STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

SR39 Appendix June 2006

Clinton River Assessment Appendix

James T. Francis
and
Robert C. Haas

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FISHERIES DIVISION
SPECIAL REPORT 39

MICHIGAN DEPARTMENT OF NATURAL RESOURCES
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Appendix 1

Distribution Maps of Fish Species

This appendix contains known past and present fish distributions in the Clinton River system. Distribution of fishes were compiled from records located at the University of Michigan Museum of Zoology, Michigan Department of Natural Resources Institute for Fisheries Research, Michigan Department of Natural Resources Lake Erie Management Unit, and from the Michigan Department of Environmental Quality. Specific locations were plotted and extrapolated by the authors.

Habitat descriptions were compiled from the Fishes of Ohio (Trautman 1981), Freshwater Fishes of Canada (Scott and Crossman 1973), Fishes of Wisconsin (Becker 1983), Fishes of Missouri (Pflieger 1975), and Fishes of the Great Lakes Region (Hubbs and Lagler 1947).

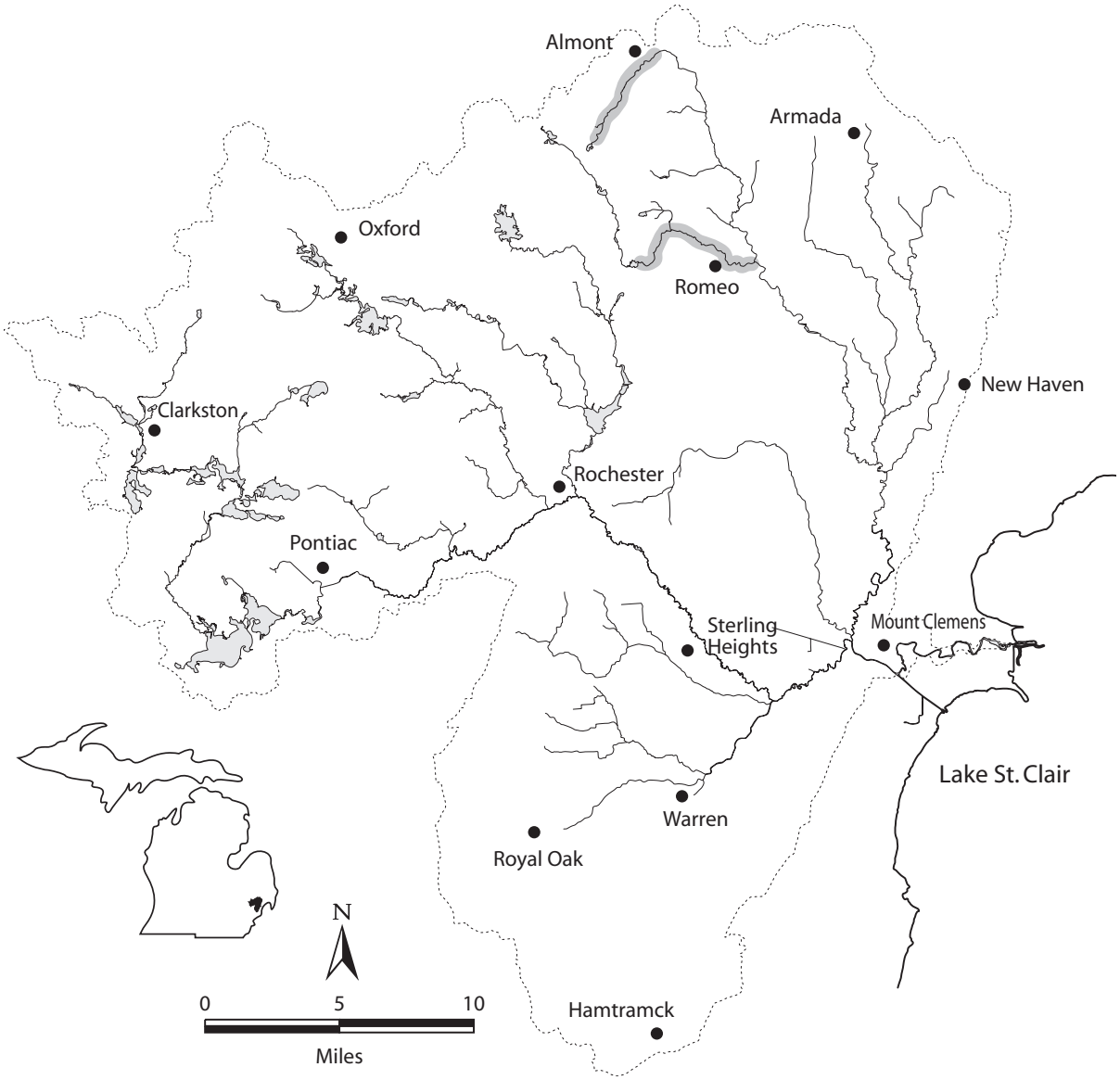
APPENDIX 1 INDEX

Chestnut lamprey *Ichthyomyzon castaneus*

Habitat:

feeding
- stable substrate of sand and silt with light growth of *chara* or quiet backwaters of muck and silt with dense rooted vegetation
- moderate current
- clear moderate-size water

spawning
- moderate-size stream
- nest builder

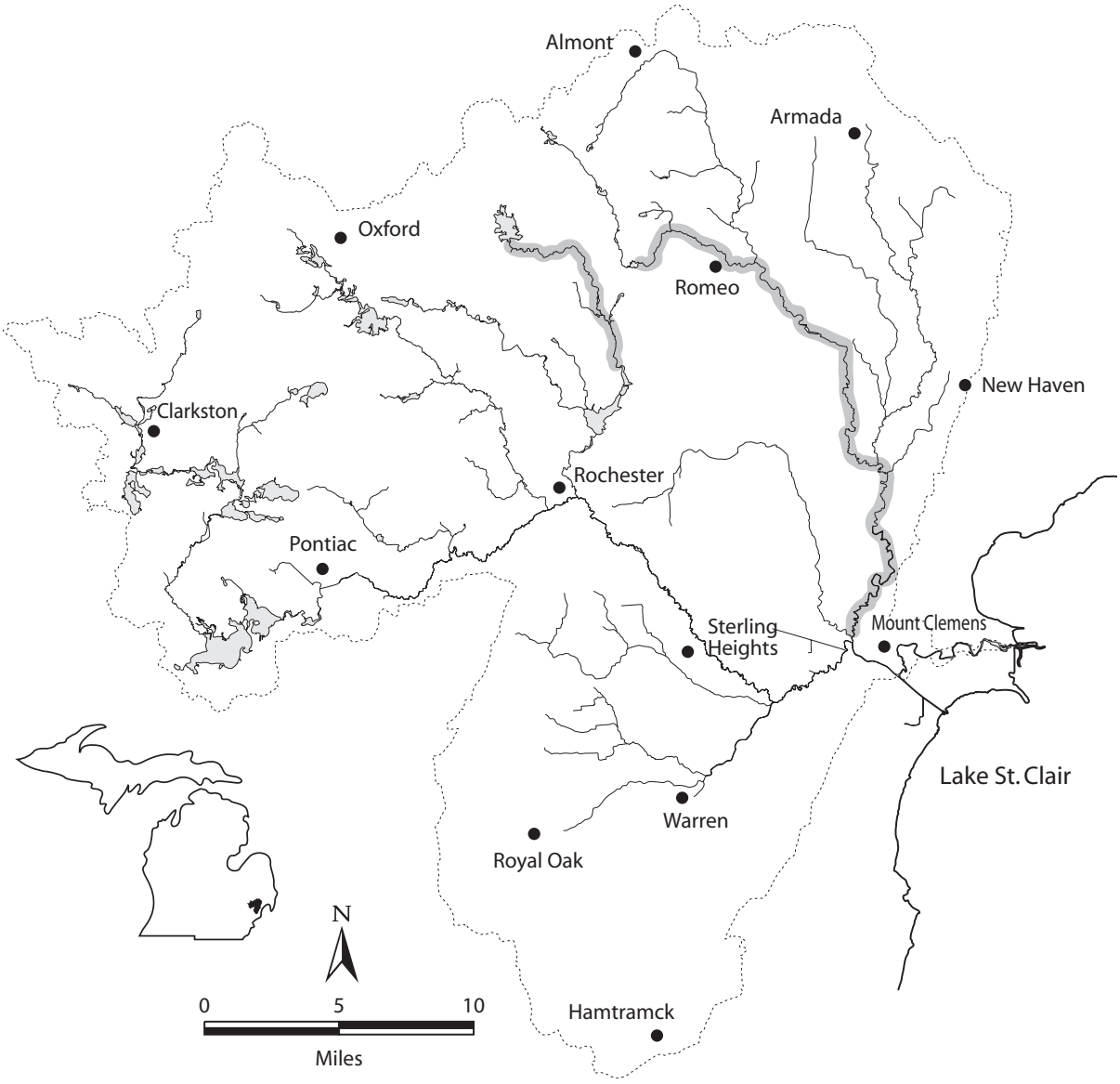


Northern brook lamprey *Ichthyomyzon fossor*

Habitat:

feeding - young: low gradient, substrate with bars and beds of mixed sand and organic debris
- moderately warm water

spawning - clear, high gradient streams (<15 feet wide)
- riffles with sand or gravel substrate



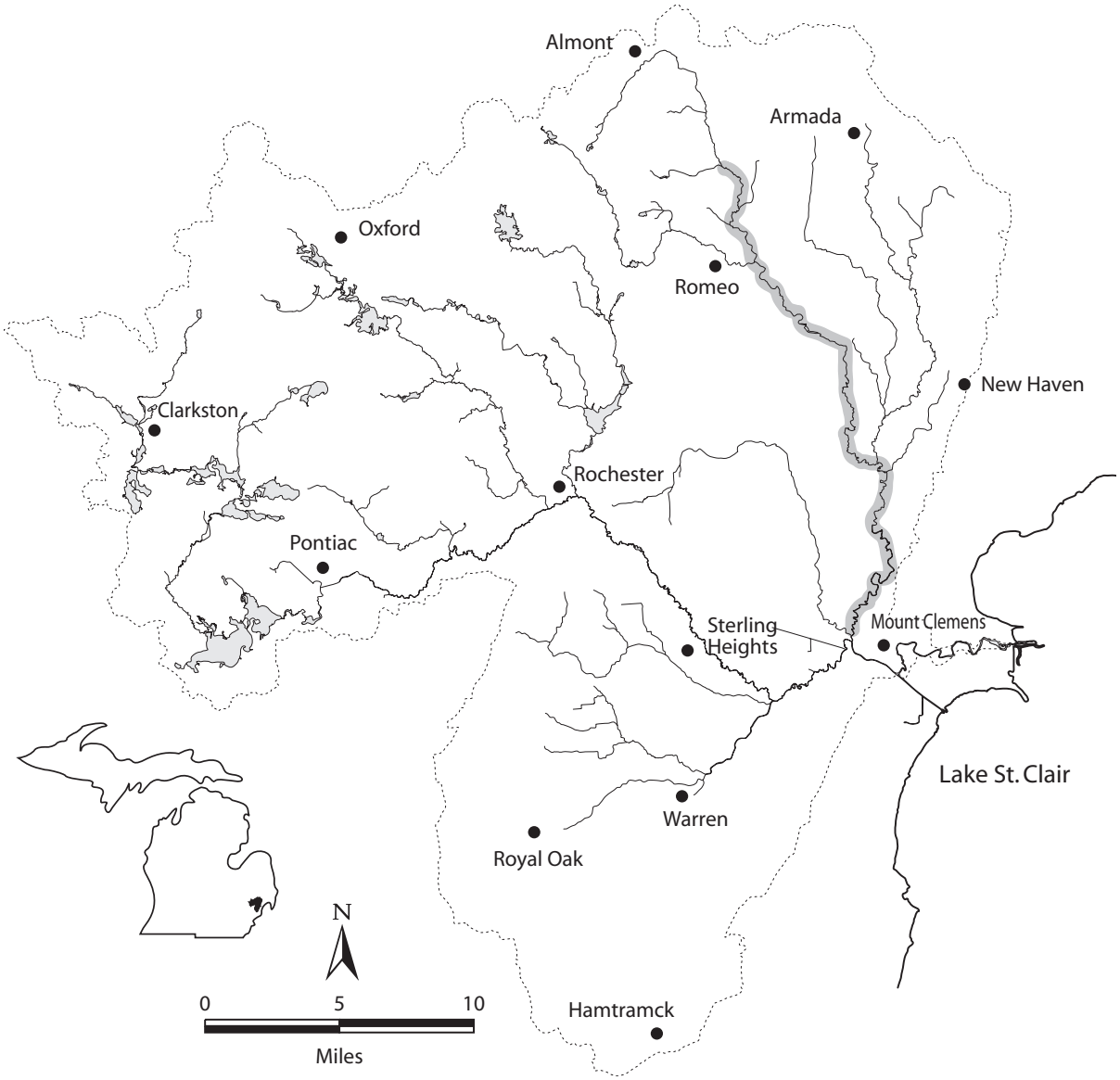
Silver lamprey *Ichthyomyzon unicuspis*

Habitat:

feeding
- young:sand,muck,or organic debris substrate
- adults:clear river water with prey species

spawning
- gravel and sand substrate
- moderate gradient
- moderate size stream
- cannot tolerate silt
- no dams

winter refuge
- ammocetes burrow for 4 to7 years in mud and silt at river margins



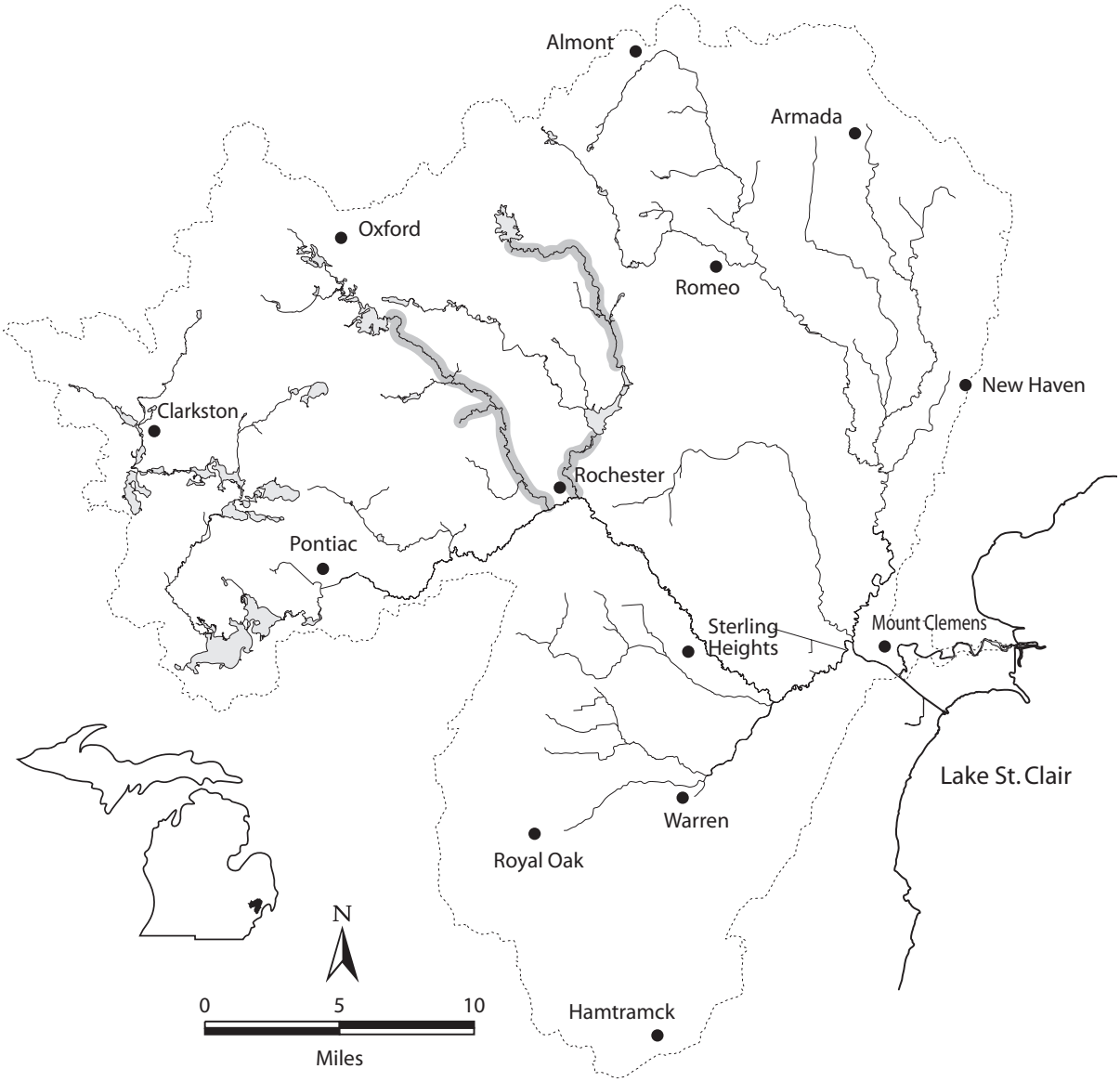
American brook lamprey *Lampetra appendix*

Habitat:

feeding
- young: low gradient, substrate with bars and beds of mixed sand and organic debris
- clear cool stream water, sensitive to turbidity

spawning
- clear, high gradient streams (>15 feet wide)
- cold water
- gravel substrate

winter refuge
- sand or silt substrate for ammocetes

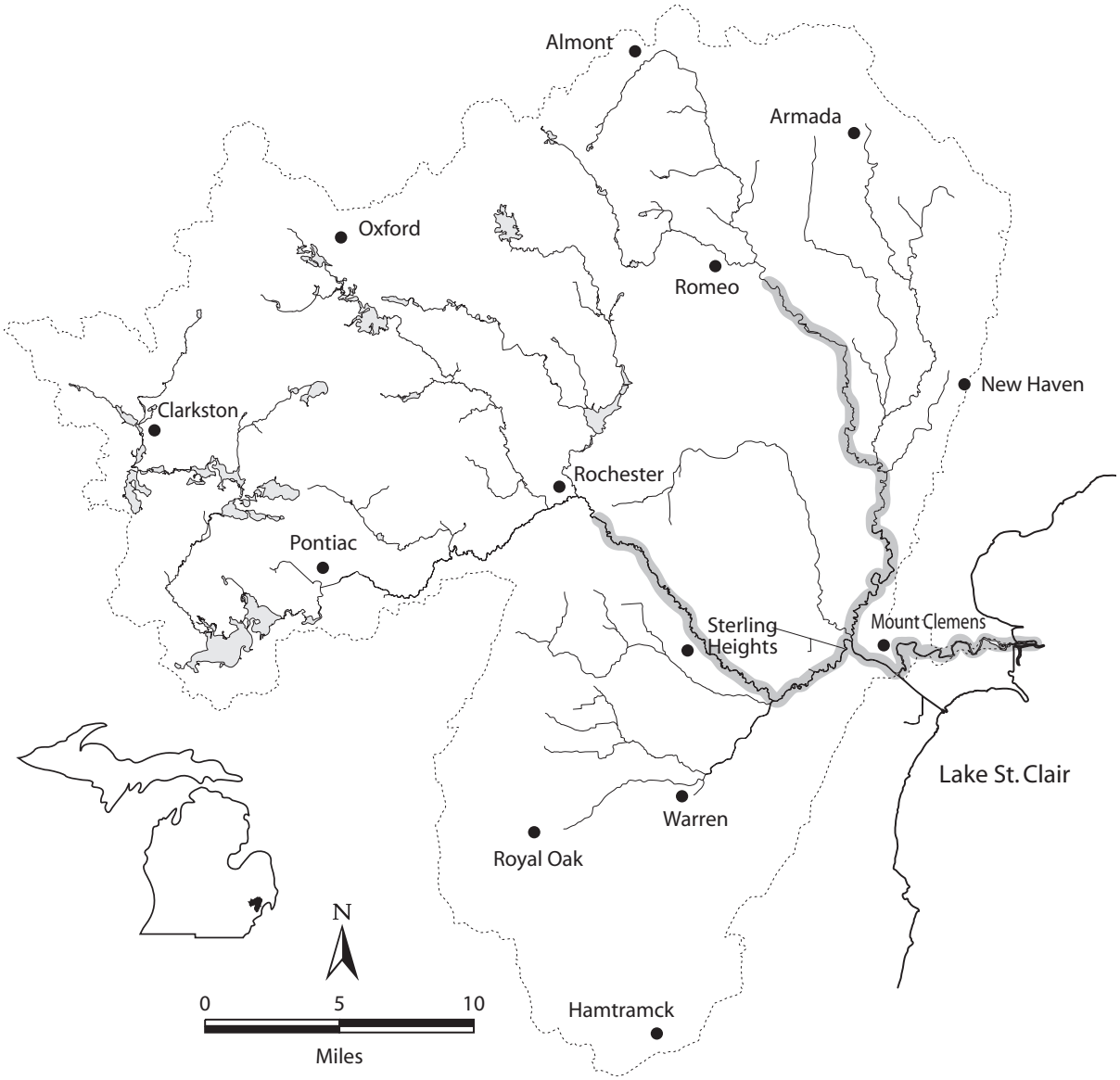


Sea lamprey *Petromyzon marinus*

Habitat:

feeding
- young: substrate with beds of sand mixed with organic debris
- cannot tolerate silt
- adults: clear cool water

spawning
- no dams
- riffles with sand and gravel substrates

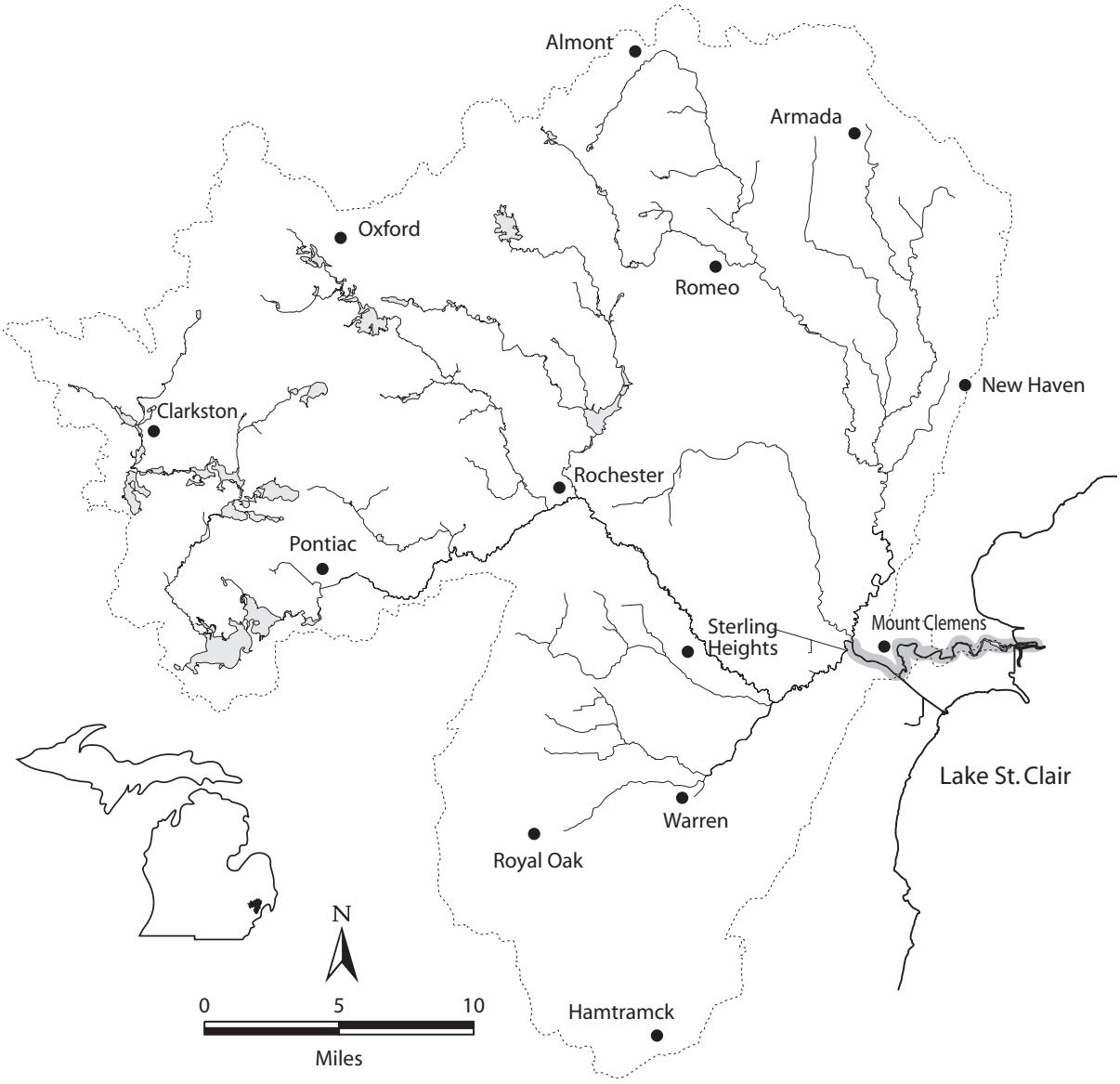


Lake sturgeon *Acipenser fulvescens* – **threatened**

Habitat:

feeding
- shoal areas of large rivers, lakes, and impoundments
- gravel, sand, rock substrates

spawning
- in or before rapids, at the base of dams in rivers
- in 2-15 feet of water
- swift current
- rocky ledges or around rocky islands in Great Lakes

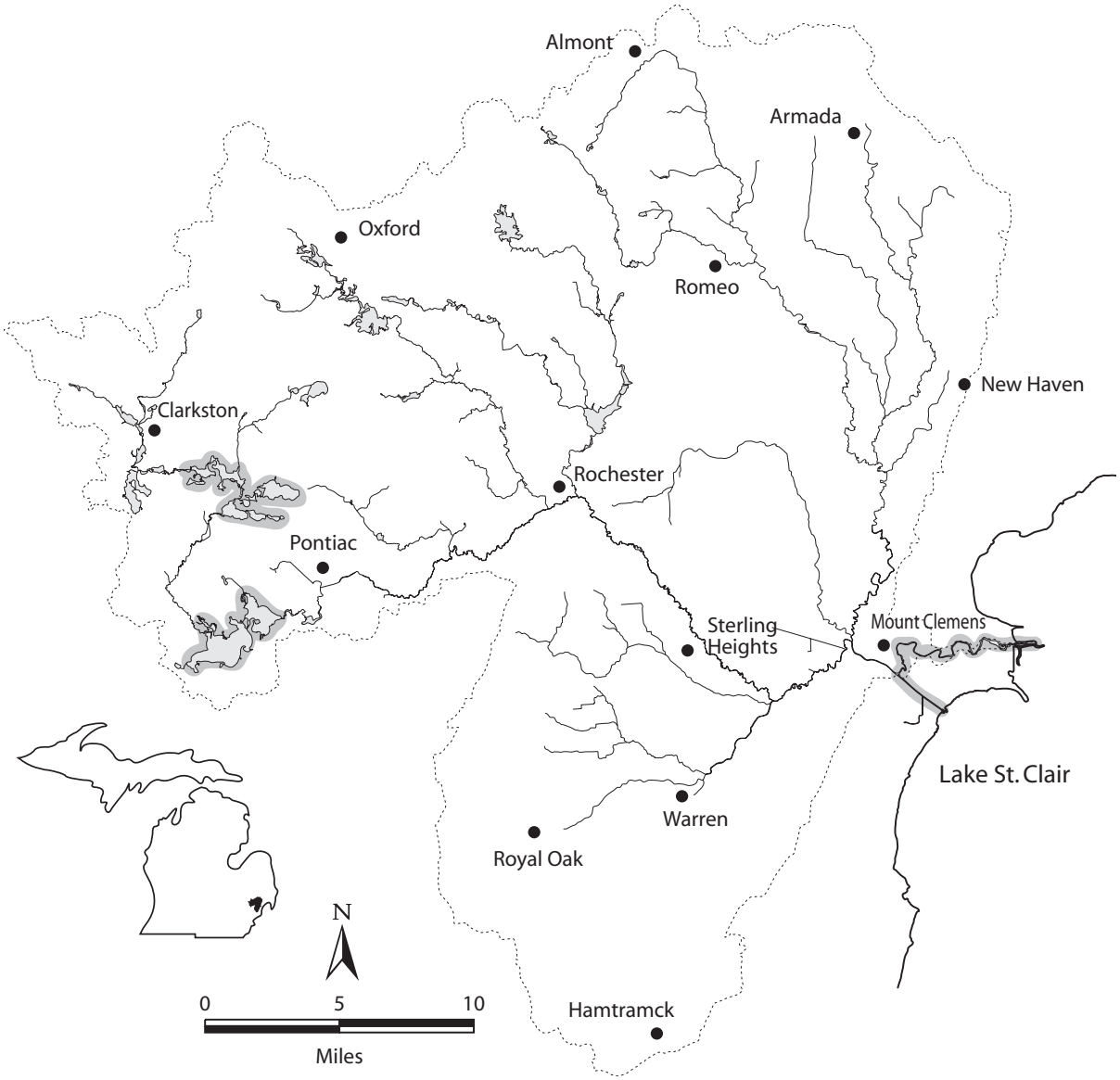


Longnose gar *Lepisosteus osseus*

Habitat:

feeding
- adults: in deeper water
- young: in shallows
- clear water, low-gradient streams, lakes, and impoundments
- will feed in moderate current
- aquatic vegetation preferred, but not necessary
- open water fish

spawning
- warm shallow water of lakes or streams over vegetation



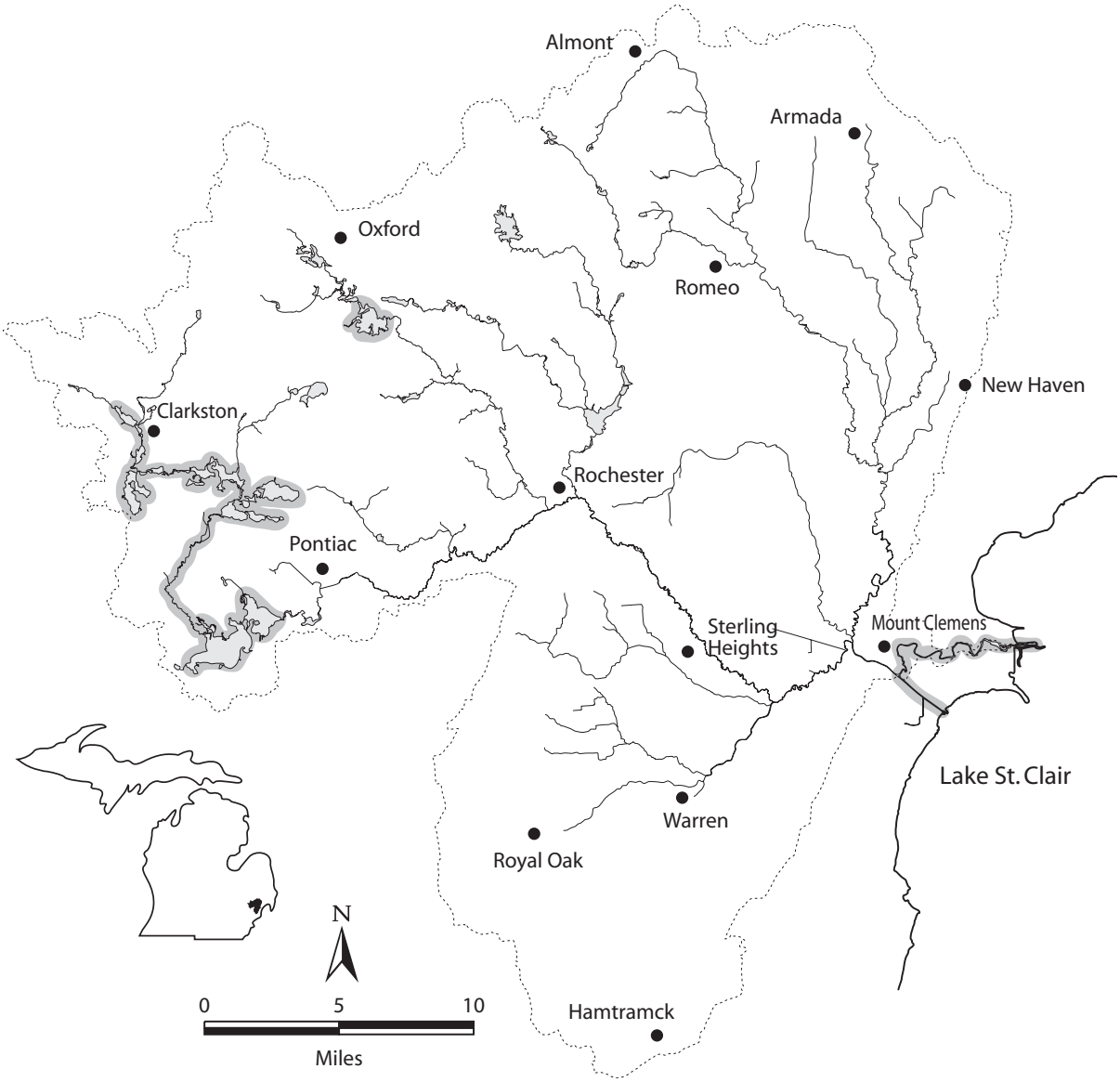
Bowfin *Amia calva*

Habitat:

feeding
- clear water
- abundant rooted aquatic vegetation
- low gradient streams, lakes, and impoundments
- tolerate only small amount of silt

spawning
- need vegetated water, 1 to 2 feet deep
- can spawn under logs, stumps, or bushes

winter refuge
- gravelly pockets among aquatic vegetation



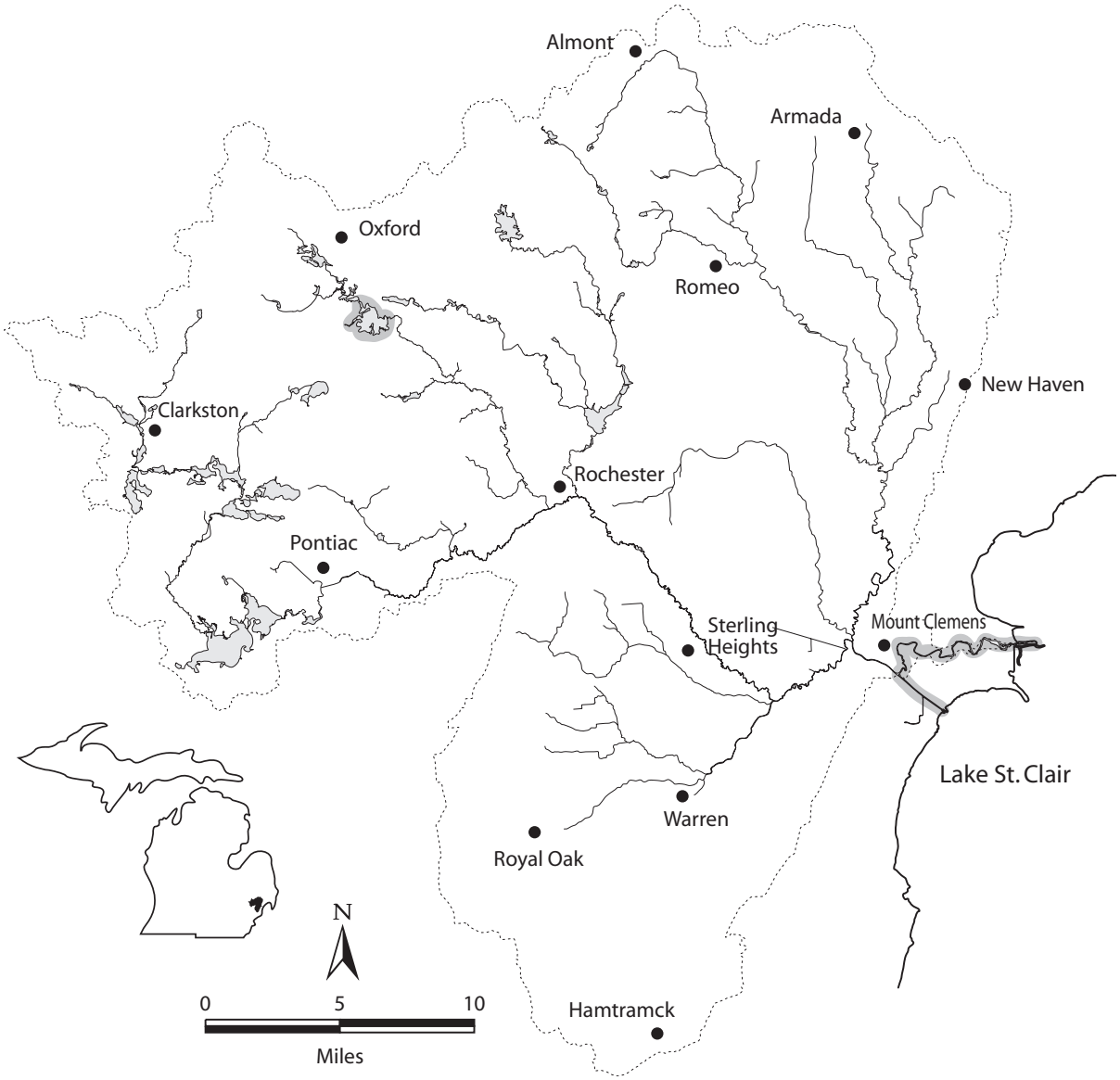
Alewife *Alosa pseudoharengus*

Habitat:

feeding - Lake St. Clair
- prefers warmer waters

spawning - streams or shallow beaches of lake
- sand or gravelly substrate

winter refuge - deep water

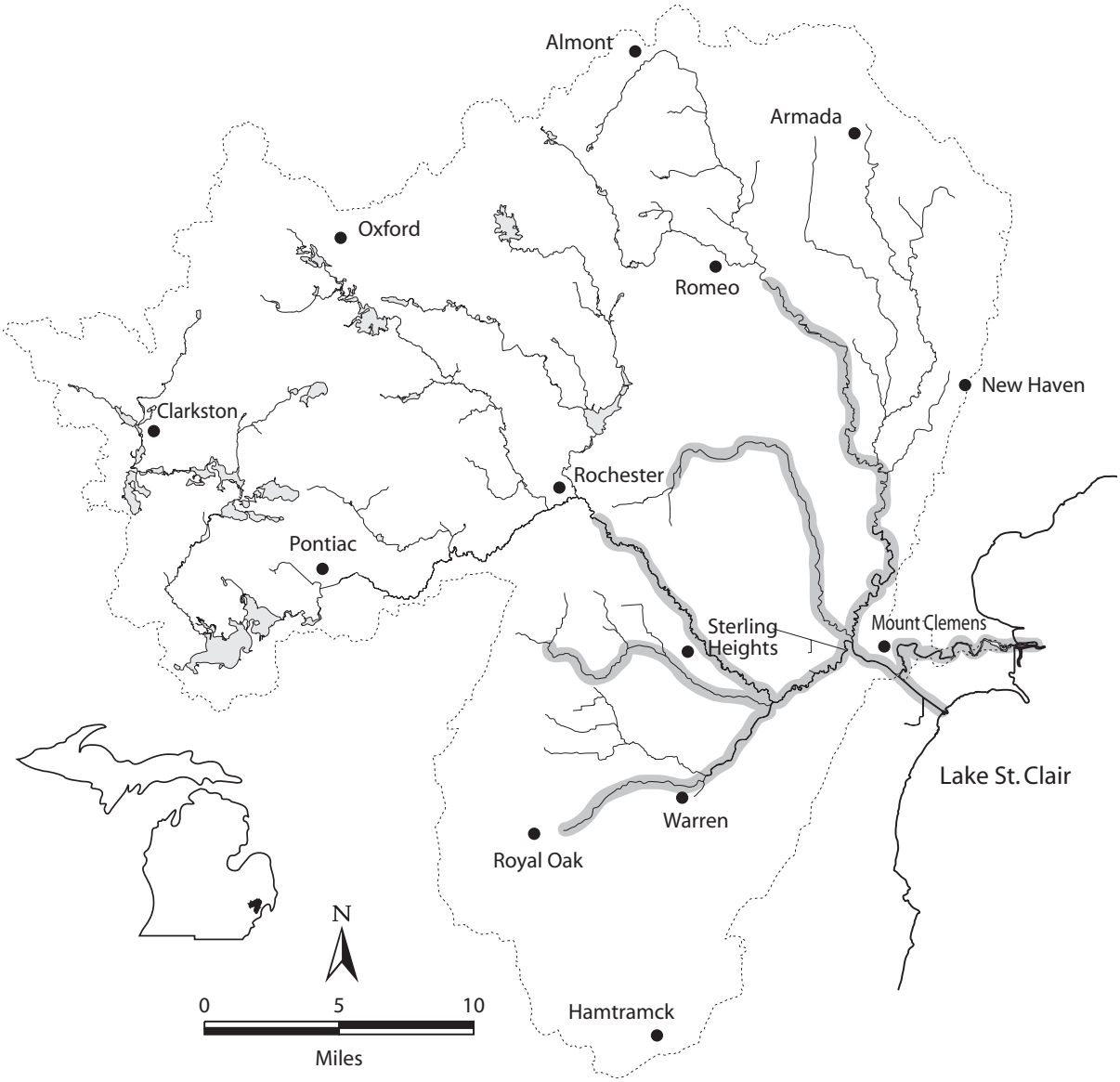


Gizzard shad *Dorosoma cepedianum*

Habitat:

feeding
- large streams with low gradient, impoundments, and Lake St. Clair
- tolerant of clear and turbid water

