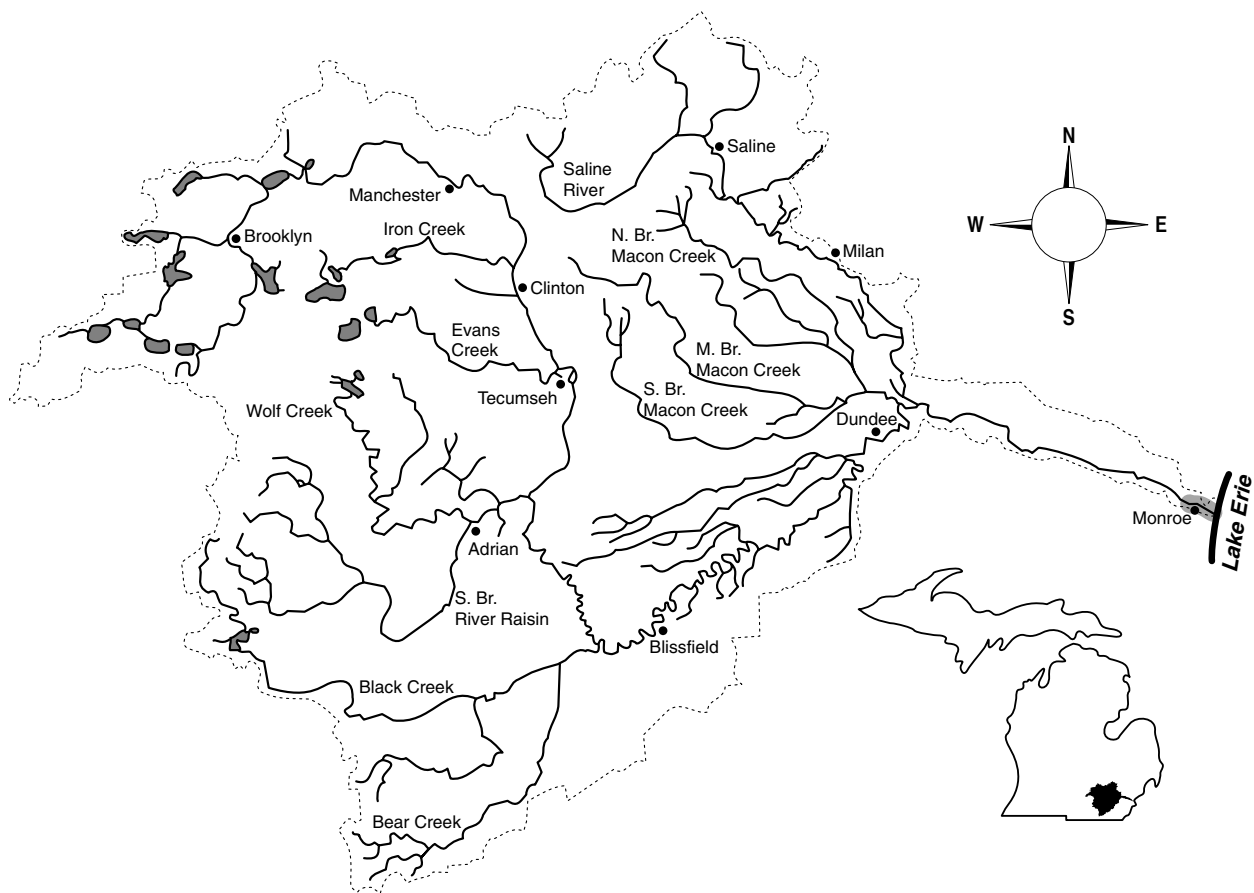
- spawning - gravelly substrate in cool streams



Brown trout (*Salmo trutta*)

Habitat:

- feeding - cold, clear streams, rivers, and lakes (not >70°F)
 - medium to swift current in streams
 - does not tolerate silt well
 - prefers few individuals and species around
 - abundance of aquatic and land insects
- spawning - gravelly riffles; shallow headwater areas

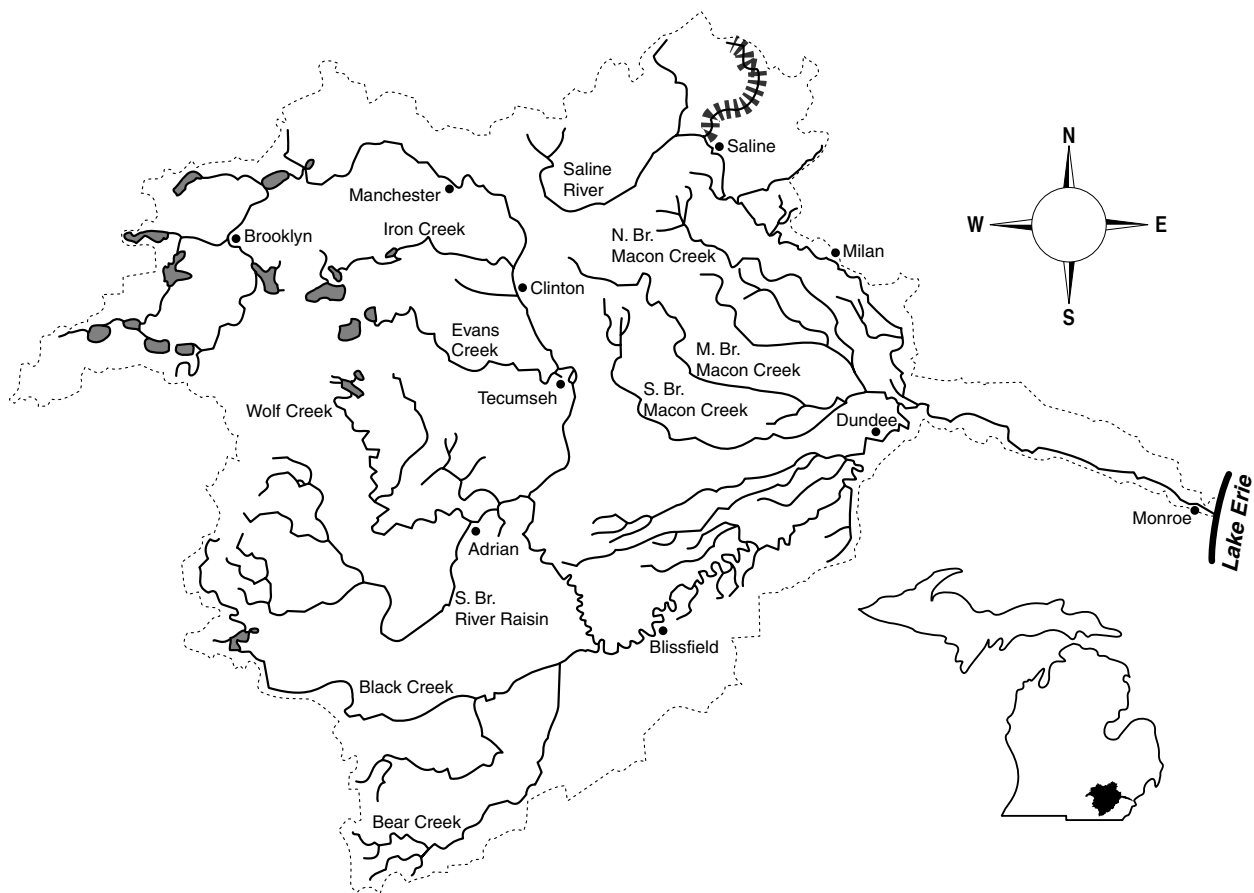


Brook trout (*Salvelinus fontinalis*) - locally extirpated

Habitat:

- feeding - cold, clear streams, rivers, and lakes (not >65°F)
- low current
- well oxygenated water

- spawning - gravelly riffles; shallow or headwater streams

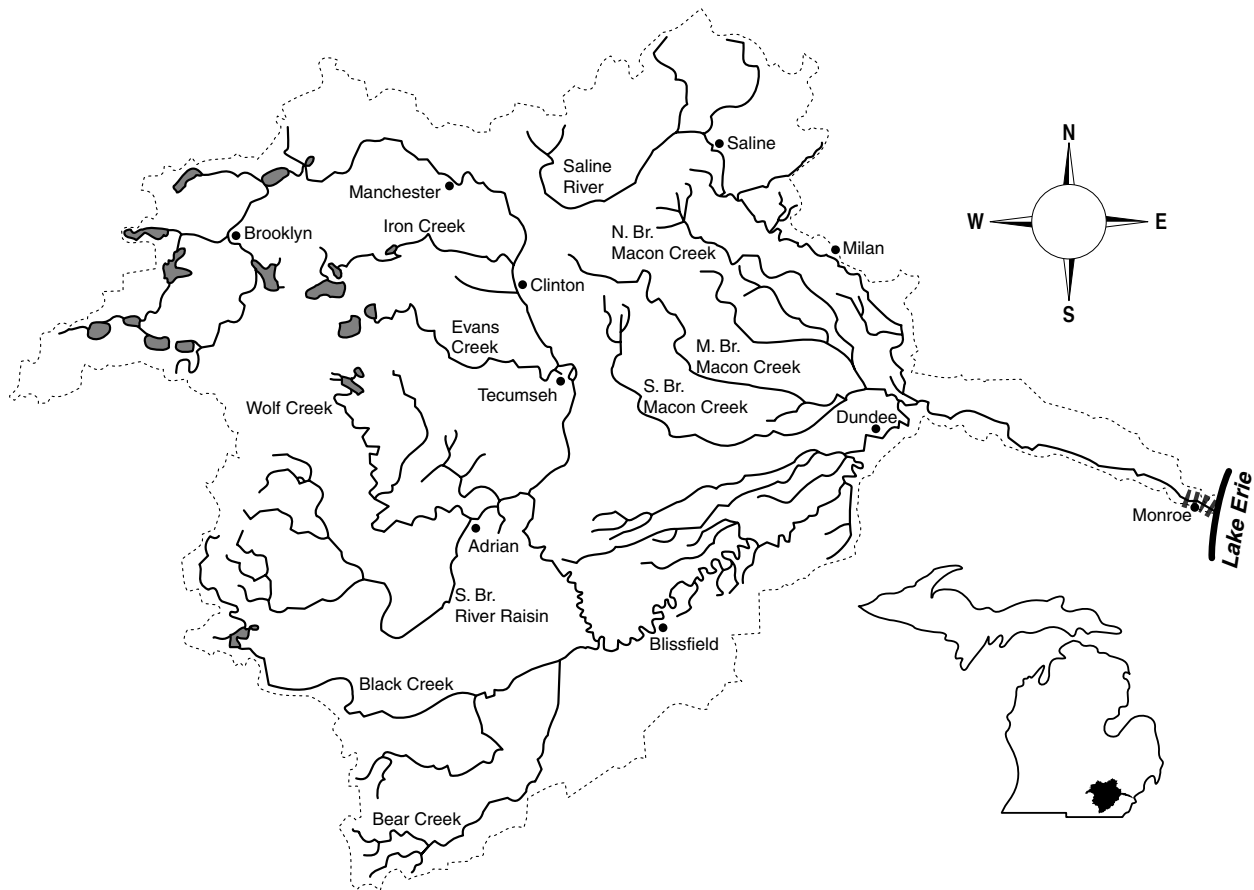


Lake trout (*Salvelinus namaycush*)

Habitat:

feeding - cold lakes and rivers

- spawning - large boulder or rubble substrate
- shallow water of lakes and rivers

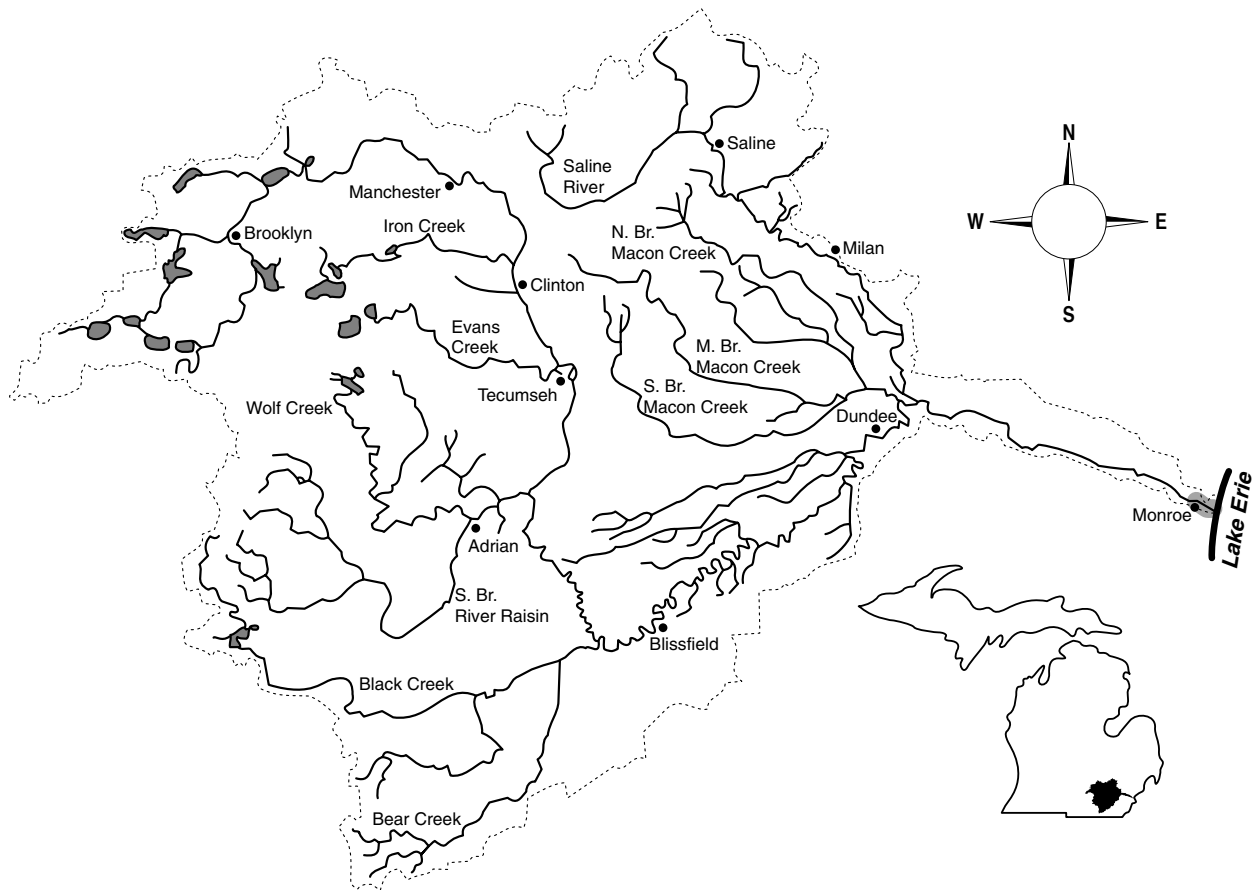


Trout-perch (*Percopsis omiscomaycus*)

Habitat:

- feeding
 - clean sand or fine gravel substrate
 - long deep pools in low gradient streams and Lake Erie
 - highly intolerant of clayey silts
 - avoids rooted aquatic vegetation

- spawning
 - over rocks in shallows
 - over sand and gravel substrates in Lake Erie

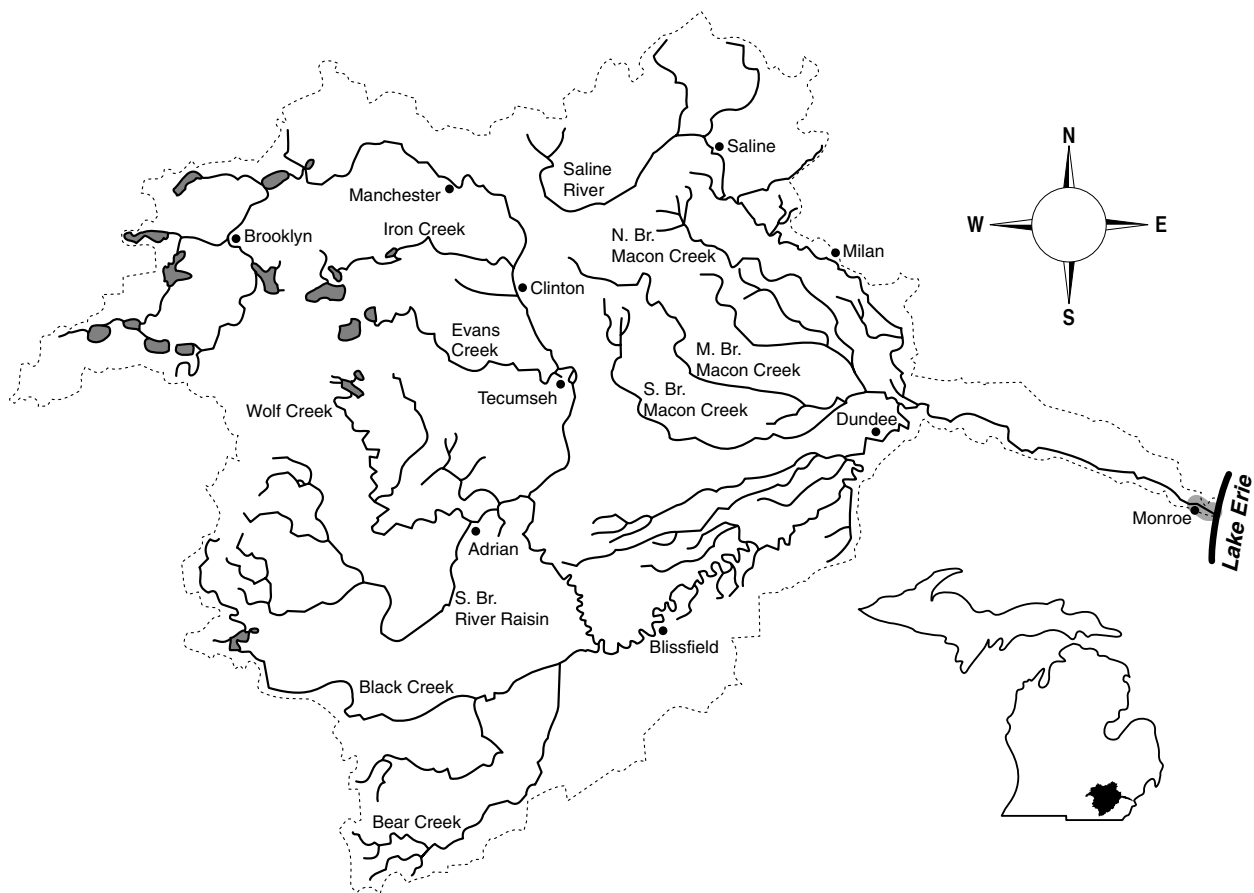


Burbot (*Lota lota*)