spawning
- shallow areas of ponds, lakes, and large rivers
- low gradient

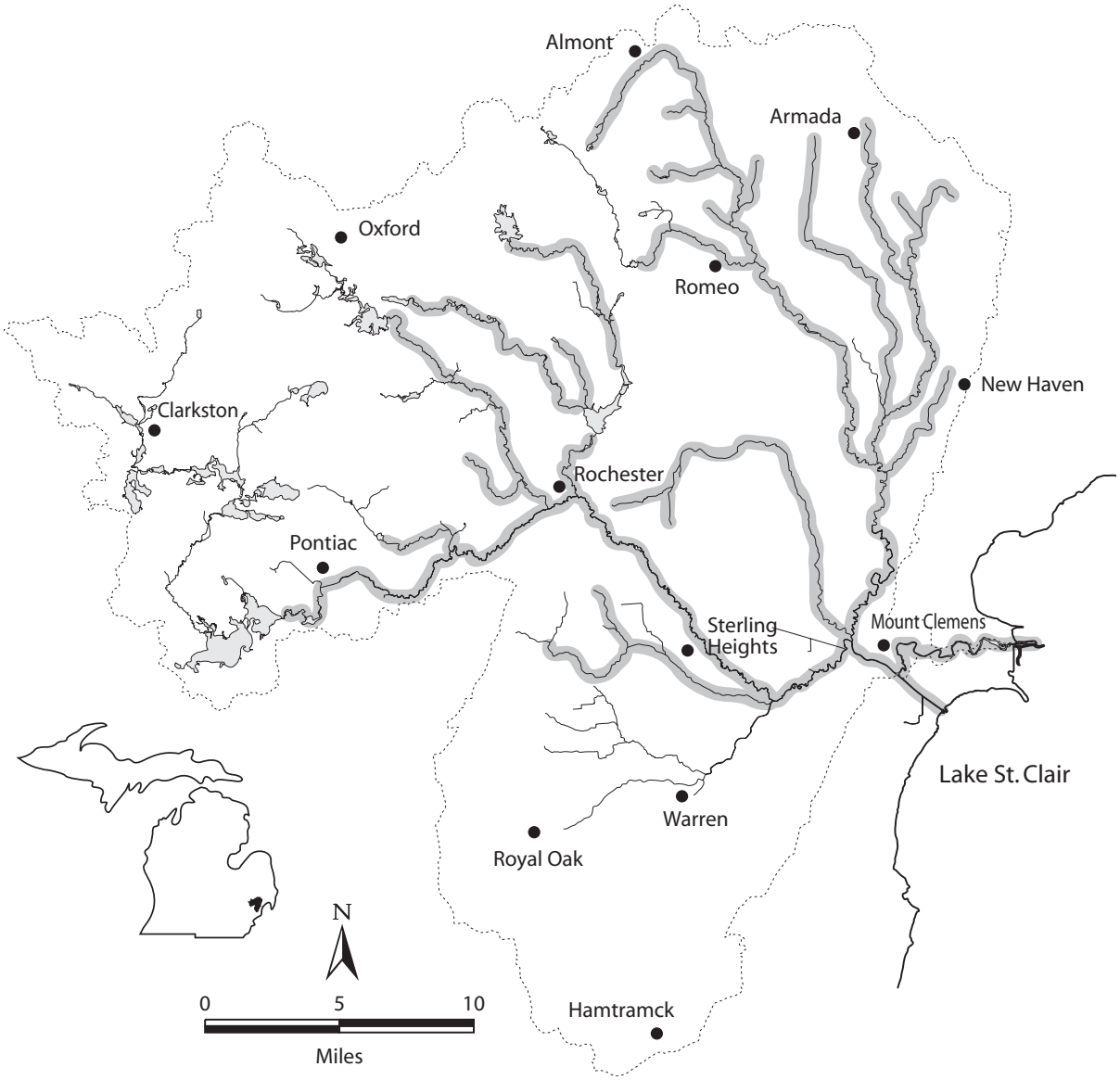


Central stoneroller *Campostoma anomalum*

Habitat:

feeding - moderate to high gradients
- rocky riffles
- somewhat tolerant of turbidity
- riffles and adjacent pools of warm, clear, shallow streams
- gravel or cobble substrate

spawning - riffles, nest with a deep pool or bank overhang

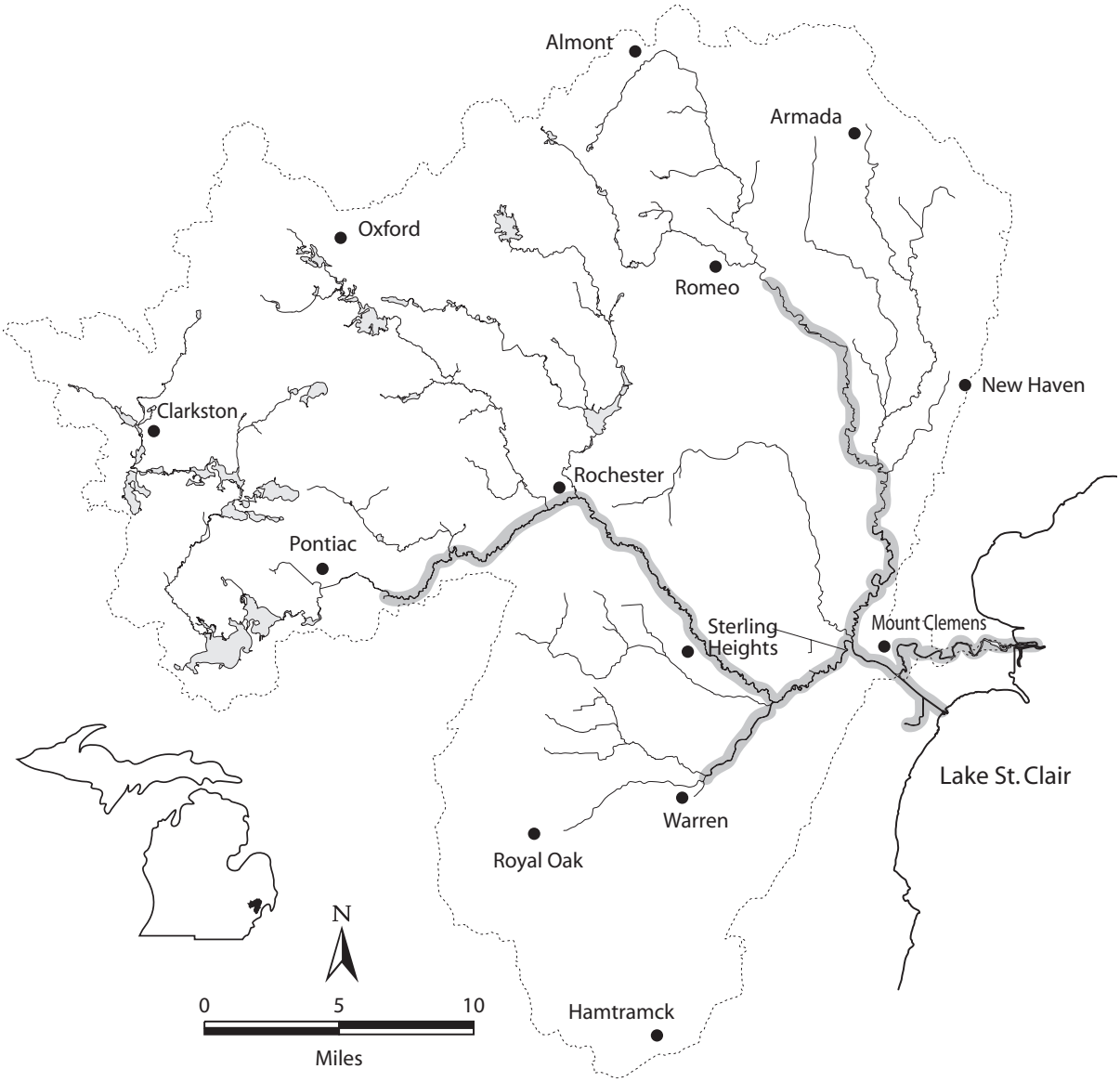


Goldfish *Carassius auratus*

Habitat:

feeding - vegetation
- low gradient, shallow, warm water streams, rivers, lakes, and impoundments
- tolerates some turbidity and siltation

spawning - warm, weedy shallows

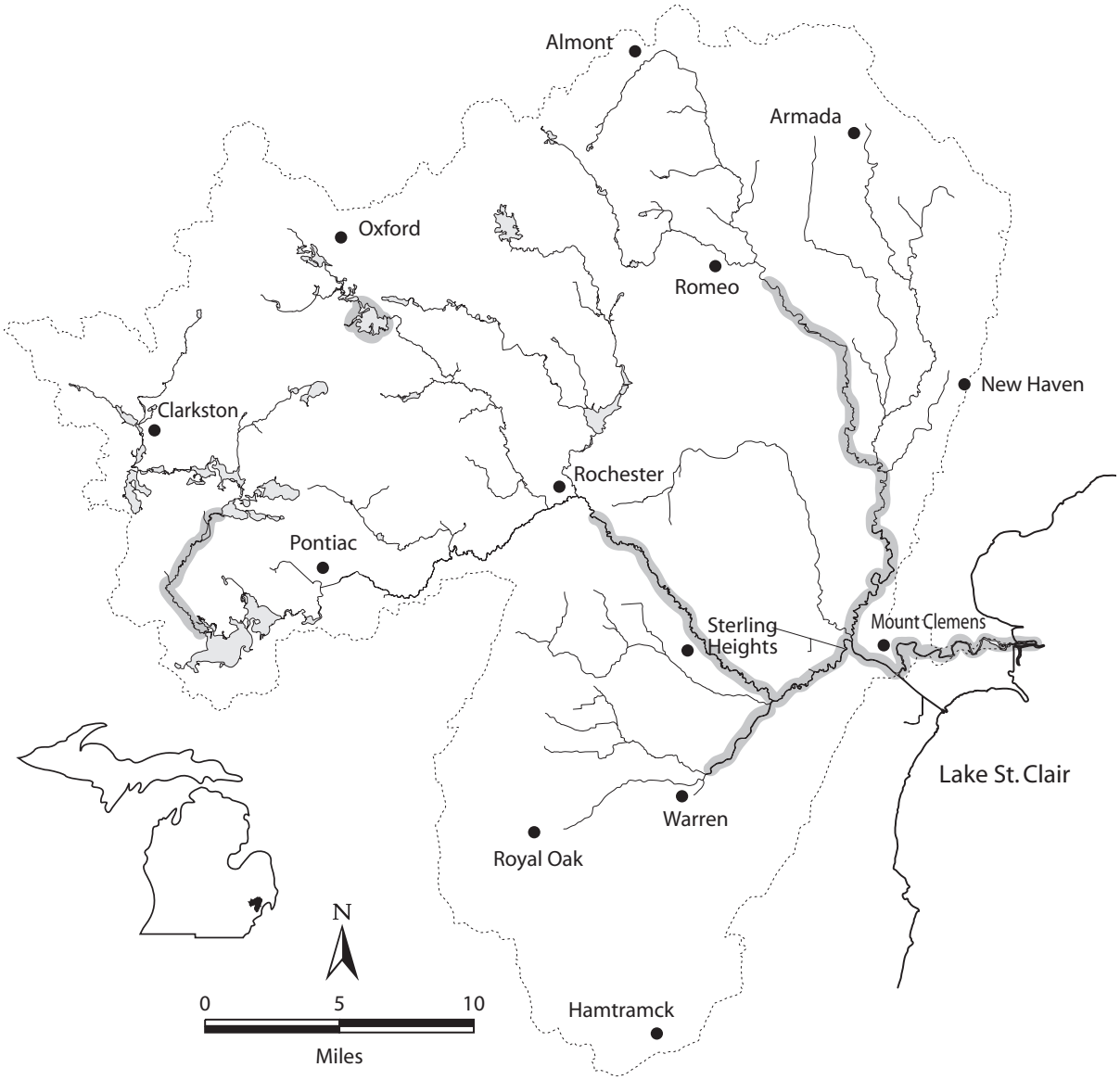


Spotfin shiner *Cyprinella spiloptera*

Habitat:

feeding
- clear water tolerant of turbidity and siltation
- some current
- shallow depths
- medium sized streams, lakes, and impoundments
- clear sand or gravel substrate

spawning
- swift current
- crevice spawner or on underside of submerged logs and roots

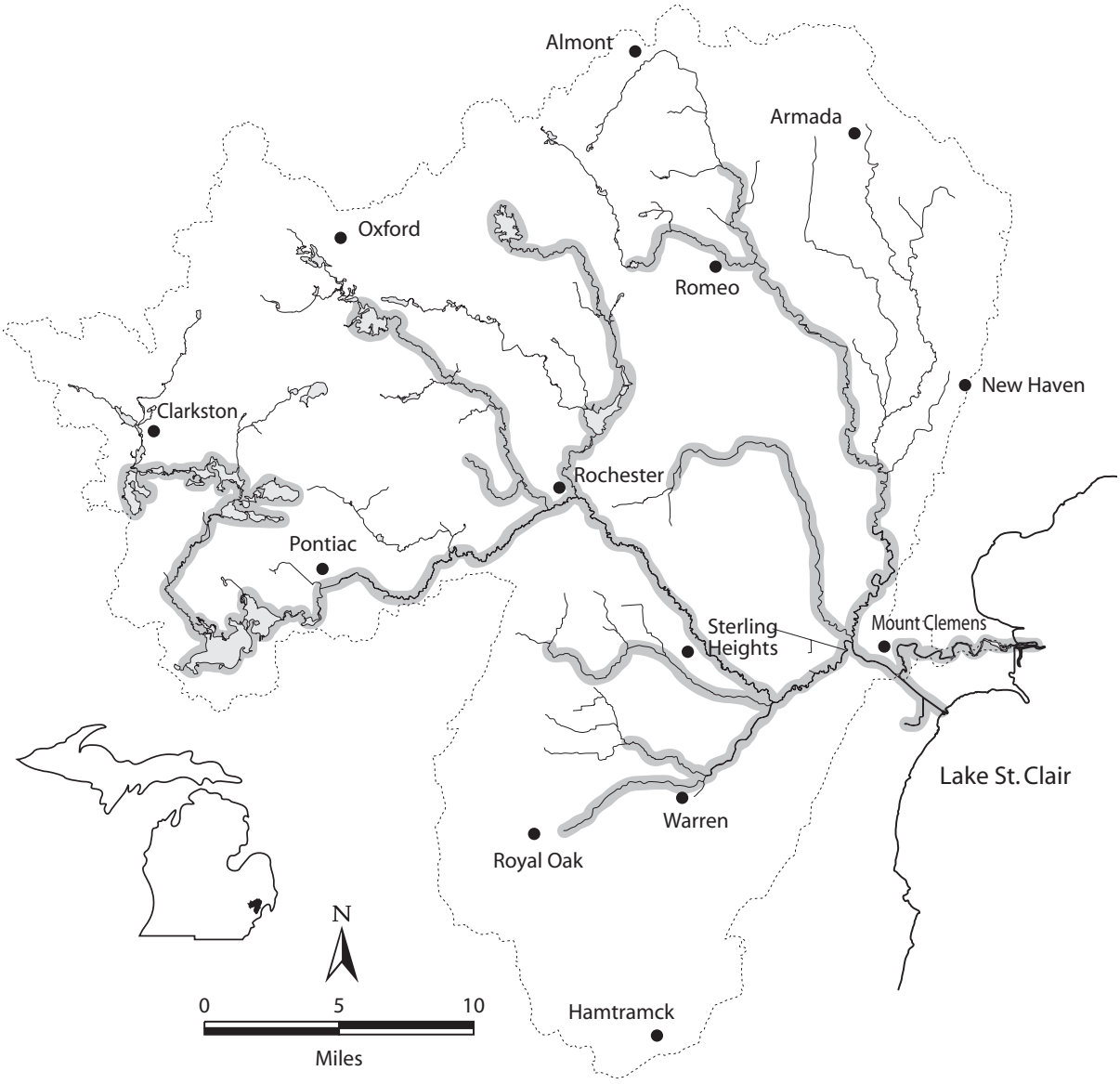


Common carp *Cyprinus carpio*

Habitat:

feeding - low gradient fertile streams, rivers, lakes, and impoundments
- abundance of aquatic vegetation or organic matter
- tolerant of all substrates and clear to turbid water

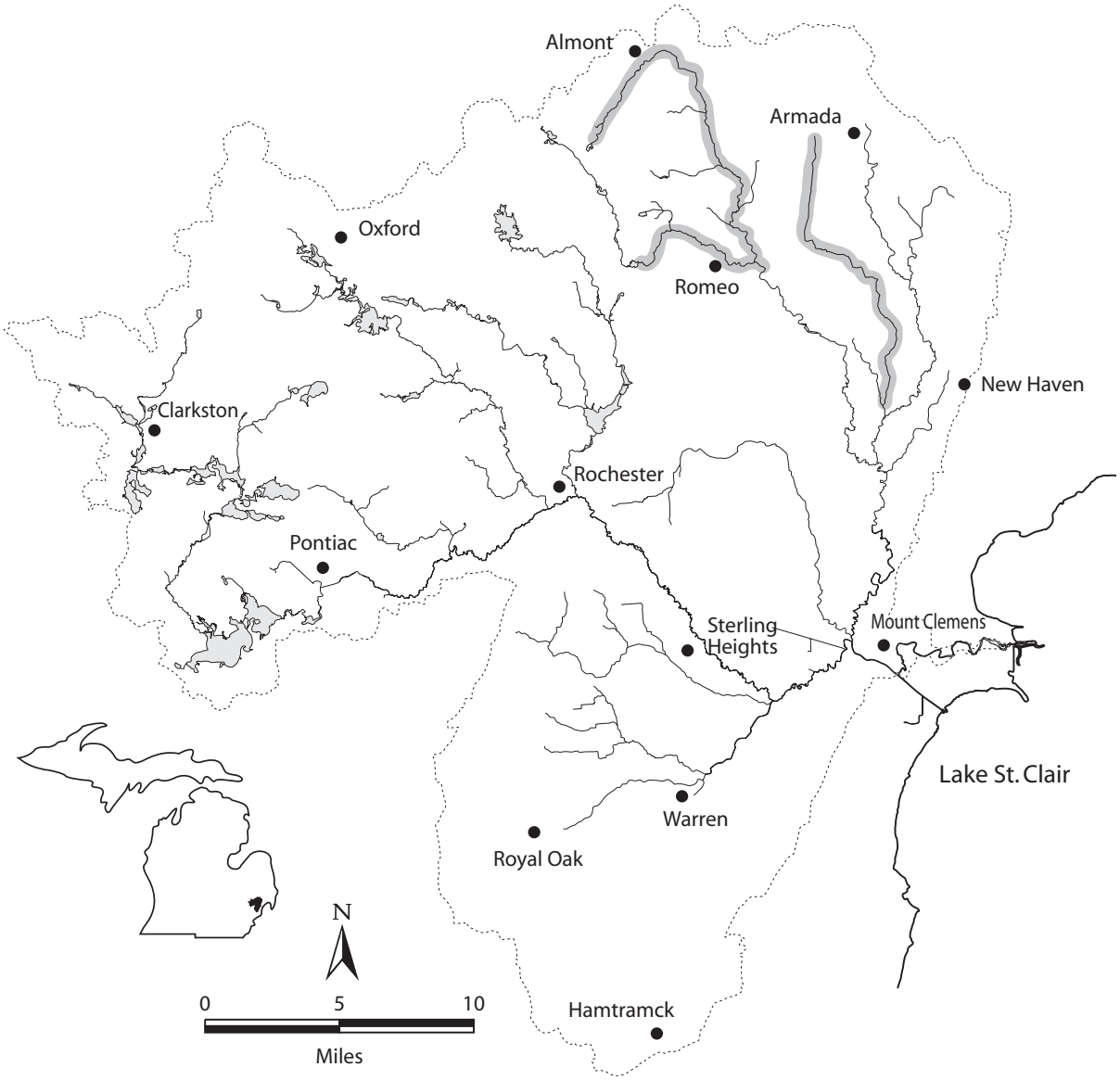
spawning - weedy or grassy shallows



Brassy minnow *Hybognathus hankinsoni*

Habitat:

feeding - cool acidic streams
- slow to moderate current
- sand or gravel substrate



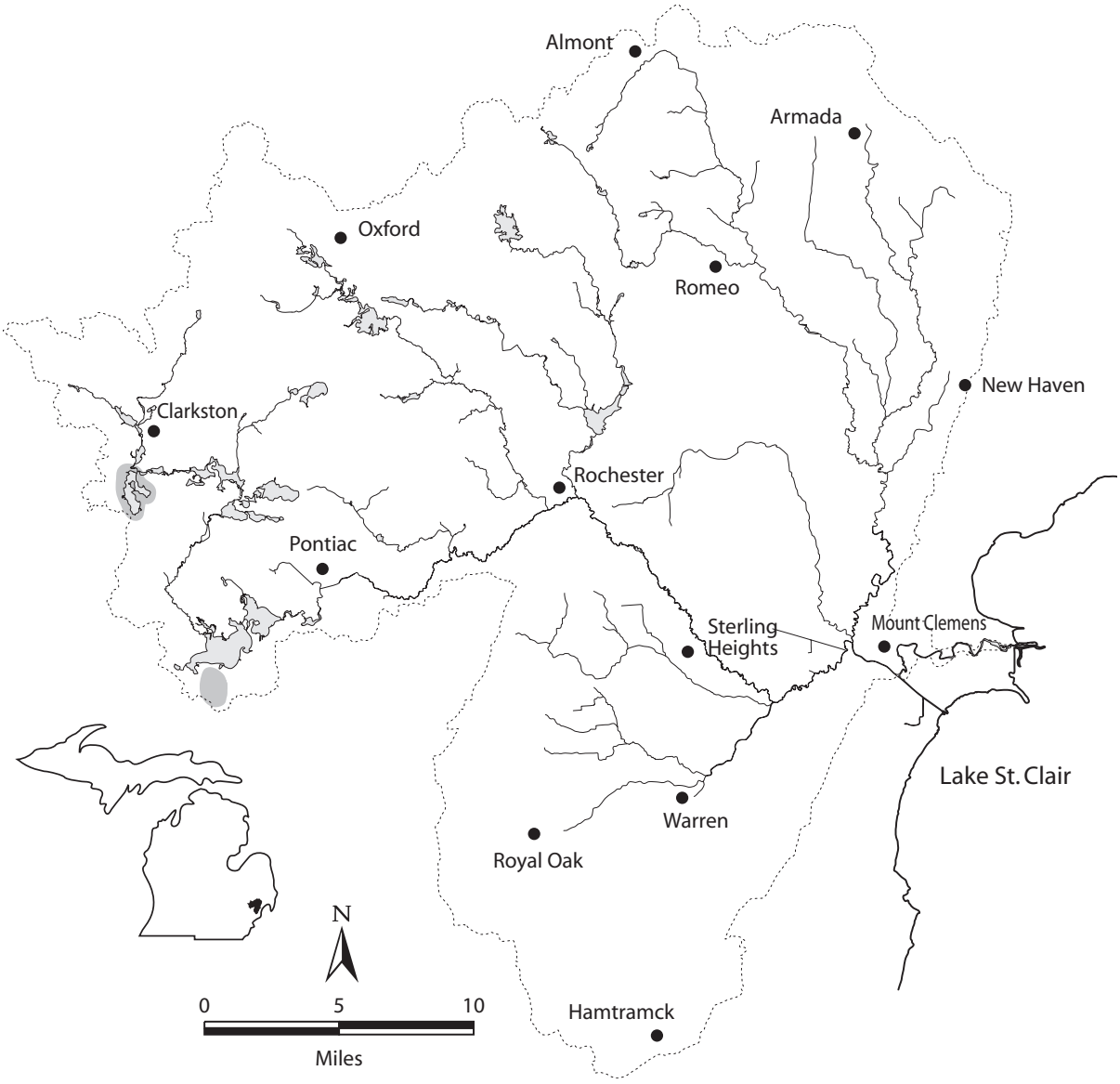
Striped shiner *Luxilus chrysocephalus*

Habitat:

feeding
- clear to slightly turbid streams and rivers
- gravel substrate
- low gradient

spawning
- gravel, boulder, bedrock, or sand substrate
- clear water in small streams with moderate to high gradient

winter refuge
- in large deep pools of low gradient rivers

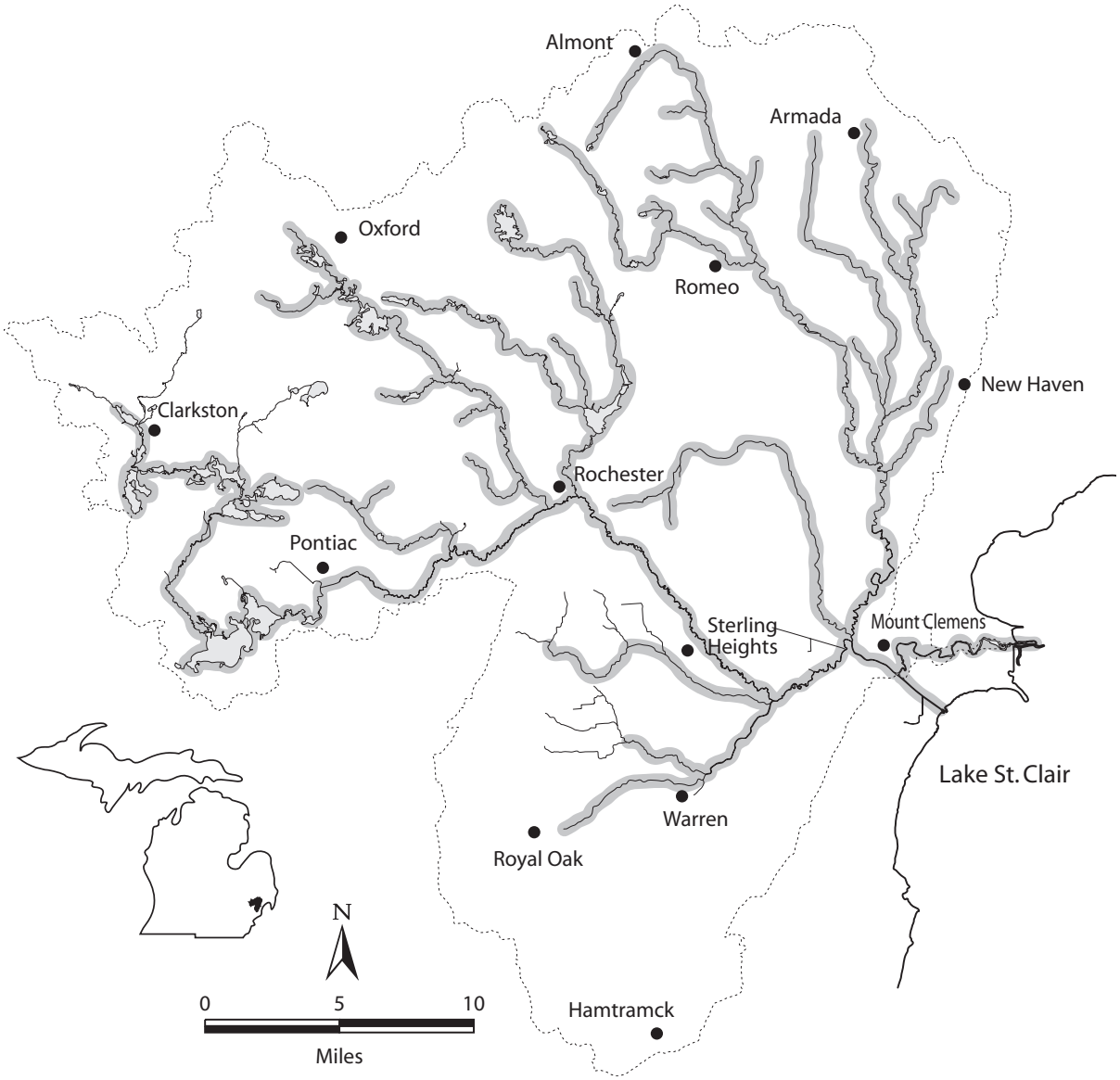


Common shiner *Luxilus cornutus*

Habitat:

feeding - small, clear, high-gradient streams and rivers, or shores of clear water lakes and impoundments
- gravel substrate
- can tolerate some submerged aquatic vegetation
- not very tolerant of turbidity or silted waters

spawning - gravel nests of other fish, especially those at the head of a riffle

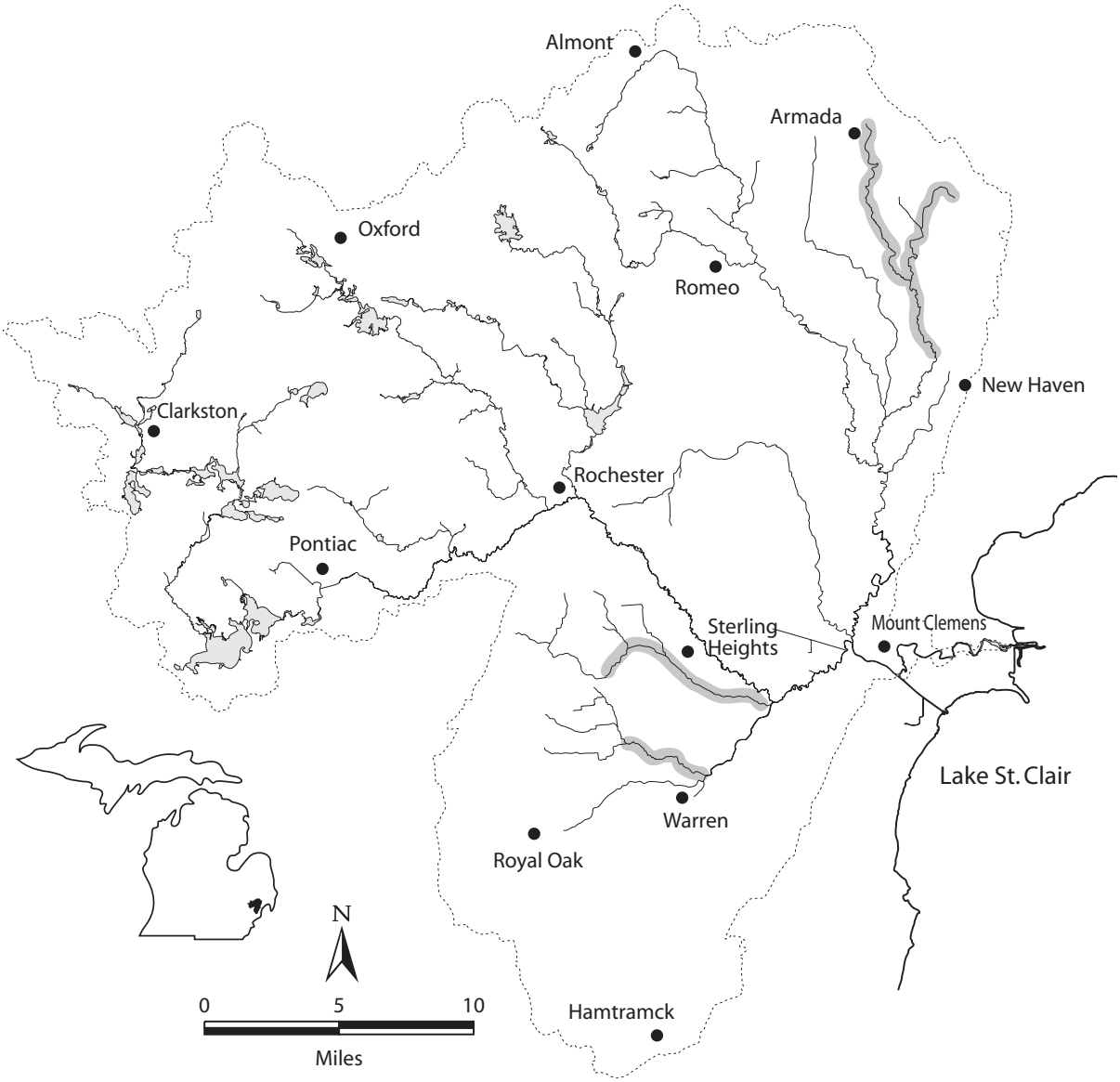


Redfin shiner *Lythrurus umbratilis*

Habitat:

feeding - clear, quiet warm rivers in weedy pools
- little to no current
- abundant submerged and emergent vegetation

spawning - over sand and gravel substrate in slow moving sections of streams

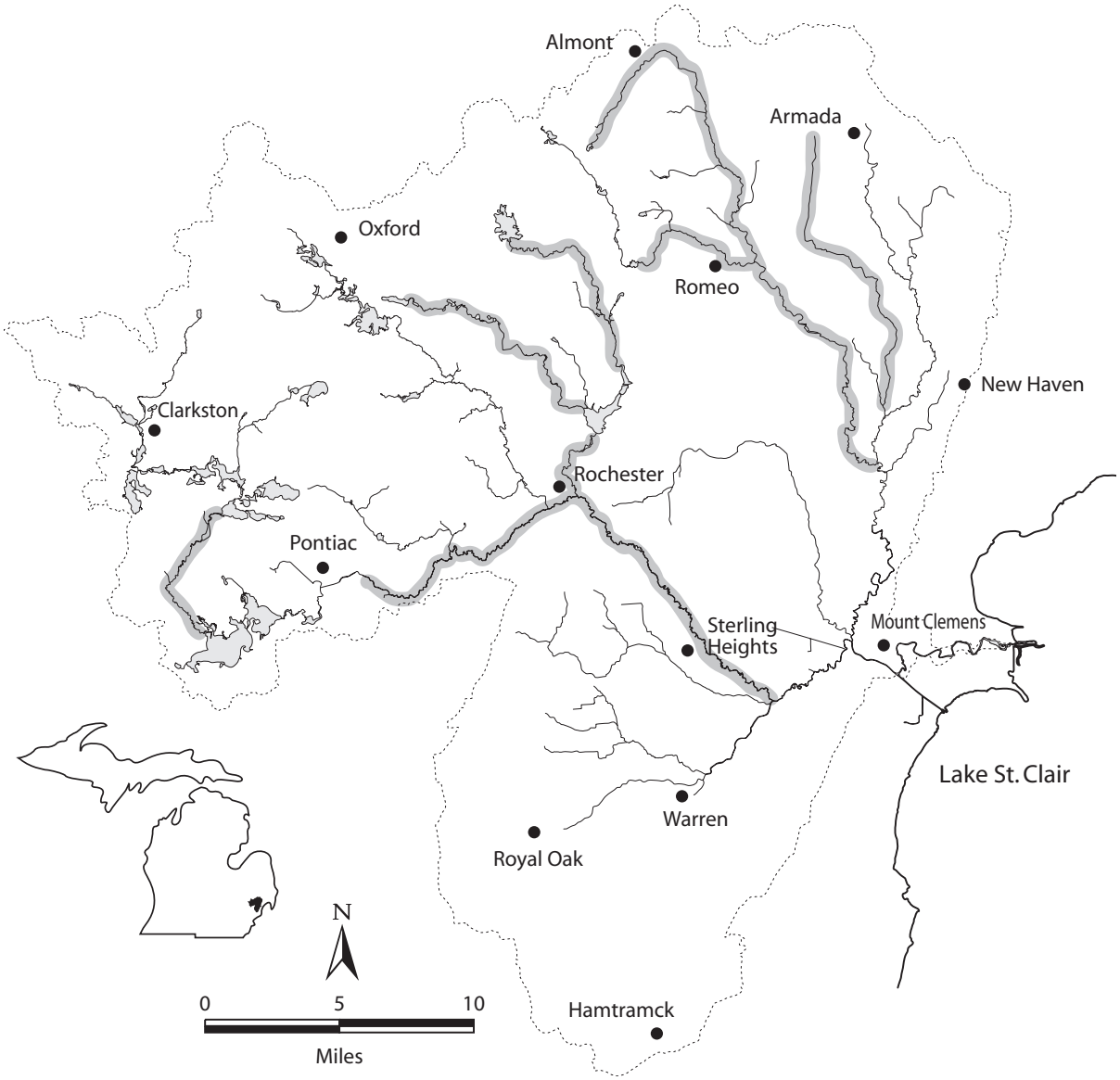


Hornyhead chub *Nocomis biguttatus*

Habitat:

feeding
- adults: near riffles
- young: near vegetation
- clear water, does not tolerate turbidity
- gravel substrate
- low gradient streams that are tributaries to large streams

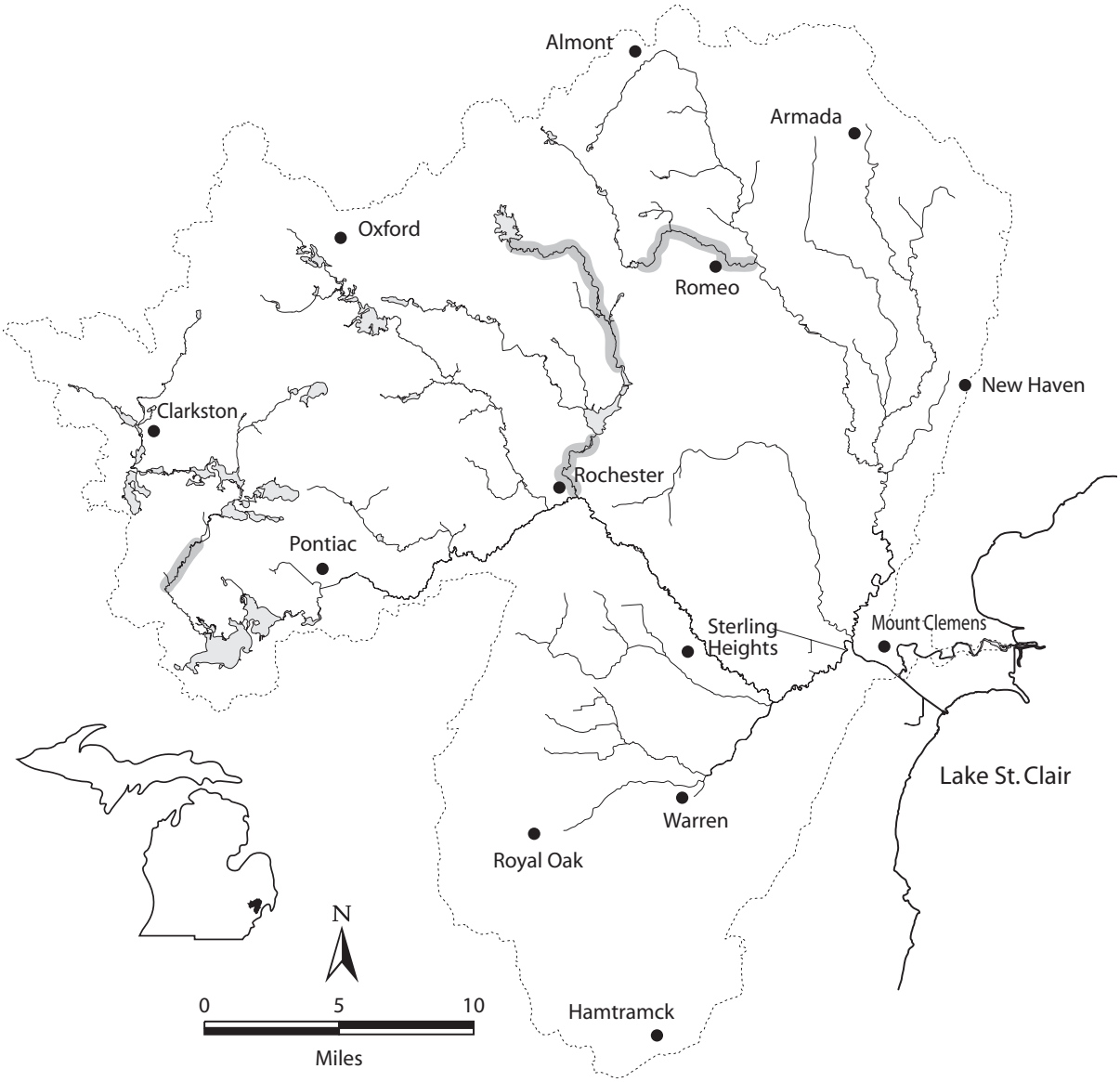
spawning
- large stones and pebbles present
- often below a riffle in shallow water
- gravel substrate



River chub *Nocomis micropogon*

Habitat:

feeding
- moderate to large streams
- moderate to high gradient
- gravel, boulder, or bedrock substrate
- little to no aquatic vegetation
- cannot tolerate turbidity or siltation

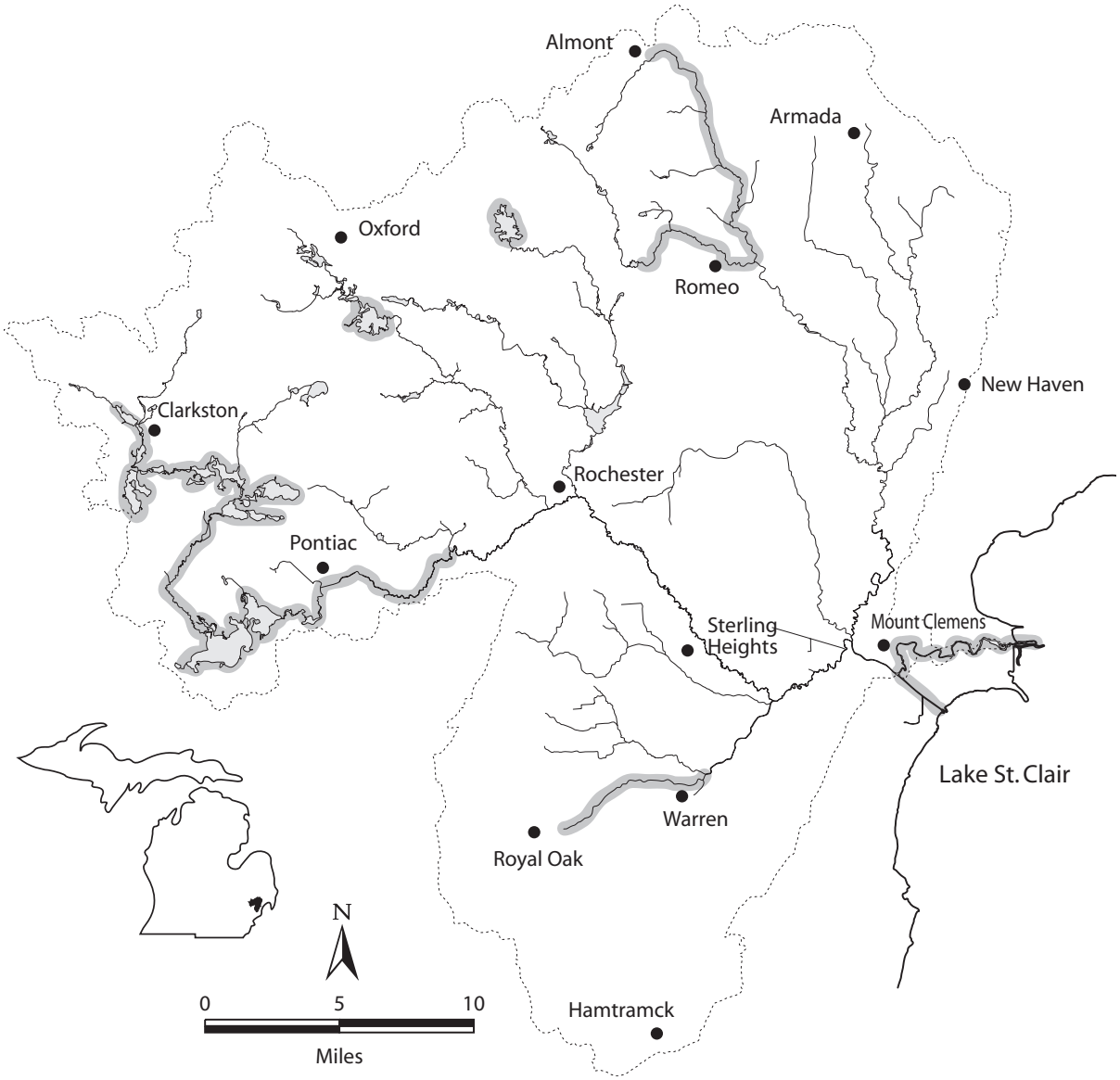


Golden shiner *Notemigonus crysoleucas*

Habitat:

feeding - lakes and impoundments and quiet pools of low gradient streams
- clear shallow water
- heavy vegetation

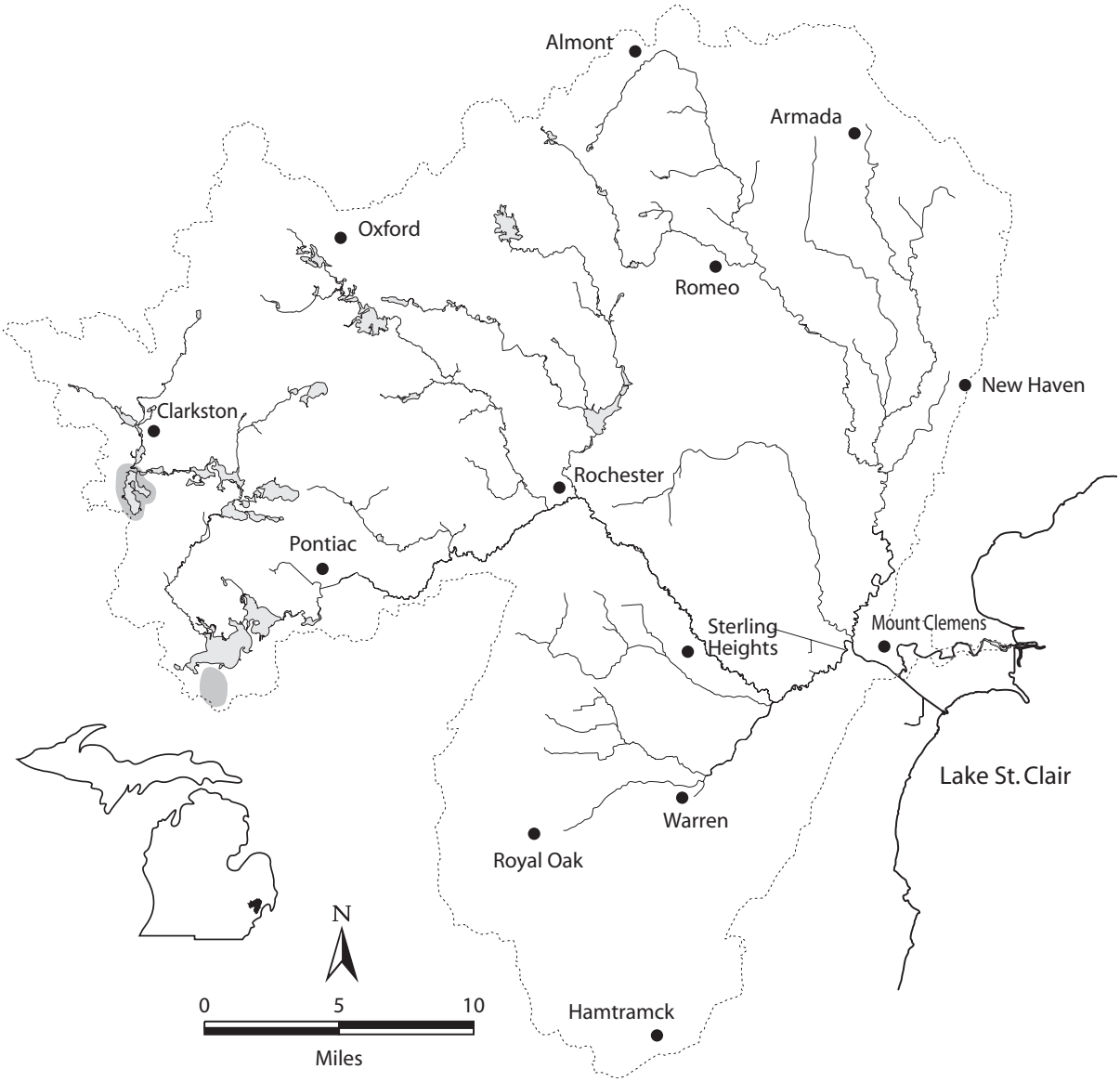
spawning - vegetation



Pugnose shiner *Notropis anogenus*

Habitat:

feeding - very clear water of lakes, impoundments, and low-gradient streams
- aquatic vegetation
- clean sand, marl, or organic debris substrate
- extremely intolerant of turbidity

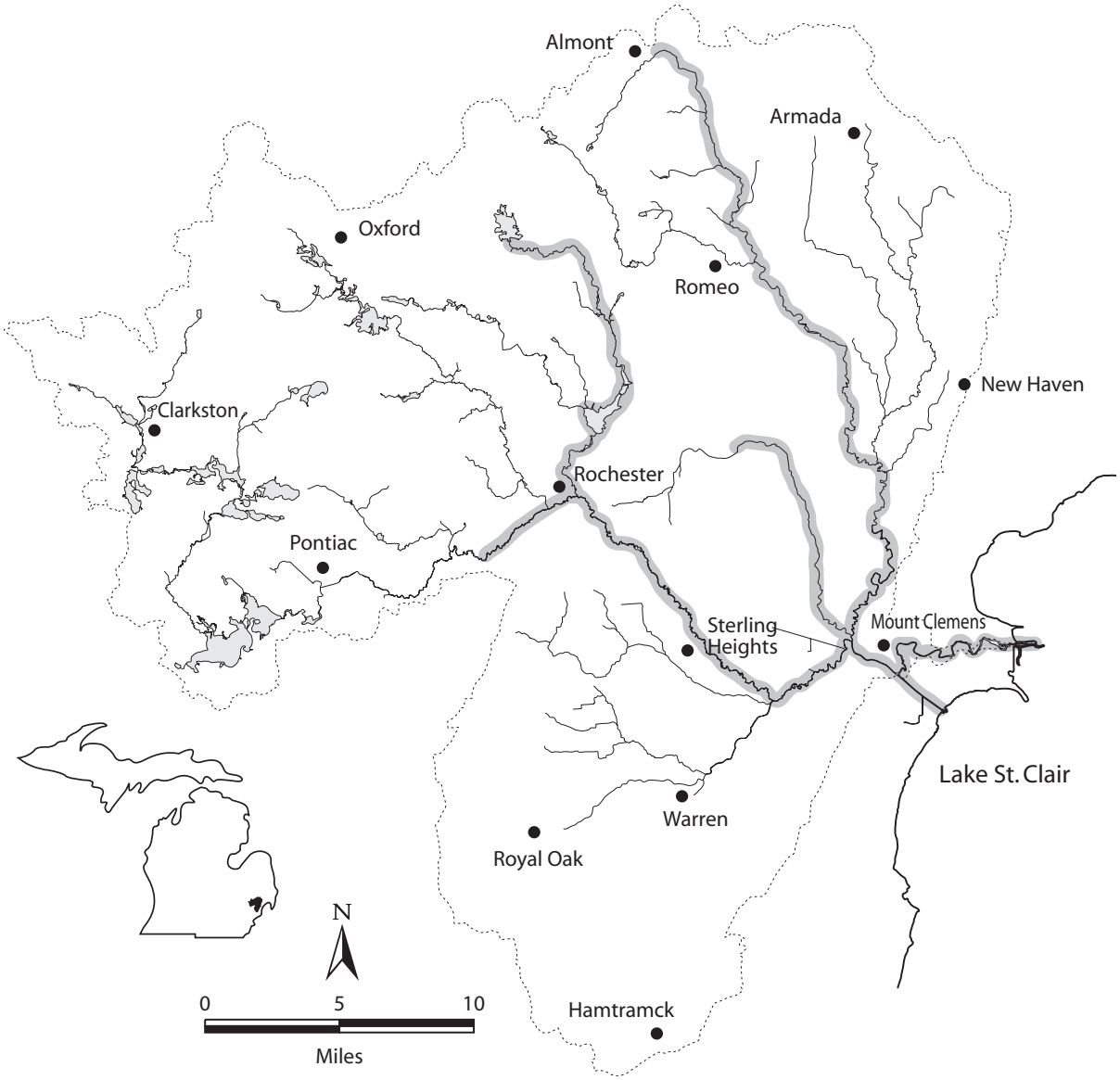


Emerald shiner *Notropis atherinoides*

Habitat:

feeding
- open-large stream channels and lake
- low to moderate gradient
- range of turbidities and bottom types
- midwater or surface preferred, substrate of little importance
- avoids rooted vegetation

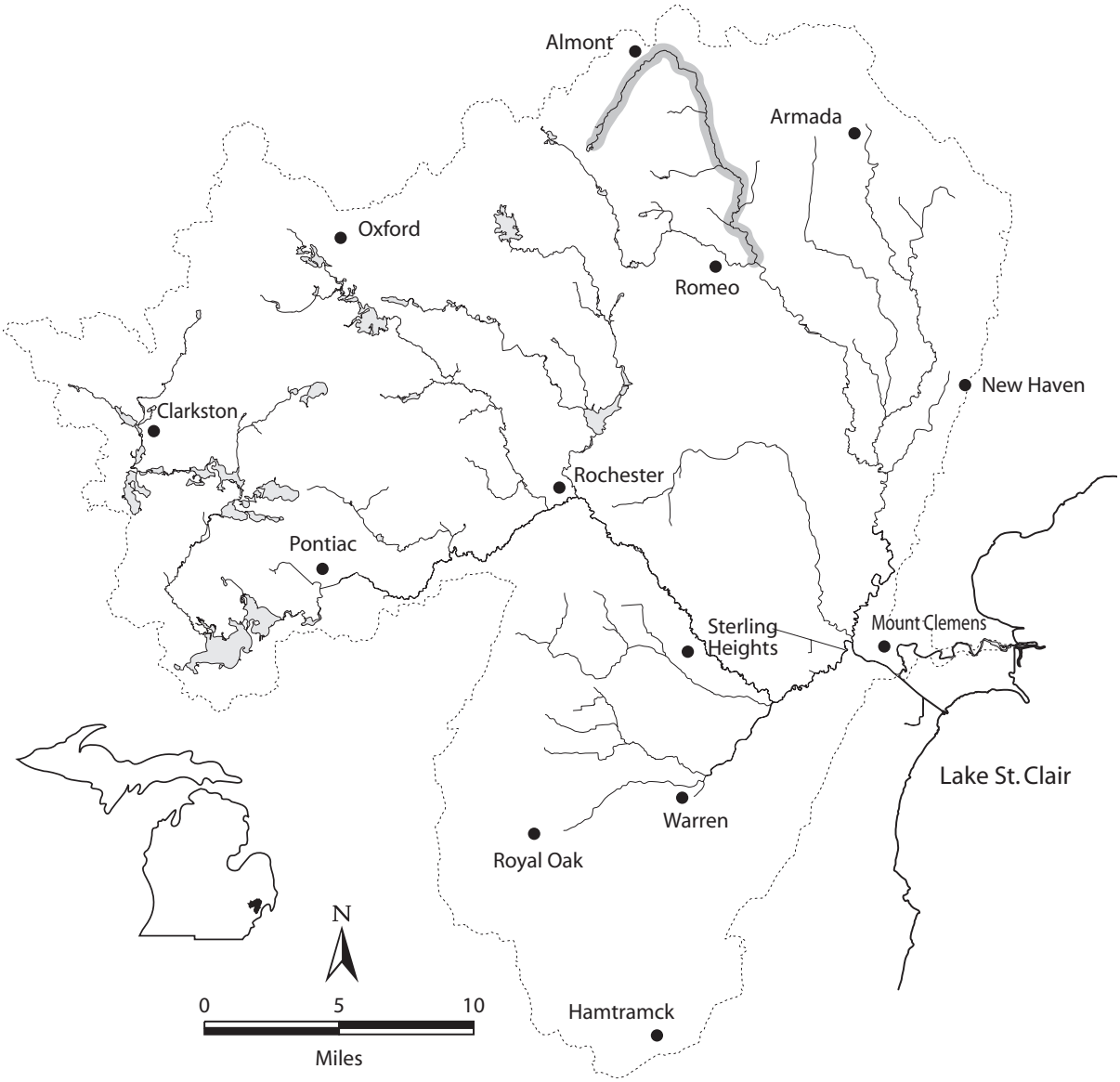
spawning
- sand or firm mud substrate or gravel shoals



Bigmouth shiner *Notropis dorsalis*

Habitat:

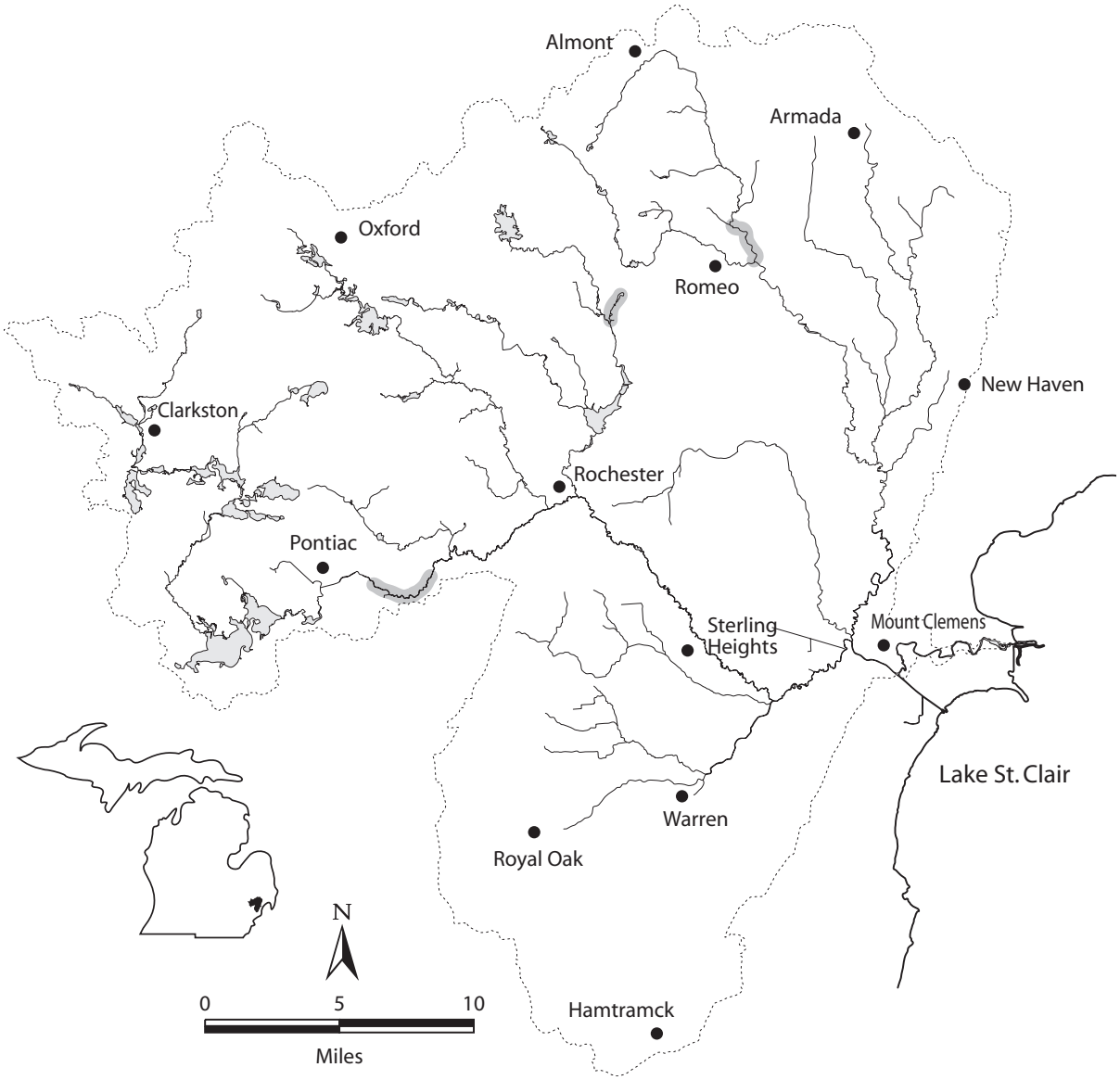
feeding - small clear streams
- good flows
- sand or gravel substrate
- open water, free from vegetation



Blackchin shiner *Notropis heterodon*

Habitat:

feeding - lakes, impoundments, and quiet pools in streams and rivers
- clear water
- clean sand, gravel, or organic debris substrate
- dense beds of submerged aquatic vegetation
- cannot tolerate turbidity, silt, or loss of aquatic vegetation

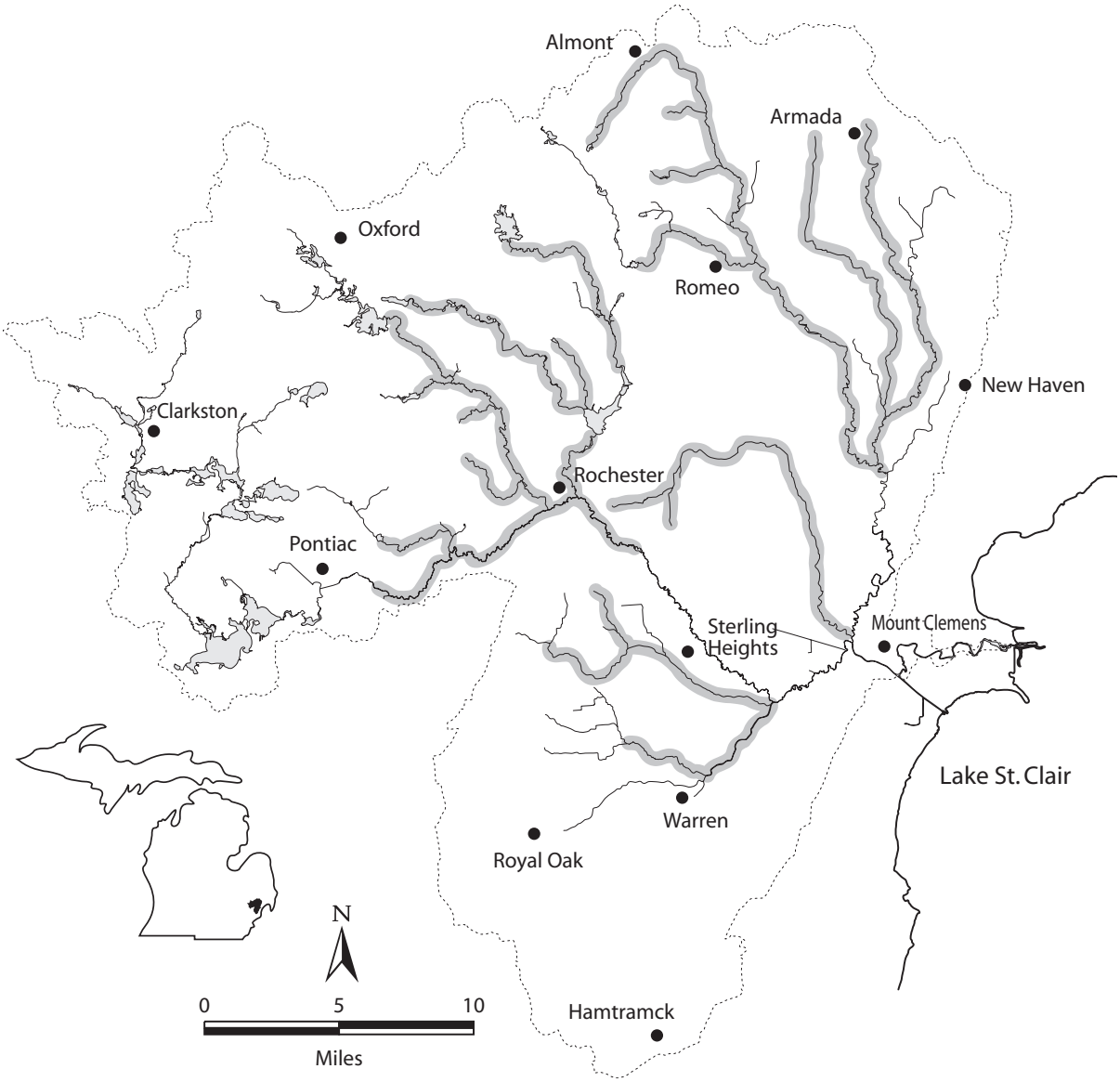


Blacknose shiner *Notropis heterolepis*

Habitat:

feeding
- clear lakes, impoundments, and pools of small, clear, low-gradient streams
- aquatic vegetation
- clean sand, gravel, marl, muck, peat, or organic debris substrate
- cannot tolerate much turbidity, much siltation, or loss of aquatic vegetation

spawning
- sandy substrate

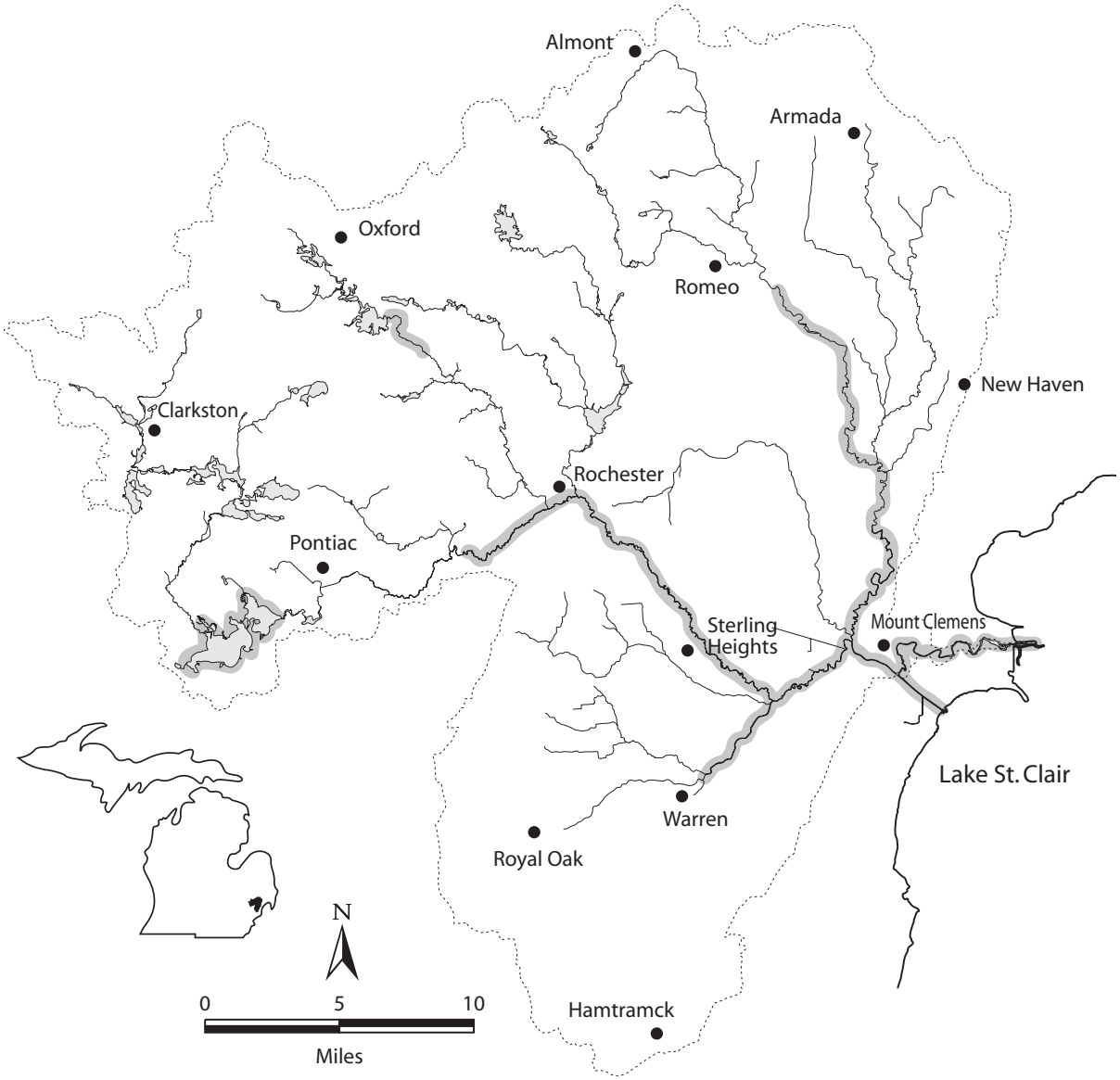


Spottail shiner *Notropis hudsonius*

Habitat:

feeding
- large rivers, lakes, and impoundments
- firm sand and gravel substrate
- low current
- sparse to moderate vegetation
- avoids turbidity

spawning
- over sandy shoals or gravelly riffles
- near the mouths of small streams

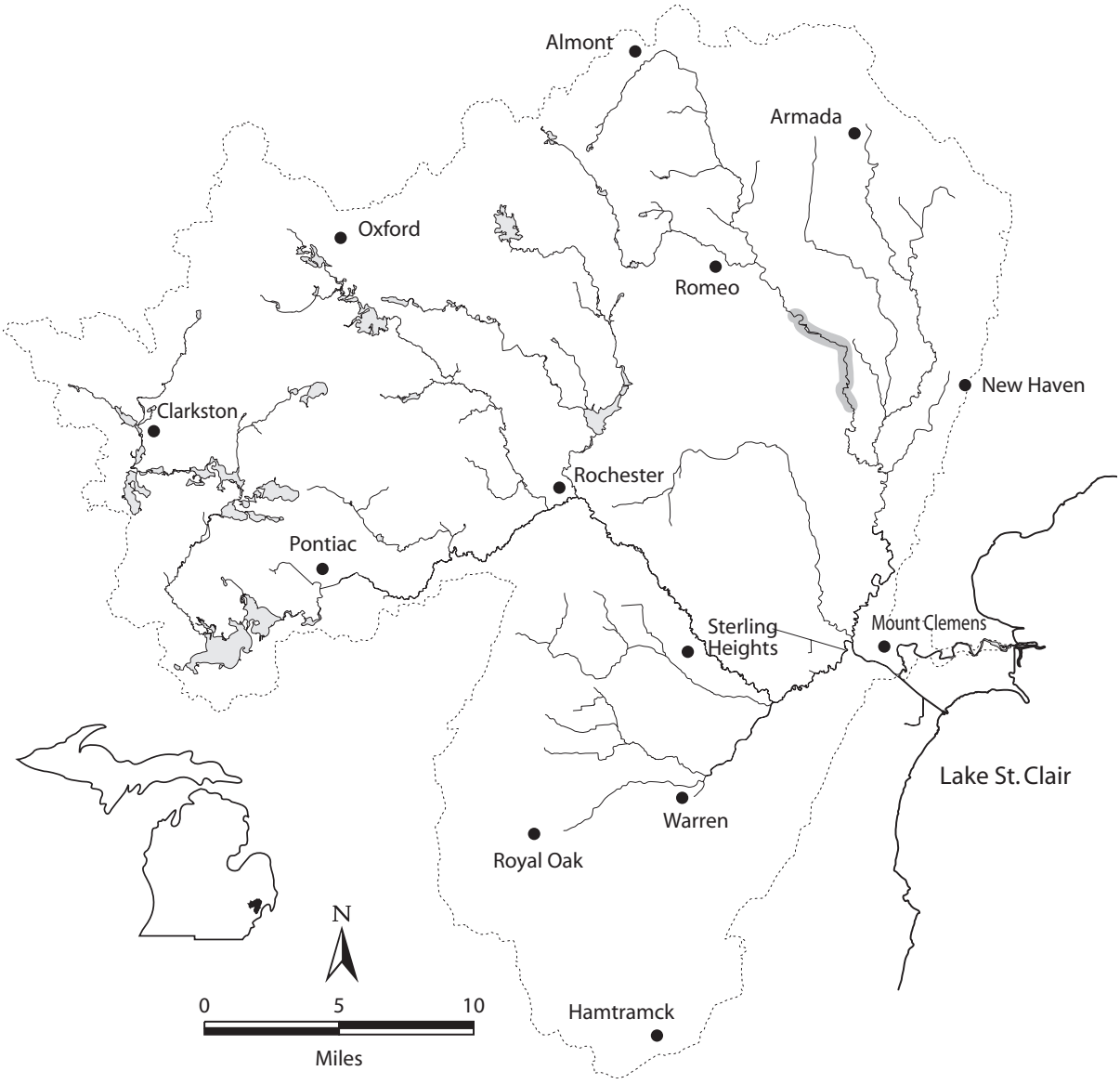


Rosyface shiner *Notropis rubellus*

Habitat:

feeding
- moderate sized streams
- moderate to high gradient
- gravel or sand substrate; intolerant of silt substrate
- clear water; intolerant of turbidity

spawning
- on nests of hornyhead chub, chestnut lamprey, and redhorses
- sandy-gravel, gravel or bedrock substrate
- shallow high gradient water

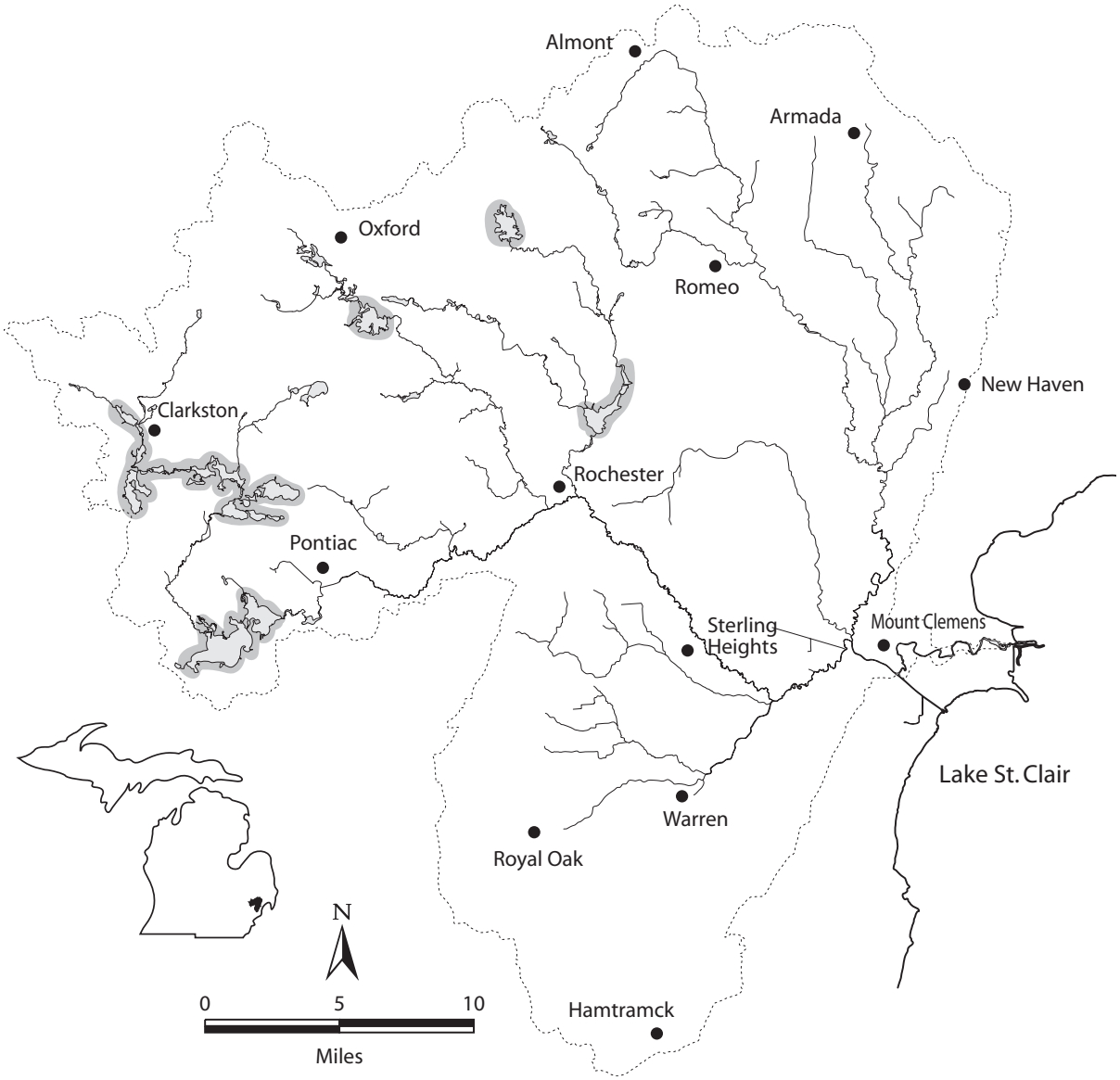


Sand shiner *Notropis stramineus*

Habitat:

feeding
- sand and gravel substrate
- shallow pools in medium size streams, lakes, and impoundments
- clear water and low gradient
- rooted aquatic vegetation preferred
- tolerant of some inorganic pollutants provided substrate is not covered

spawning
- clean gravel or sand substrate

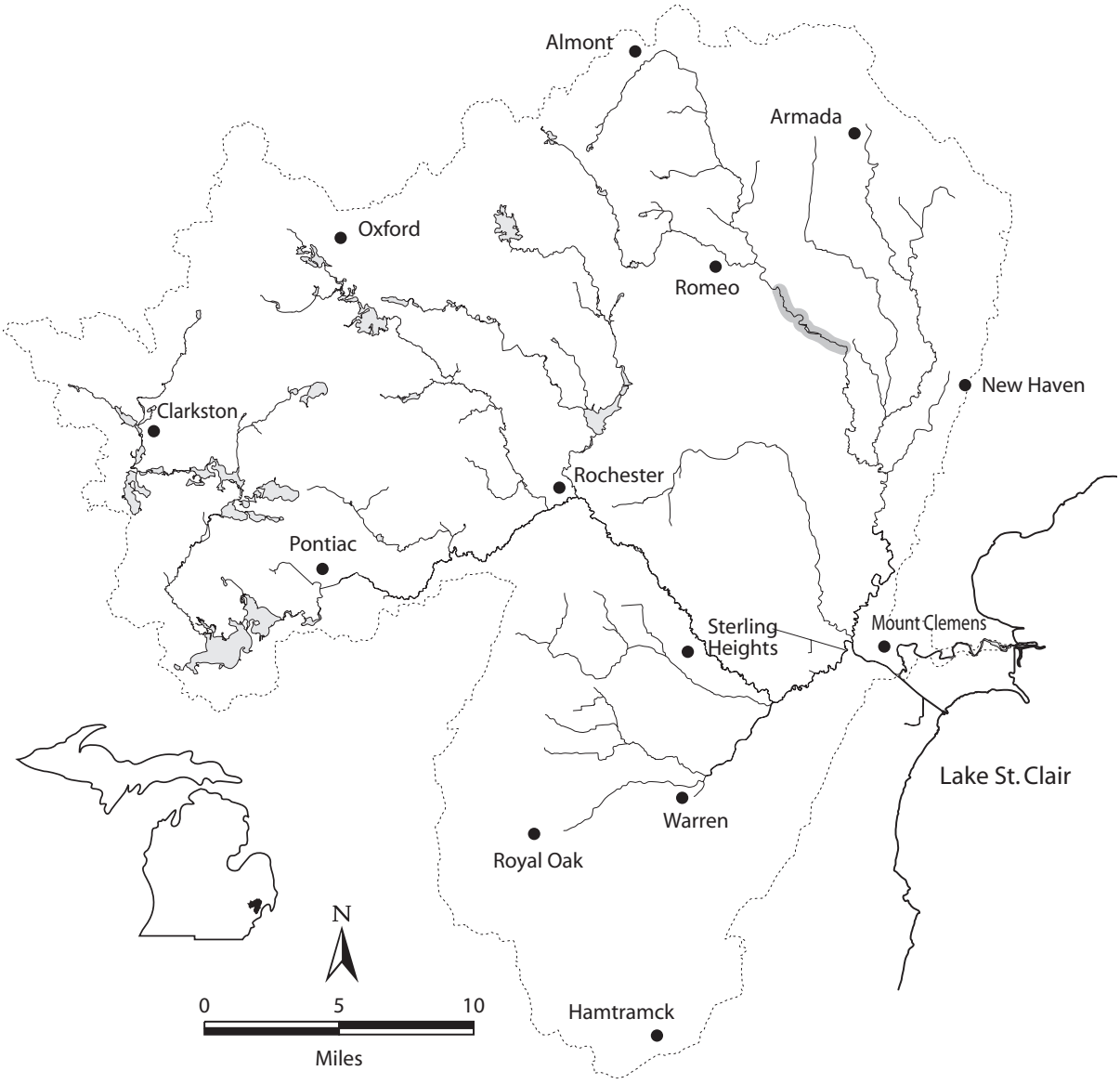


Mimic shiner *Notropis volucellus*

Habitat:

feeding - pools and backwater of streams, moderately weedy lakes and impoundments
- quiet or still water
- clear shallow water

spawning - aquatic vegetation necessary

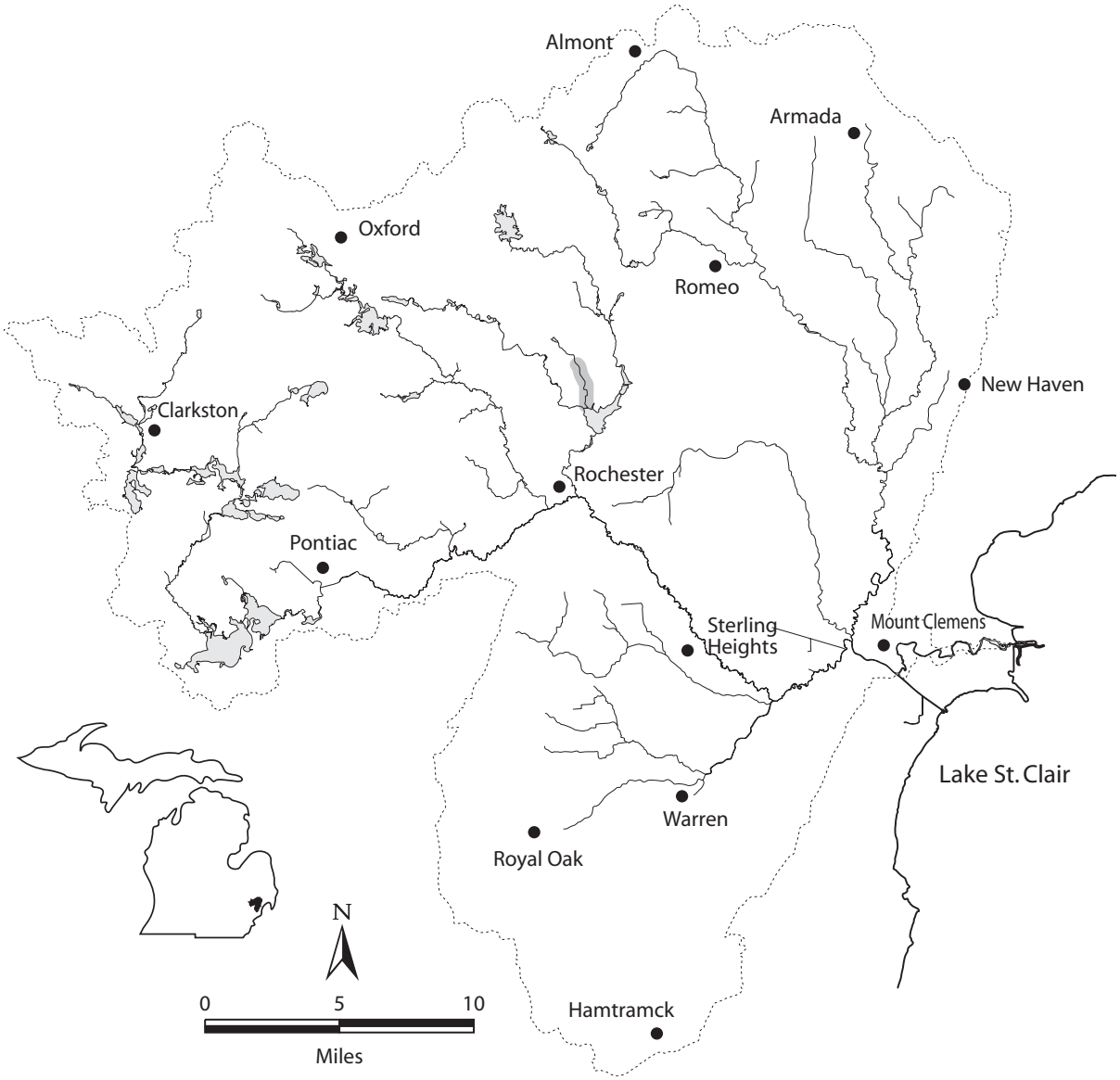


Northern redbelly dace *Phoxinus eos*

Habitat:

feeding - slow current
- in boggy lakes and streams
- detritus or silt substrate
- clear to slightly turbid water

spawning - filamentous algae needed for egg deposition

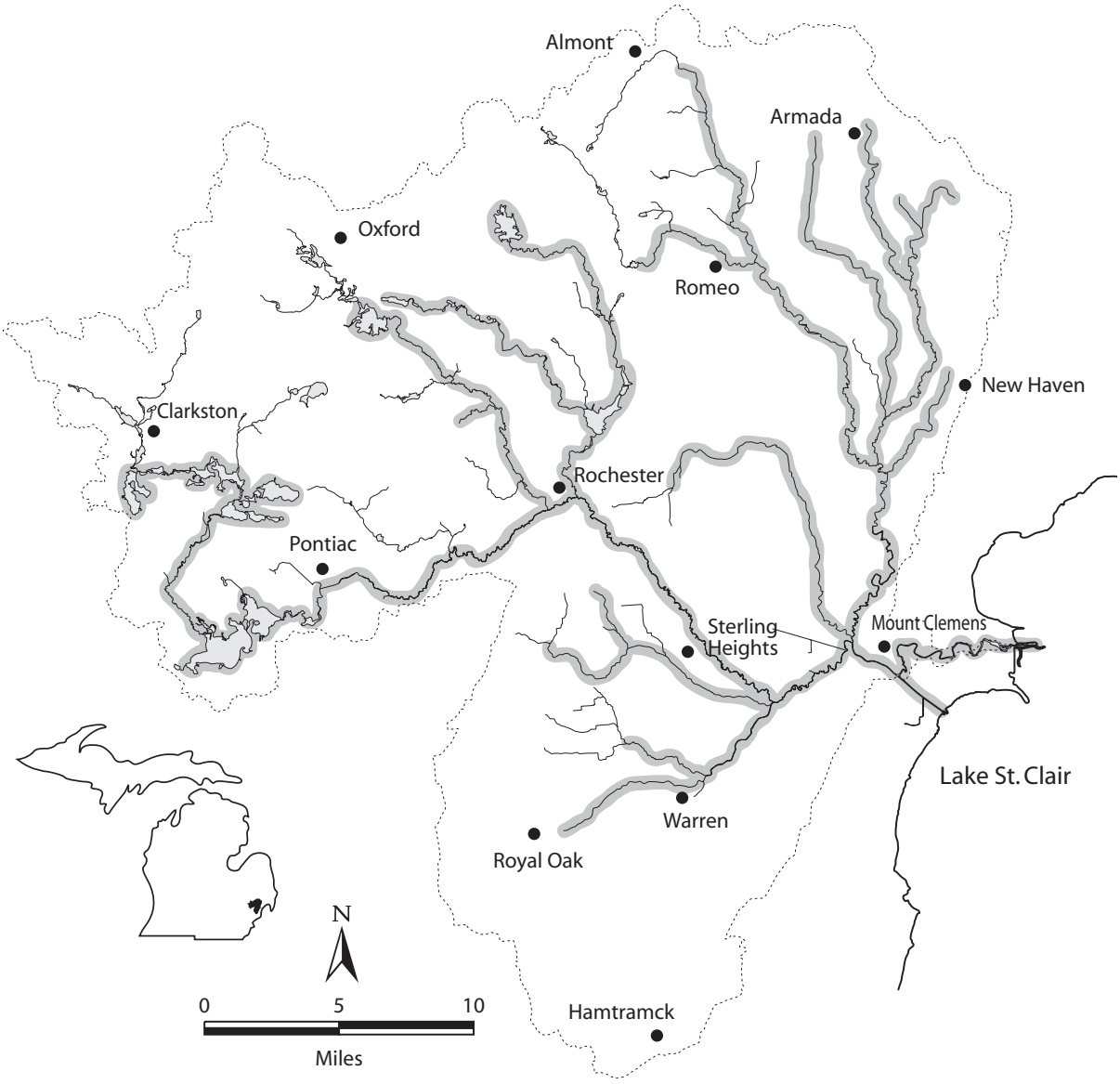


Bluntnose minnow *Pimephales notatus*

Habitat:

feeding
- quiet pools and backwaters of medium to large streams, lakes, and impoundments
- clear warm water
- some aquatic vegetation
- firm substrates
- tolerates all gradients, turbidity, organic and inorganic pollutants

spawning
- eggs deposited on the underside of flat stones or objects
- nests in sand or gravel substrate