Habitat:

- feeding
 - deep cold lakes and large cool rivers
 - mud, sand, rubble, boulder, silt, and gravel substrates

- spawning
 - in 1 to 4 feet of water in shallow bays or on shoals 5-10 feet deep usually in lakes, sometimes rivers
 - over sand or gravel substrate
 - under ice

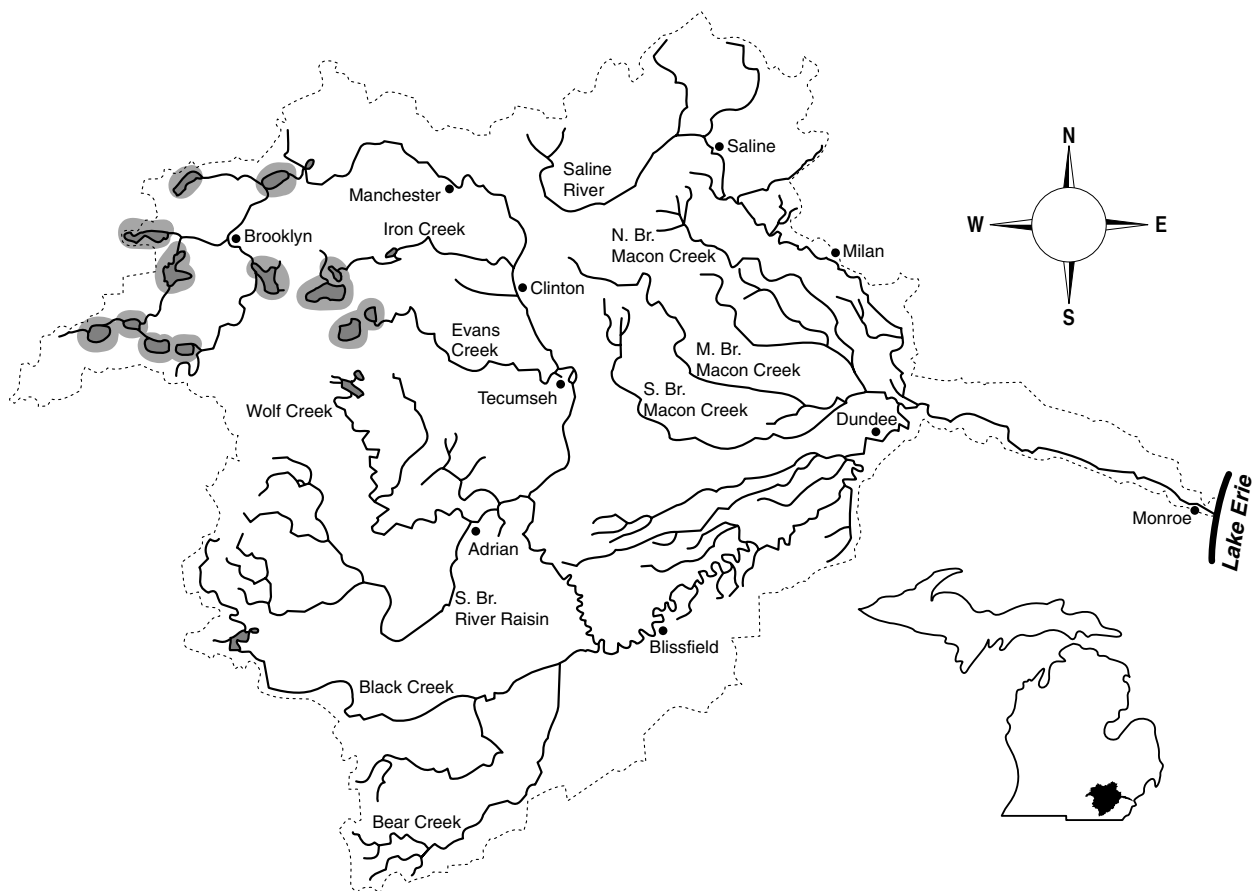


Banded killifish (*Fundulus diaphanus*)

Habitat:

- feeding - quiet backwaters at the mouths of streams and lakes
- substrate of sand, gravel, and a few boulders
- also found over detritus substrate where patches of submerged aquatic vegetation are present

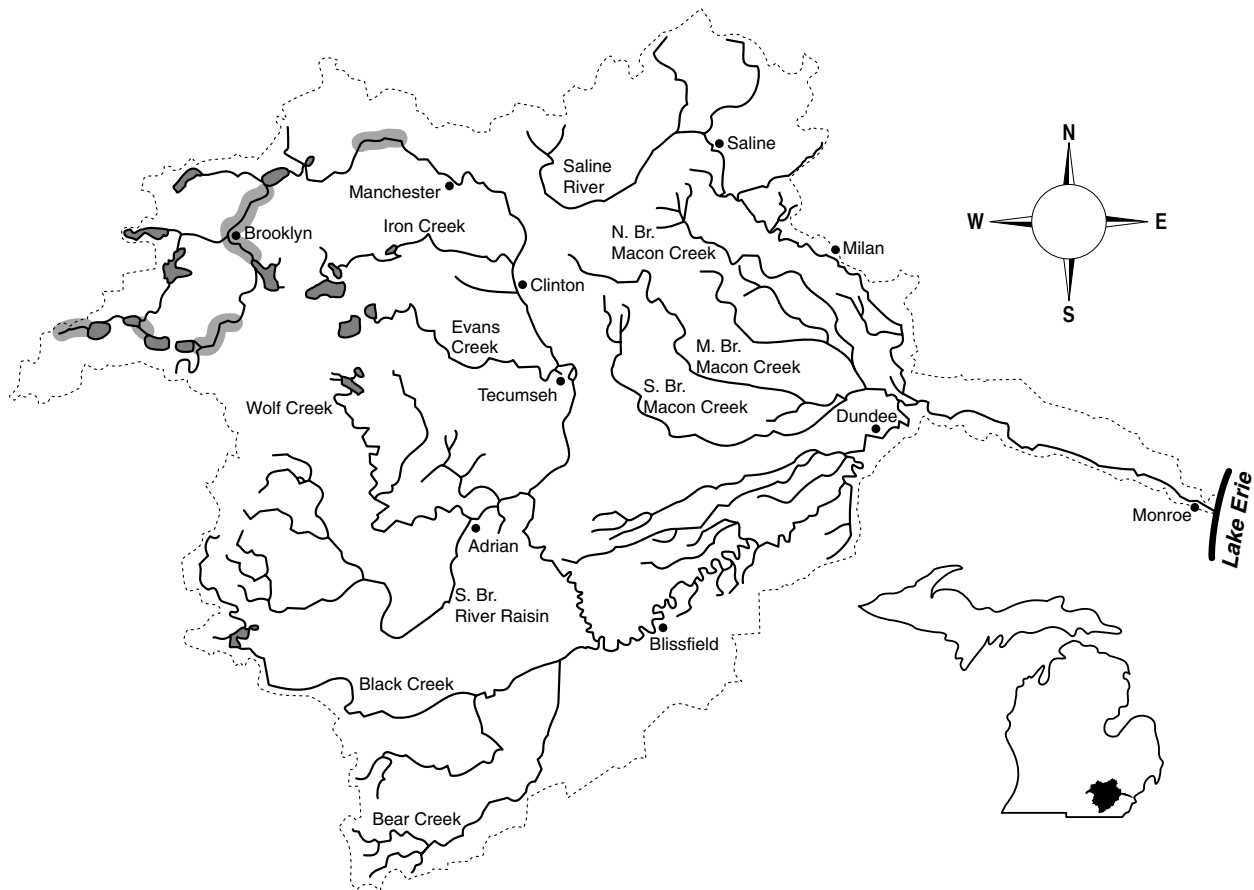
- spawning - quiet areas of weedy pools



Blackstripe topminnow (*Fundulus notatus*)

Habitat:

- feeding - clear waters of lakes, impoundments and in low-gradient streams
 - aquatic or submerged land vegetation
 - somewhat tolerant of turbid water
- spawning - in vegetation or algae
- winter refuge - in deeper water with bottom vegetation

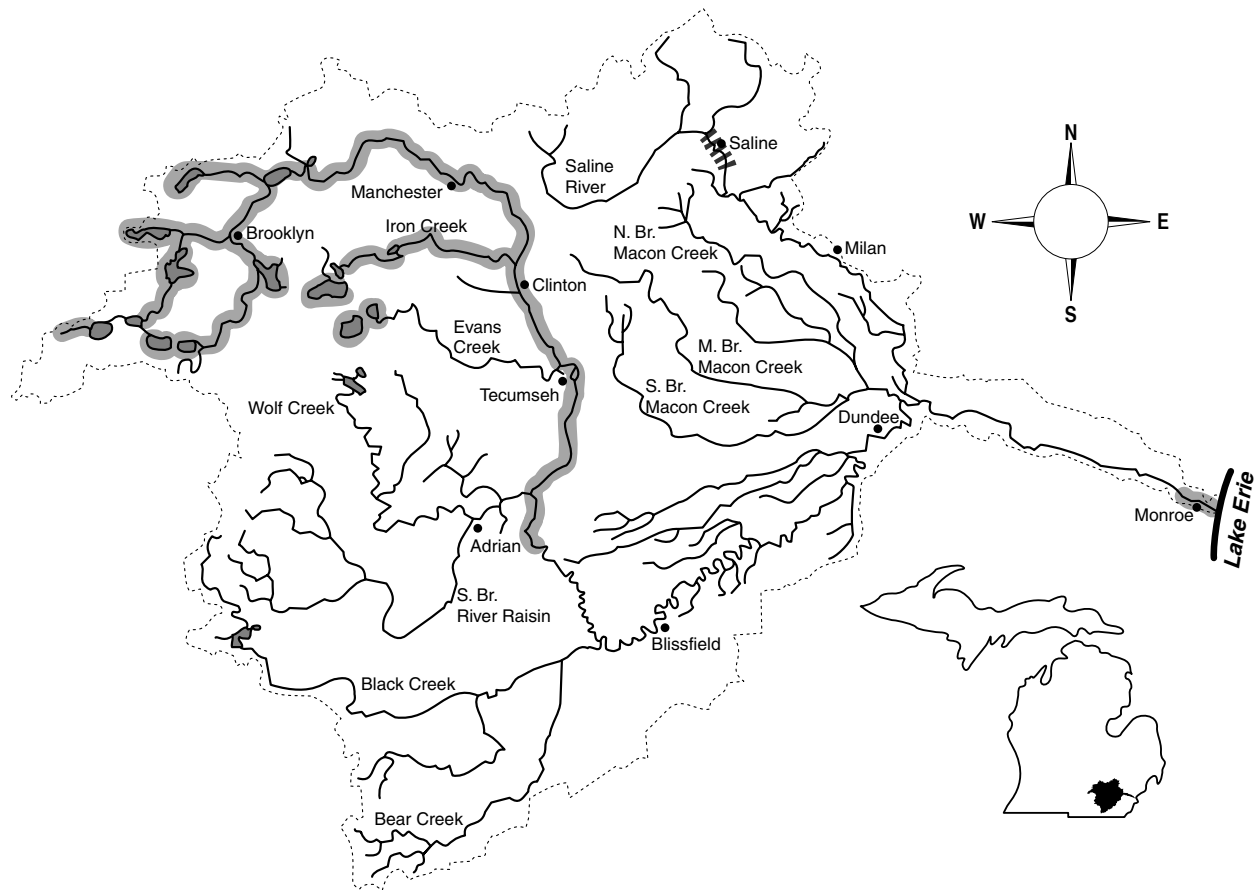


Brook silverside (*Labidesthes sicculus*)

Habitat:

- feeding - clear, warm pools in streams and rivers; also lakes
 - does not tolerate turbidity
 - most frequently at surface

- spawning - in and around aquatic vegetation or over gravel substrate with a moderate current

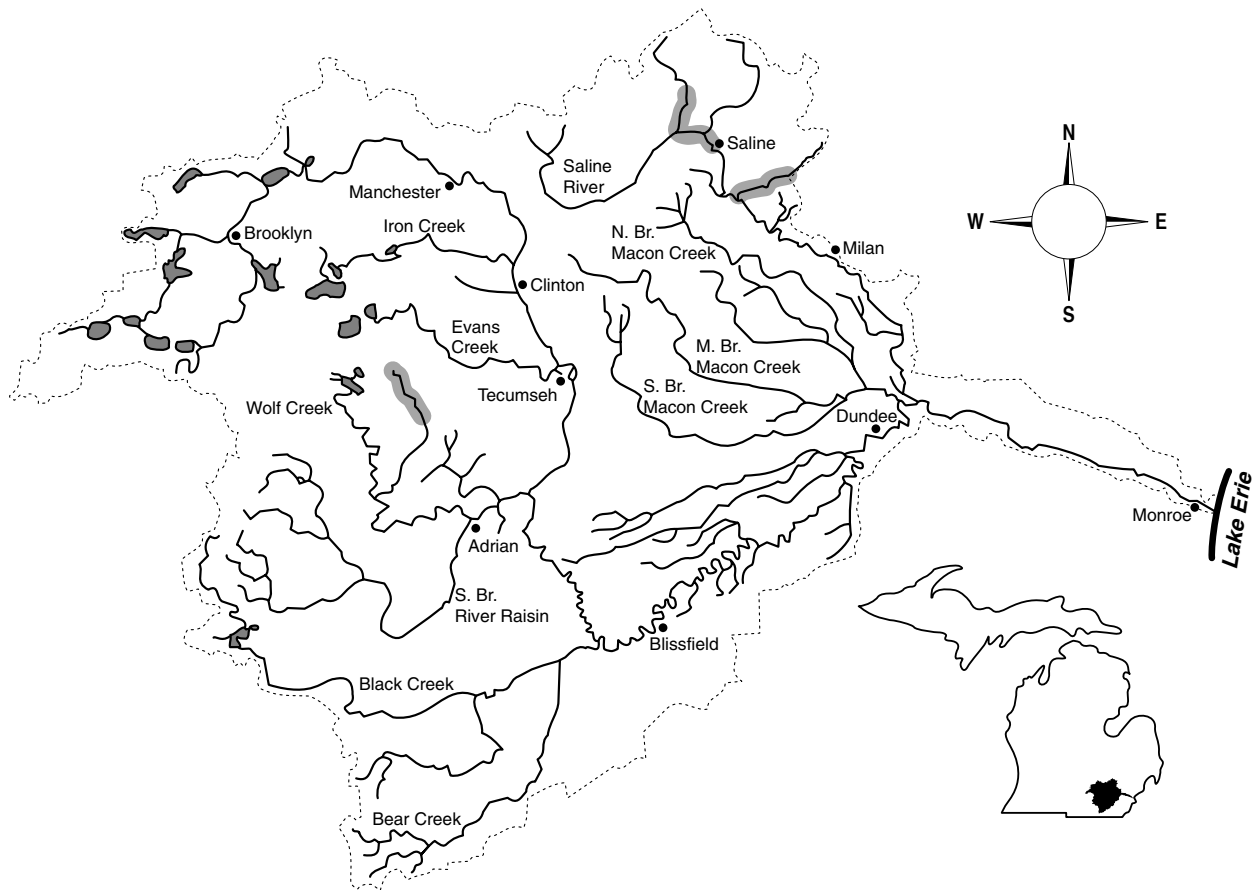


Brook stickleback (*Cluaea inconstans*)

Habitat:

- feeding - clear, cold, densely vegetated streams, and swampy margins of lakes
- low gradient
- muck, peat, or marl substrate
- not tolerant of turbidity

- spawning - shallow cool (<66°F) water
- aquatic reeds or grasses necessary

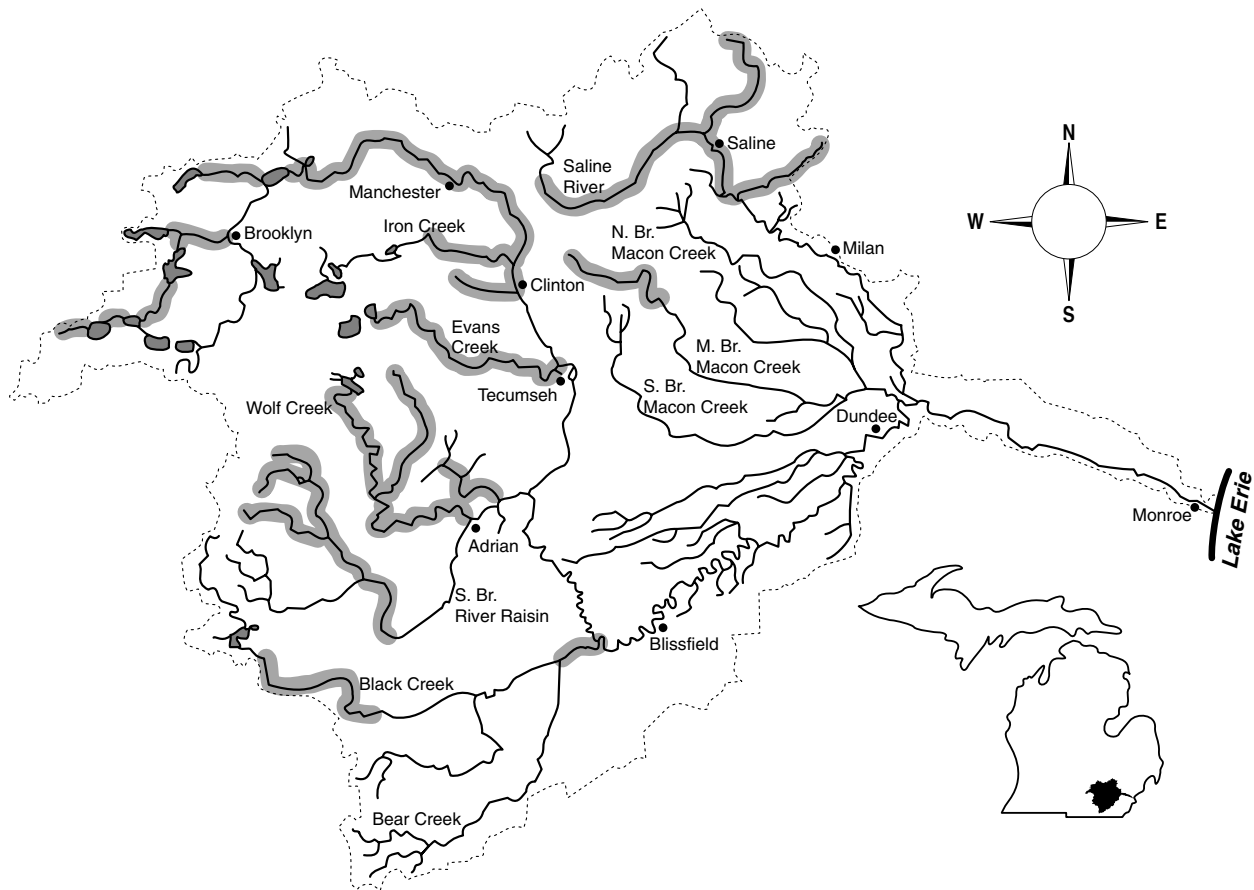


Mottled sculpin (*Cottus bairdi*)

Habitat:

- feeding - cool to cold streams
- riffle and rock substrates preferred
- clear to slightly turbid shallow water

- spawning - nests under logs or rock

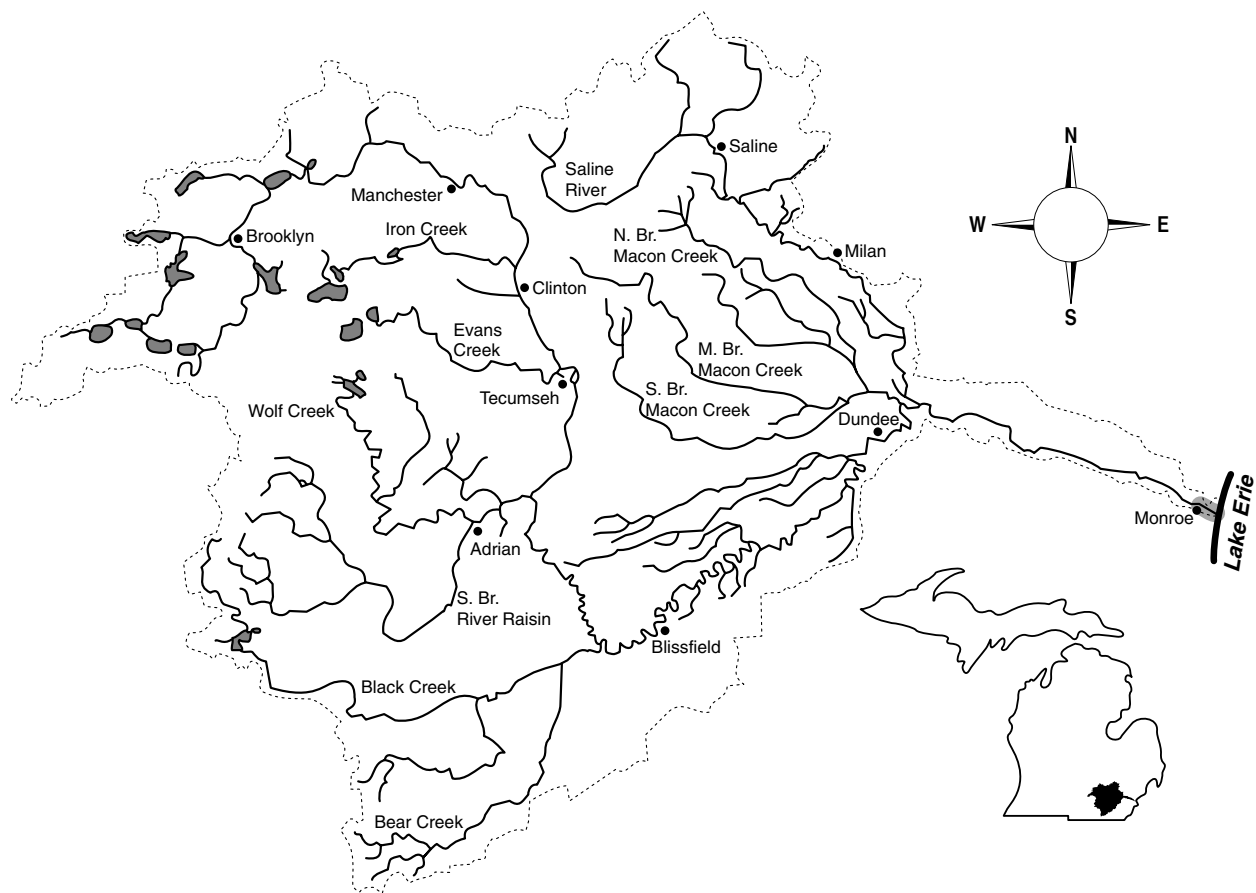


White perch (*Morone americana*)

Habitat:

feeding - clear, warm water of low-gradient streams, lakes, and impoundments

spawning - shallow water over firm substrate

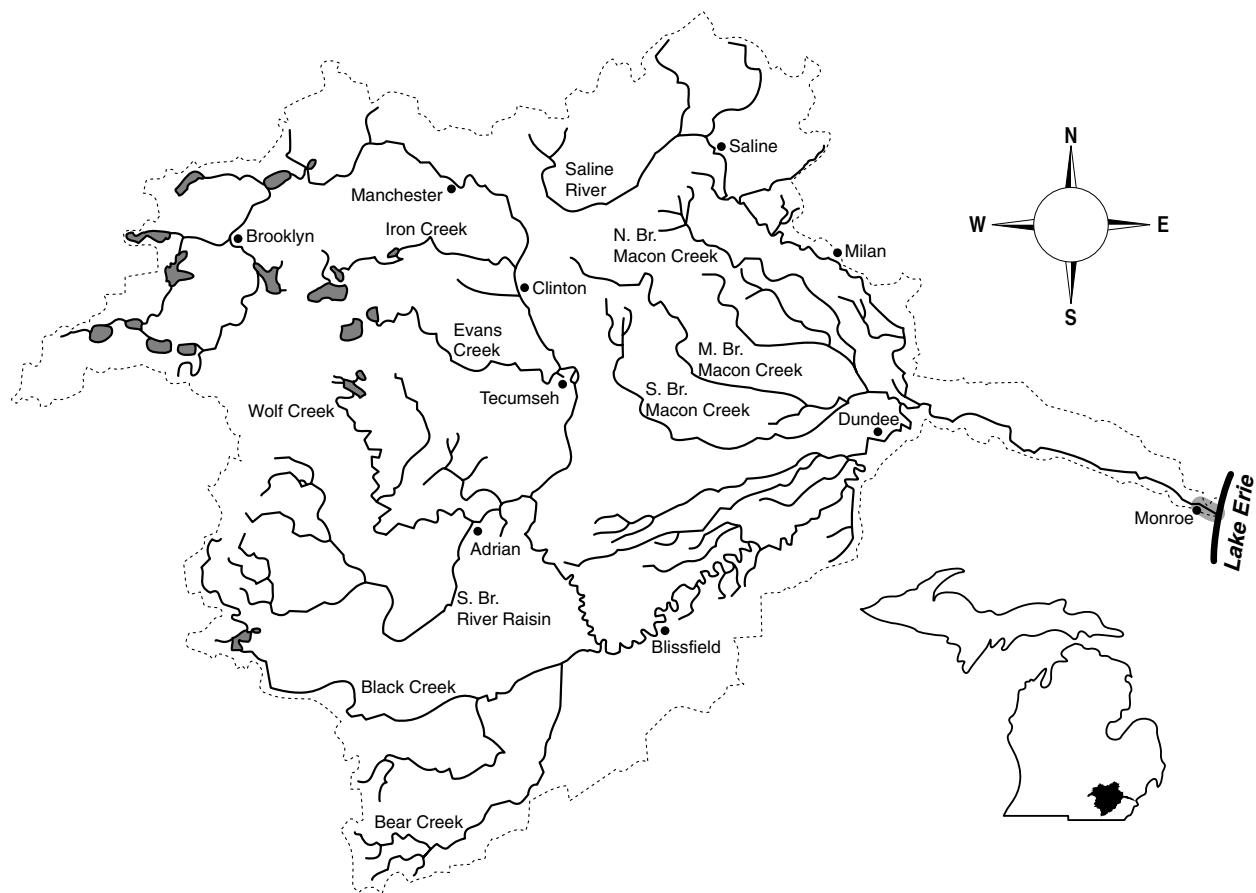


White bass (*Morone chrysops*)

Habitat:

- feeding
 - large lakes, impoundments, and Lake Erie
 - clear water of 30 feet or less depth
 - firm substrate

- spawning
 - tributary streams or shallow water of lakes
 - over firm substrate



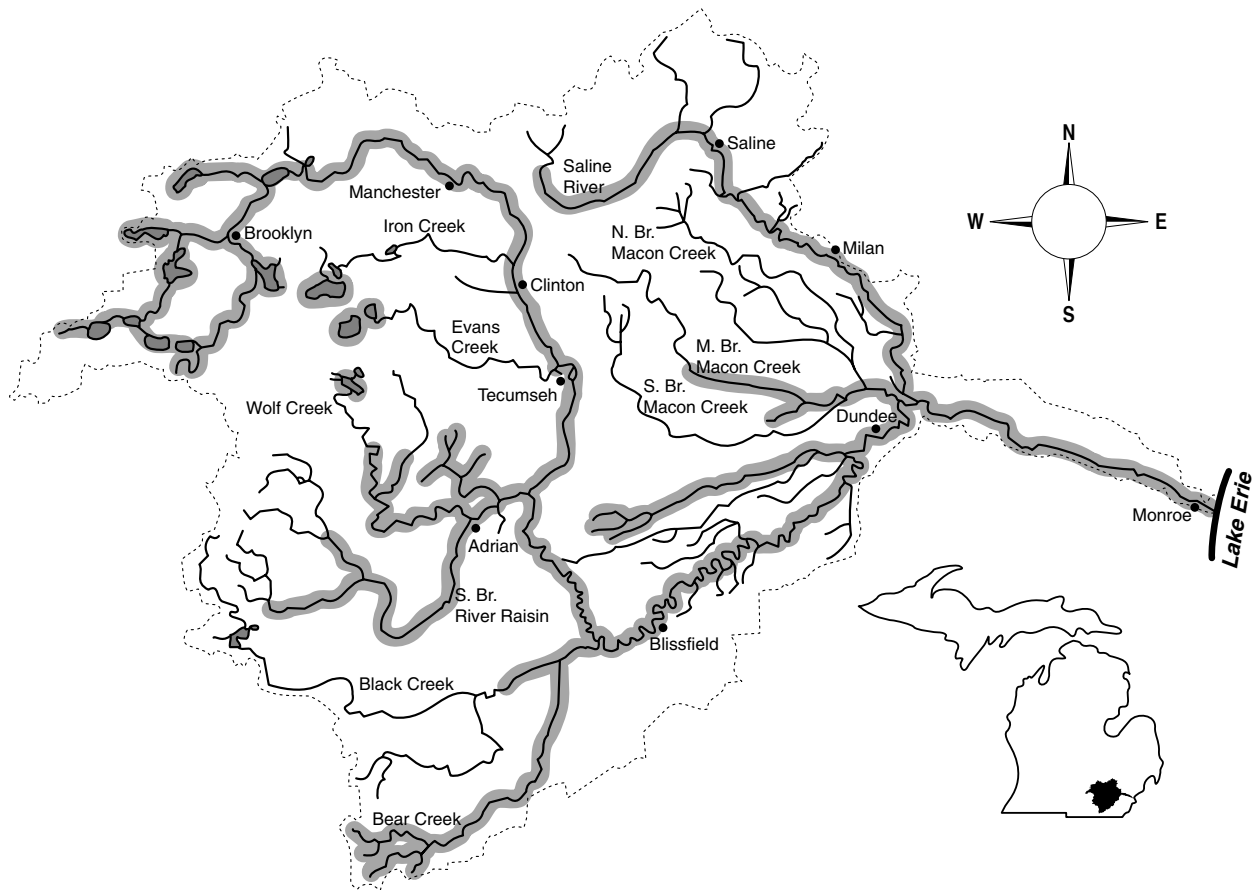
Rock bass (*Ambloplites rupestris*)

Habitat:

- feeding - clear, cool streams, rivers, and lakes
- rocky to sand substrate
- woody or vegetative cover

- spawning - sand or gravel nests
- shallow water

- winter refuge - deep water

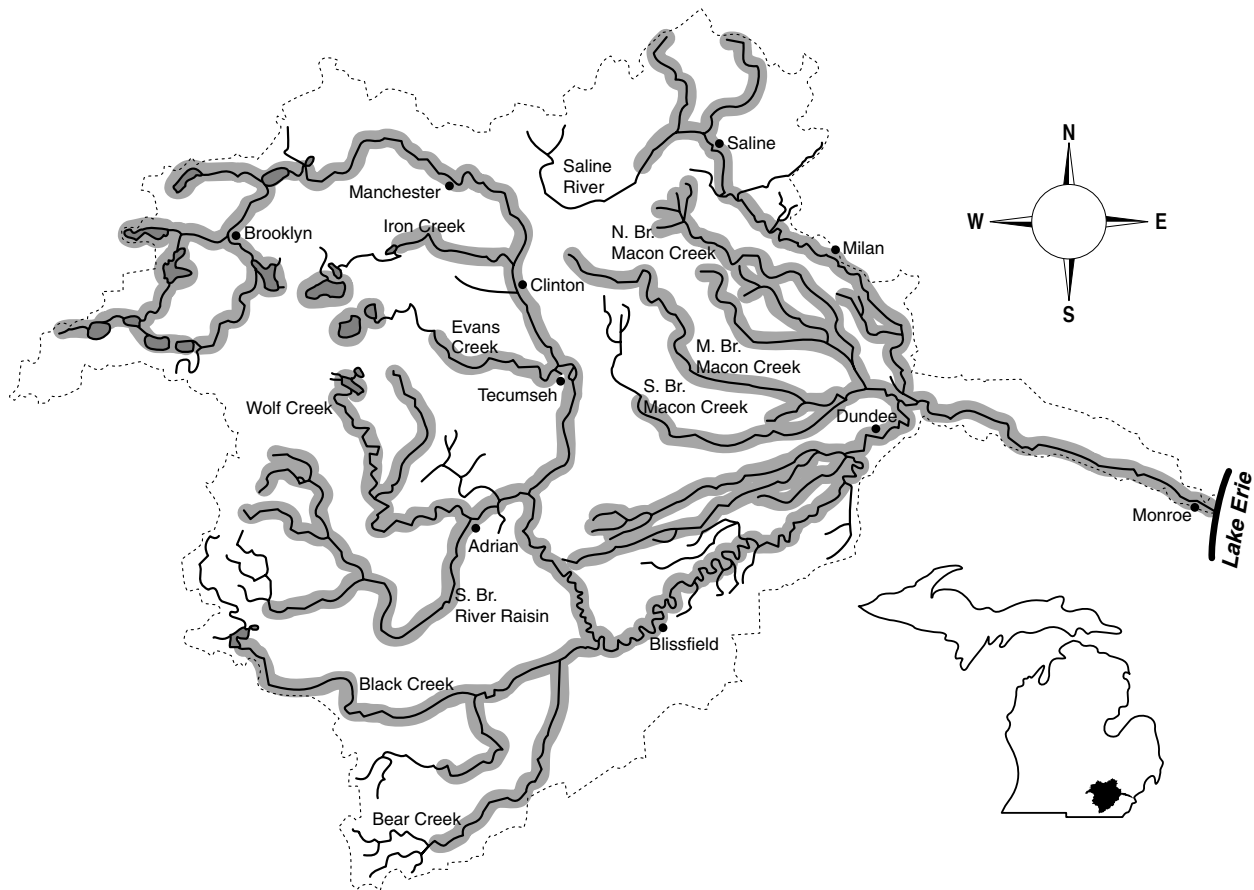


Green sunfish (*Lepomis cyanellus*)

Habitat:

- feeding - impoundments and lakes, and low-current streams and rivers
- no substrate preference

- spawning - nests in shallow areas sheltered by rocks, logs, or aquatic vegetation

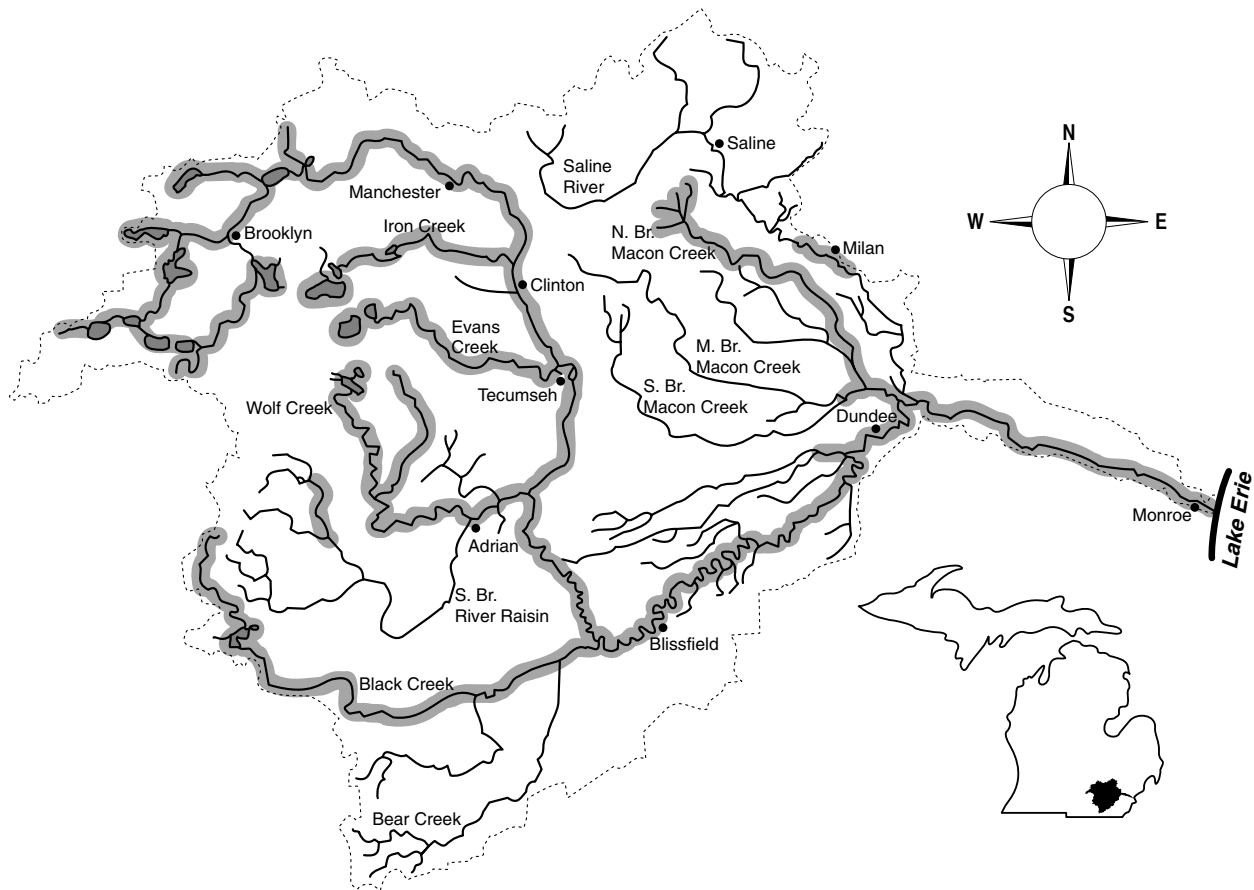


Pumpkinseed sunfish (*Lepomis gibbosus*)