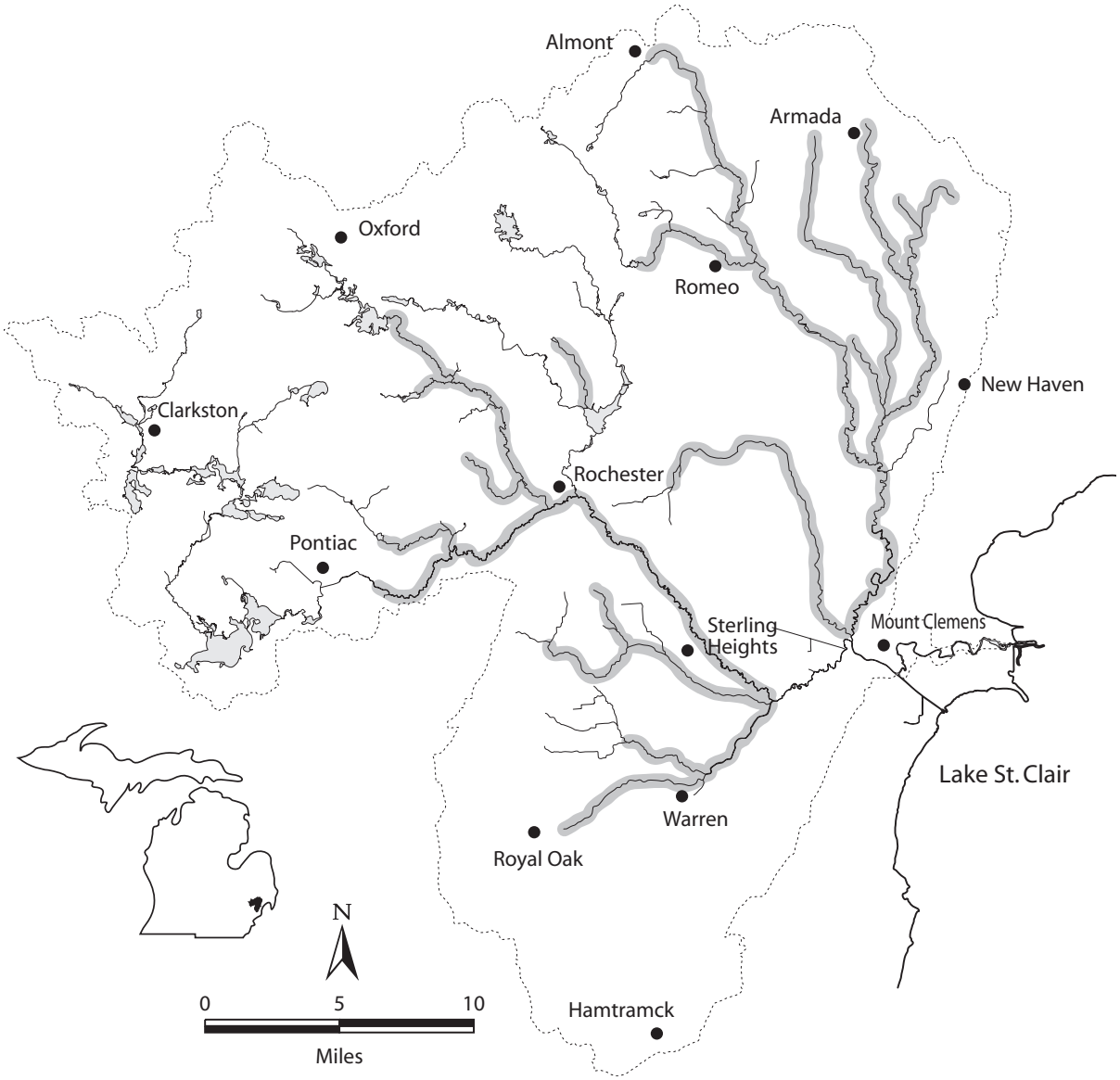


Fathead minnow *Pimephales promelas*

Habitat:

feeding - pools of small streams, lakes, and impoundments
- tolerant of turbidity, high temperatures, and low oxygen

spawning - on underside of objects in water 2 to 3 feet deep
- prefer sand, marl, or gravel substrate



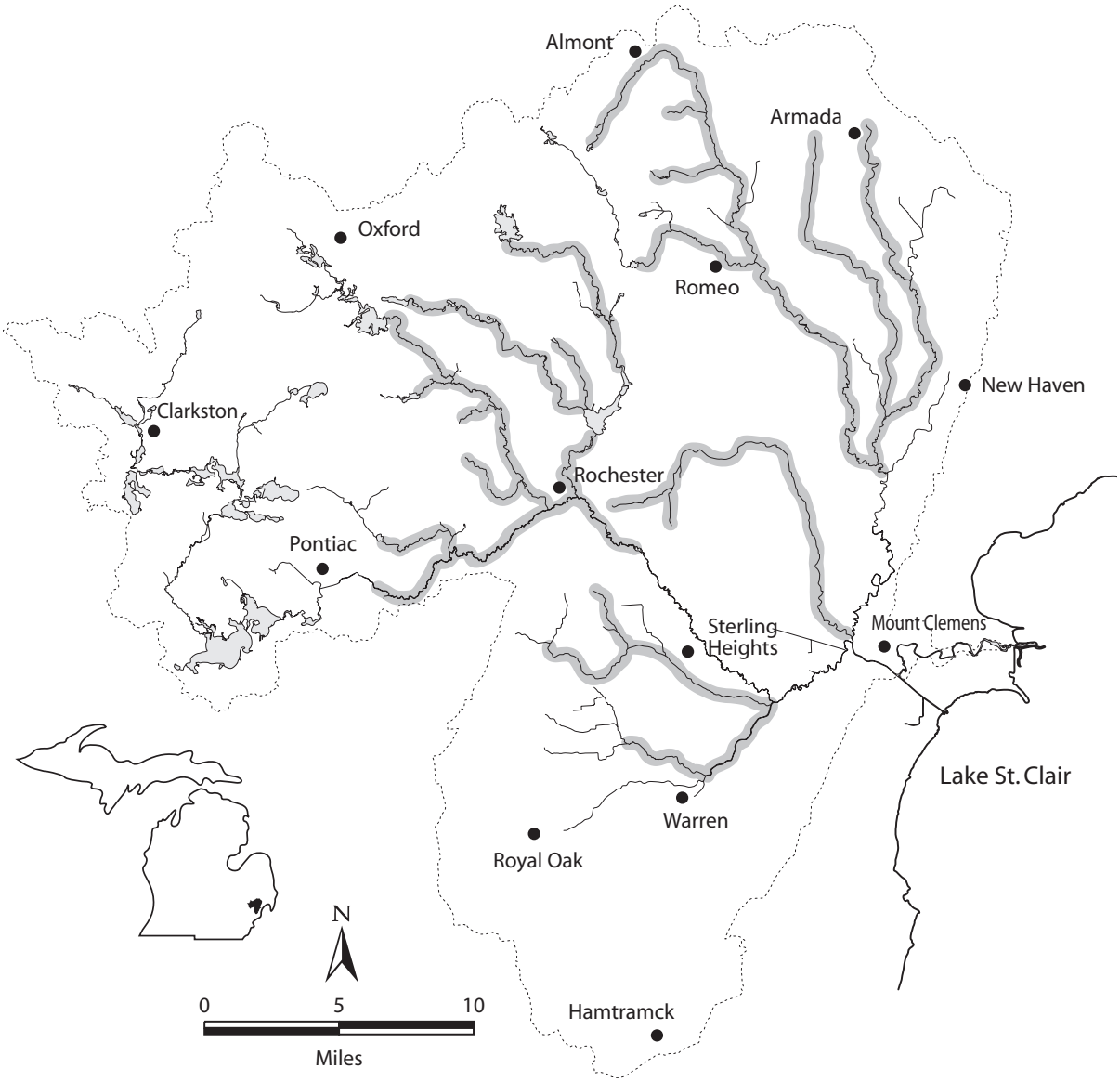
Western blacknose dace *Rhinichthys obtusus*

Habitat:

feeding - moderate to high gradient streams
- sand and gravel substrate
- clear cool water in pools with deep holes and undercut banks
- does not tolerate turbidity and silt well

spawning - riffles with gravel substrate and fast current

winter refuge - larger waters



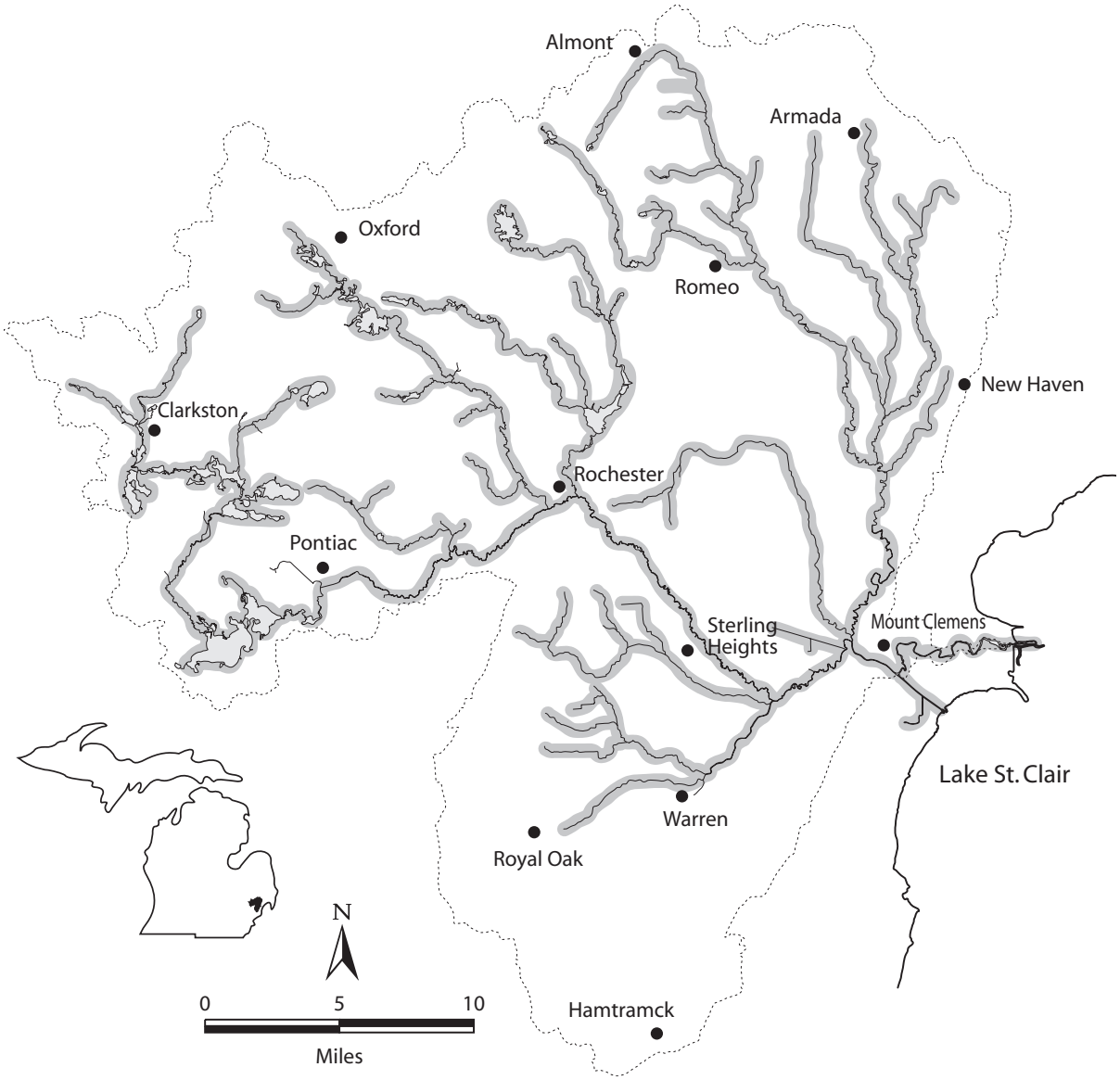
Creek chub *Semotilus atromaculatus*

Habitat:

feeding - streams, rivers, or shore waters of lakes and impoundments
- can tolerate intermittent flows
- tolerates moderate turbidity

spawning - gravel nests
- low current

winter refuge - deeper pools and runs

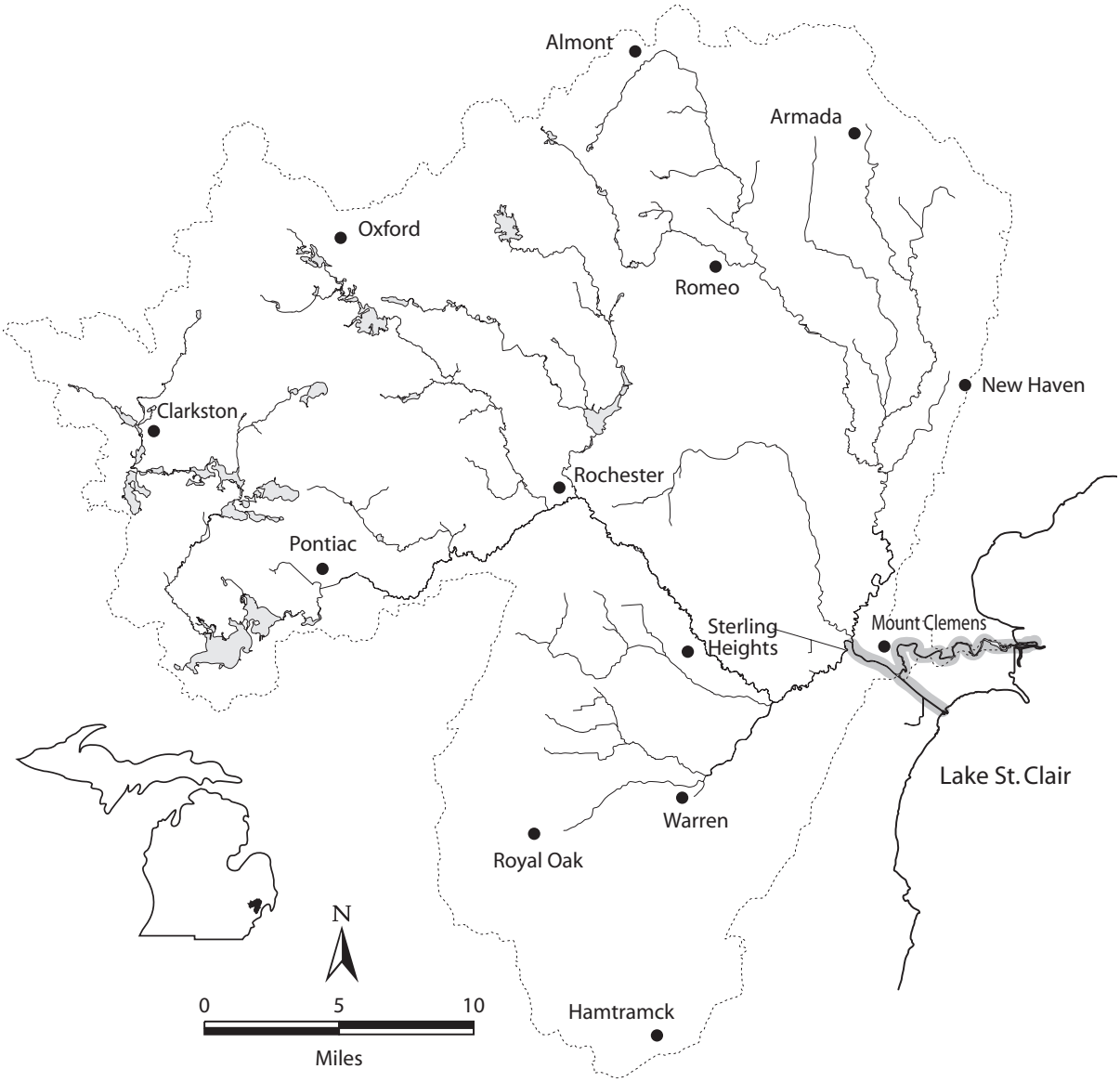


Quillback *Carpoides cyprinus*

Habitat:

feeding
- clear to turbid water
- Lake St. Clair
- sand, sandy gravel, sandy silt, or clay-silt substrate
- medium- to low-gradient rivers and streams; also lakes and sloughs

spawning
- streams or overflow areas of bends of rivers or bays of lakes
- scatter eggs over sand or mud substrate

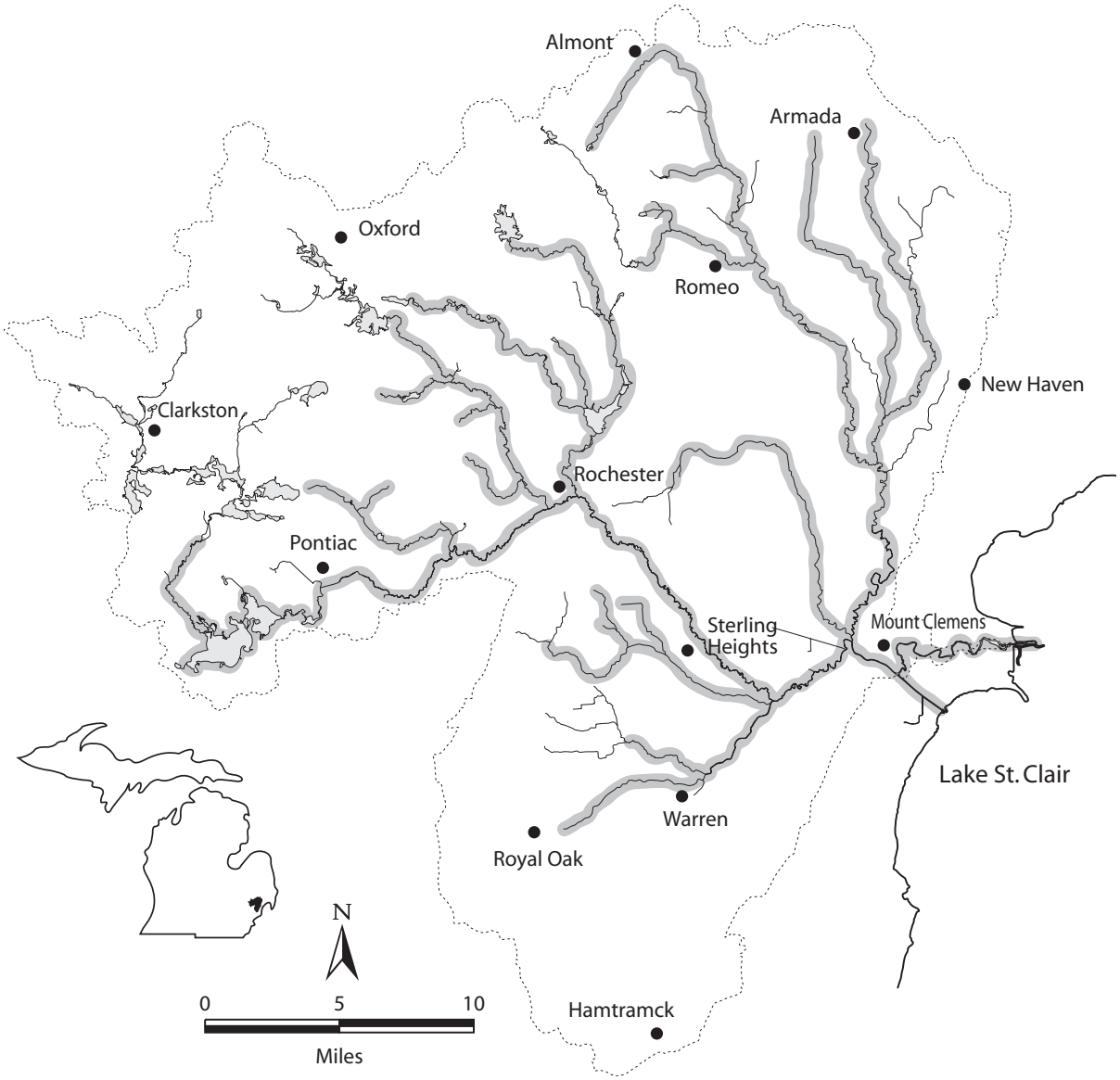


White sucker *Catostomus commersonii*

Habitat:

feeding - streams, rivers, lakes, and impoundments
- can inhabit highly turbid and polluted waters

spawning - quiet gravelly shallow areas of streams

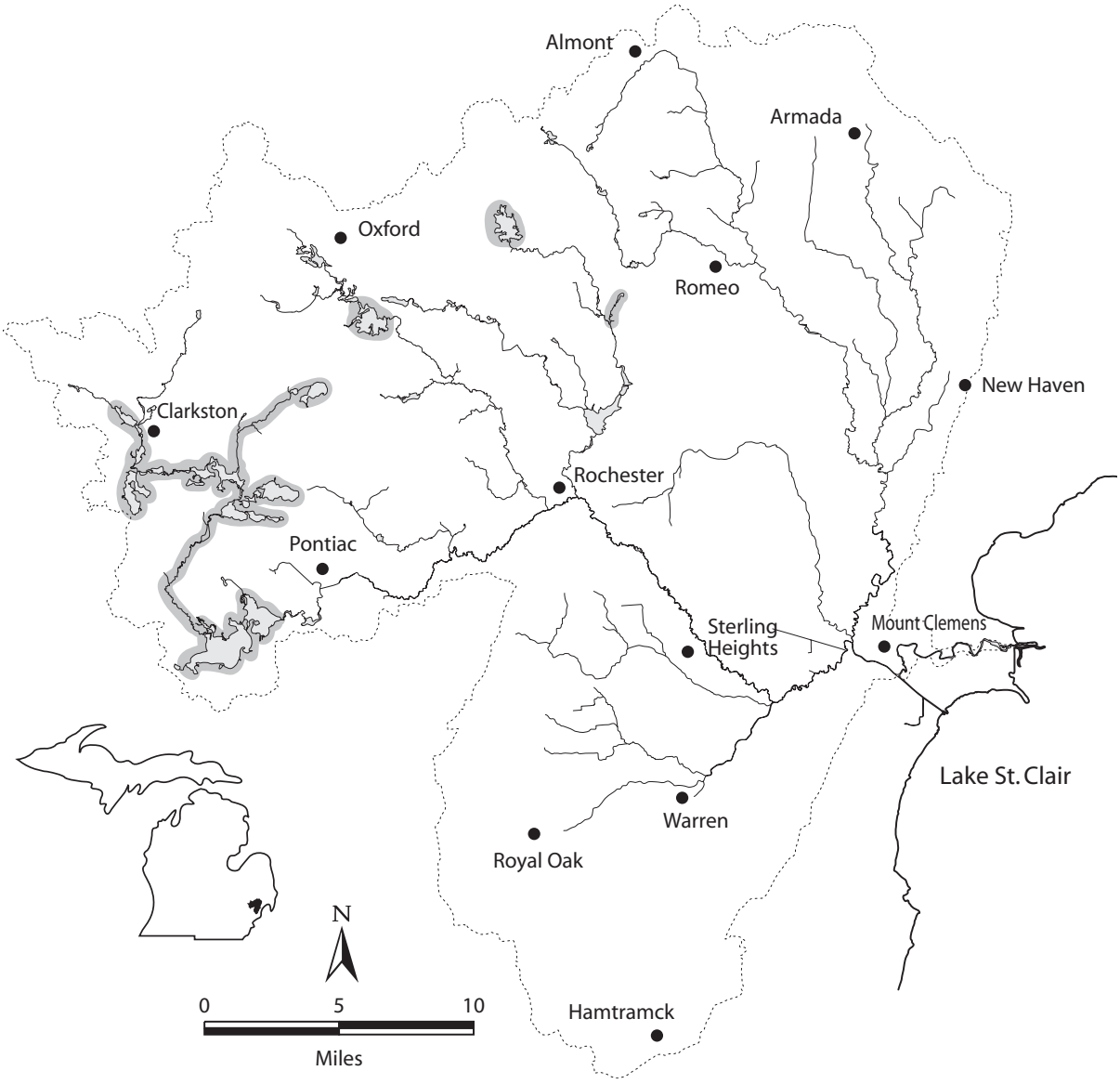


Lake chubsucker *Erimyzon sucetta*

Habitat:

feeding
- larger clear streams, rivers, lakes, and impoundments
- cannot tolerate turbid water
- low gradient
- prefers dense vegetation over substrate of sand or silt mixed with organic debris

spawning
- small clear streams with moderate to high gradient
- sand or gravel substrate; no clayey silt



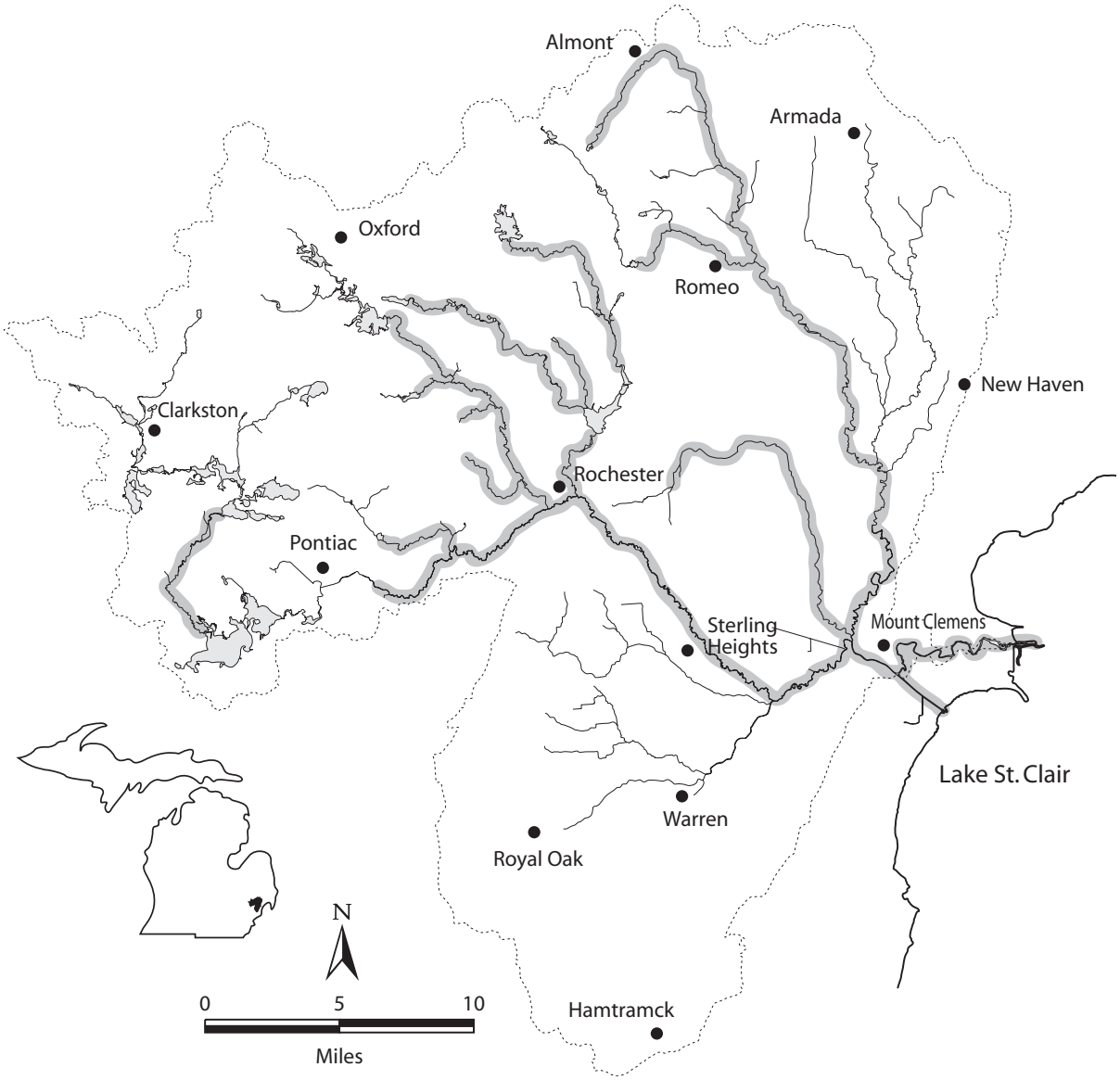
Northern hog sucker *Hypentelium nigricans*

Habitat:

feeding
- gravel or rubble substrate
- riffles and adjacent pools of warm shallow streams
- clear water
- doesn't like turbidity or siltation
- avoids profuse amounts of aquatic vegetation

spawning
- riffles
- shallow gravel substrate
- high gradient

winter refuge
- deeper quieter pools

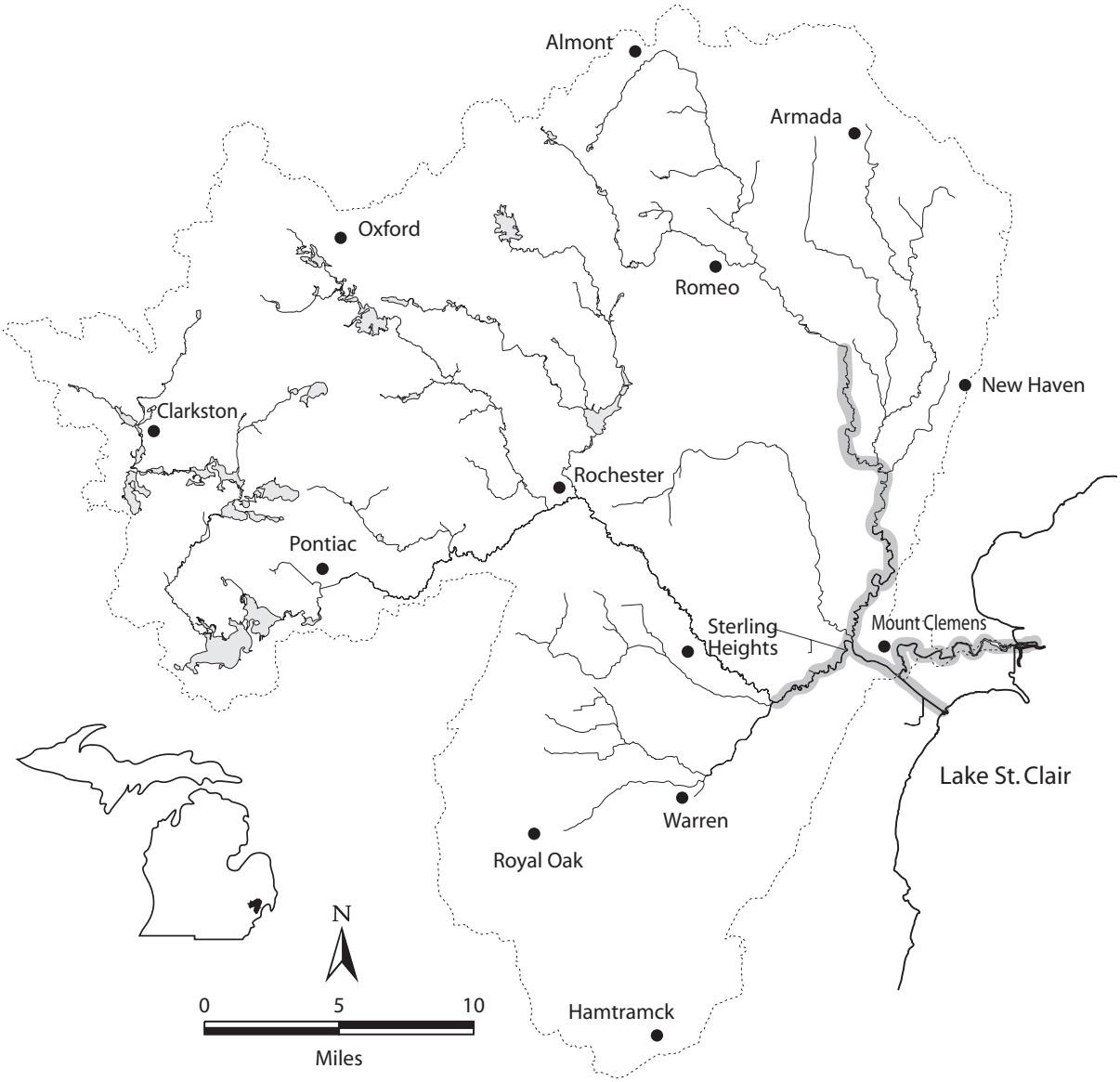


Spotted sucker *Minytrema melanops*

Habitat:

feeding - clear warm rivers (pools, backwaters) with little current
- abundant vegetation
- soft substrate with organic debris
- intolerant of turbidity

spawning - riffles

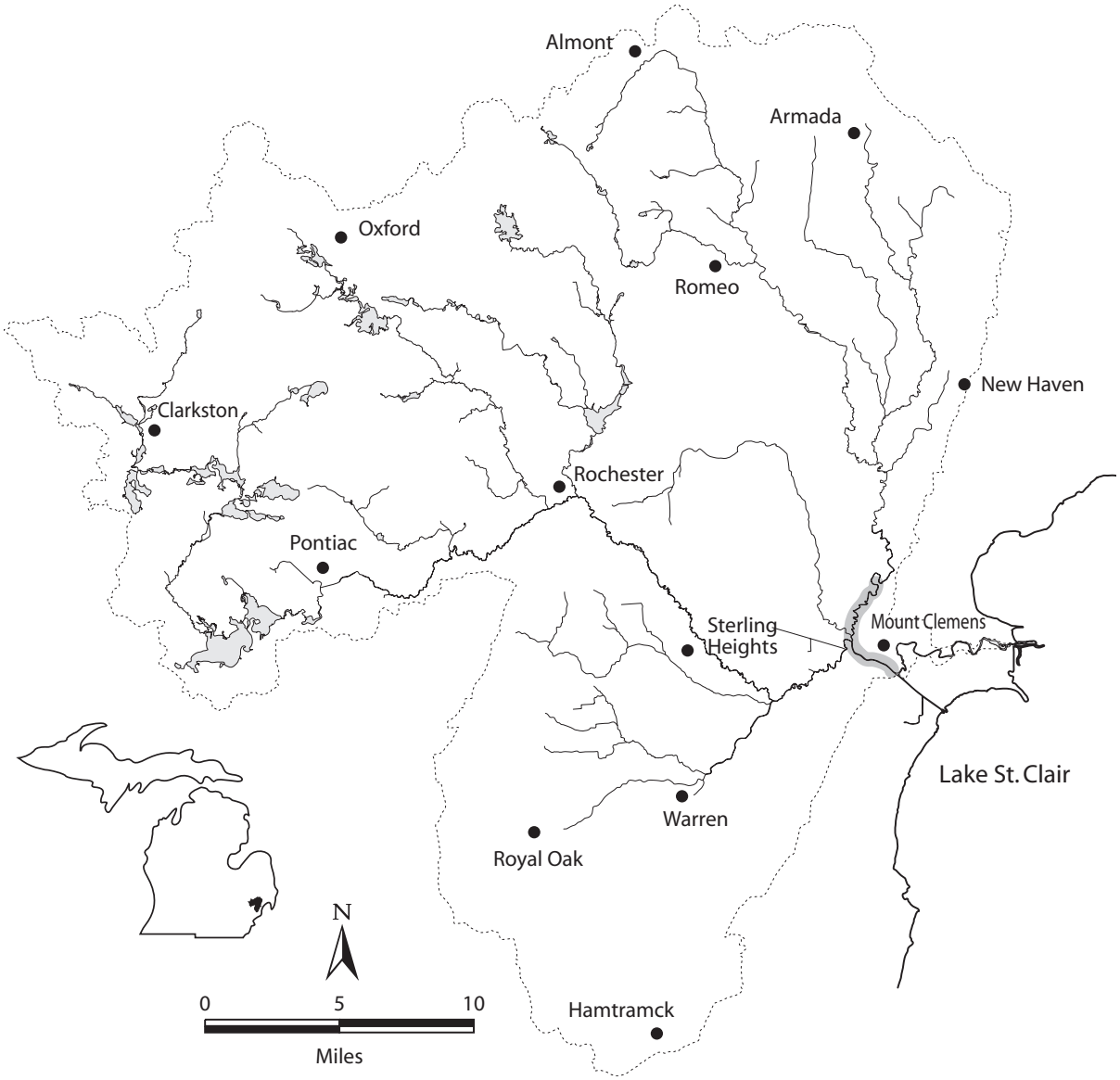


Silver redhorse *Moxostoma anisurum*

Habitat:

feeding
- streams, rivers, lakes, and impoundments
- low current
- pollution and turbidity intolerant

spawning
- swift current in rivers, do not spawn in tributaries
- males territorial
- gravel to rubble substrate