Habitat:

- feeding - non-flowing clear water in streams and rivers; also lakes and impoundments
 - muck or sand partly covered with organic debris substrate
 - dense beds of submerged aquatic vegetation

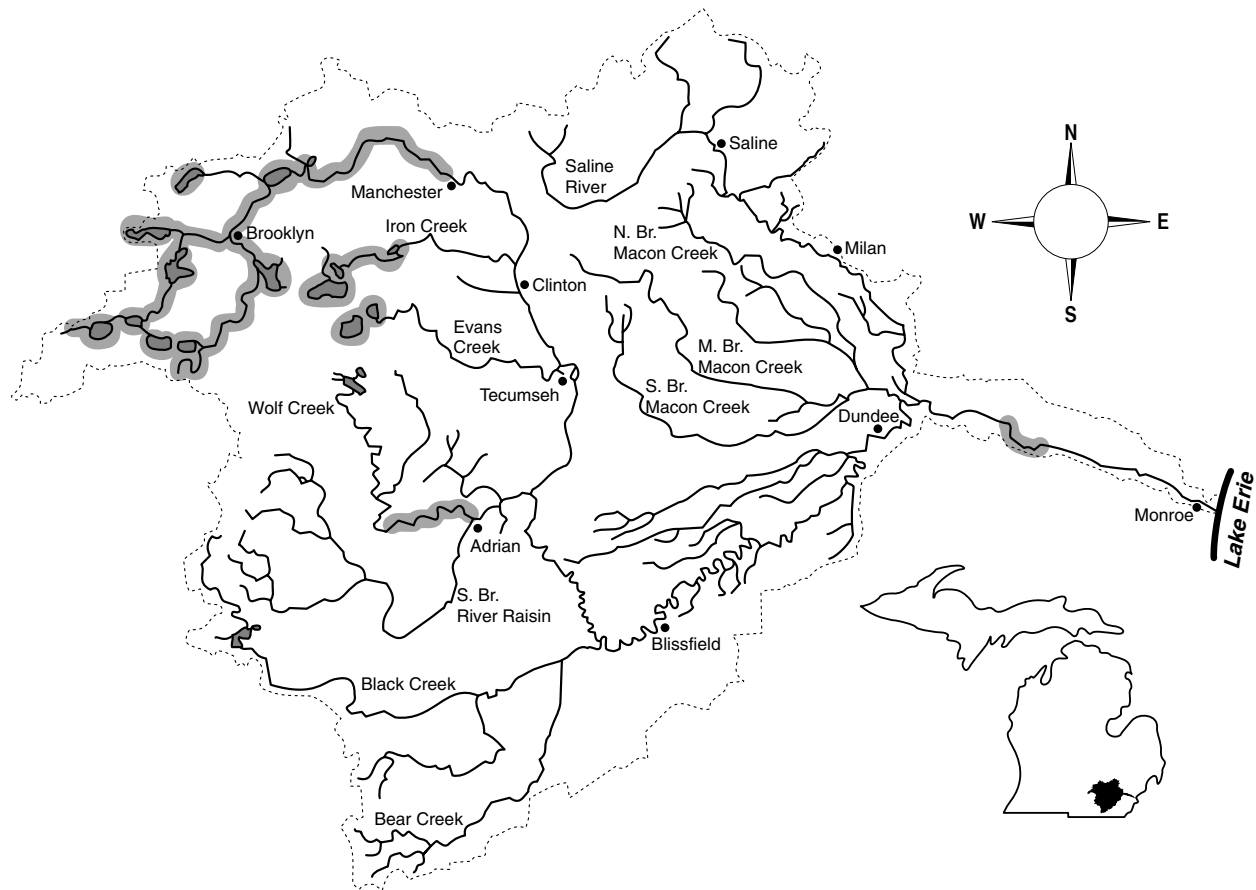
- spawning - nest in sand, gravel, or rock substrate
 - in shallow water near submerged vegetation



Warmouth (*Lepomis gulosus*)

Habitat:

- feeding - clear lakes and impoundments and very low-gradient streams
 - abundant aquatic vegetation
 - silt-free water
 - mucky substrate often covered with organic debris
- spawning - nesting sites in loose silt, sand with silt, or rubble over silt near stumps, roots, or vegetation

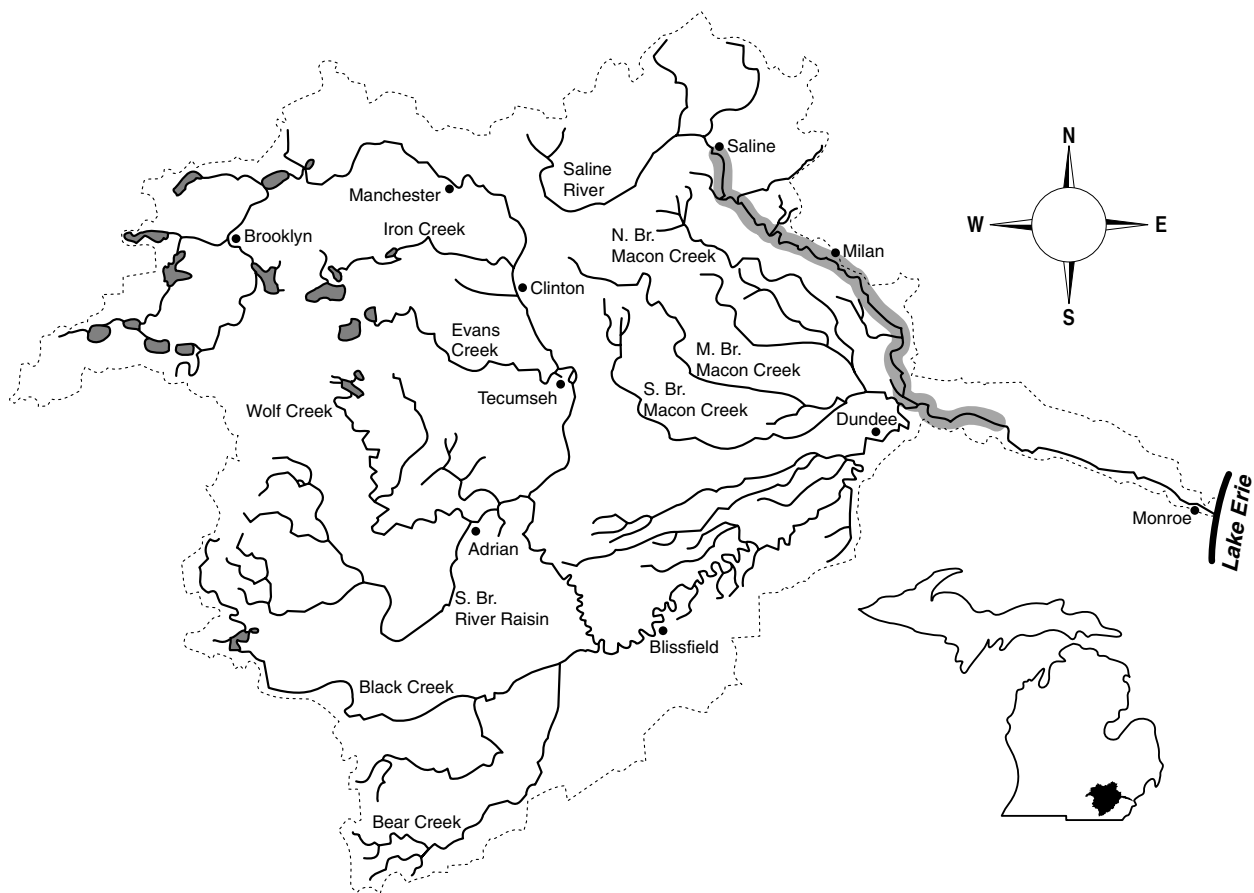


Orangespotted sunfish (*Lepomis humilis*) - non-native species

Habitat:

- feeding - soft bottomed pools, sloughs, backwater lakes, and sluggish streams >15ft. wide
- tolerant of silt, turbidity, and some pollution mainly over mud, gravel, clay, and sand substrates
 - prefers scanty to moderate amounts of vegetation
 - can withstand low oxygen concentrations
 - low to no gradient
 - not in cool water

- spawning - shallow water
- gravel, sand, or mud substrate



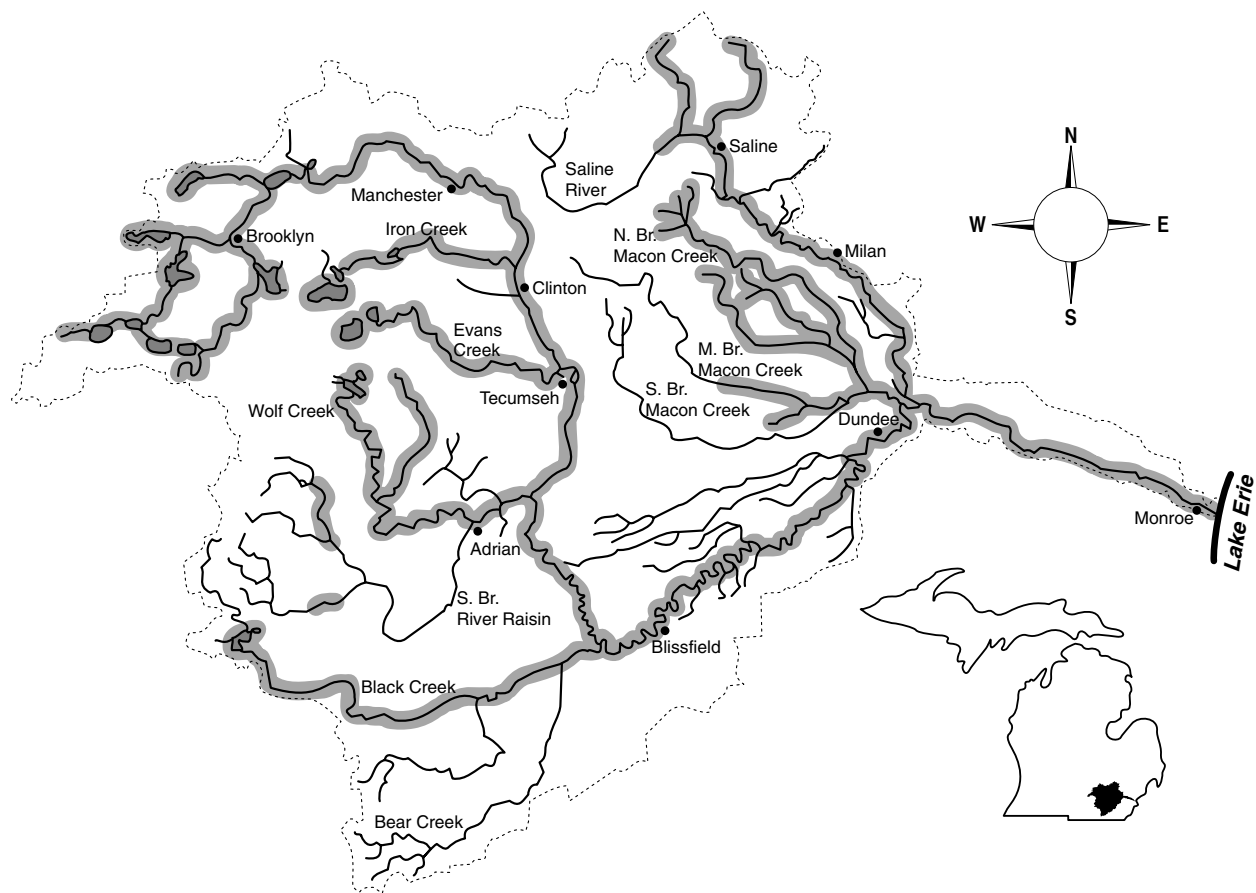
Bluegill (*Lepomis macrochirus*)

Habitat:

- feeding - non-flowing clear streams and rivers; also lakes and impoundments
- sand, gravel, or muck containing organic debris substrate
- scattered beds of aquatic vegetation
- cannot tolerate low oxygen or continuous high turbidity and siltation

spawning - nests in firm substrate of gravel, sand, or mud

winter refuge - deep water

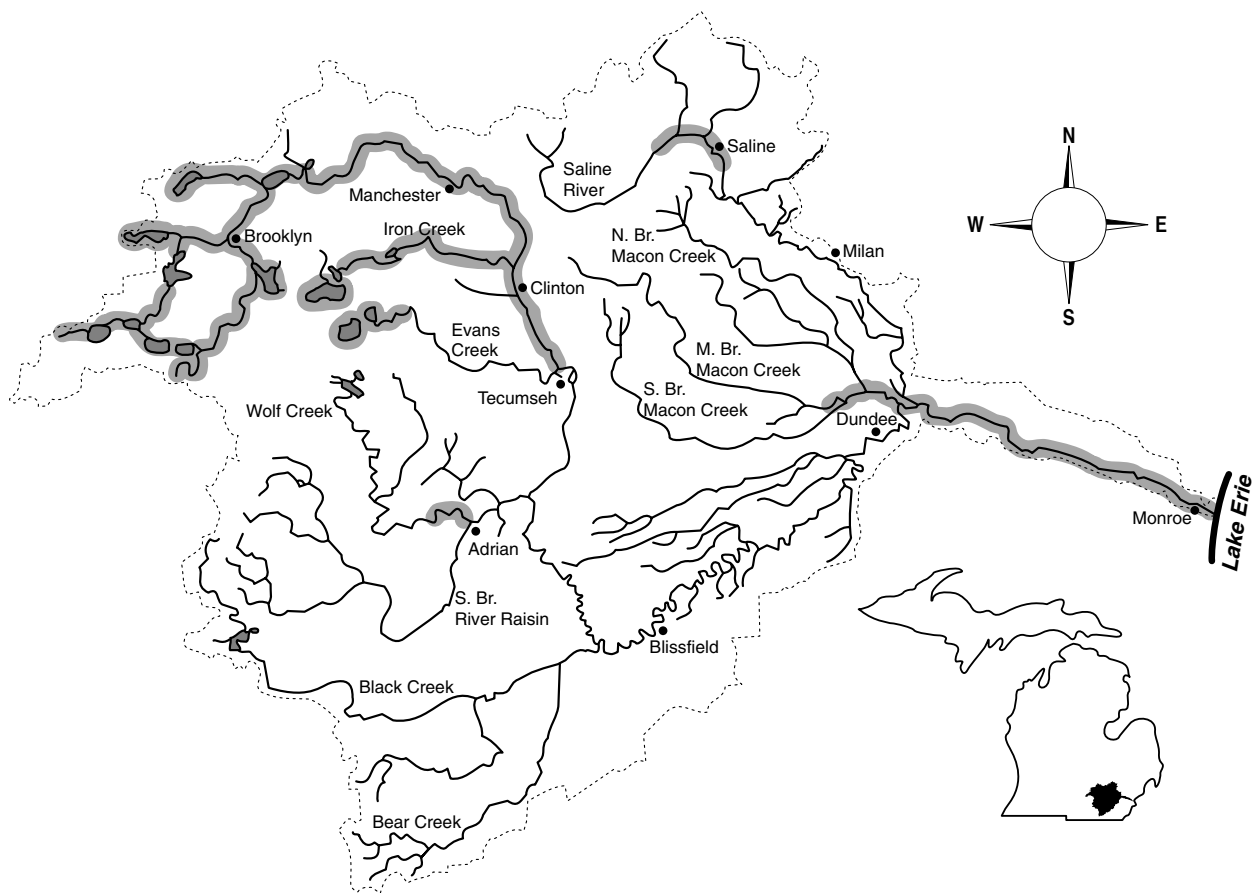


Longear sunfish (*Lepomis megalotis*)

Habitat:

- feeding - clear moderate-sized shallow streams with moderate vegetation
- rocky substrates
- little to no current

- spawning - nests in gravel, sand, or hard rock substrate

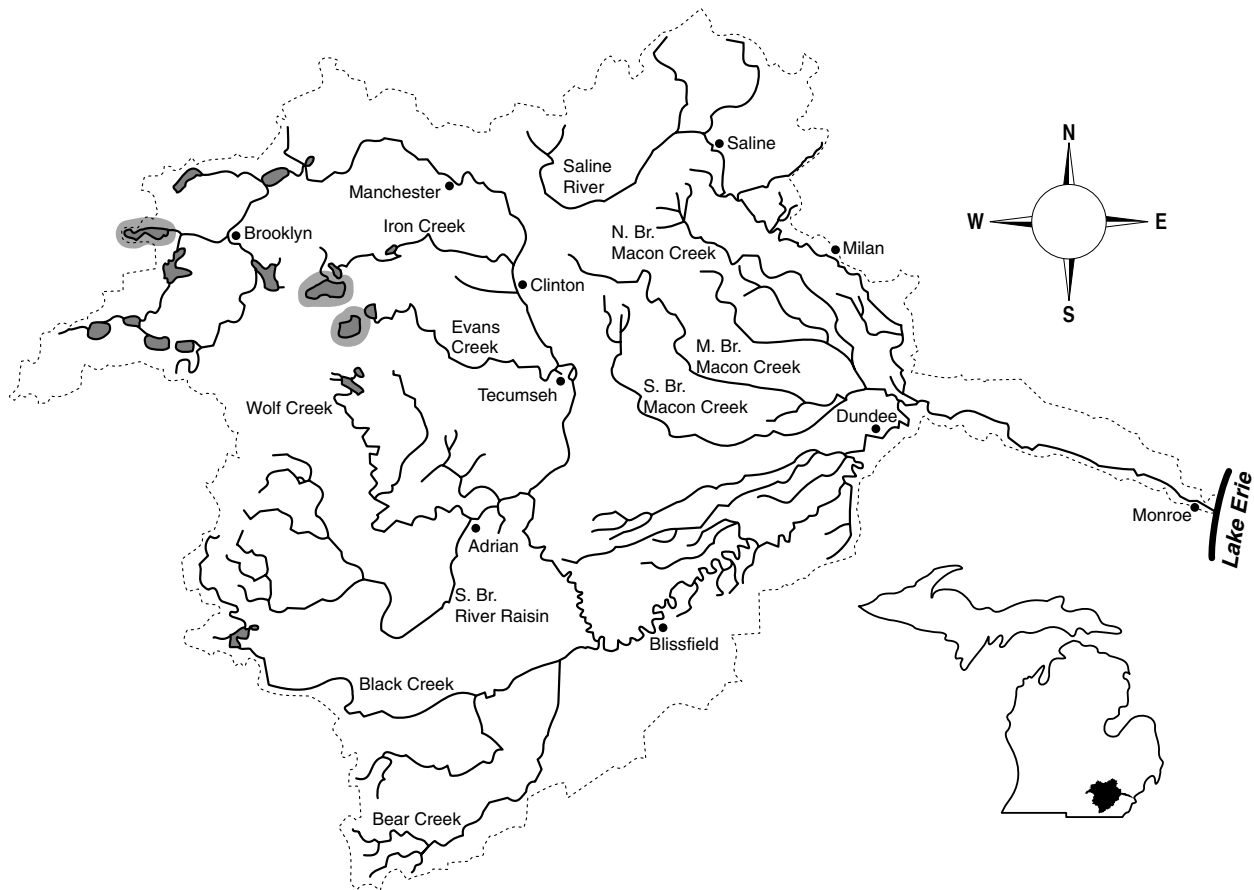


Redear sunfish (*Lepomis microlophus*)