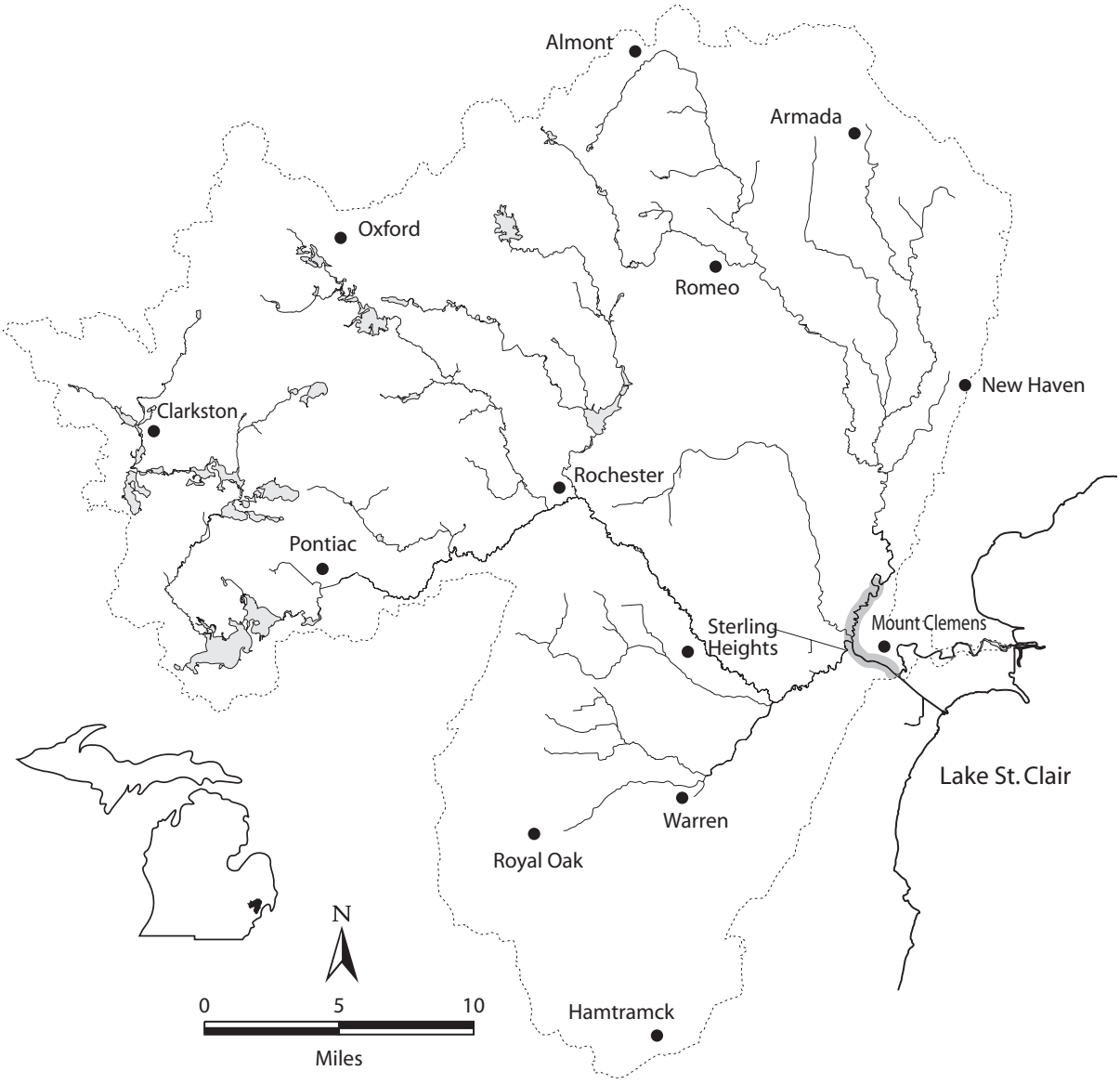
Black redhorse *Moxostoma duquesnei*

Habitat:

feeding
- gravel substrate
- clear water, intolerant of siltation, turbidity, and low gradients
- medium size streams
- cooler swifter streams and short rocky pools with current

spawning
- gravelly riffles

winter refuge
- deeper holes



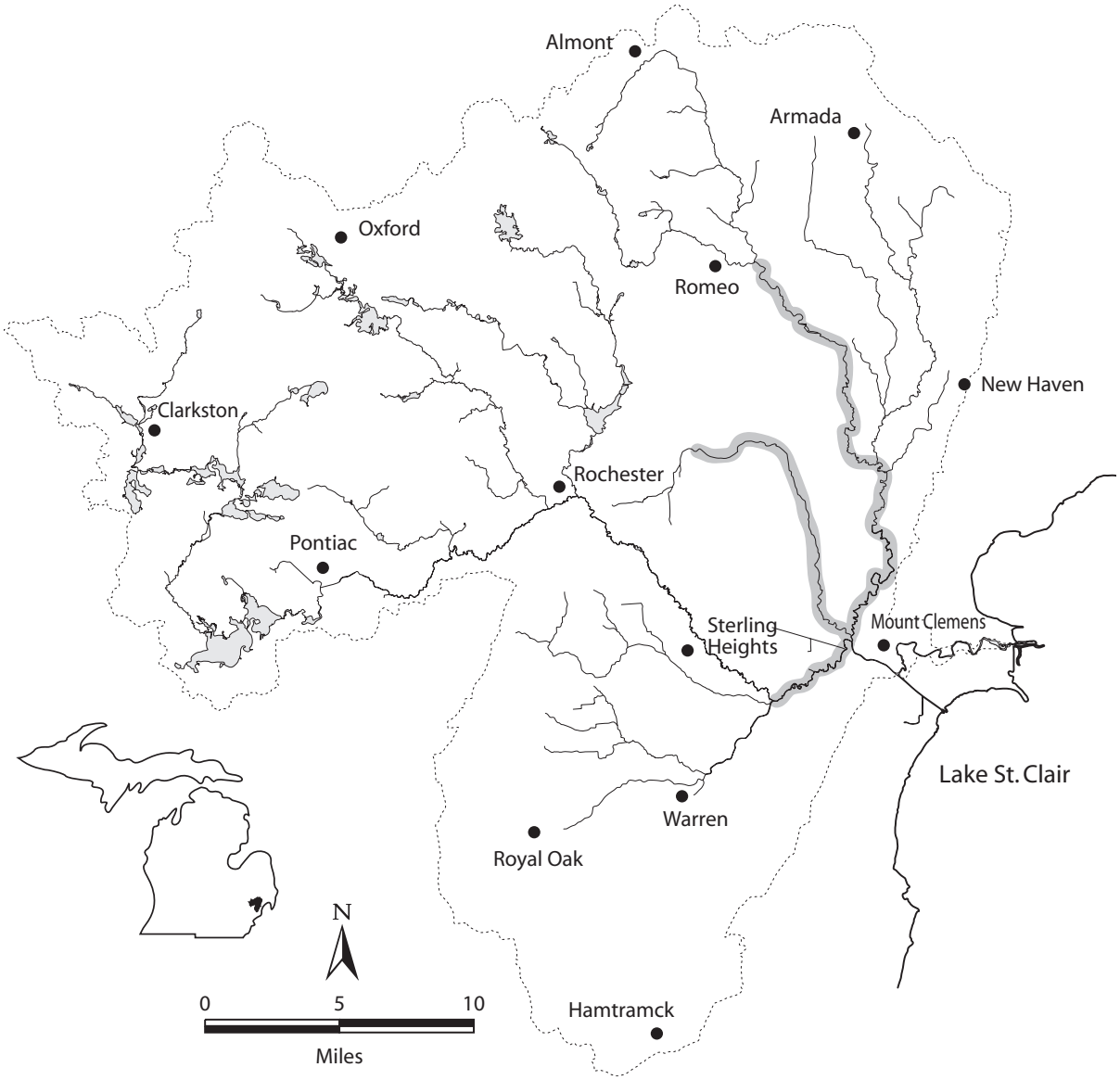
Golden redhorse *Moxostoma erythrurum*

Habitat:

feeding
- warm medium gradient streams and rivers
- clear riffly streams
- medium size streams and rivers
- tolerates some turbidity and silt

spawning - shallow gravelly riffles

winter refuge - larger streams

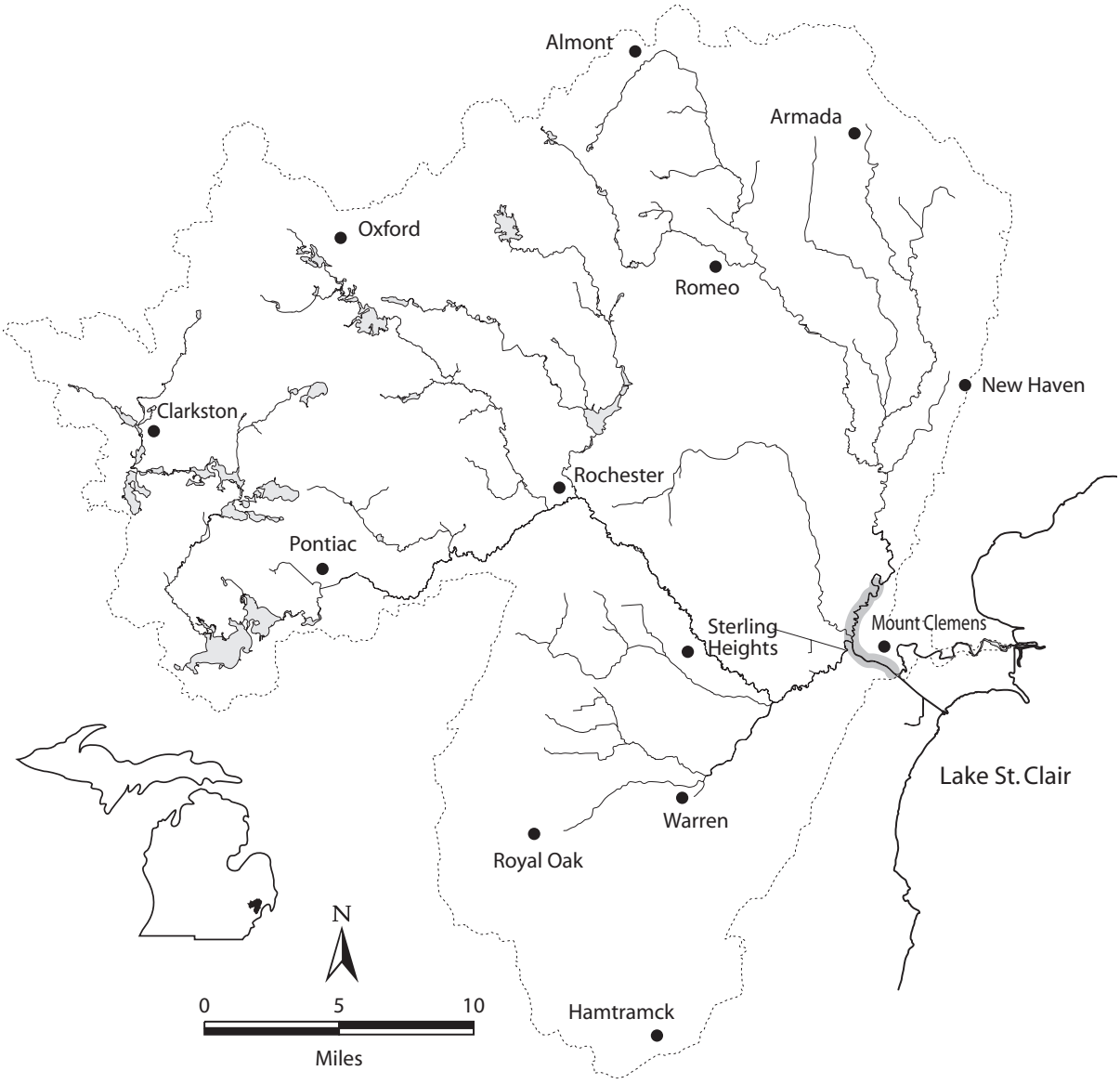


Shorthead redhorse *Moxostoma macrolepidotum*

Habitat:

feeding
- downstream sections of large rivers, lakes, and impoundments
- rocky substrates
- swift water near riffles
- clear to slightly turbid water

spawning
- gravelly riffles in smaller feeder streams

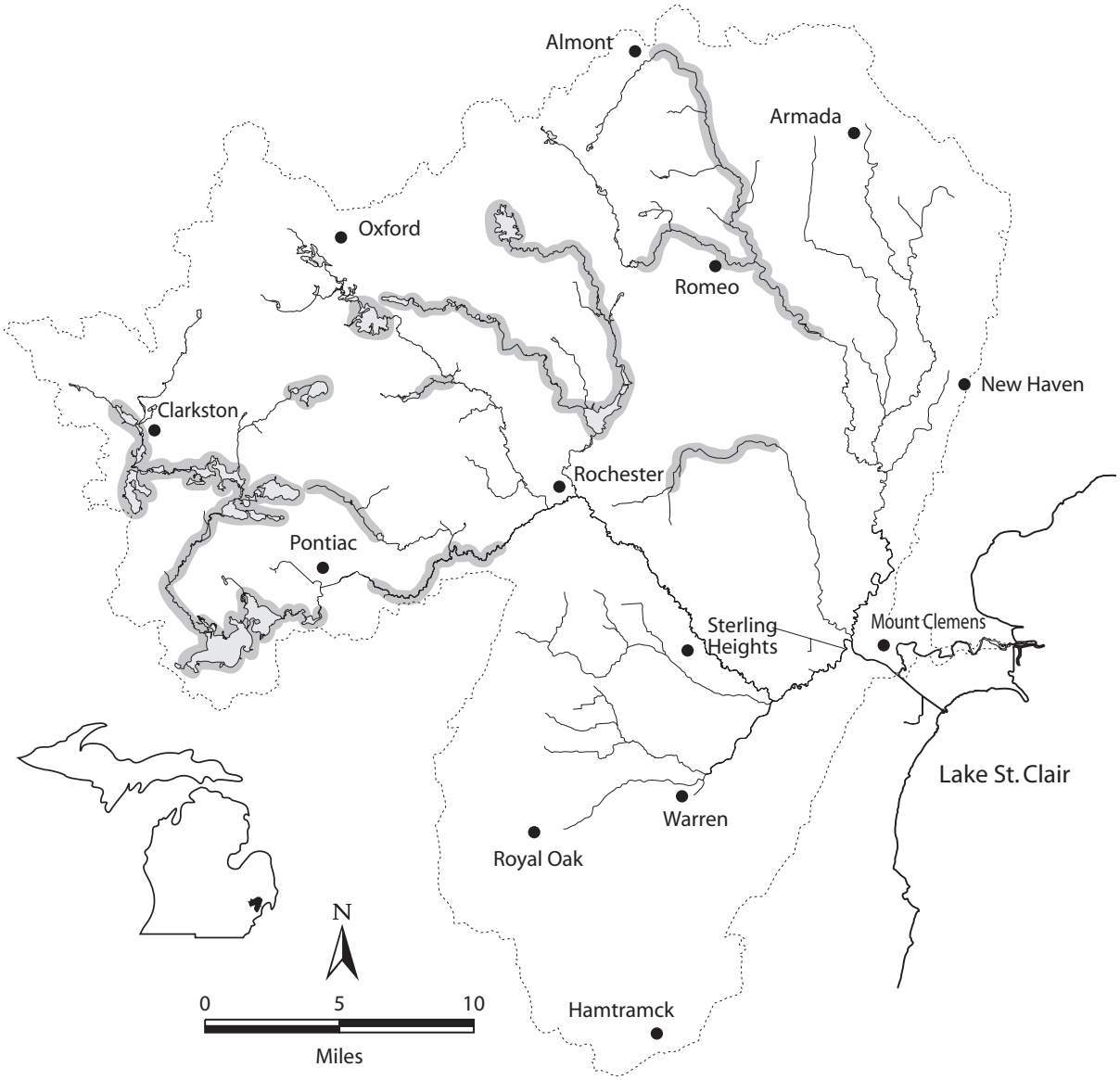


Black bullhead *Ameiurus melas*

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

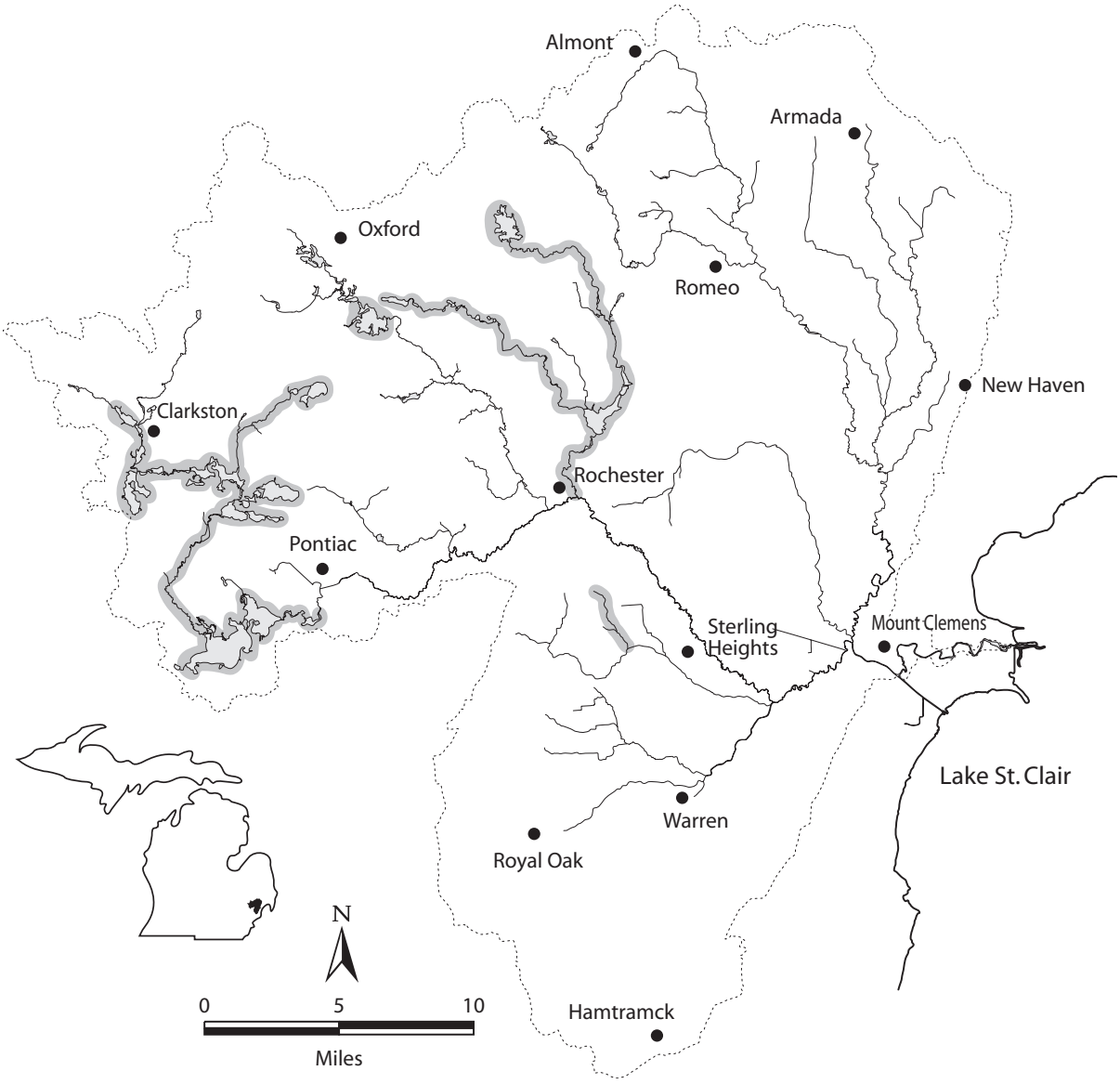


Yellow bullhead *Ameiurus natalis*

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



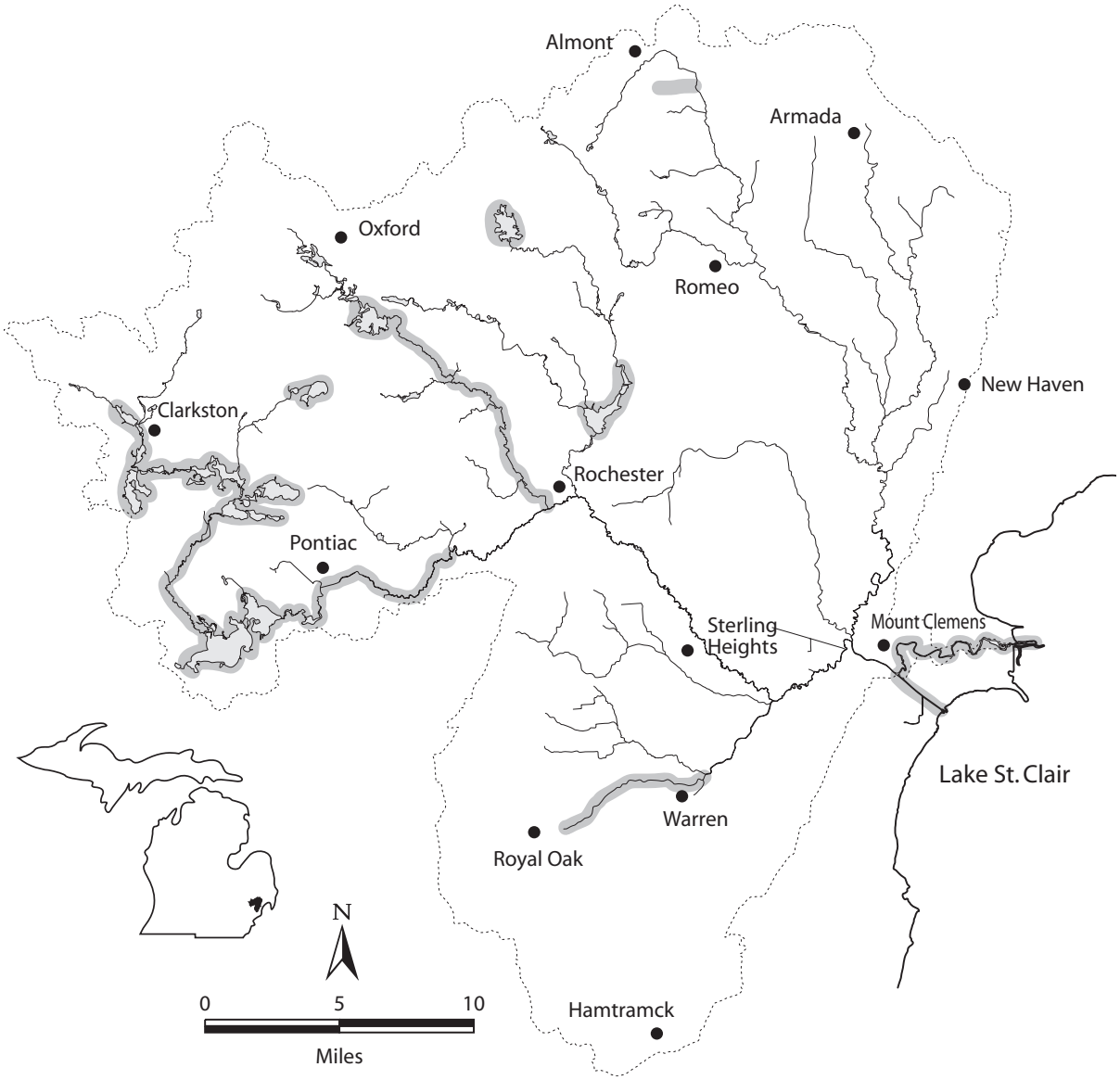
Brown bullhead *Ameiurus nebulosus*

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

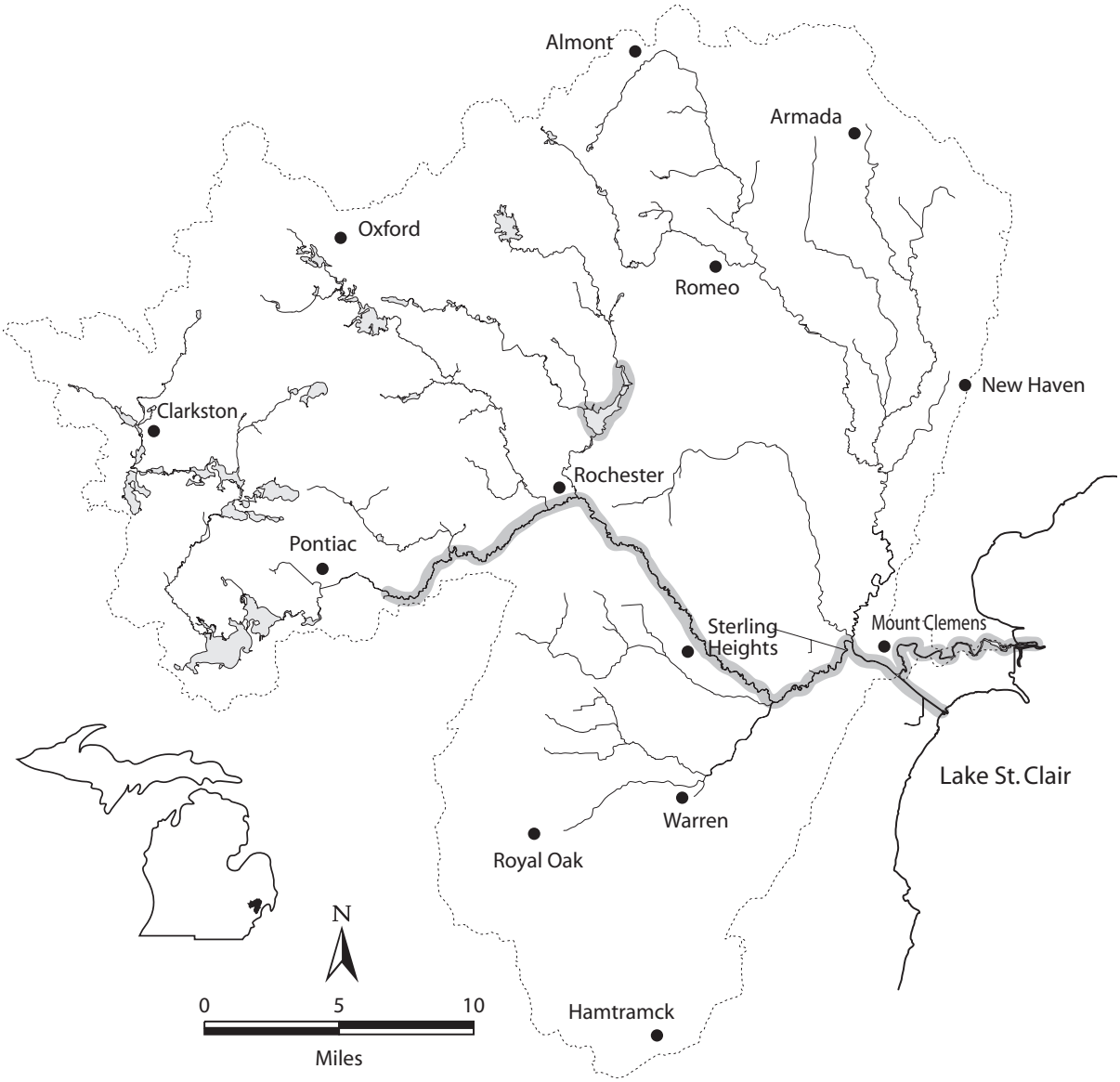


Channel catfish *Ictalurus punctatus*

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

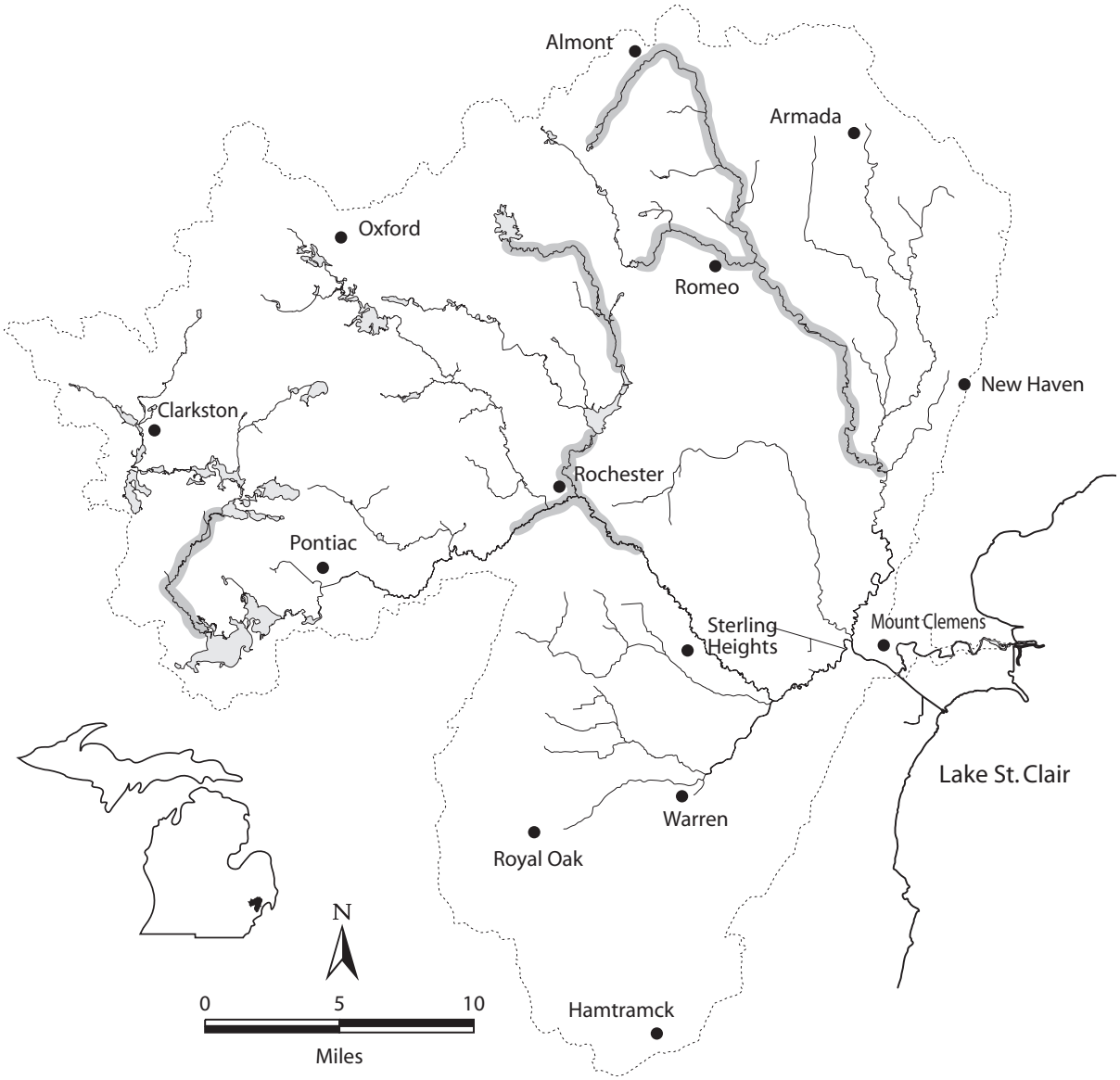


Stonecat *Noturus flavus*

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

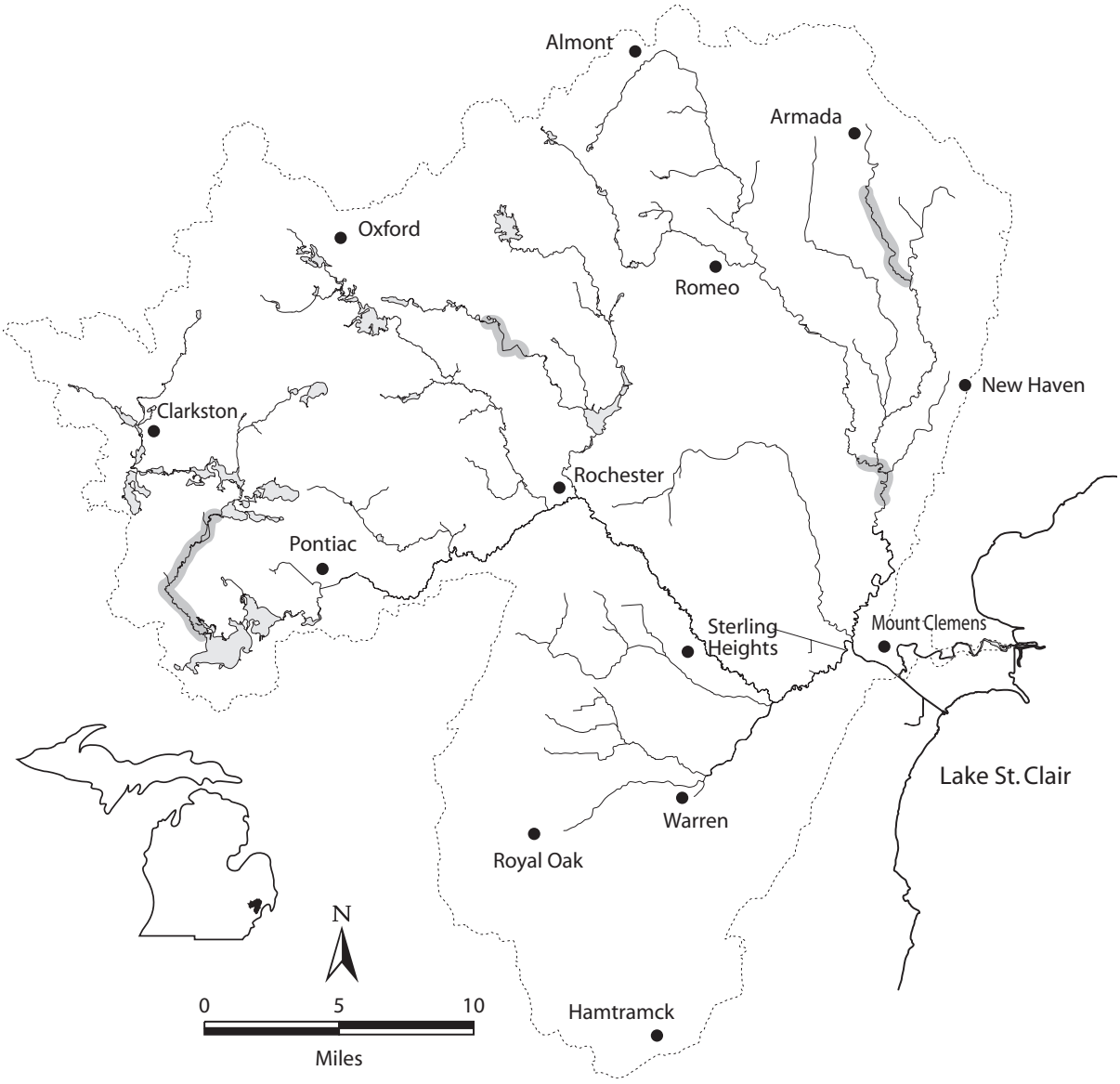


Tadpole madtom *Noturus gyrinus*

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)

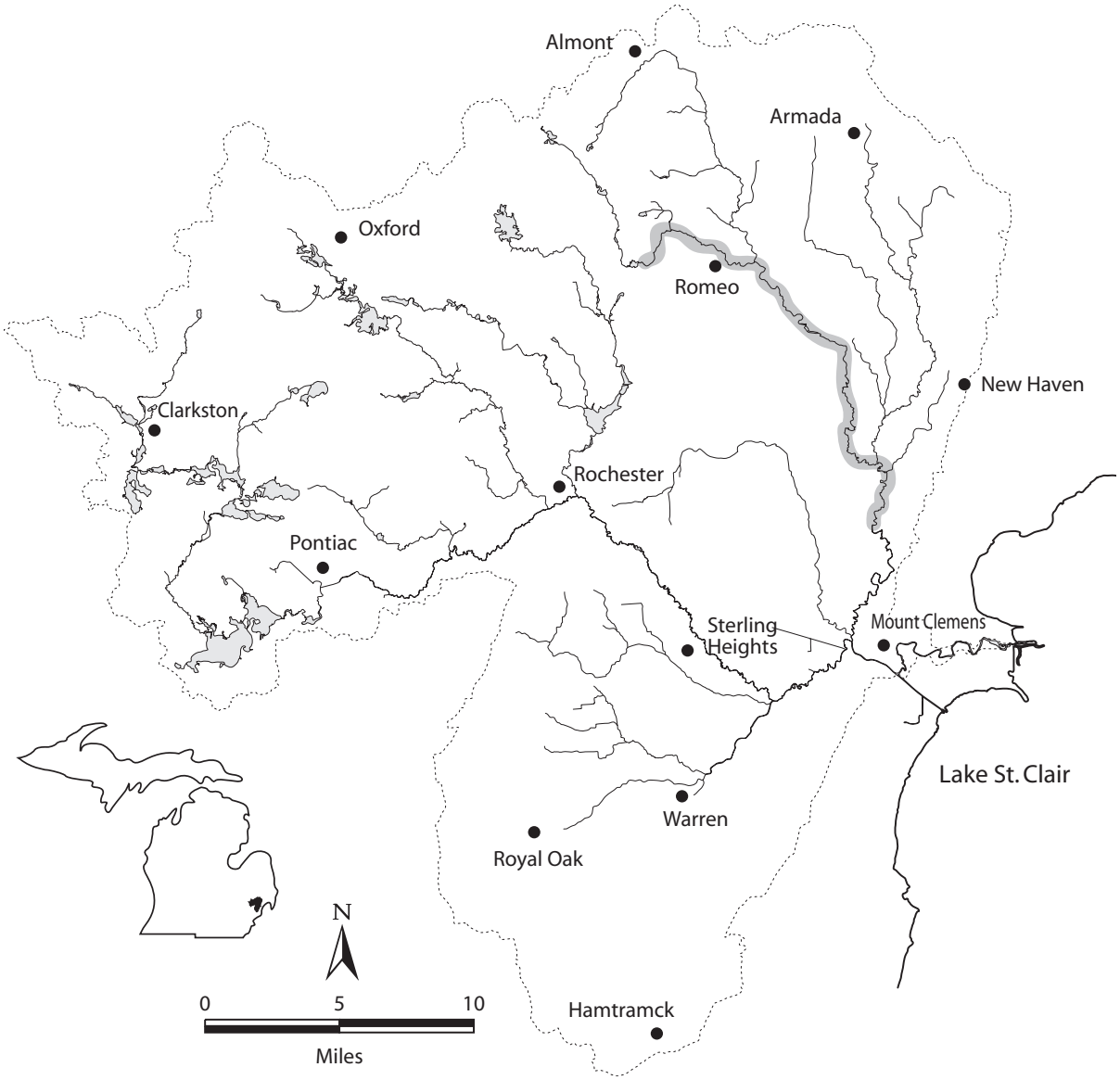


Brindled madtom *Noturus miurus* – **special concern**

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

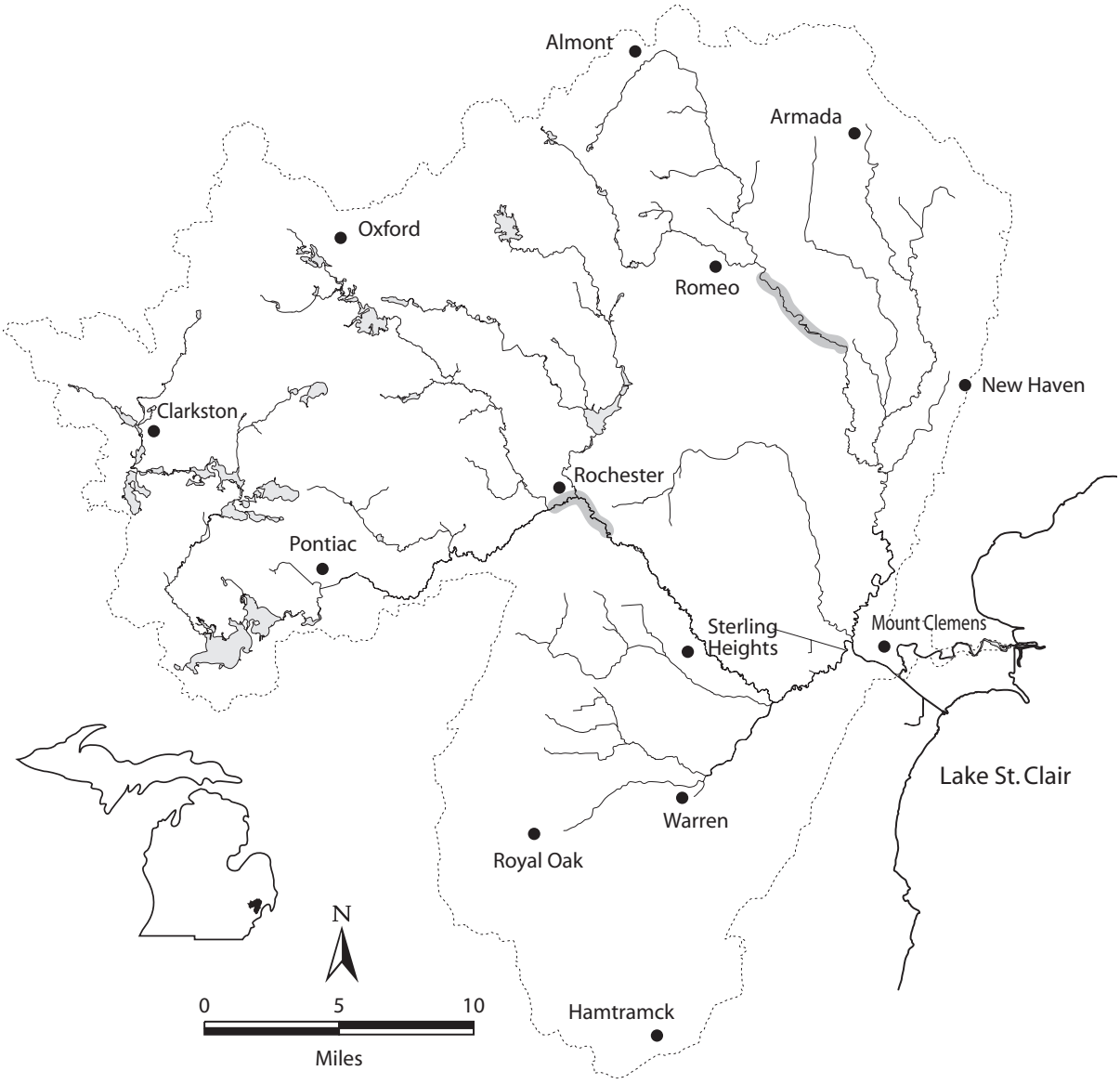
spawning
- silt or mud substrate
- emergent vegetation