Habitat:

- feeding - non-flowing clear waters of streams and lakes
- some aquatic vegetation

- spawning - nest in silt or gravel substrate



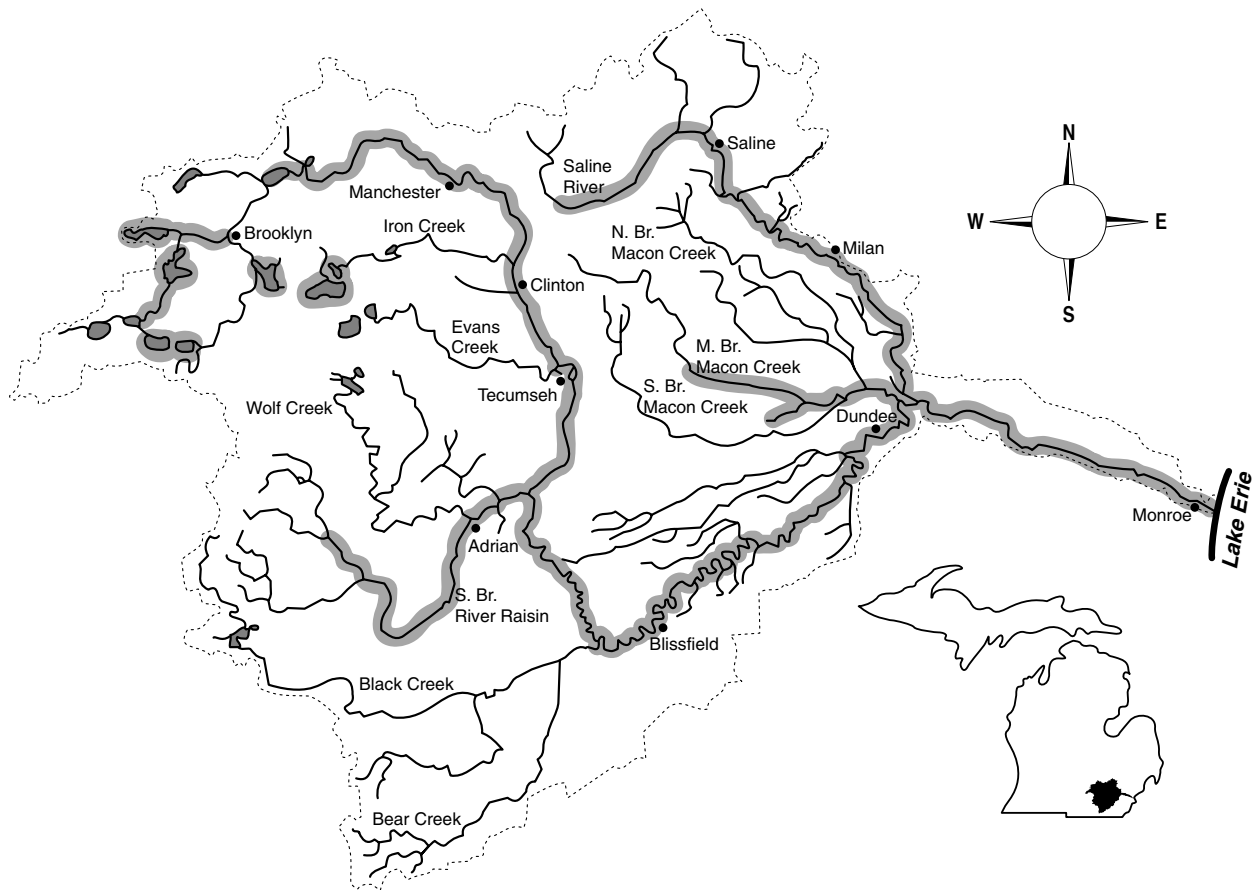
Smallmouth bass (*Micropterus dolomieu*)

Habitat:

- feeding - clear, cool, deep lakes and rivers
- streams where 40% consists of riffles over clean gravel, boulder, or bedrock substrate
- in pools with a current and >4 feet of depth
- gradients between 4 and 25 feet per mile

- spawning - nest in sandy, gravel, or rocky substrate
- gradients 7 to 25 feet per mile
- streams 20 to 100 feet wide

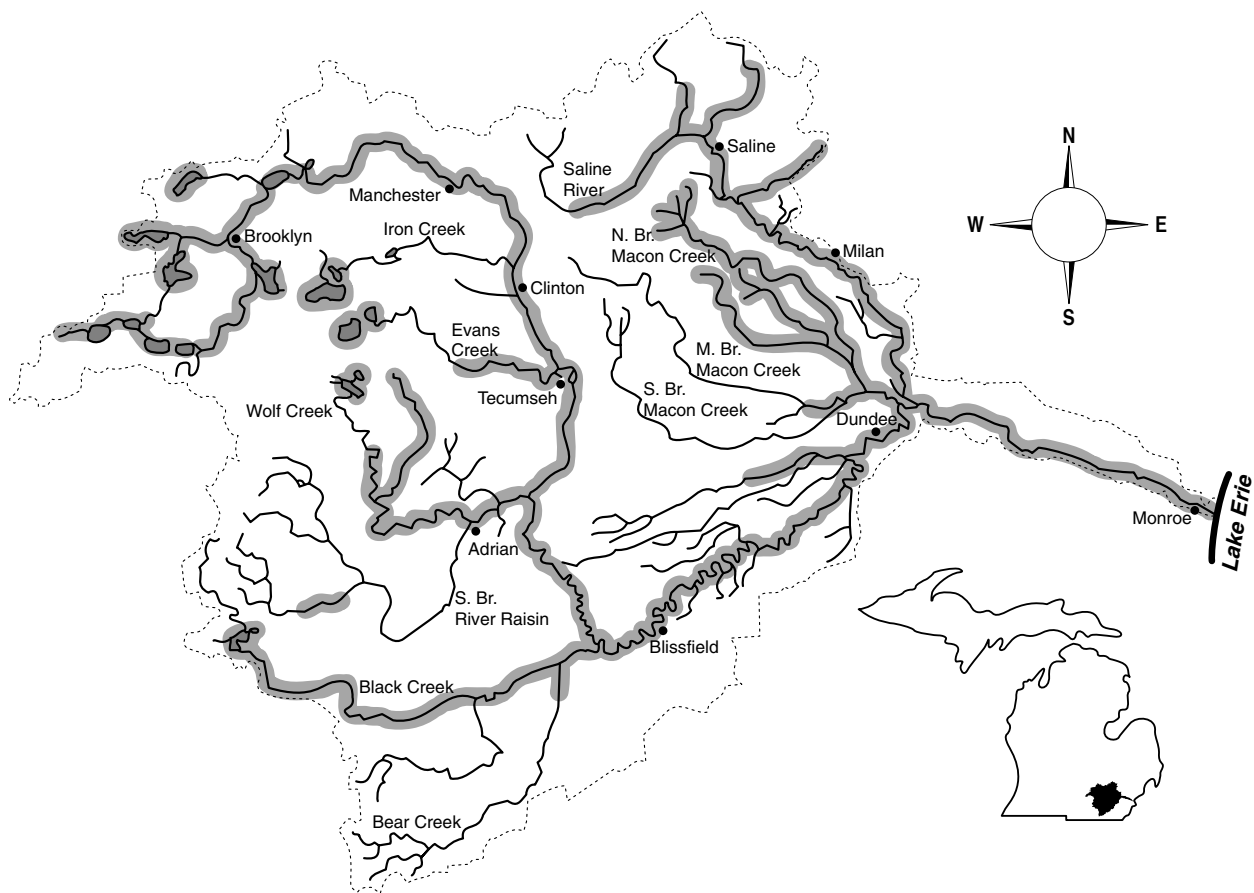
- winter refuge - larger deeper waters with gradients between 3 to 7 feet per mile



Largemouth bass (*Micropterus salmoides*)

Habitat:

- feeding - non-flowing clear waters - lakes, impoundments, and pools of streams
 - abundant aquatic vegetation
 - soft muck, organic debris, gravel, sand, and hard non-flocculent clay substrates
-
- spawning - nest in gravelly sand to marl and soft mud substrates
 - emergent vegetation
 - quiet shallow bays; no current

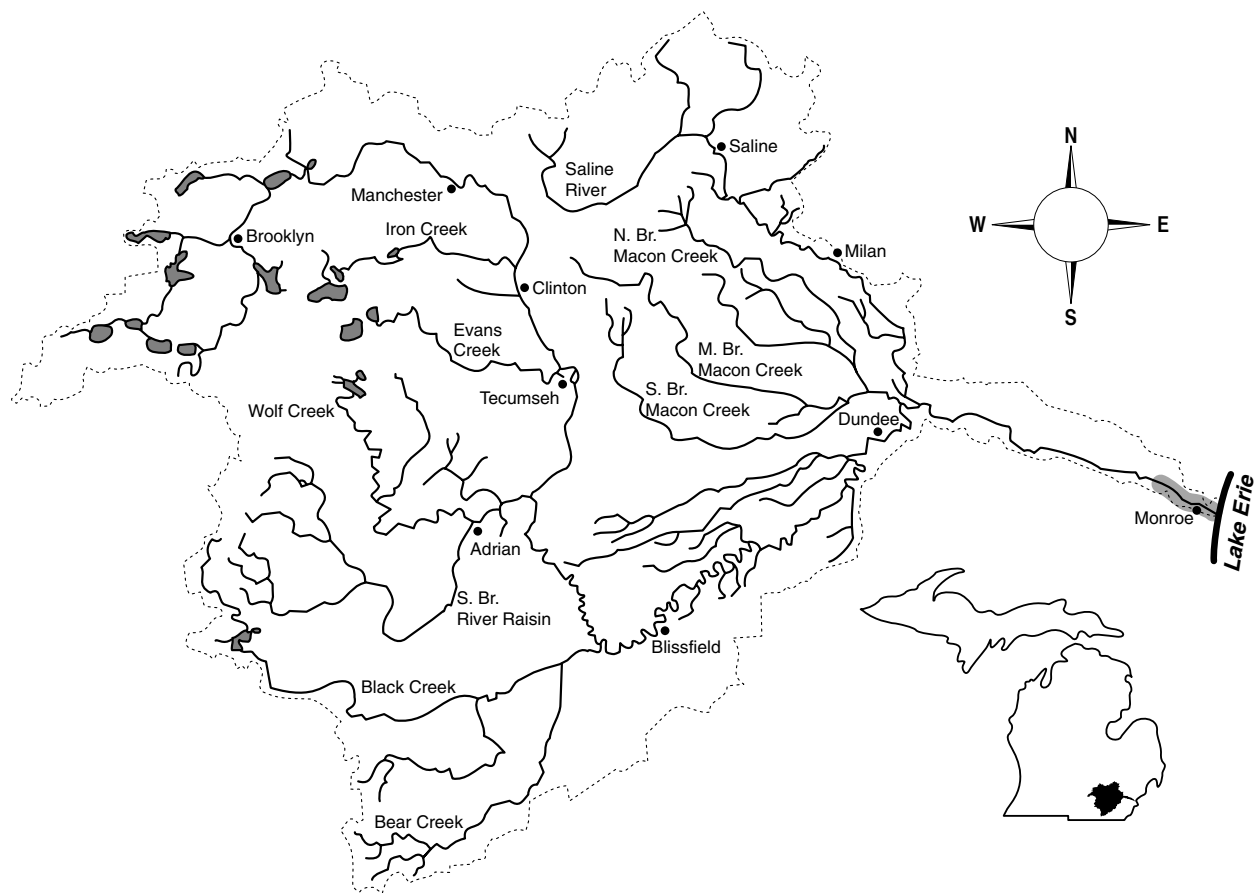


White crappie (*Pomoxis annularis*)

Habitat:

- feeding - lakes and impoundments >5 acres
- sluggish pools of moderate to large low-gradient rivers
- no substrate preference
- can tolerate severe turbidity and rapid siltation

- spawning - various substrates usually beside rooted aquatic vegetation
- sometimes under banks

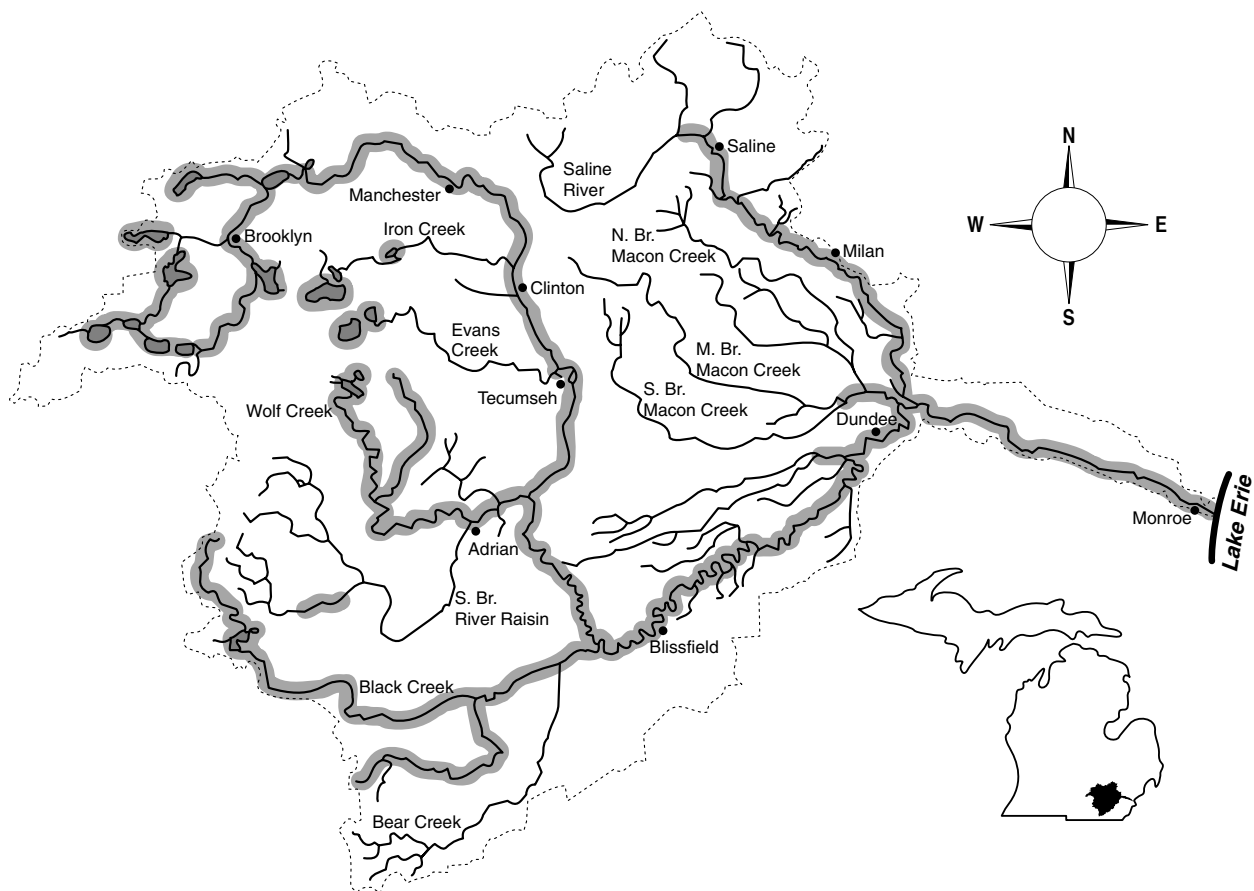


Black crappie (*Pomoxis nigromaculatus*)

Habitat:

- feeding - larger clear non-silty low-gradient rivers; also in lakes and impoundments
 - clean hard sand or muck substrate
 - associated with submerged aquatic vegetation
 - does not tolerate silt or turbidity well

- spawning - nests in gravel, sand, or mud substrate
 - some vegetation must be present
 - sometimes nests under banks