Northern madtom *Noturus stigmosus* – **endangered**

Habitat:

feeding - deep, wide, swift riffles of streams and rivers
- gravel and boulder substrates

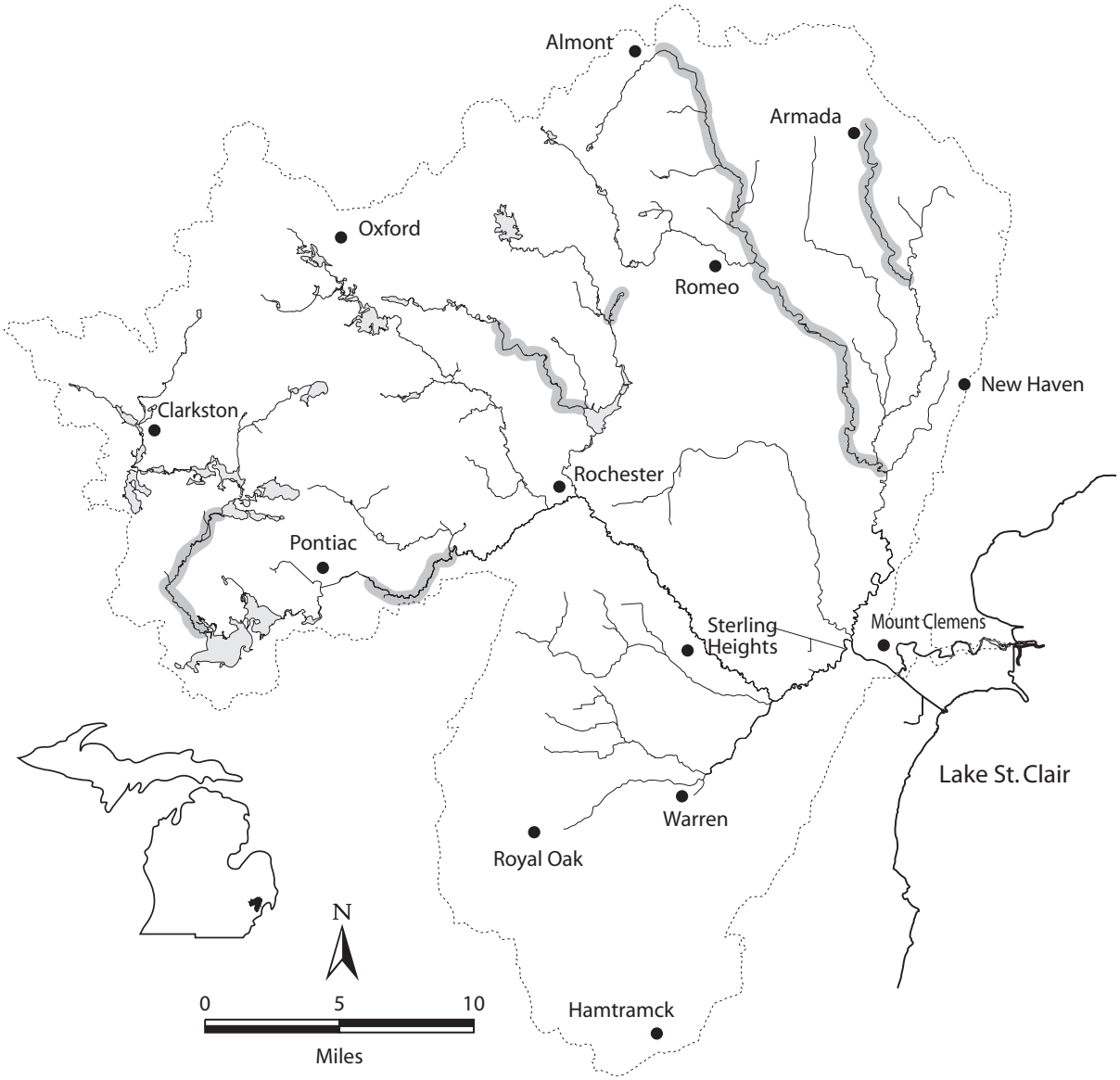


Grass pickerel *Esox americanus vermiculatus*

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

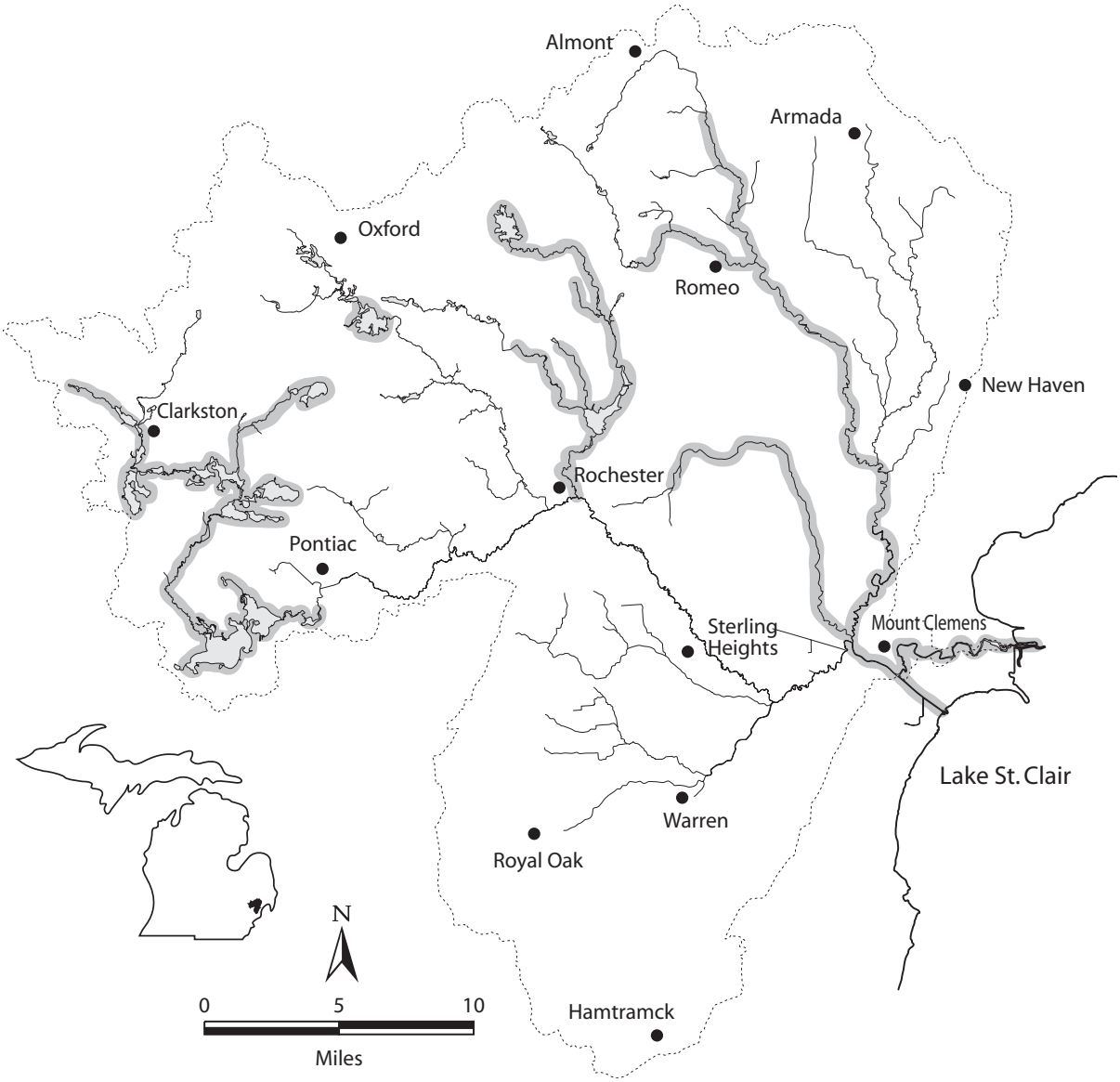


Northern pike *Esox lucius*

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

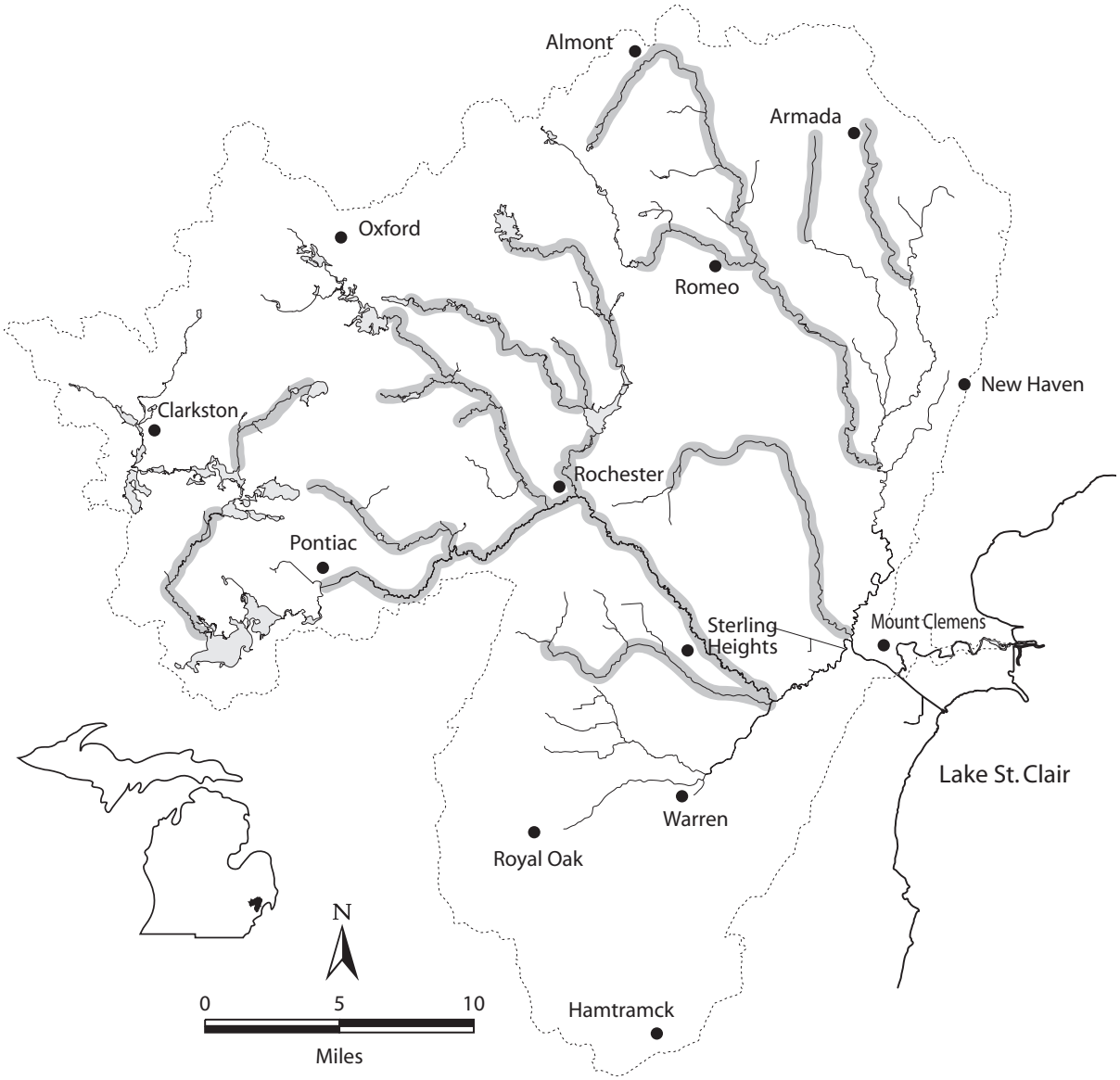


Central mudminnow *Umbra limi*

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



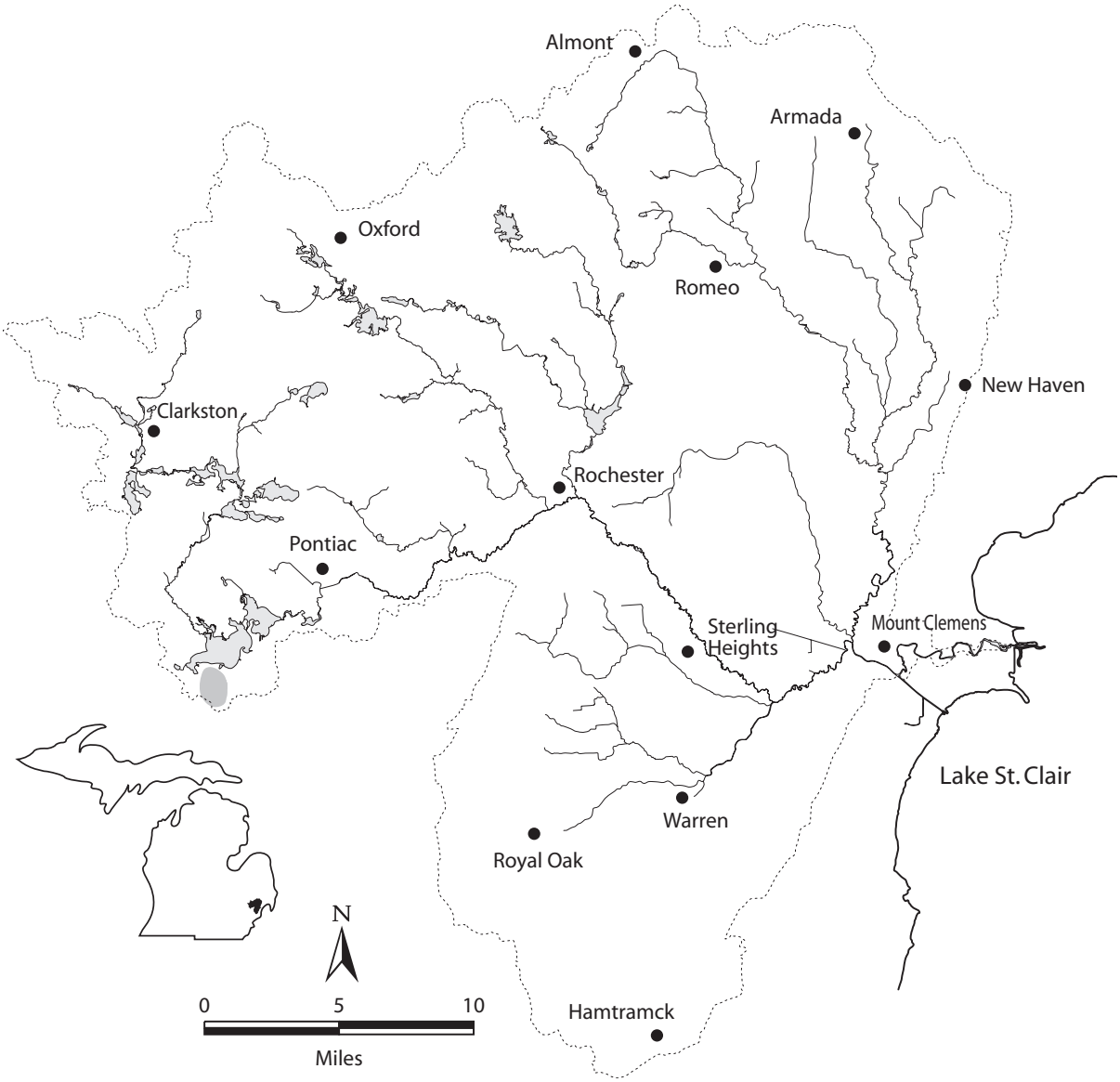
Rainbow smelt *Osmerus mordax*

Habitat:

feeding - young:close inshore lake habitat along sand and gravel beaches
- cold water

spawning - clear high-gradient streams or wave swept shoreline
- riffles with coarse sand or gravel substrate

winter refuge - midwaters of lakes or inshore coastal waters

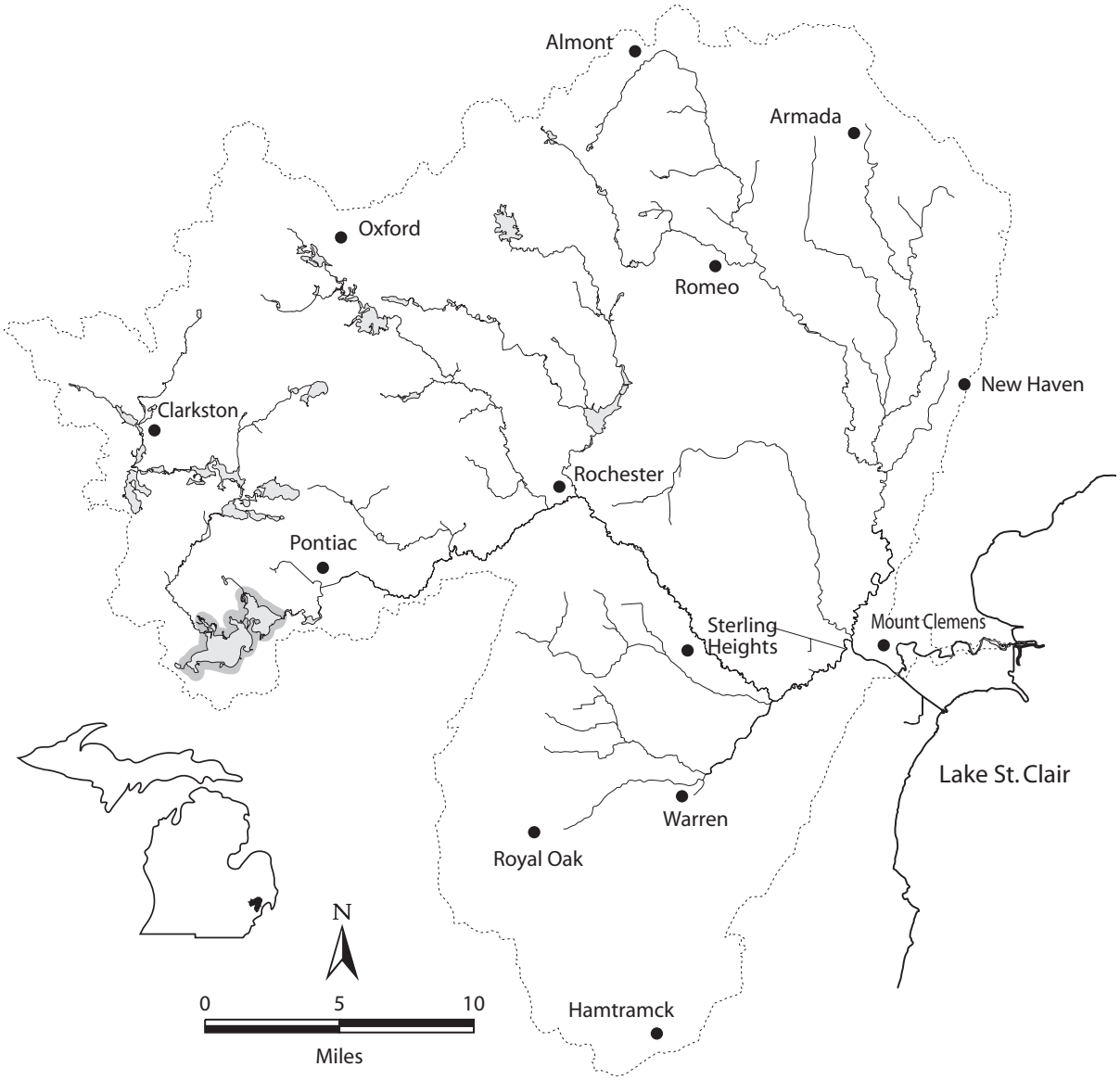


Cisco {lake herring} *Coregonus artedi* – **threatened**

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

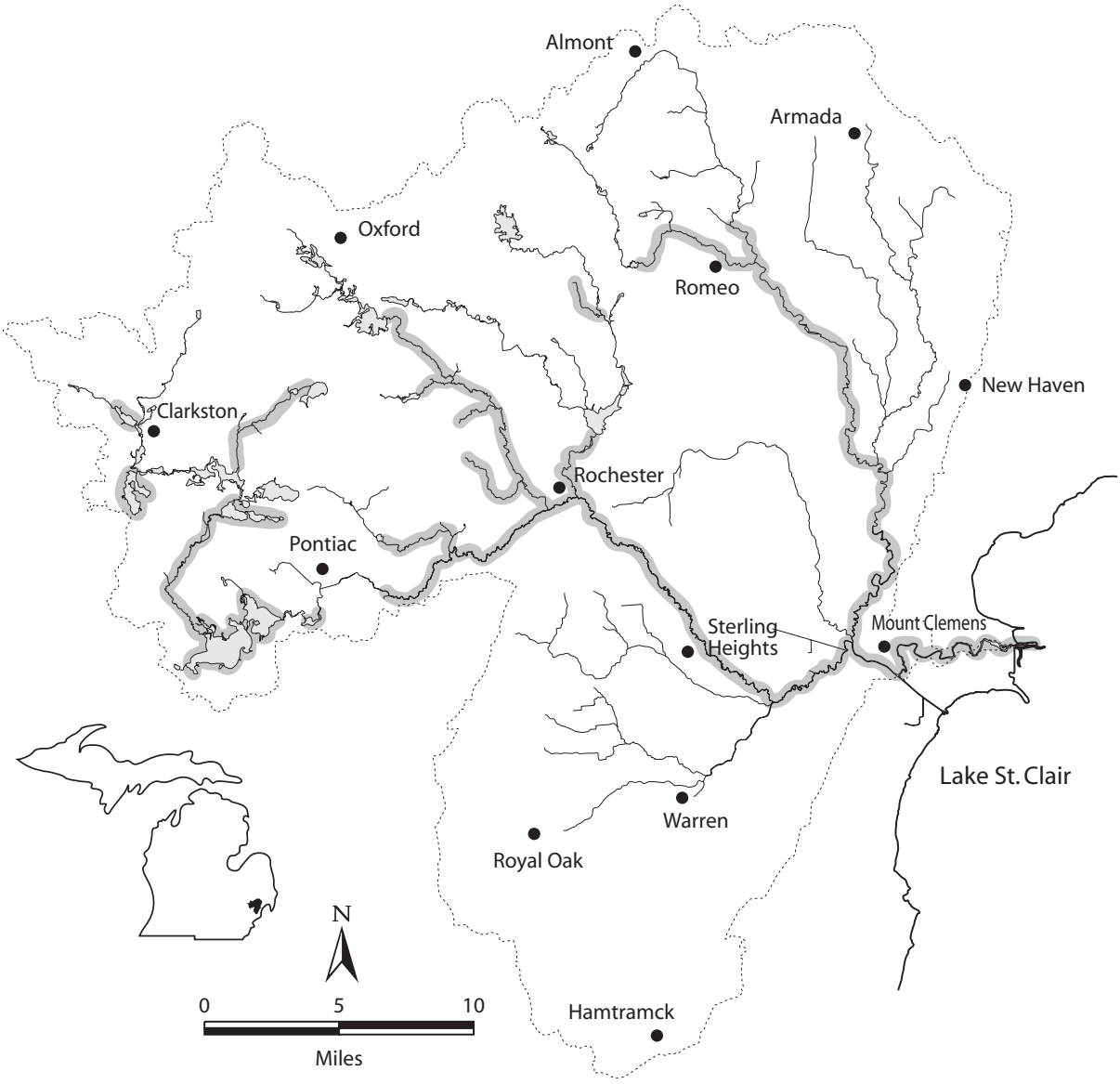


Rainbow trout *Oncorhynchus mykiss*

Habitat:

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

spawning - gravelly riffles above a pool
- smaller tributaries

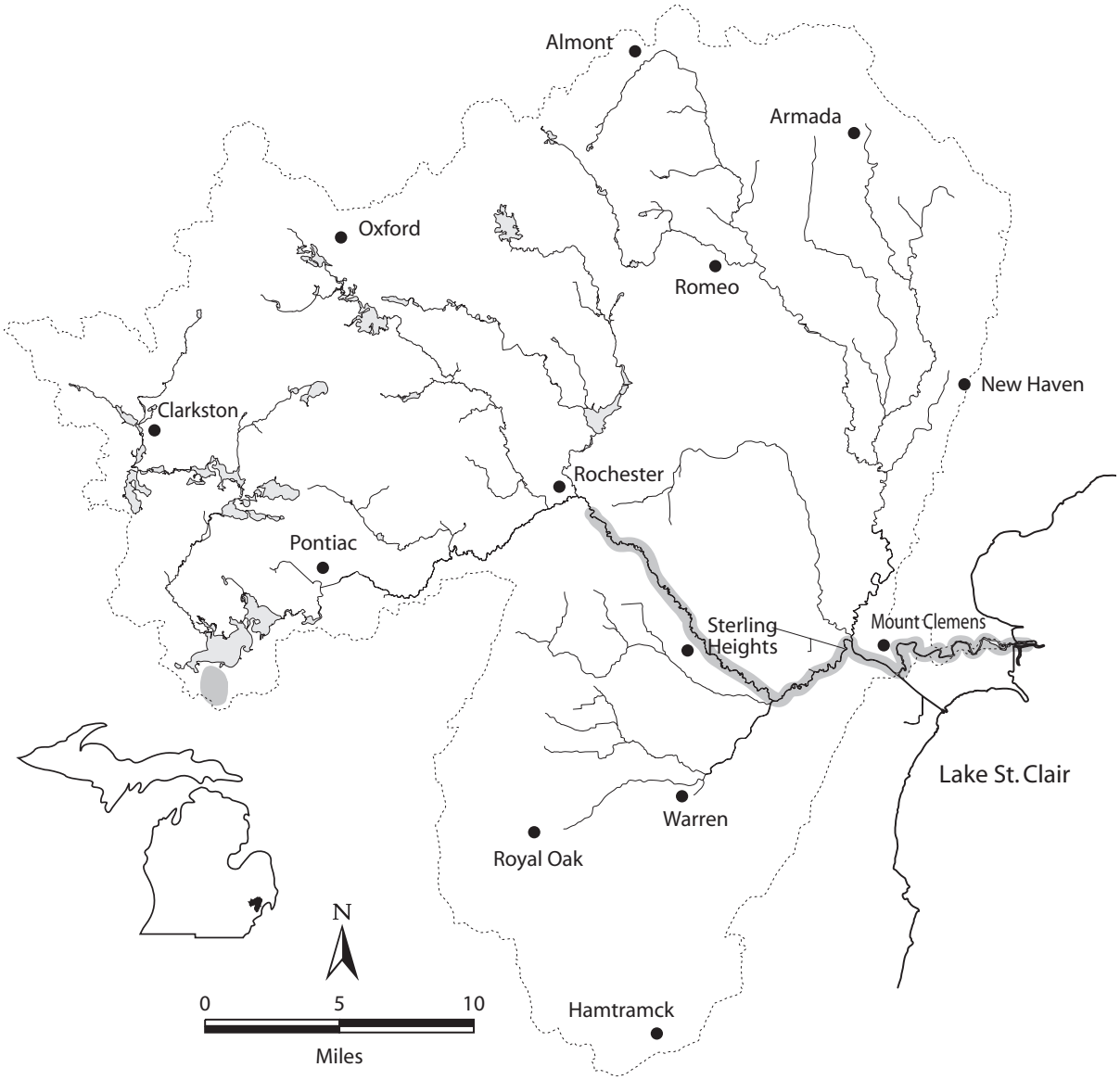


Chinook salmon *Oncorhynchus tshawyscha*

Habitat:

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

spawning - gravelly substrate in cool streams

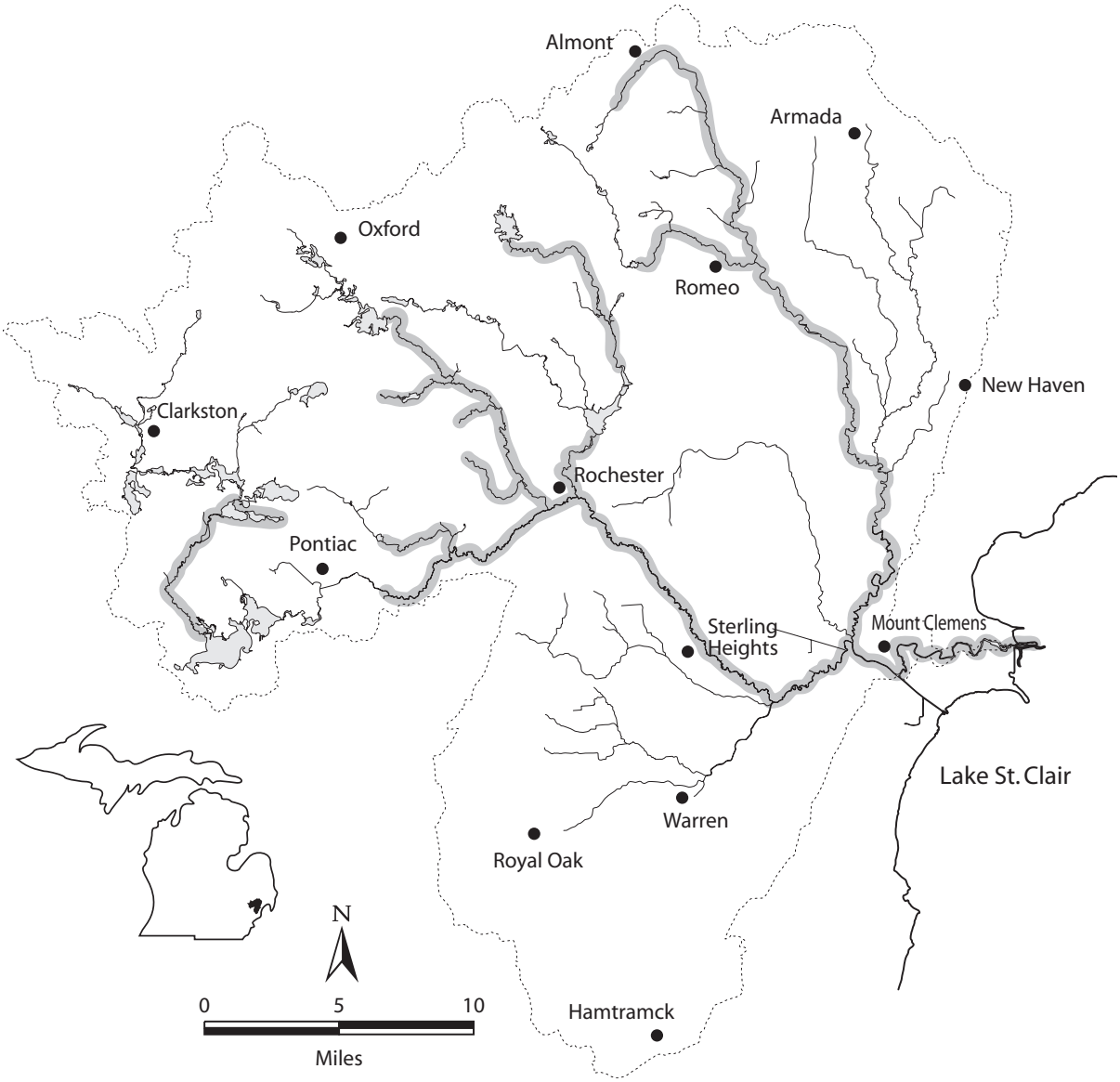


Brown trout *Salmo trutta*

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

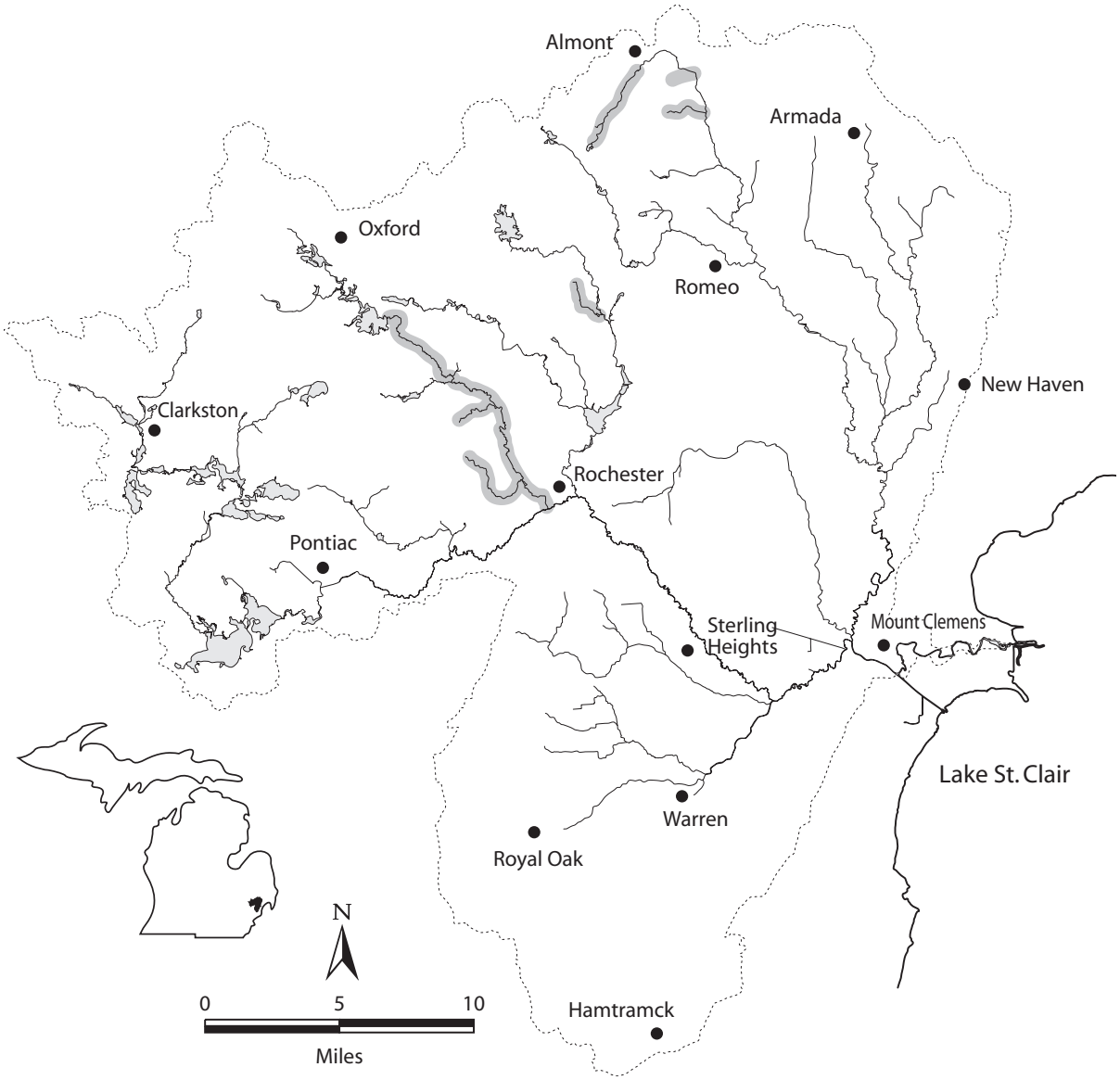


Brook trout *Salvelinus fontinalis*

Habitat:

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

spawning
- gravelly riffles; shallow or headwater streams

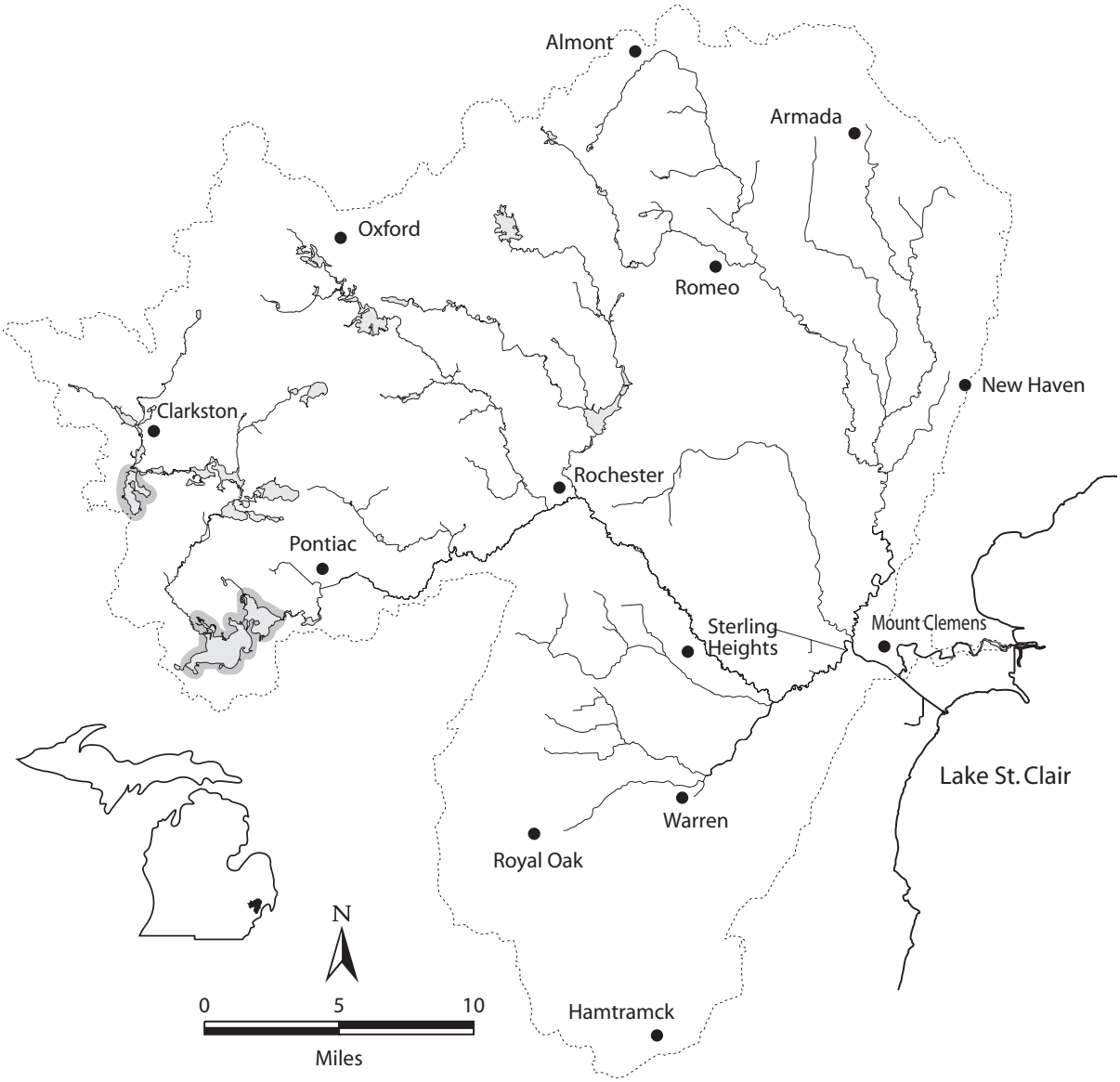


Lake trout *Salvelinus namaycush*

Habitat:

feeding - cold lakes and rivers

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

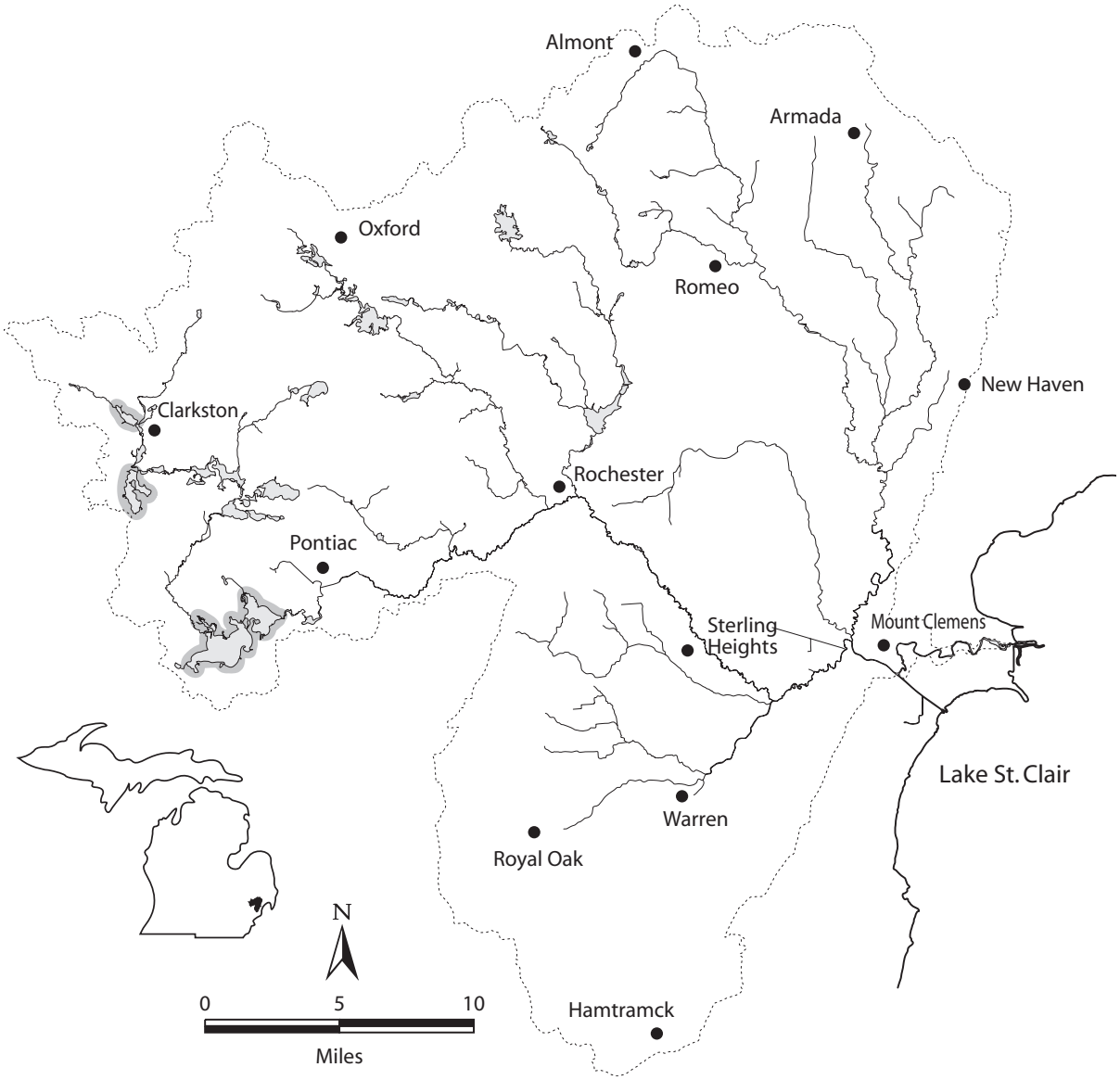


Splake *Salvelinus fontinalis* x *Salvelinus namaycush*

Habitat:

feeding - littoral habitat
- cool water lakes

spawning - hatchery produced cross of brook and lake trout
- offspring usually fertile, but with lower fecundity than either parent species