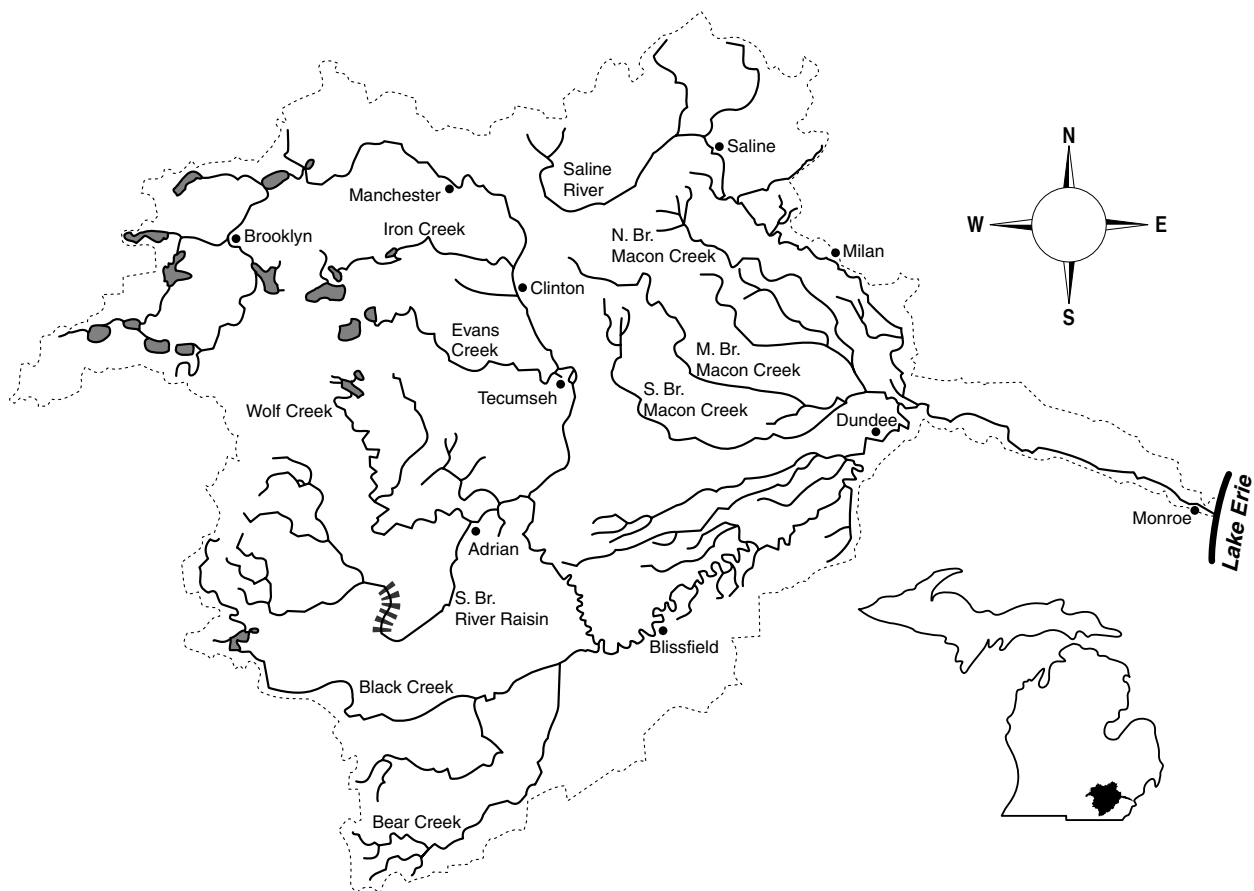


Eastern sand darter (*Ammocrypta pellucida*) - threatened, may be locally extirpated

Habitat:

- feeding - sandy substrate in clear streams and lakes
- does not tolerate silt well

- spawning - sandy substrate

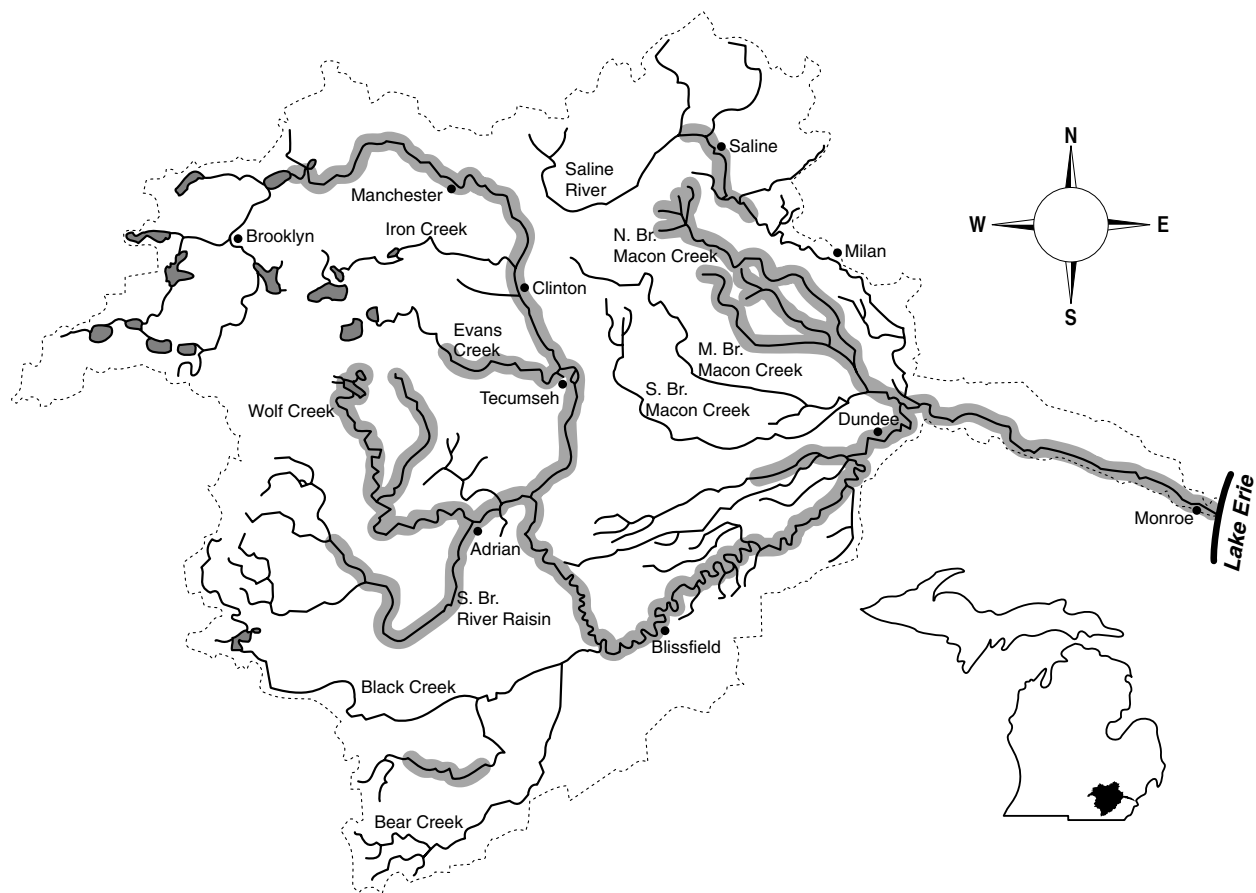


Greenside darter (*Etheostoma blennioides*)

Habitat:

- feeding - young: in quiet water
- swift gravelly riffles or pools with current of streams and rivers

- spawning - filamentous algae necessary for egg deposition

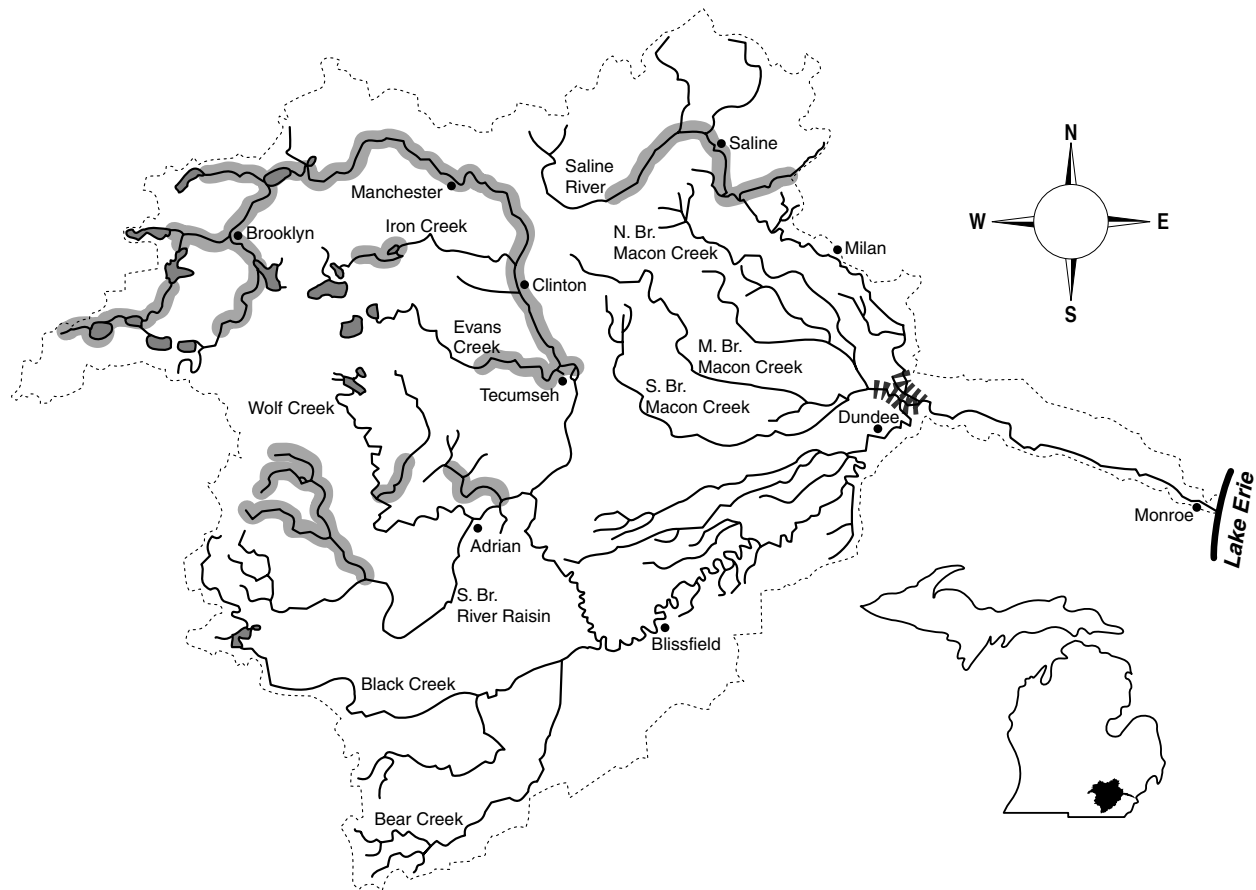


Rainbow darter (*Etheostoma caeruleum*)

Habitat:

- feeding - gravelly high gradient riffles
- clear, moderate to large streams
- in shallows (average 1 foot)

- spawning - gravel or rubble riffles

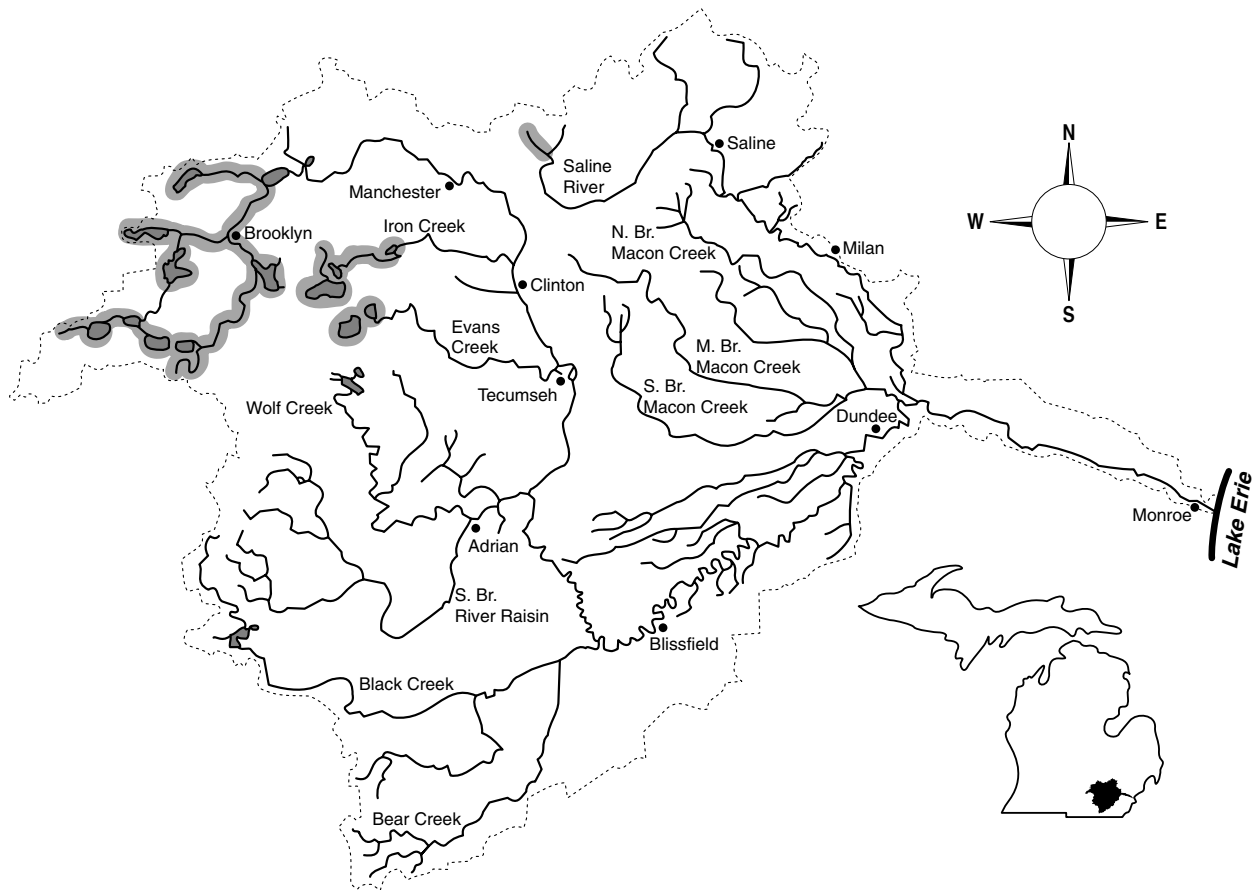


Iowa darter (*Etheostoma exile*)

Habitat:

- feeding - clear, slow moving streams and lakes
- sandy to muddy substrates
- intolerant of turbid water
- lives in rooted aquatic vegetation

- spawning - in pond-like extensions of streams on organic matter or roots
- in shallows



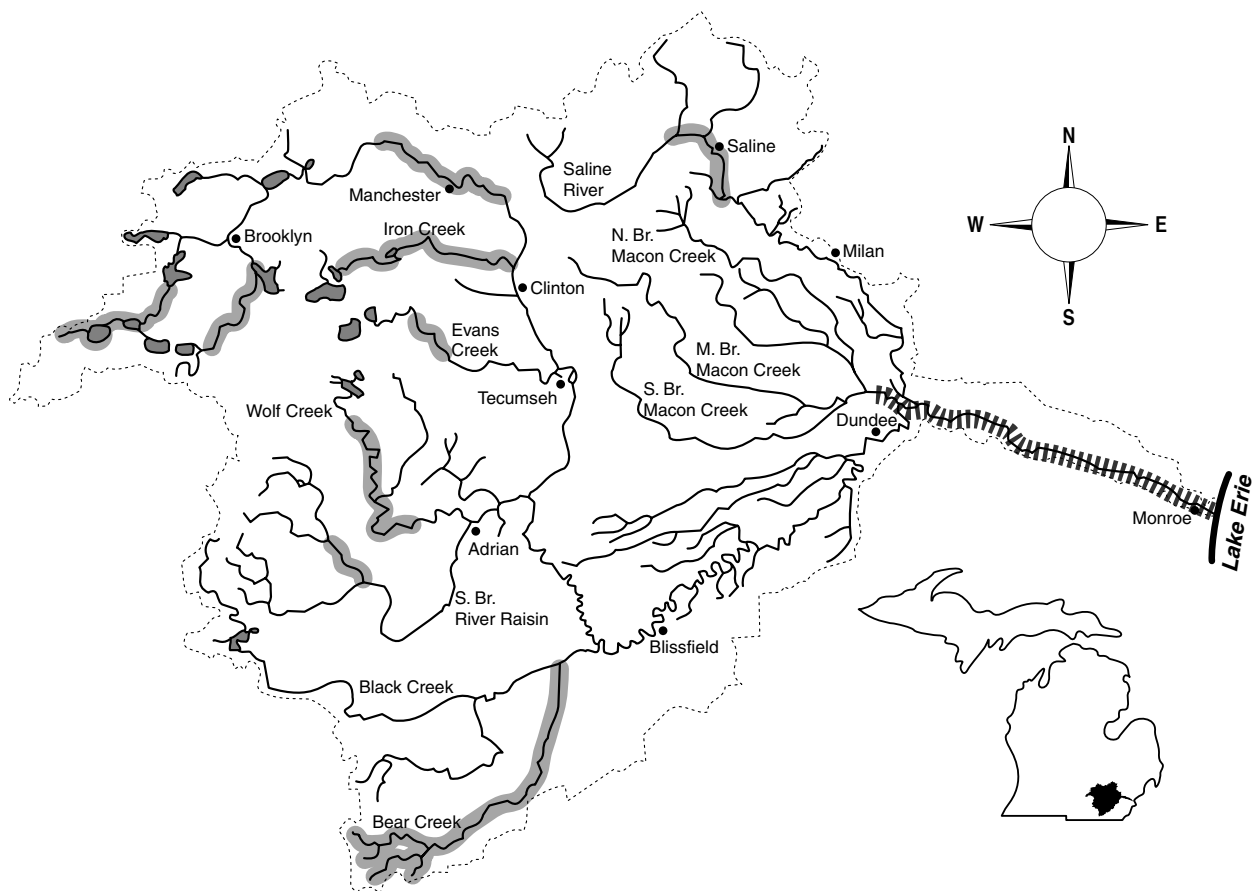
Fantail darter (*Etheostoma flabellare*)

Habitat:

- feeding - small, shallow (<18 inches) streams
- some tolerance of turbidity and siltation
- clear warm waters
- slow to moderate current
- gravel and boulder substrate

- spawning - gravel in slower water
- lays eggs on underside of rocks, male guards and fans them

- winter refuge - moves downstream to larger and deeper waters

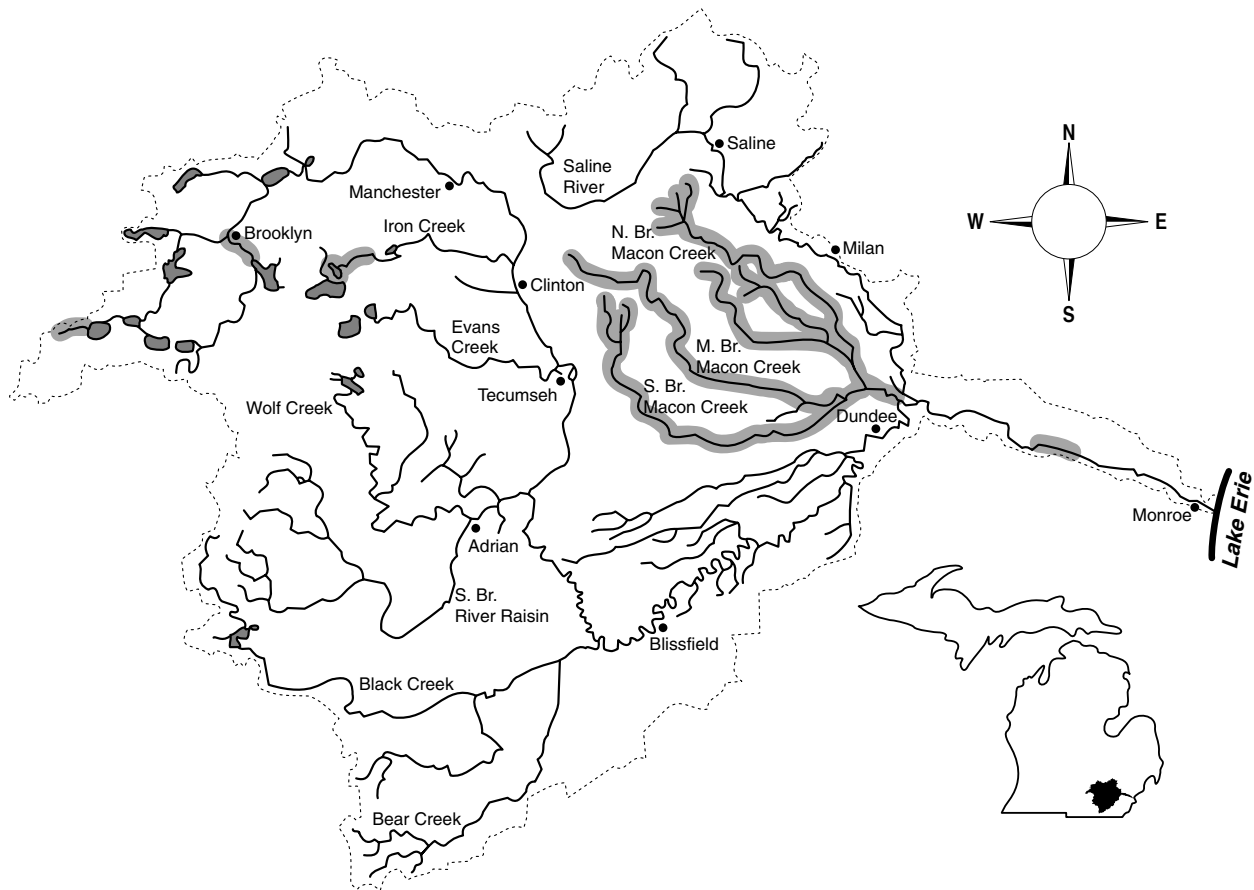


Least darter (*Etheostoma microperca*)

Habitat:

- feeding - moderate to warm temperature
- clear quiet low-gradient vegetated streams (wetlands, floodplains)
- soft substrate

- spawning - spawning occurs on stems of plants
- male guards a territory in a vegetated area

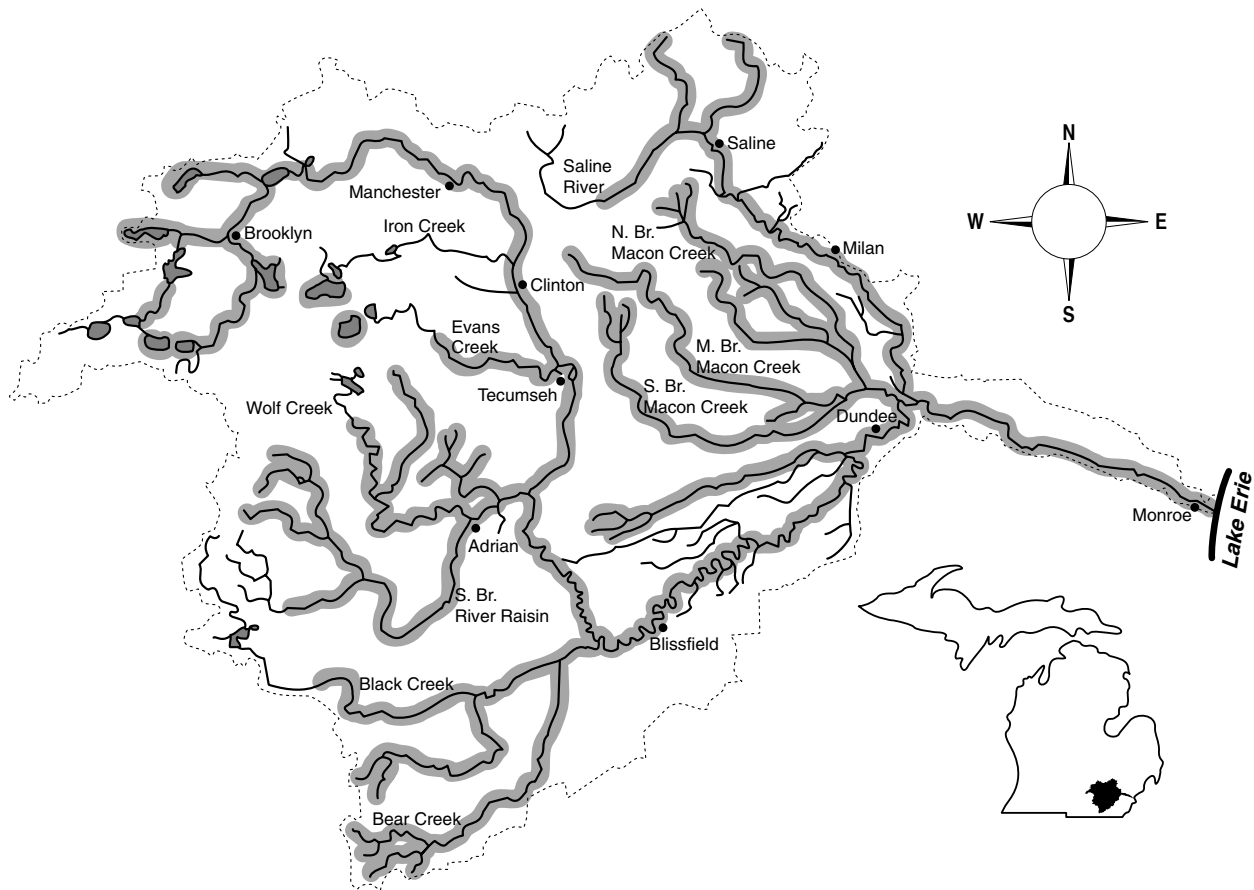


Johnny darter (*Etheostoma nigrum*)

Habitat:

- feeding
 - sand and silt substrate
 - little to moderate current
 - shallow areas of streams, rivers, lakes, and impoundments
 - tolerant of many organic and inorganic pollutants and turbidity

- spawning
 - underneath rocks
 - in stream pools or protected shallows of lakes

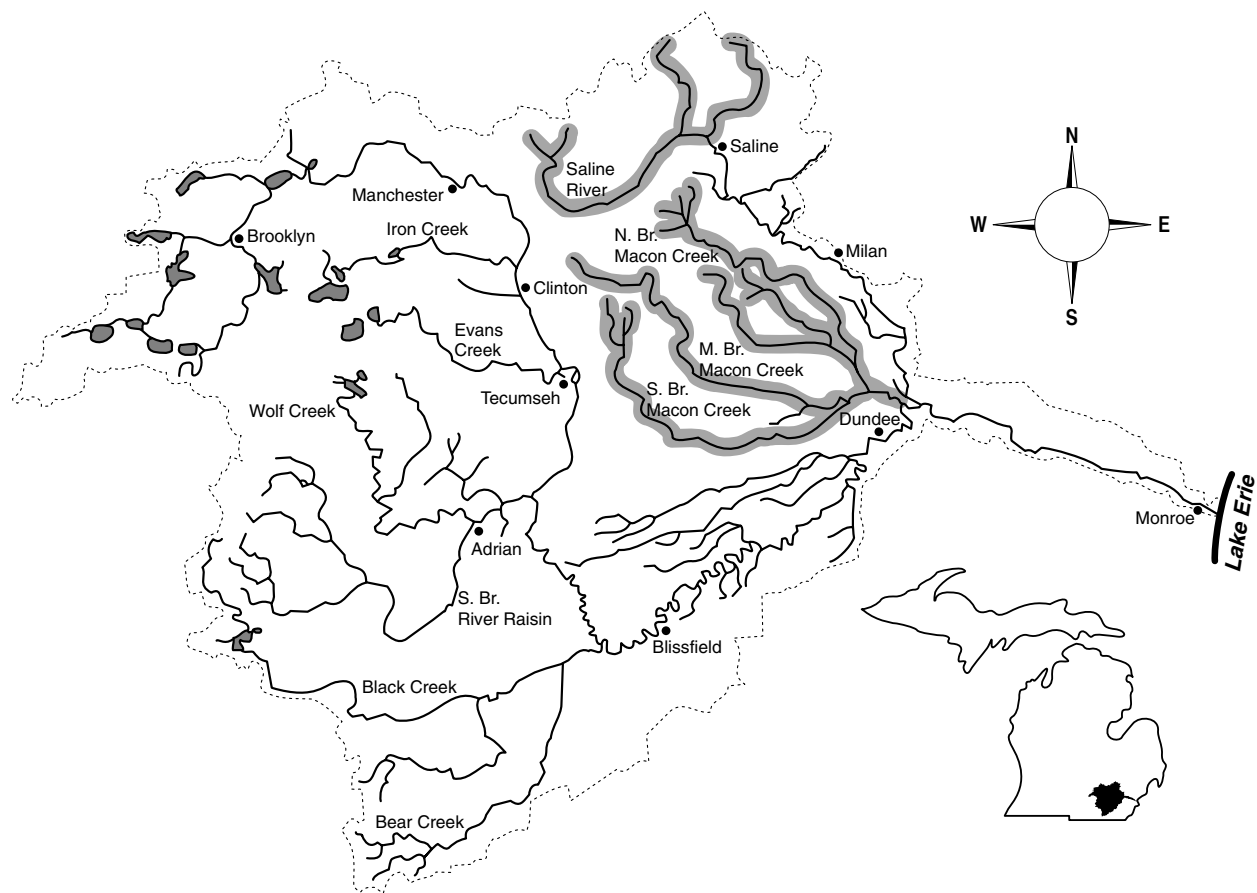


Orangethroat darter (*Etheostoma spectabile*)

Habitat:

- feeding - small-moderate size creeks and spring branches
- sand, gravel, or rock substrate in sluggish riffles or in pools with sufficient current to prevent siltation
- prefers clear streams but tolerant of turbidity
- low to moderate gradient

- spawning - gravel riffles
- slow current

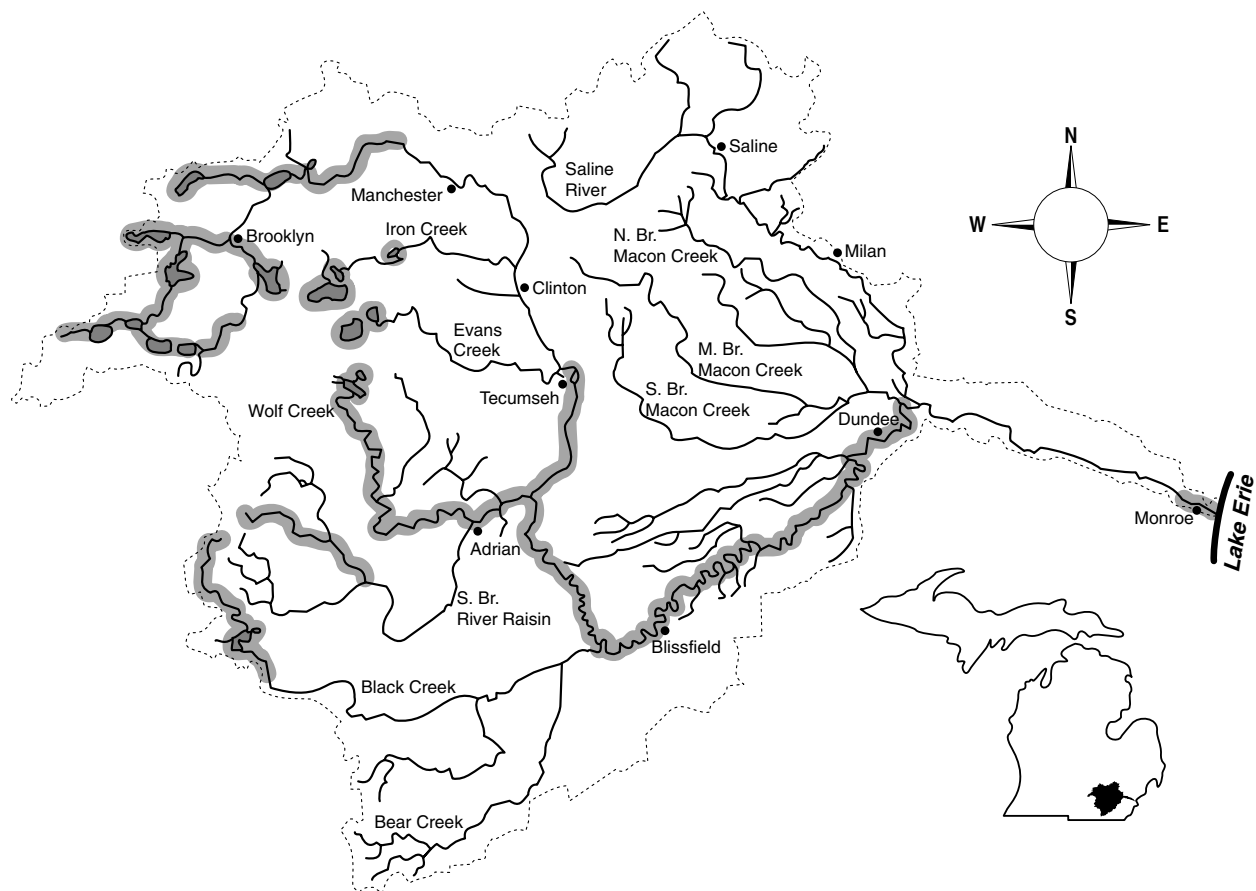


Yellow perch (*Perca flavescens*)

Habitat:

- feeding - clear lakes and impoundments; also Lake Erie
- low gradient rivers
- abundance of rooted aquatics
- muck, organic debris, sand, or gravel substrate
- does not tolerate turbidity and siltation

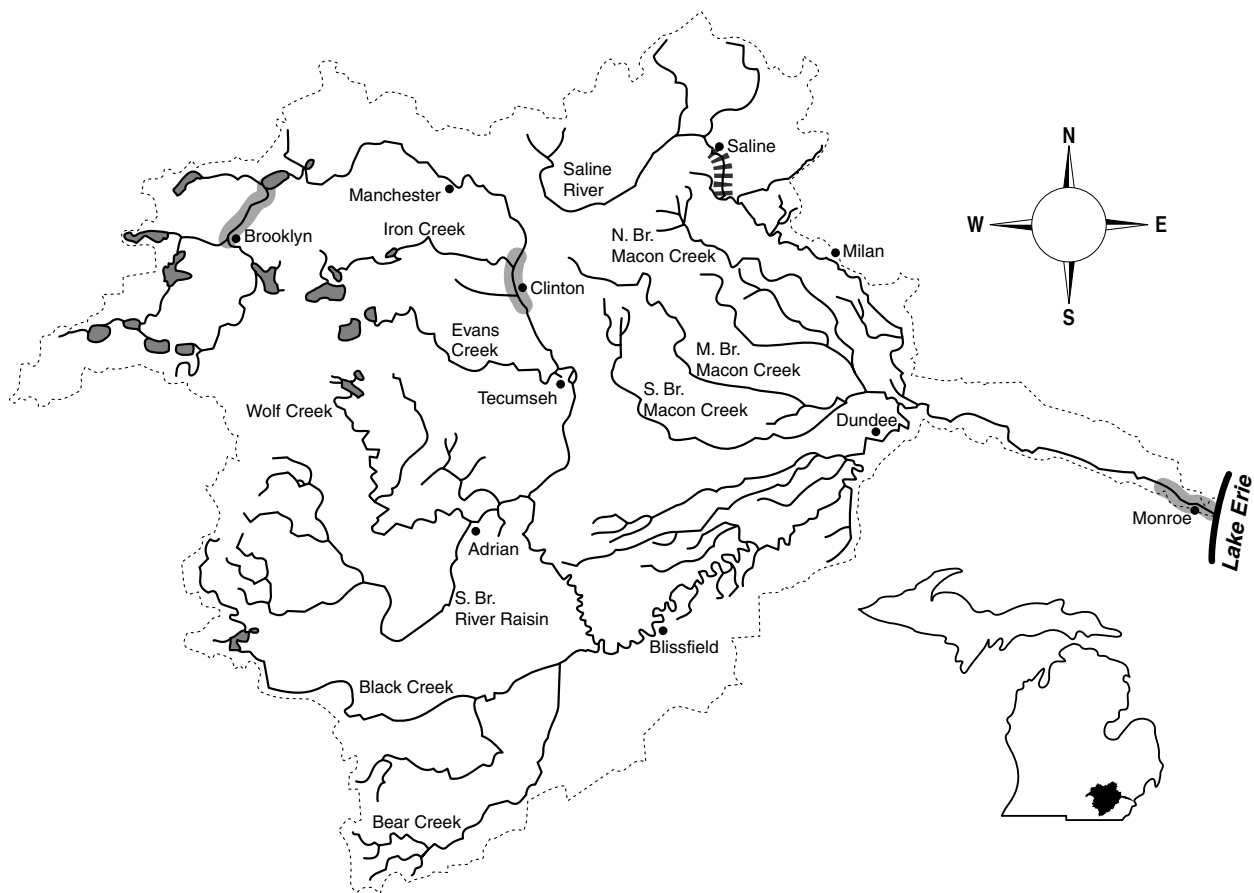
- spawning - shallows of lakes, tributaries of streams
- occurs over rooted vegetation, submerged brush, fallen trees
- may occur over sand or gravel



Logperch (*Percina caprodes*)

Habitat:

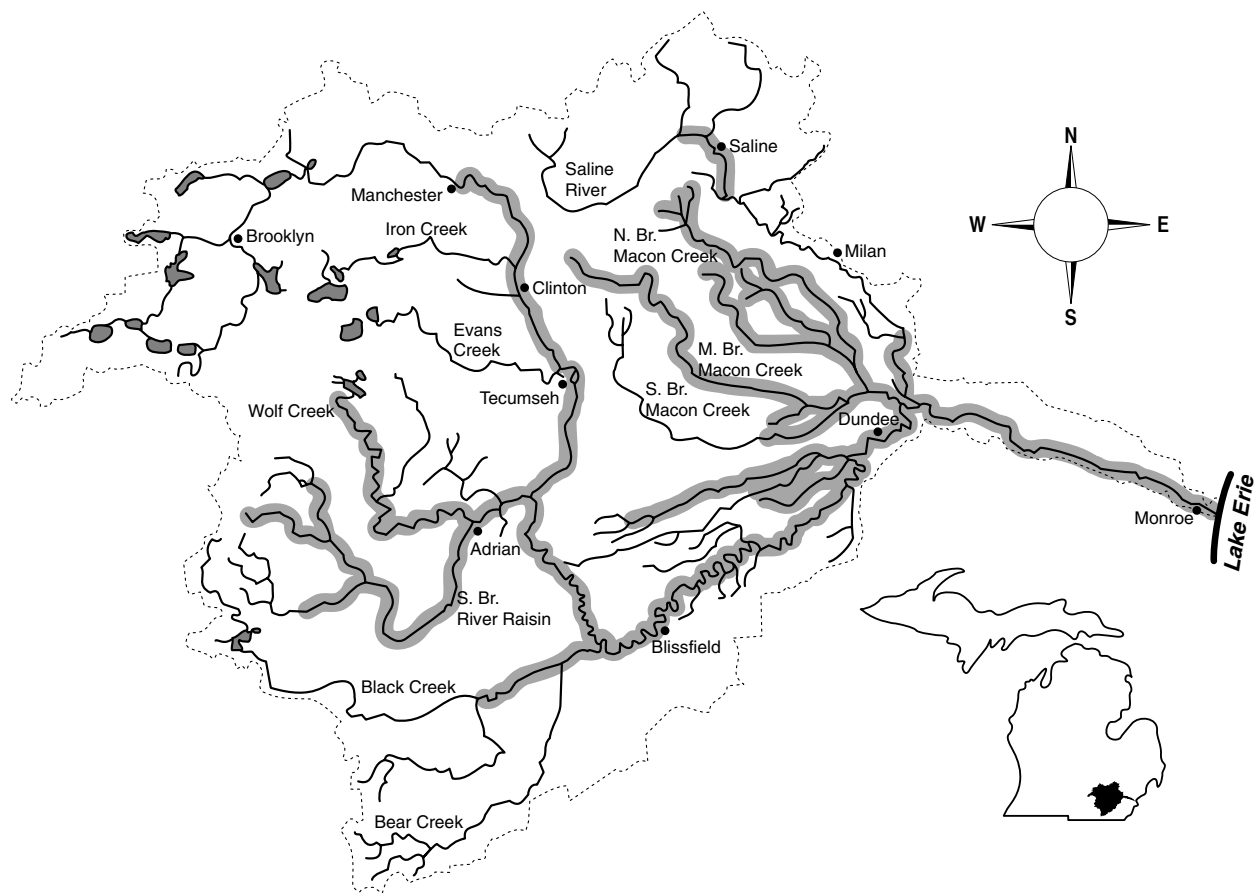
- feeding - gravel riffles, deeper slower sections of rivers
 - medium size streams; also lakes, impoundments, and Lake Erie
 - sand, gravel, or rock substrate
 - avoids turbidity and silt
- spawning - riffles or sandy in-shore shallows



Blackside darter (*Percina maculata*)

Habitat:

- feeding - small to medium streams
 - low to medium gradient
 - gravel and sand substrate
 - tolerate some turbidity
- spawning - gravel and sand substrate

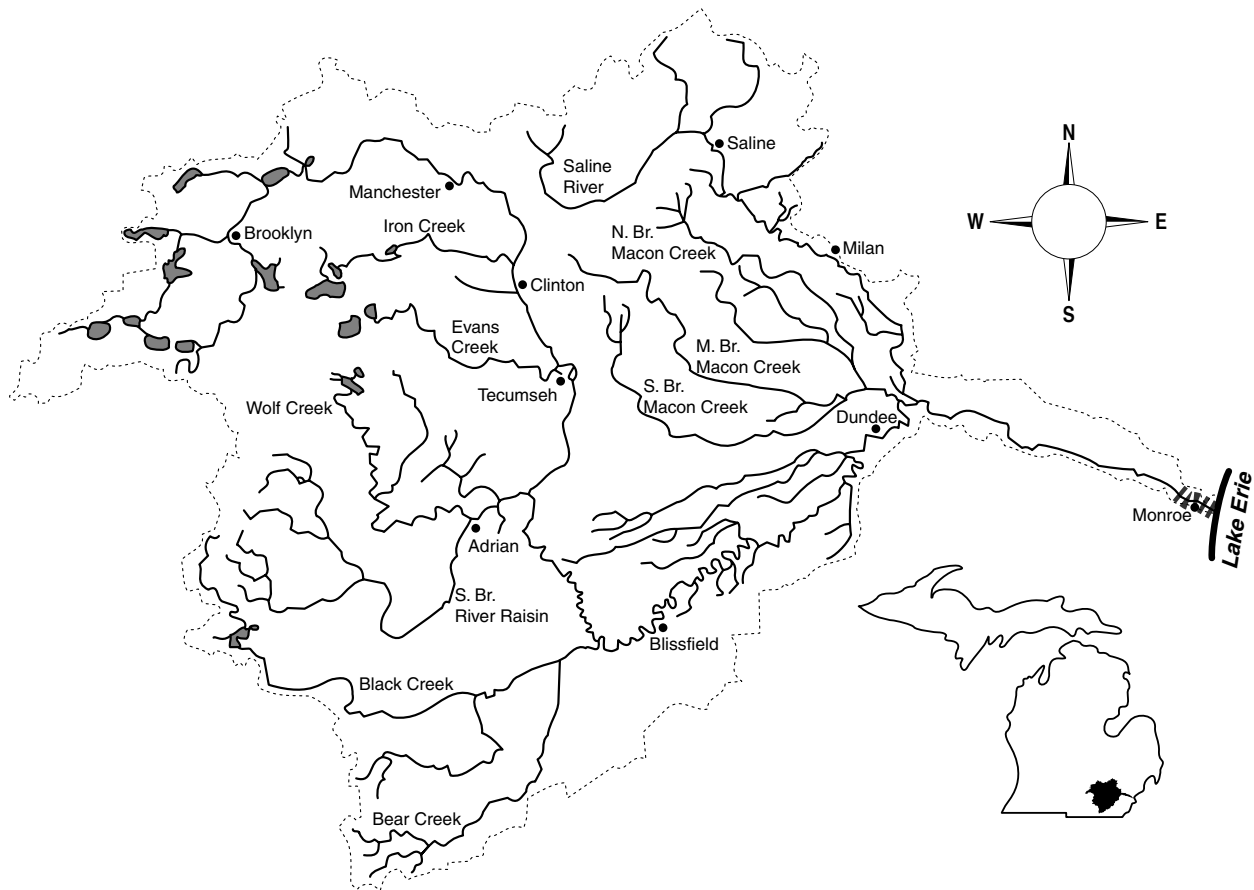


Sauger (*Stizostedion canadense*) - threatened

Habitat:

- feeding - larger, deeper, low gradient rivers; turbid lakes and impoundments; also Lake Erie
- not tolerant of high gradient
- tolerant of silted substrate
- more tolerant of turbid water than walleye
- young may be in shallows or flats

spawning - shoals of gravel and rubble



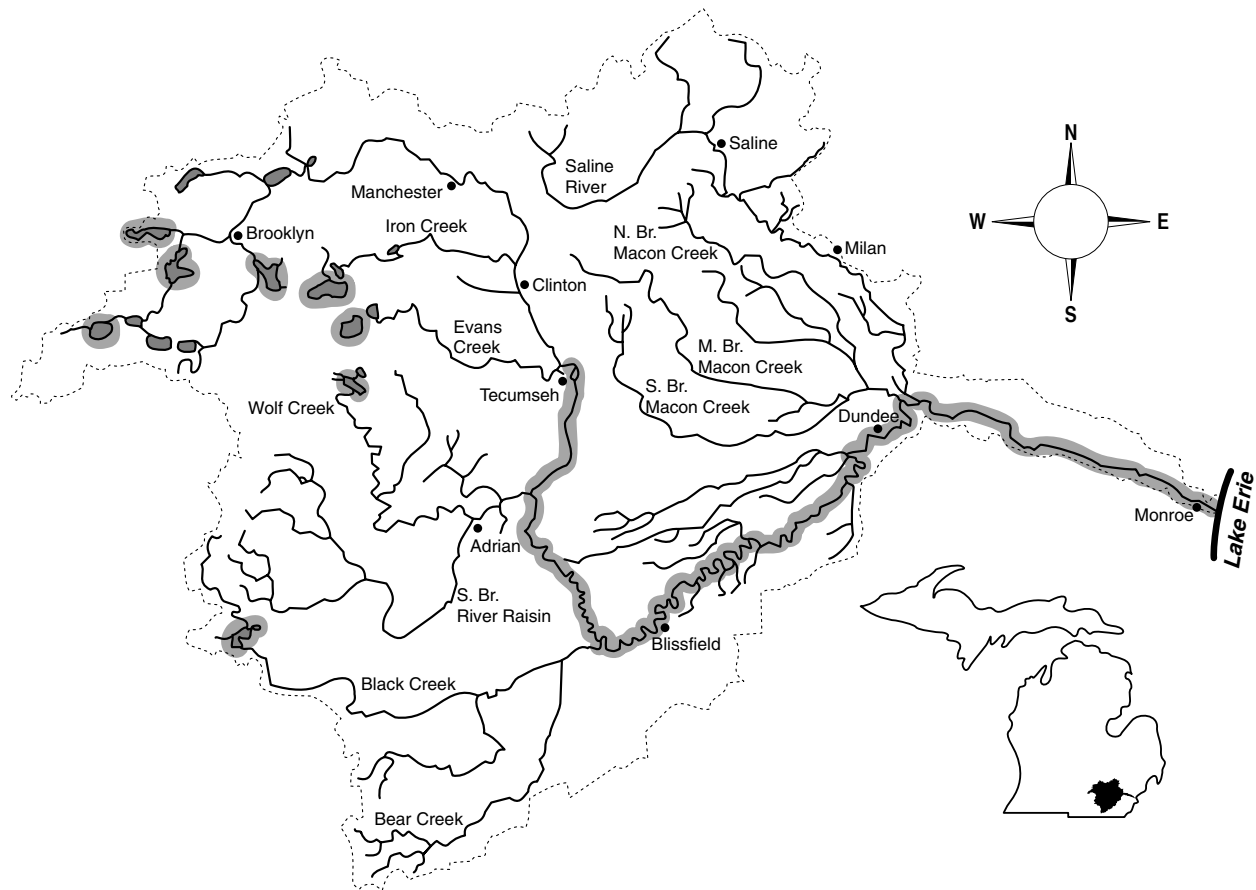
Walleye (*Stizostedion vitreum*)

Habitat:

- feeding - larger, deeper streams and in large, shallow, turbid lakes and impoundments; also Lake Erie
 - gravel, bedrock, and firm substrates preferred
 - does not tolerate a lot of turbidity or low oxygen

- spawning - rocky substrates in high gradient water in rivers
 - boulder to coarse gravel shoals in lakes

- winter refuge - avoids strong currents

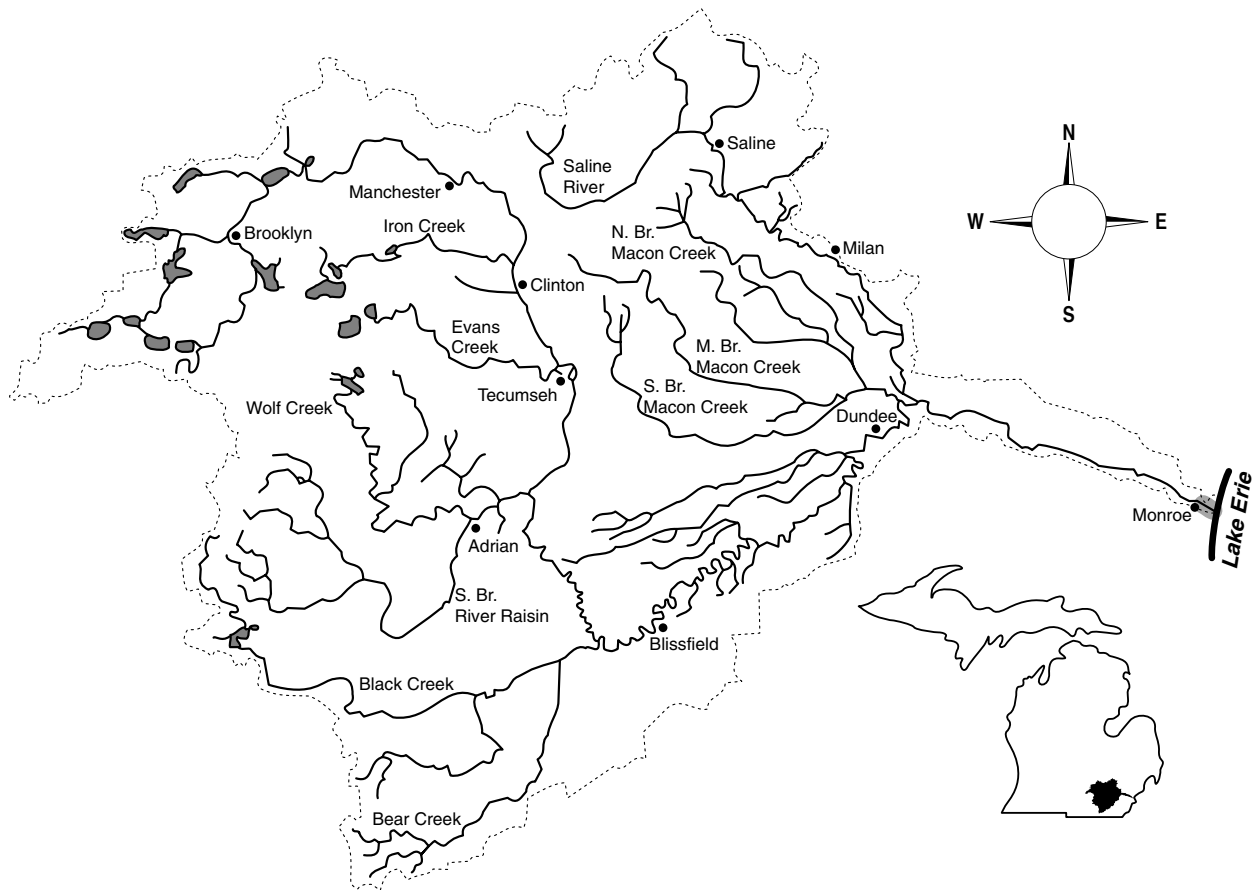


Freshwater drum (*Aplodinotus grunniens*)

Habitat:

- feeding - deeper pools of rivers
- in shallows
- prefers clear waters and clean substrates
- can adapt to high turbidity levels

- spawning - pelagically, in open water, over sand or mud substrate
- occurs in bays or lower portions of marshes



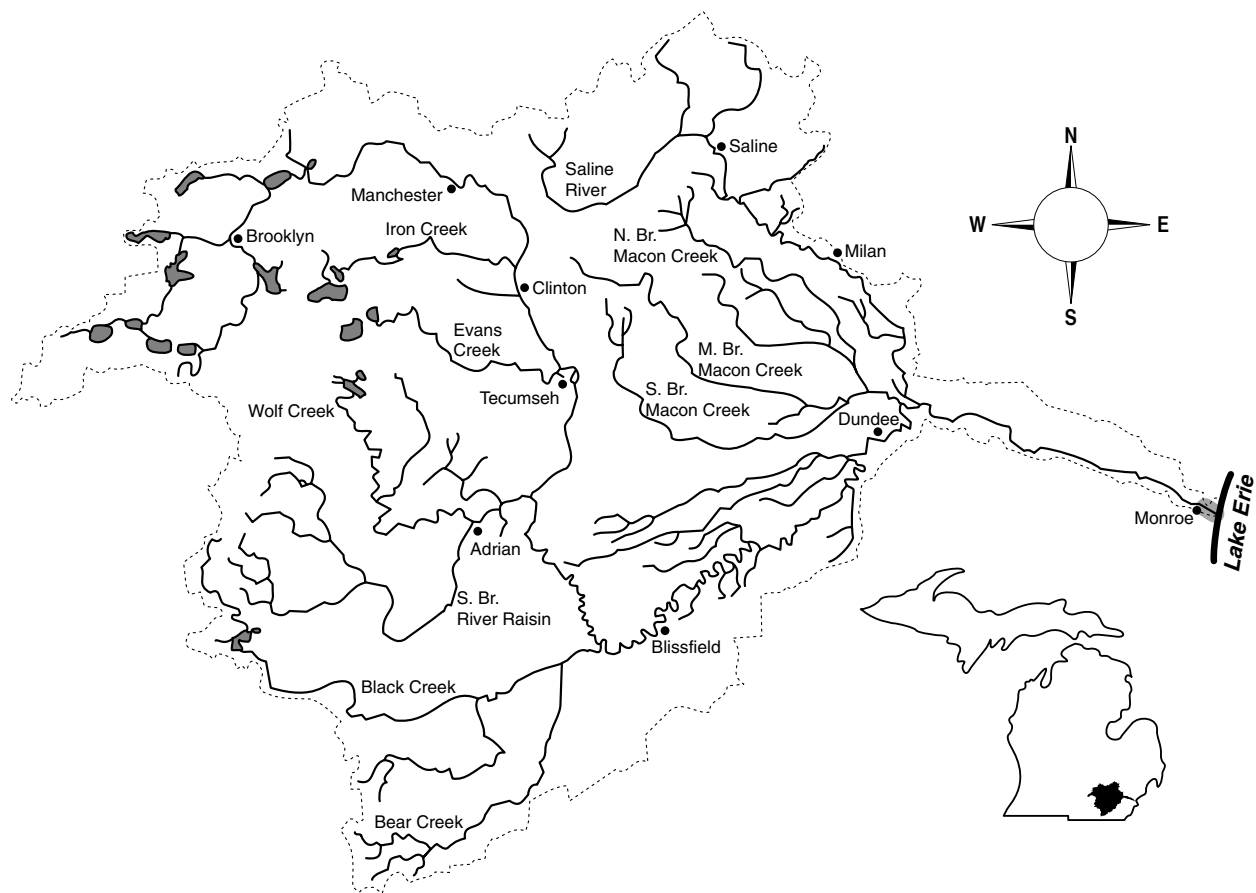
Round goby (*Neogobius melanostomus*) - non-native species

Habitat:

- feeding - rock, cobble, riprap, and vegetate areas of rivers and lakes
- young found over sand substrate

- spawning - rocky substrate with large interstitial spaces

- winter refuge - rocky substrate with large interstitial spaces
- deep water



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