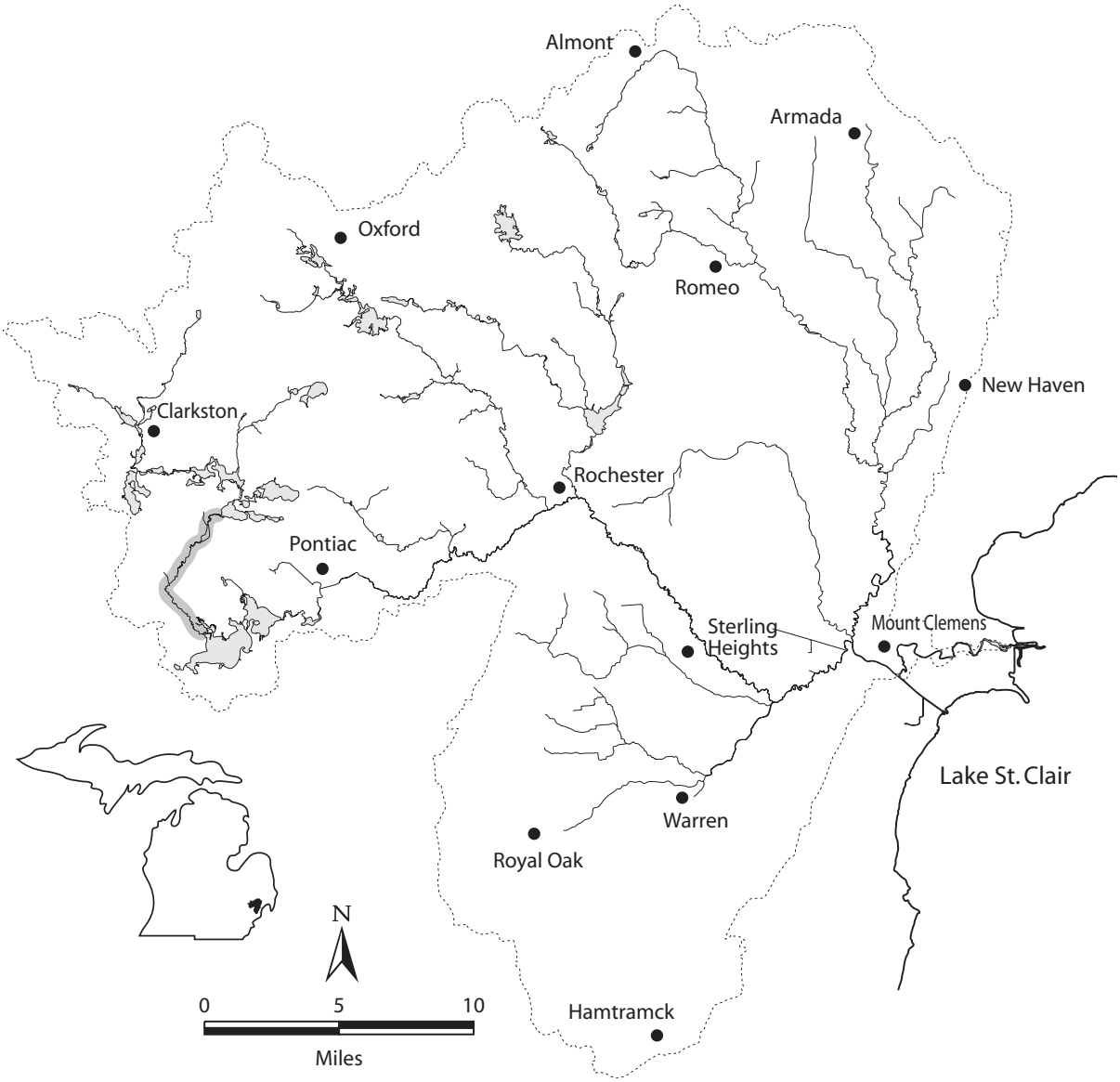


Western banded killifish *Fundulus diaphanus*

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

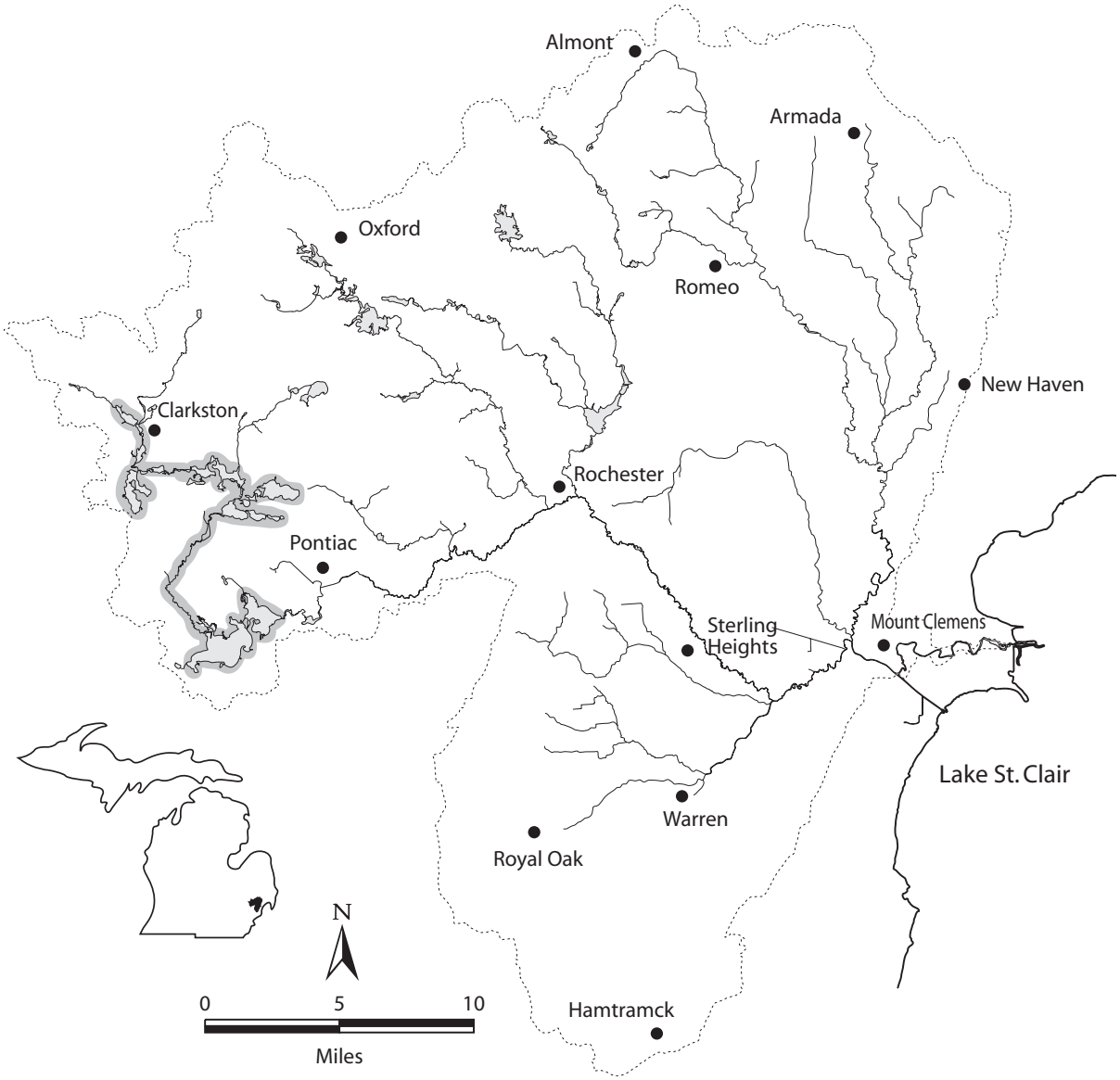


Brook silverside *Labidesthes sicculus*

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

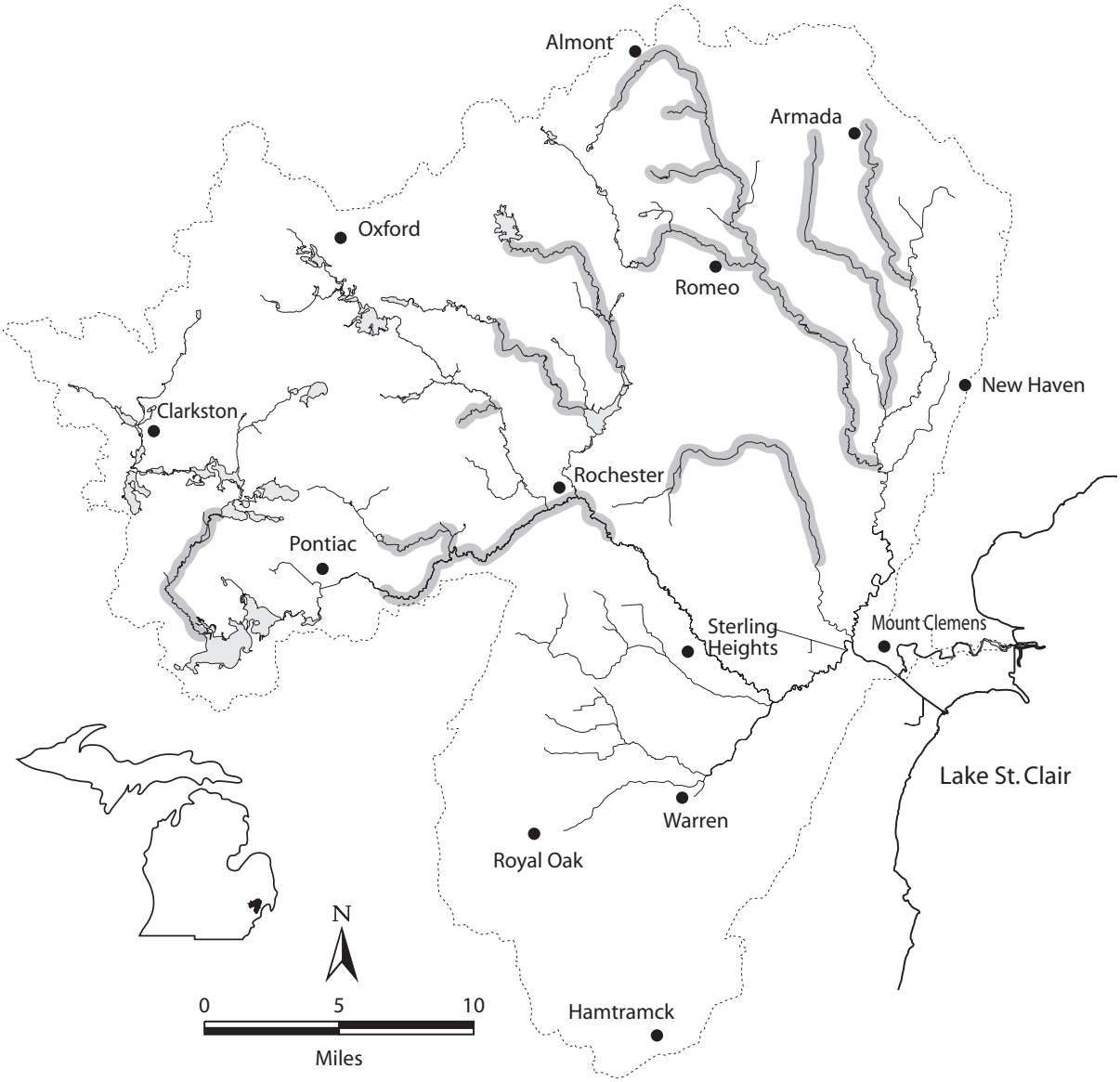


Brook stickleback *Cluaea inconstans*

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

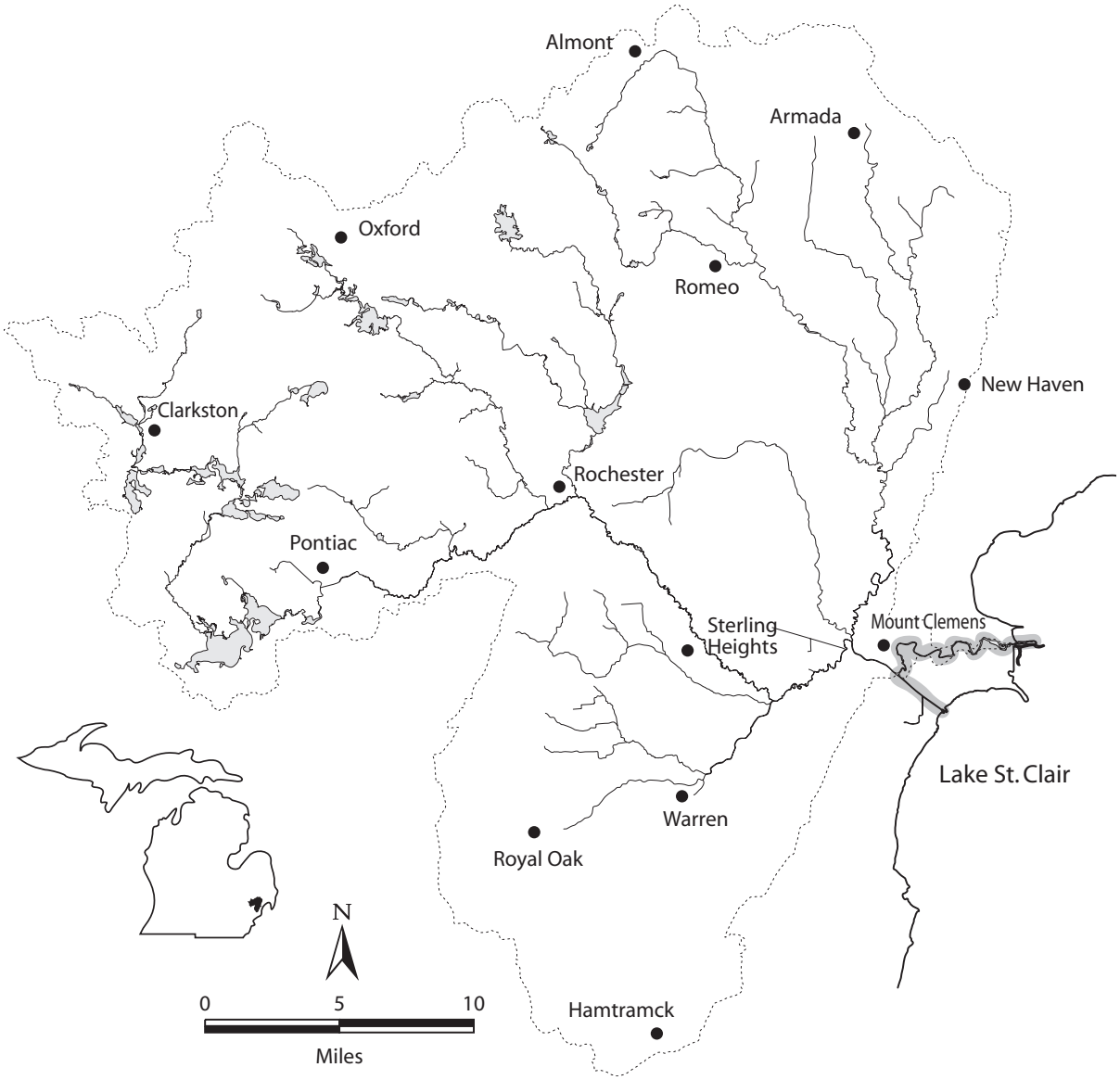


Ninespine stickleback *Pungitius pungitius*

Habitat:

feeding - open water of lakes; also Lake St. Clair
- cool quiet waters

spawning - builds nests among aquatic vegetation in creeks and streams

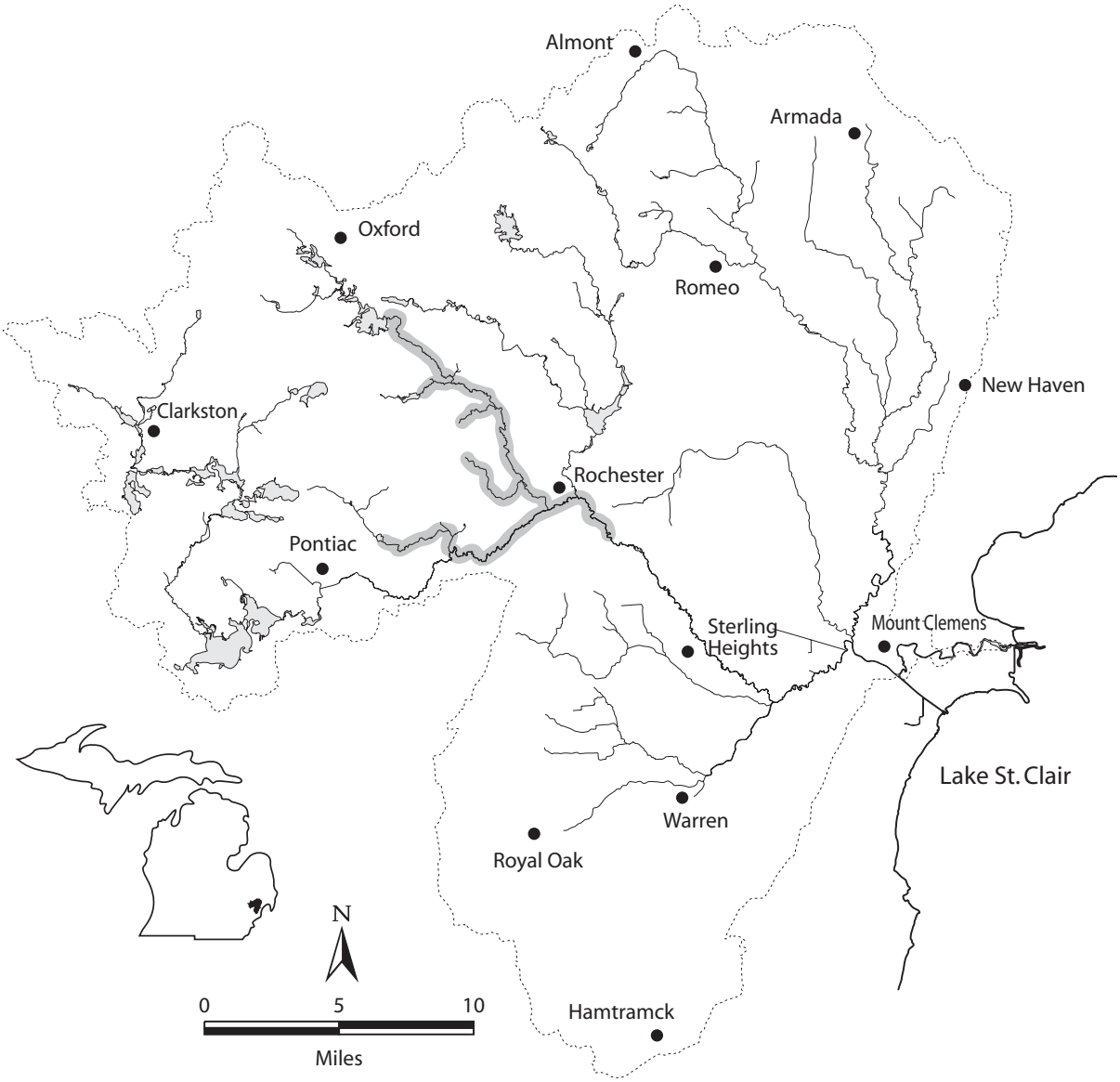


Mottled sculpin *Cottus bairdi*

Habitat:

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

spawning - nests under logs or rock

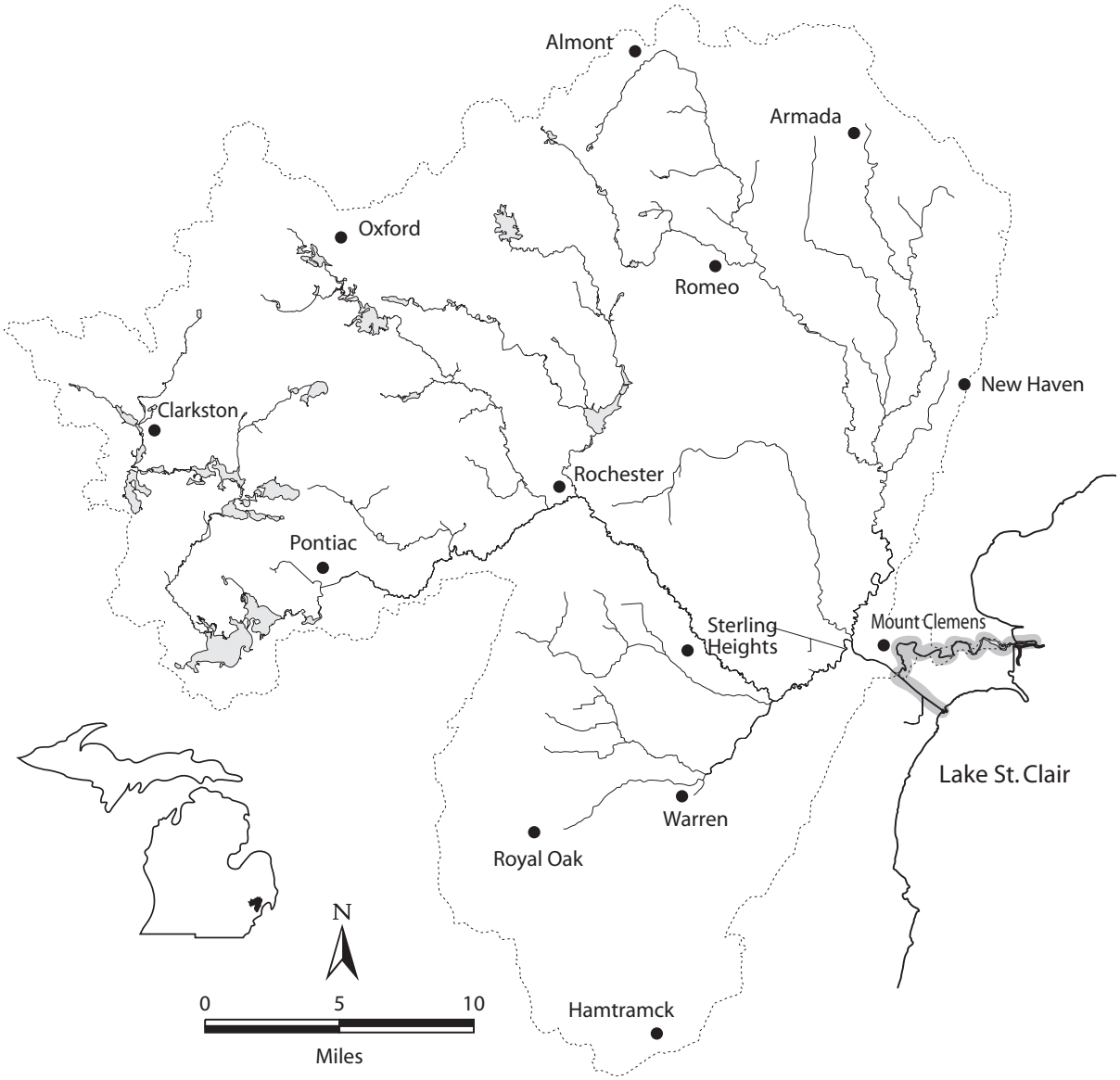


White perch *Morone americana*

Habitat:

feeding - clear, warm water of low-gradient streams, lakes, impoundments, and Lake St. Clair

spawning - shallow water over firm substrate

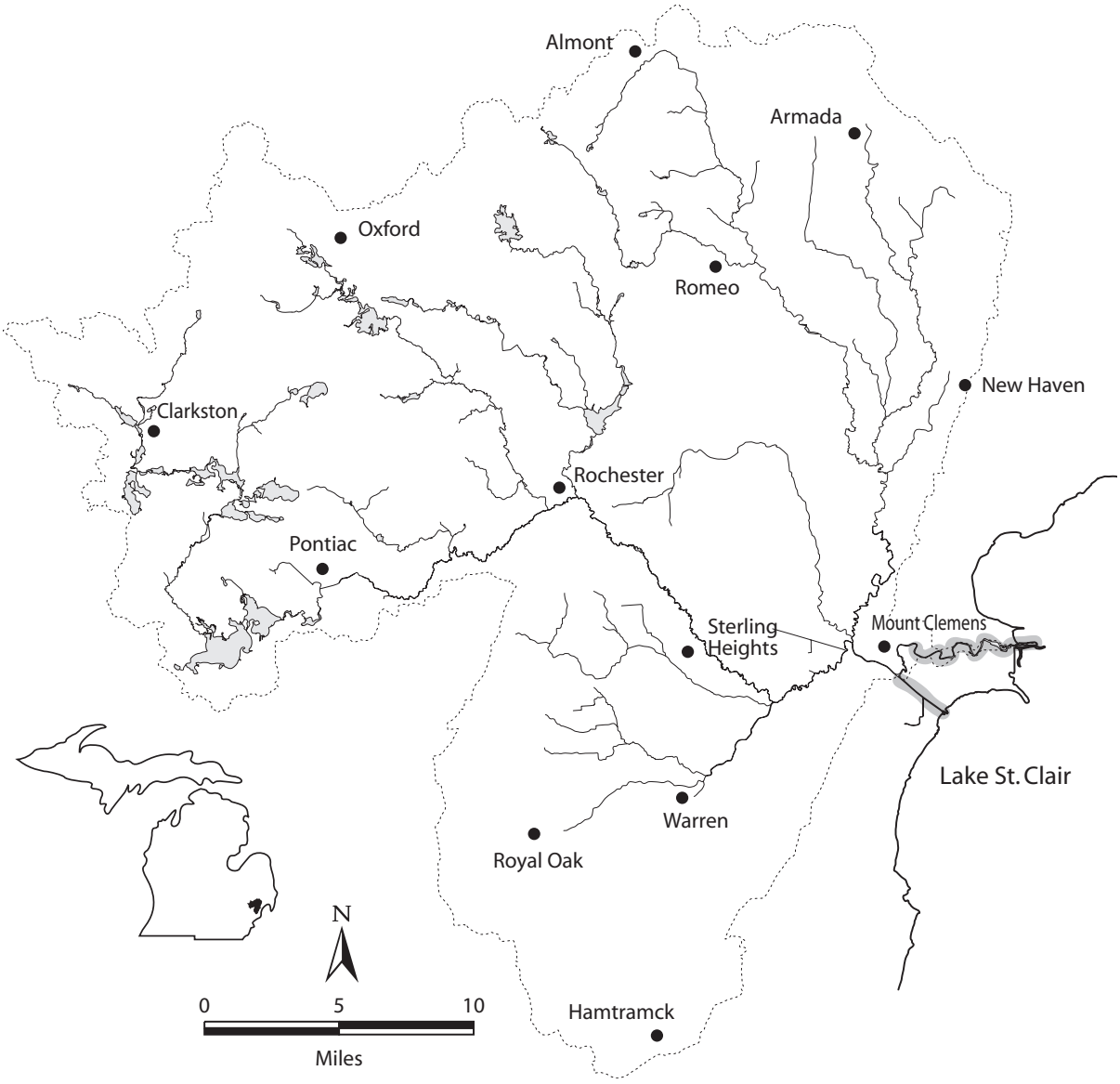


White bass *Morone chrysops*

Habitat:

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

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



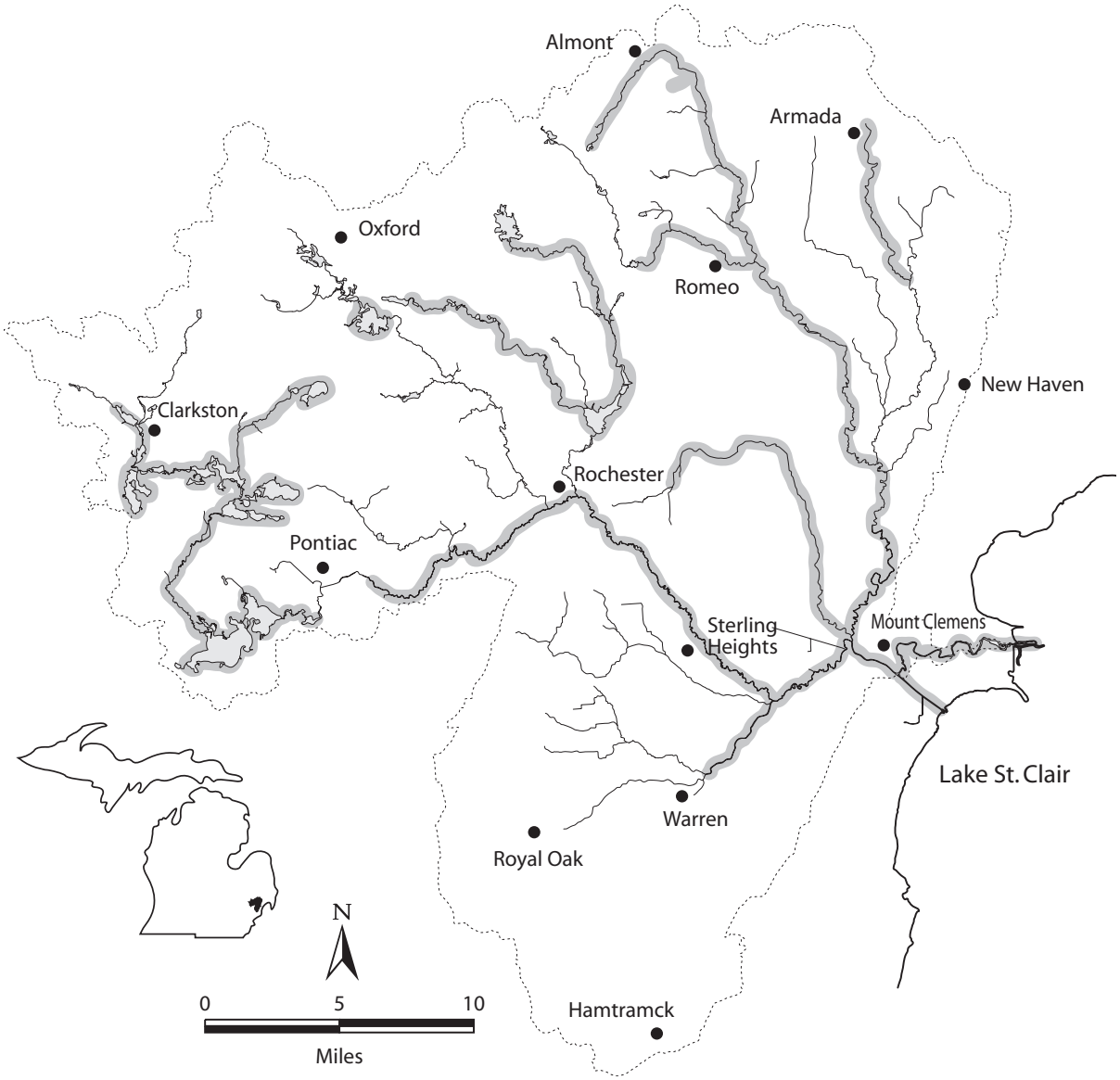
Rock bass *Ambloplites rupestris*

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

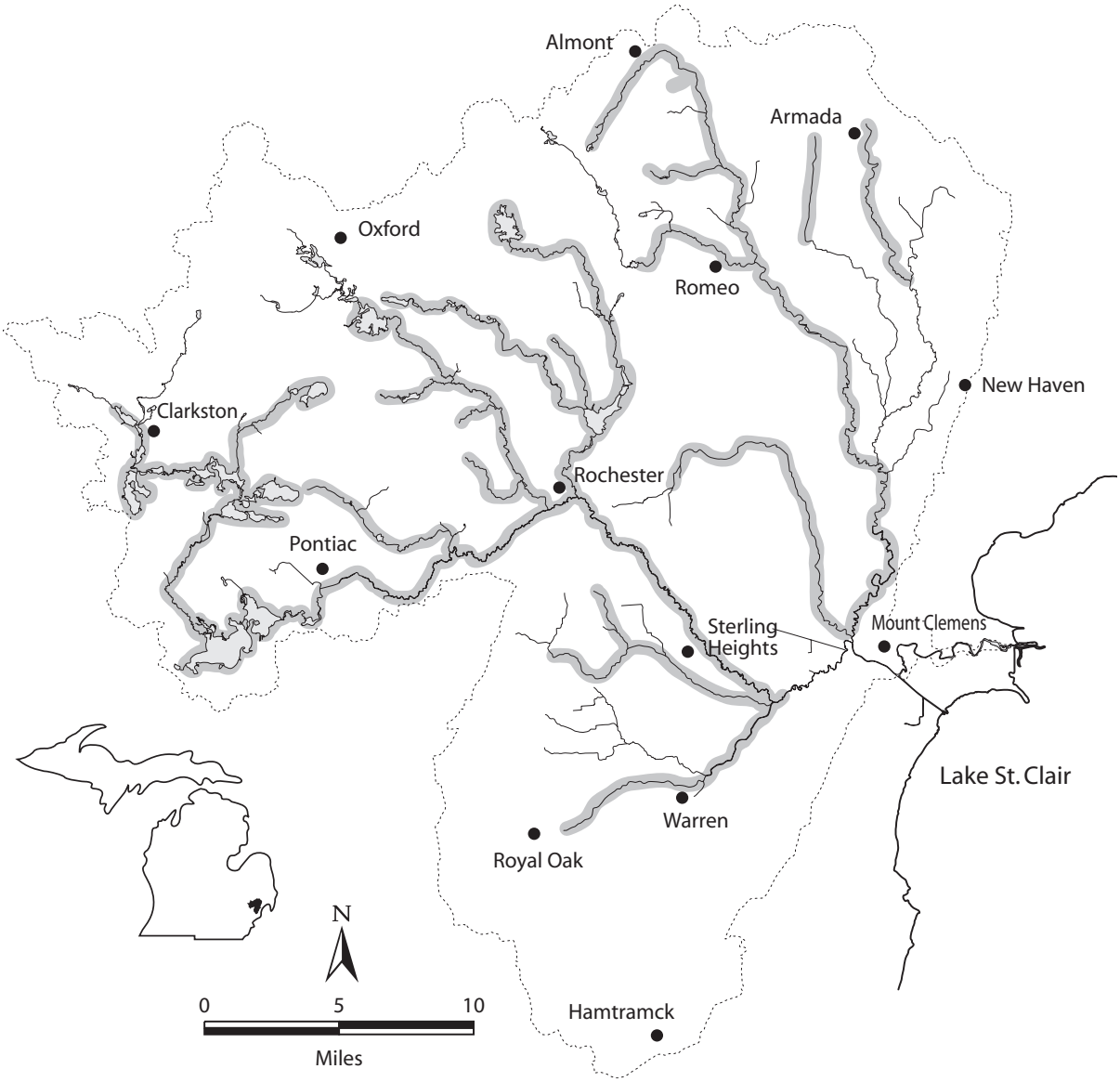


Green sunfish *Lepomis cyanellus*

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

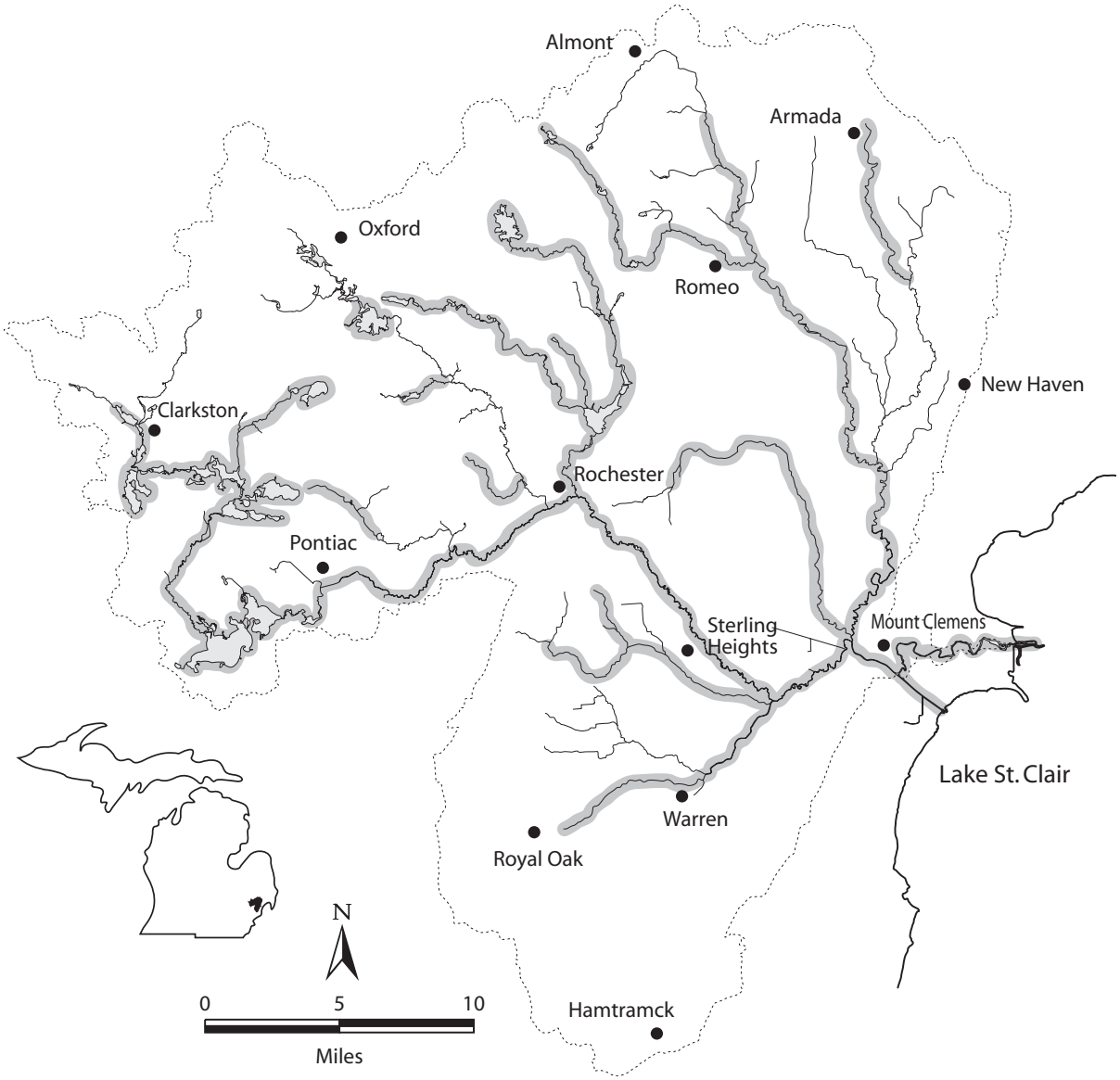


Pumpkinseed *Lepomis gibbosus*

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

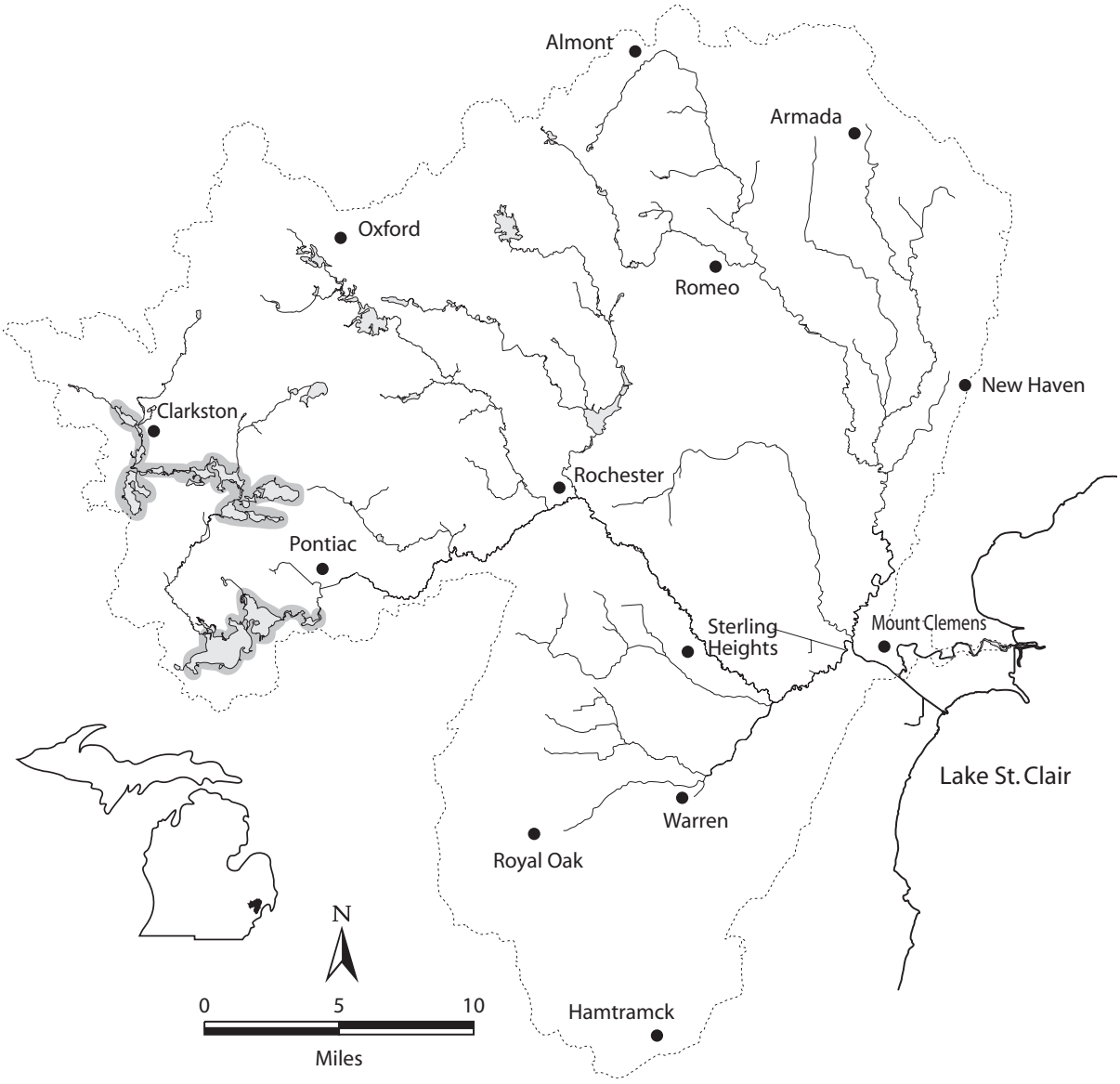


Warmouth *Lepomis gulosus*

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



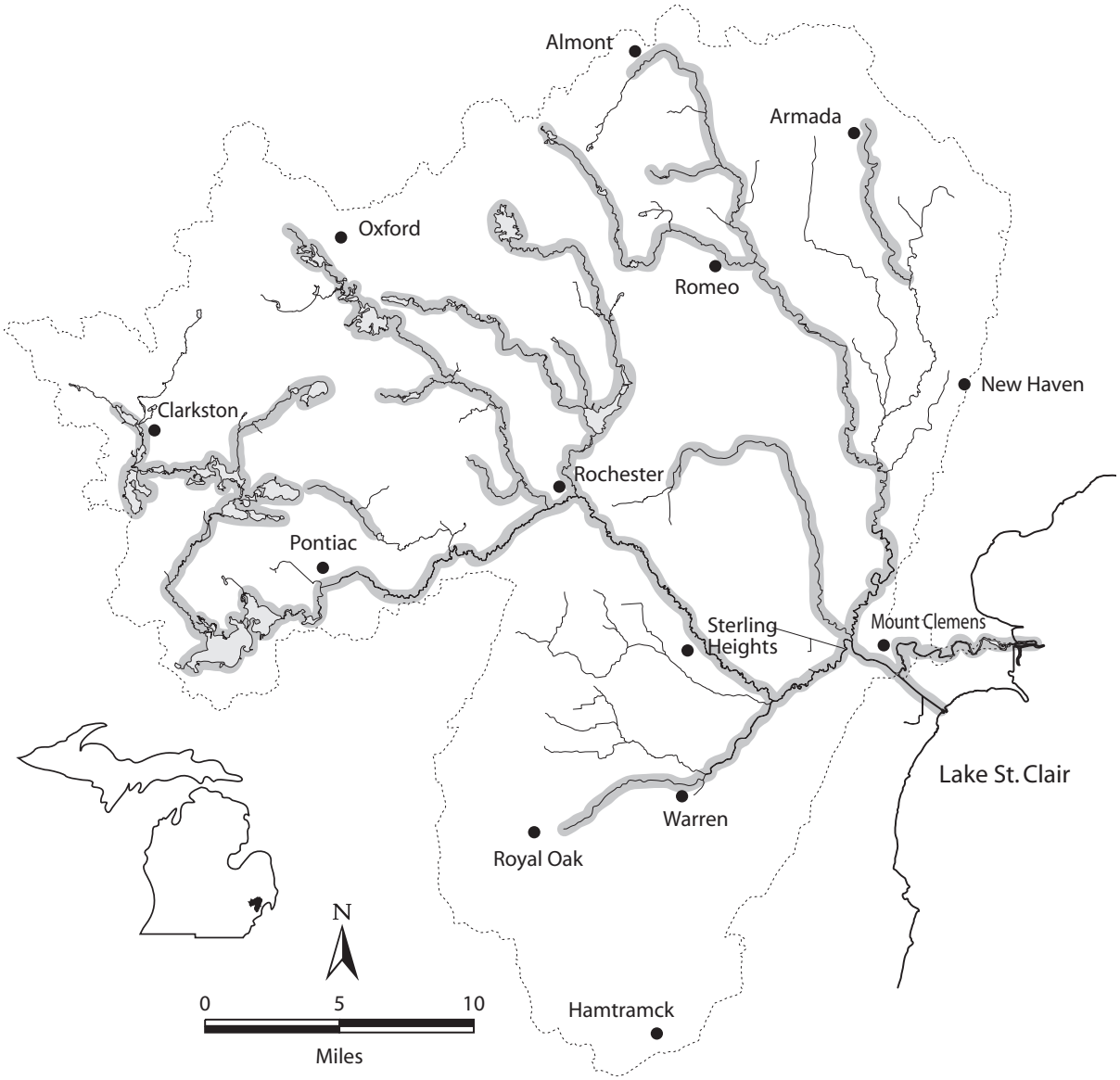
Bluegill *Lepomis macochrius*

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

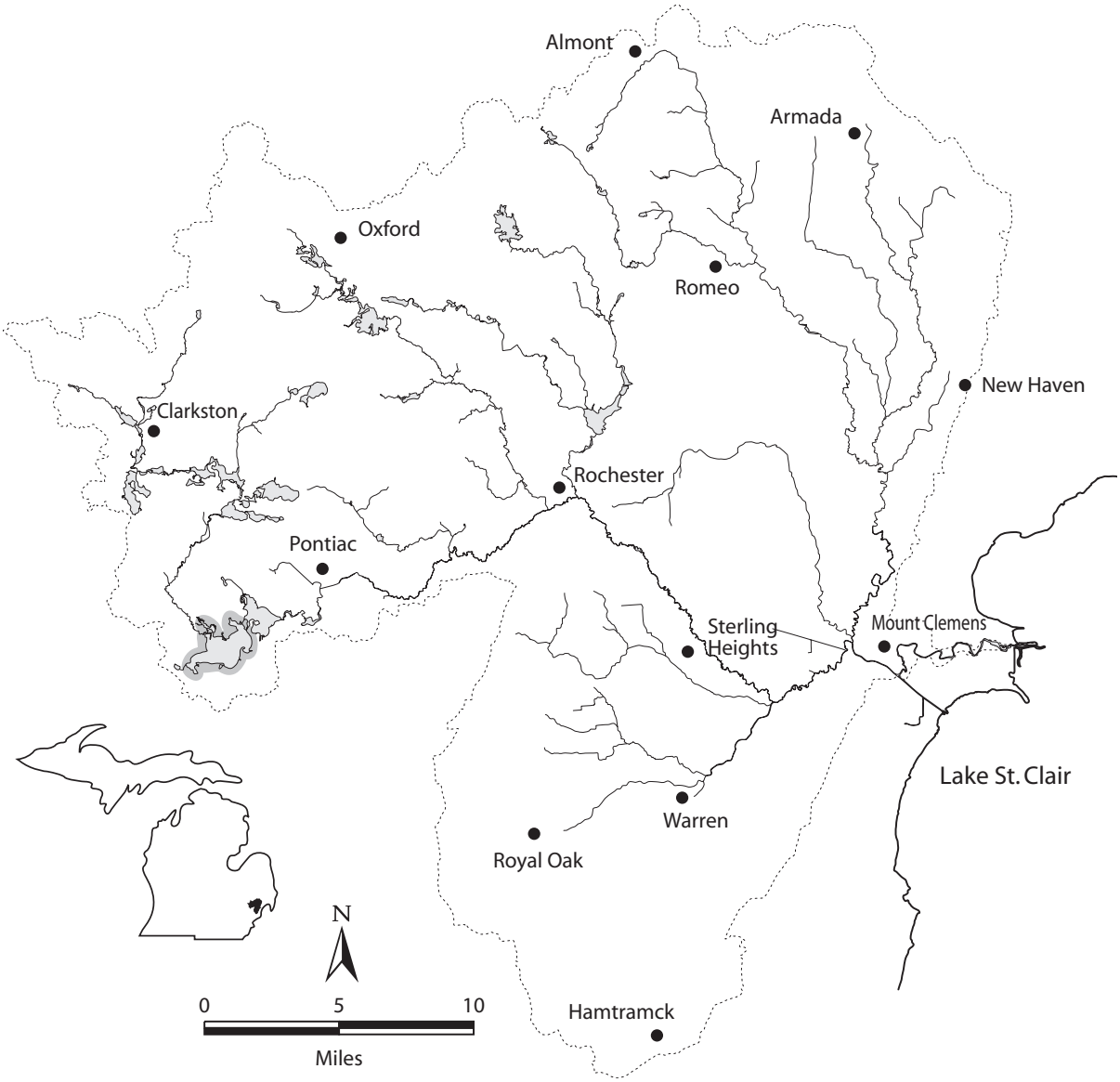


Redear sunfish *Lepomis microlophus*

Habitat:

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

spawning - nest in silt or gravel substrate

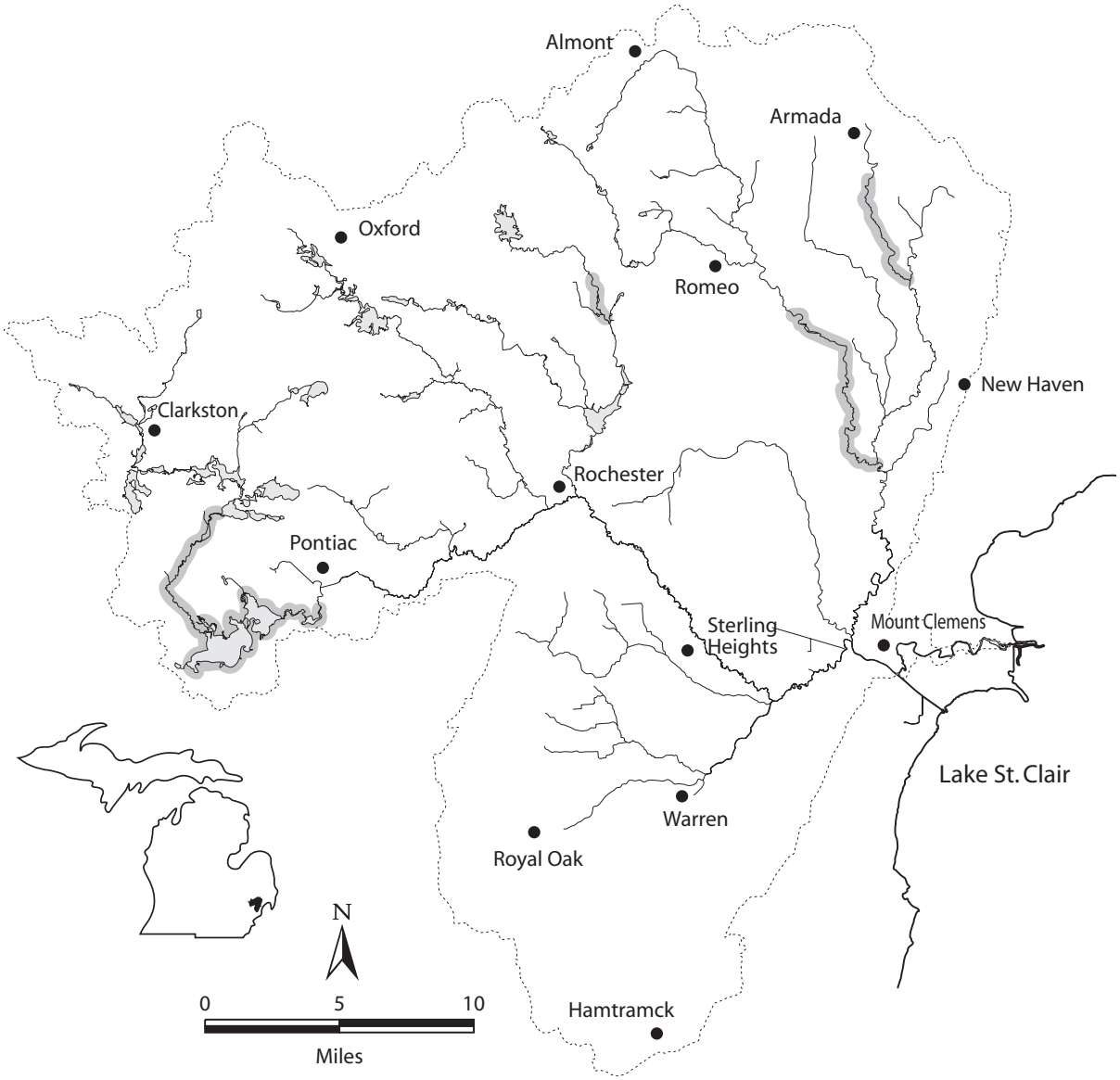


Northern longear sunfish *Lepomis peltastes*

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



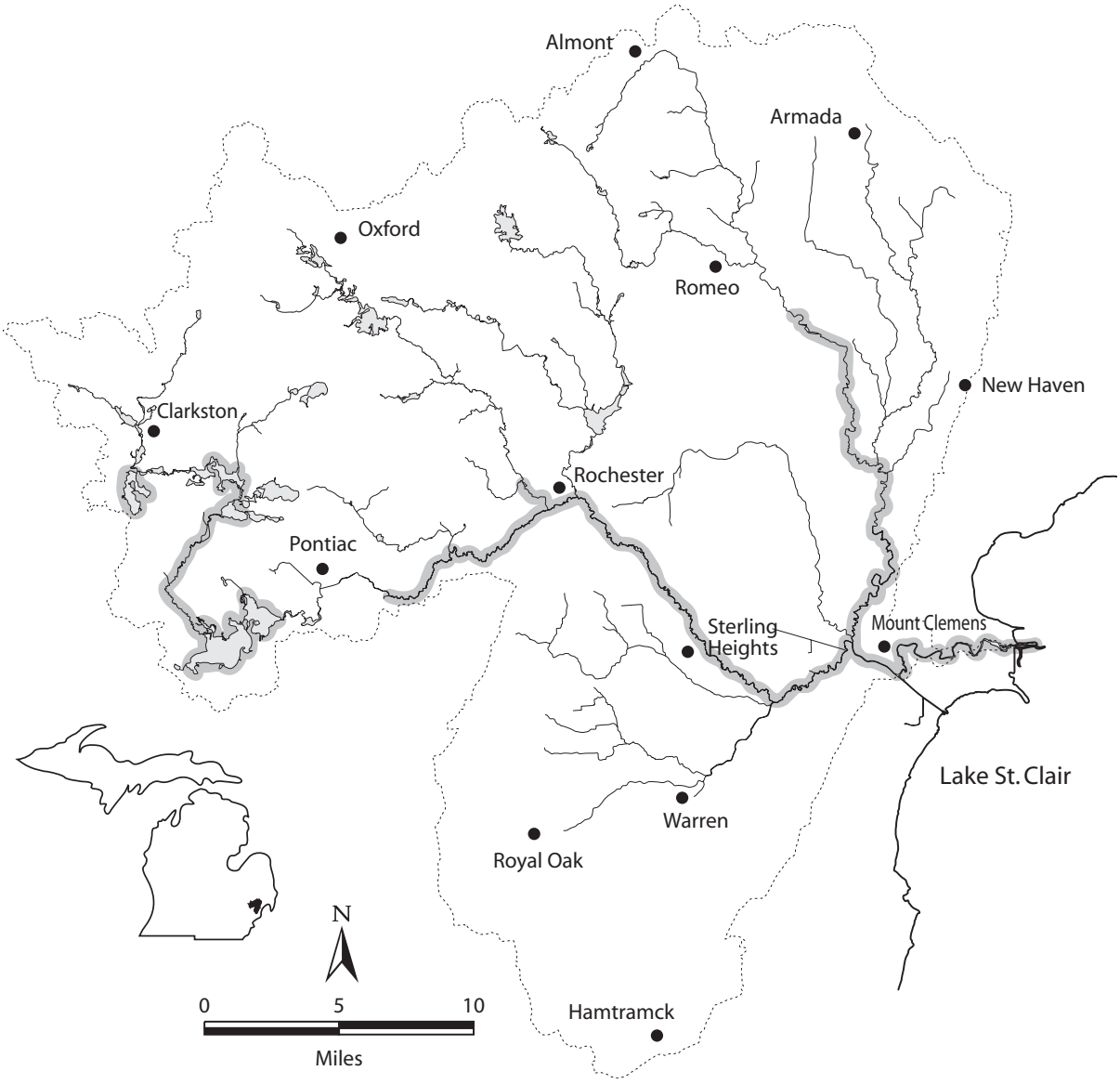
Smallmouth bass *Micropterus dolomieu*

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

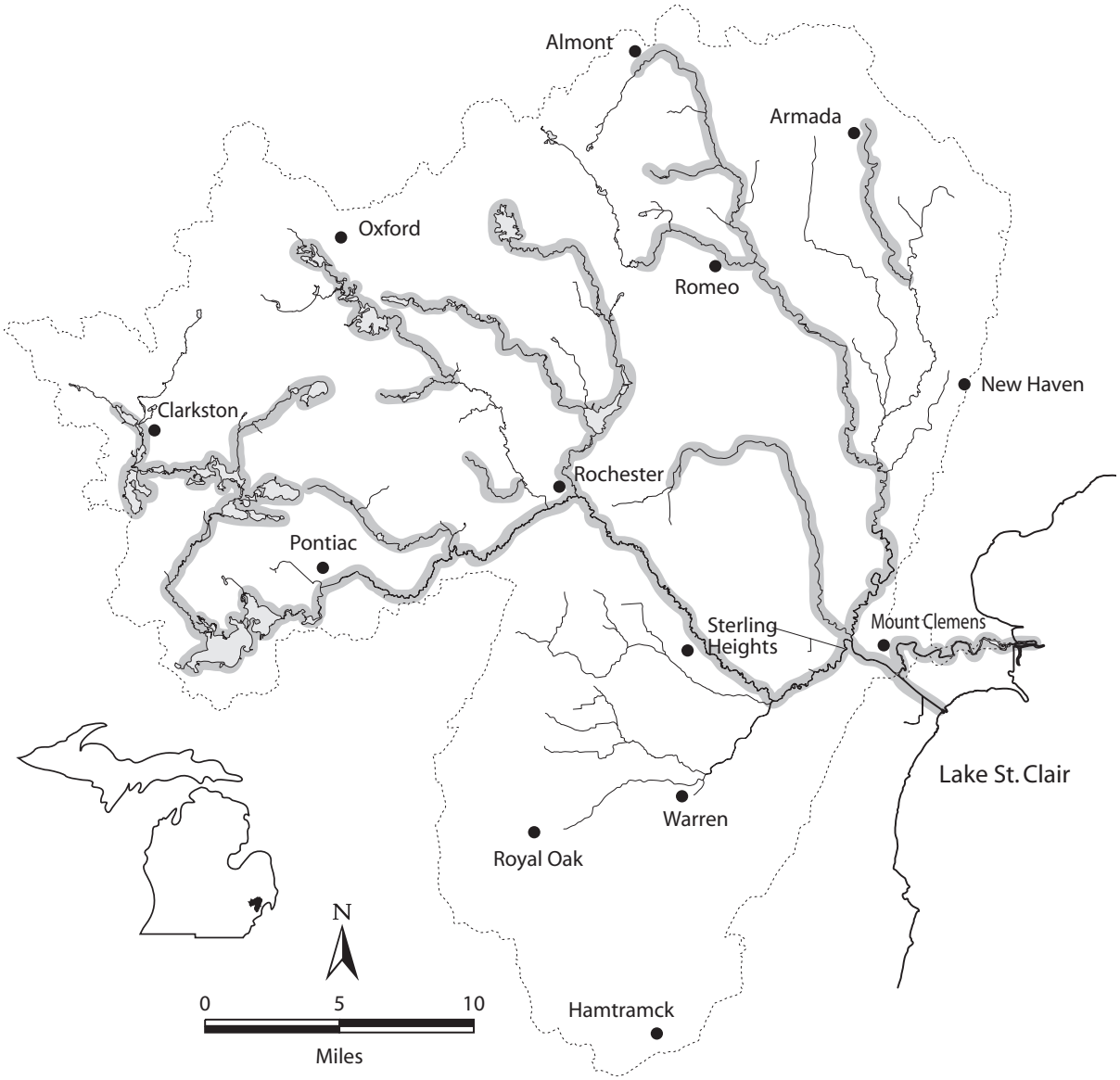


Largemouth bass *Micropterus salmoides*

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

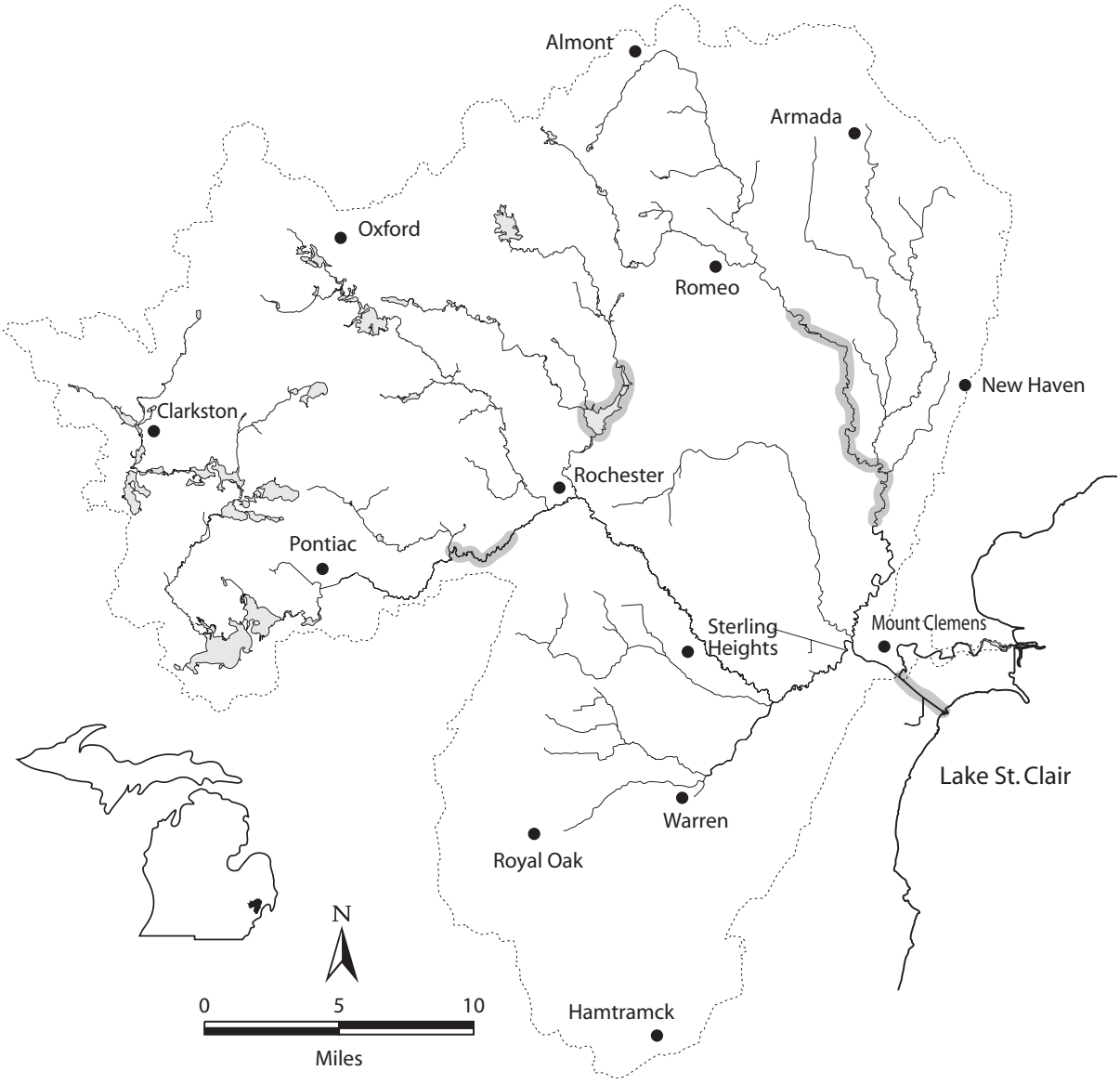


White crappie *Pomoxis annularis*

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

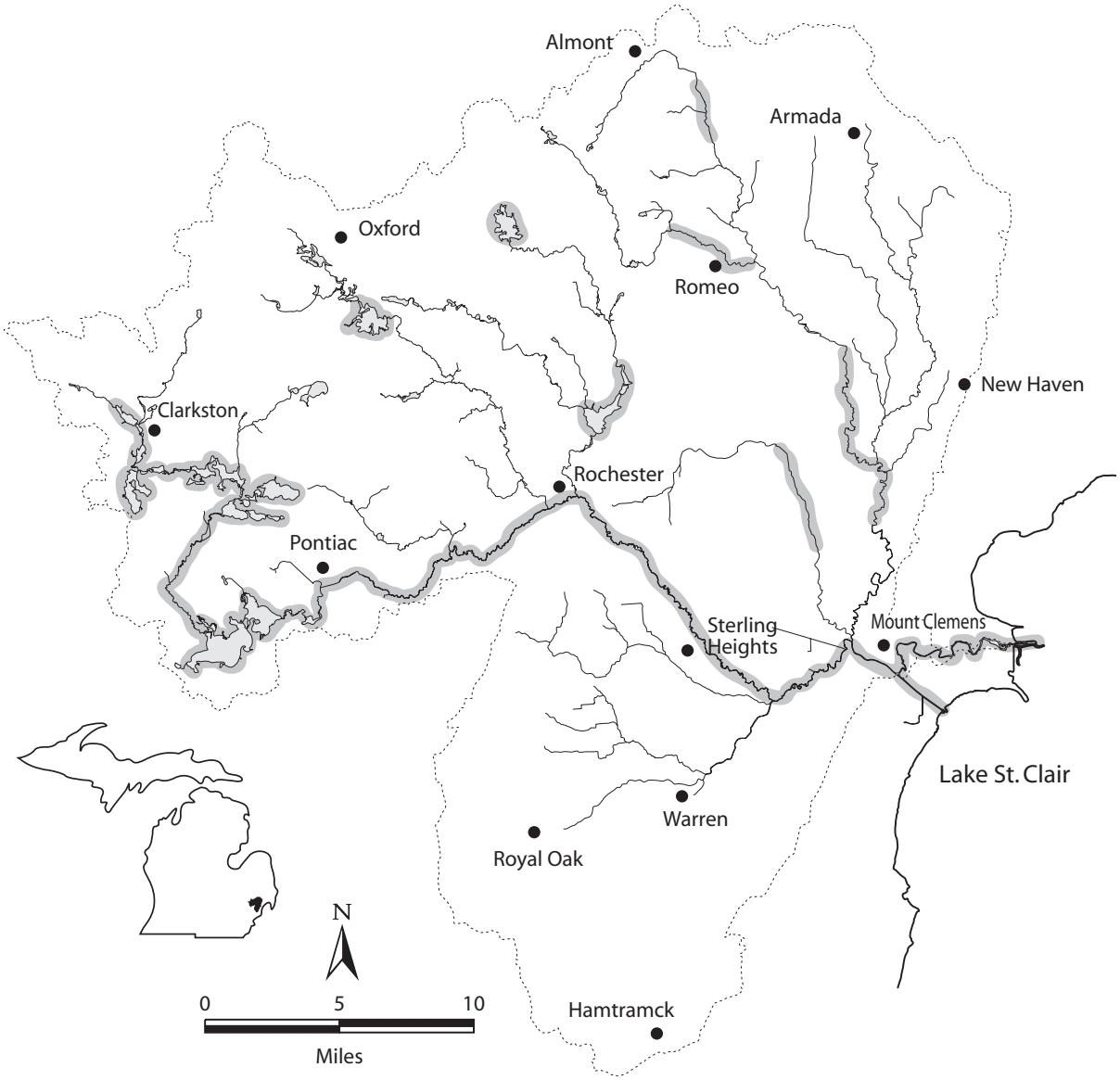


Black crappie *Pomoxis nigromaculatus*

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

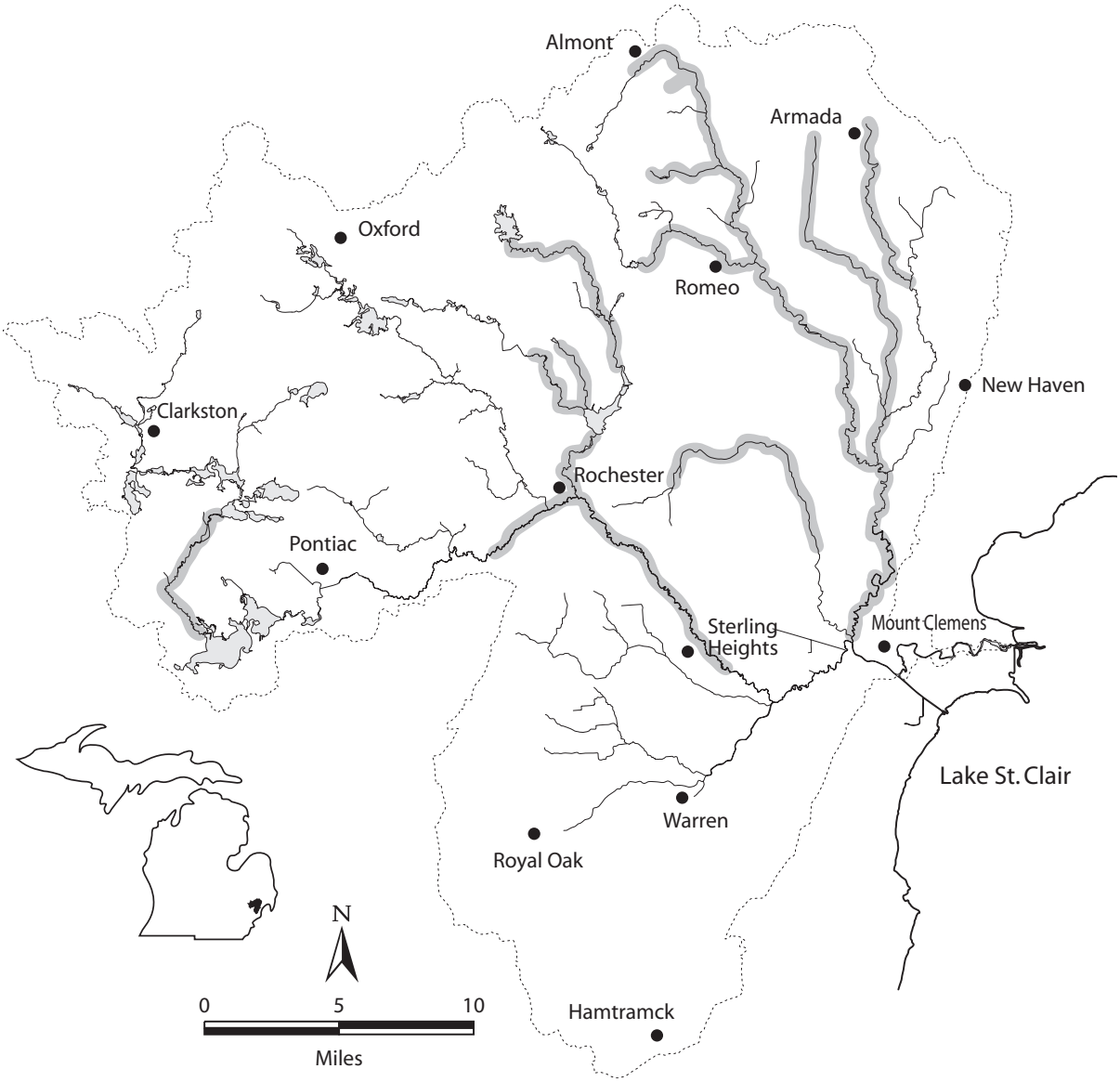


Greenside darter *Etheostoma blennioides*

Habitat:

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

spawning - filamentous algae necessary for egg deposition

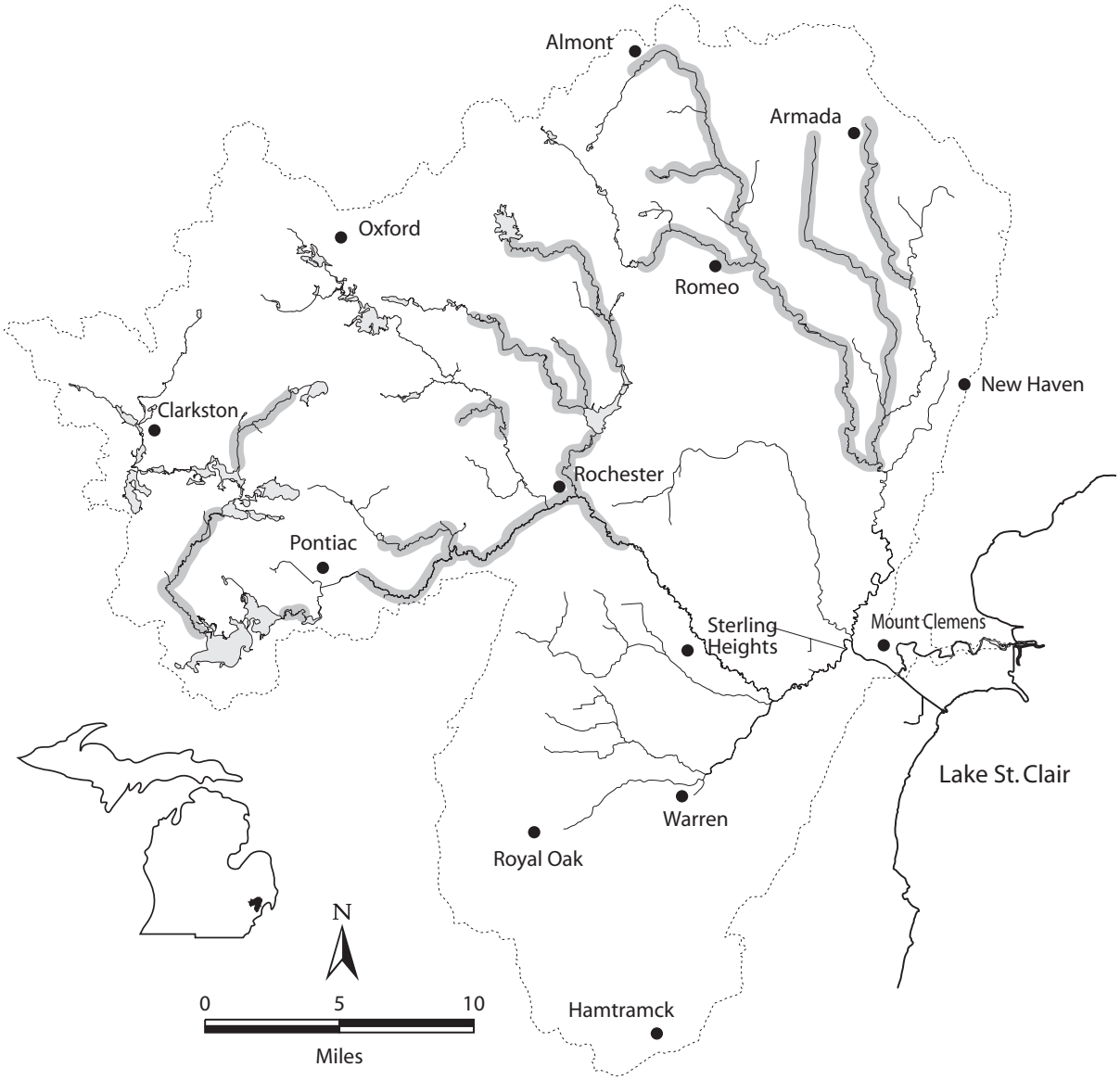


Rainbow darter *Etheostoma caeruleum*

Habitat:

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

spawning - gravel or rubble riffles

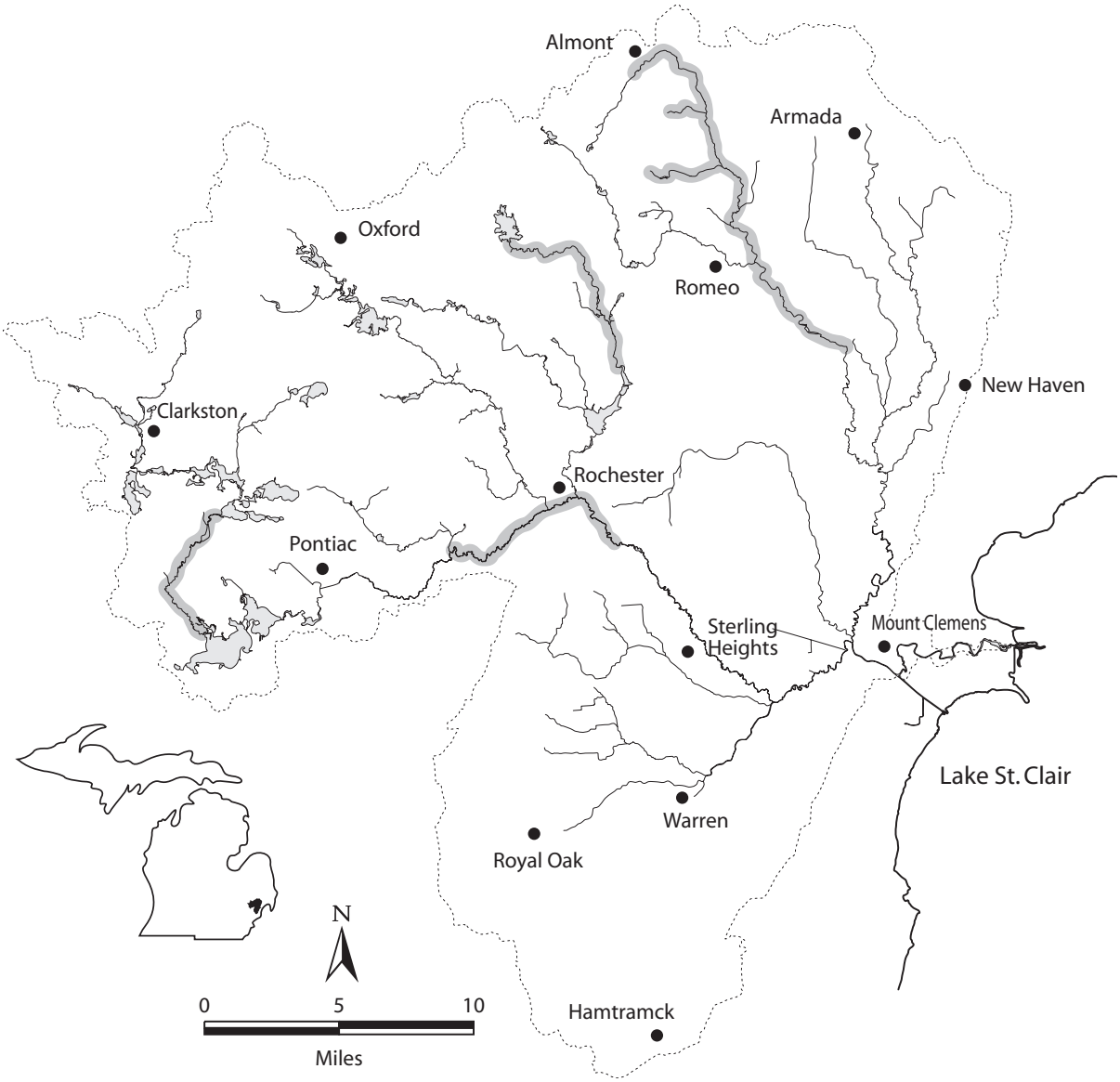


Iowa darter *Etheostoma exile*

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



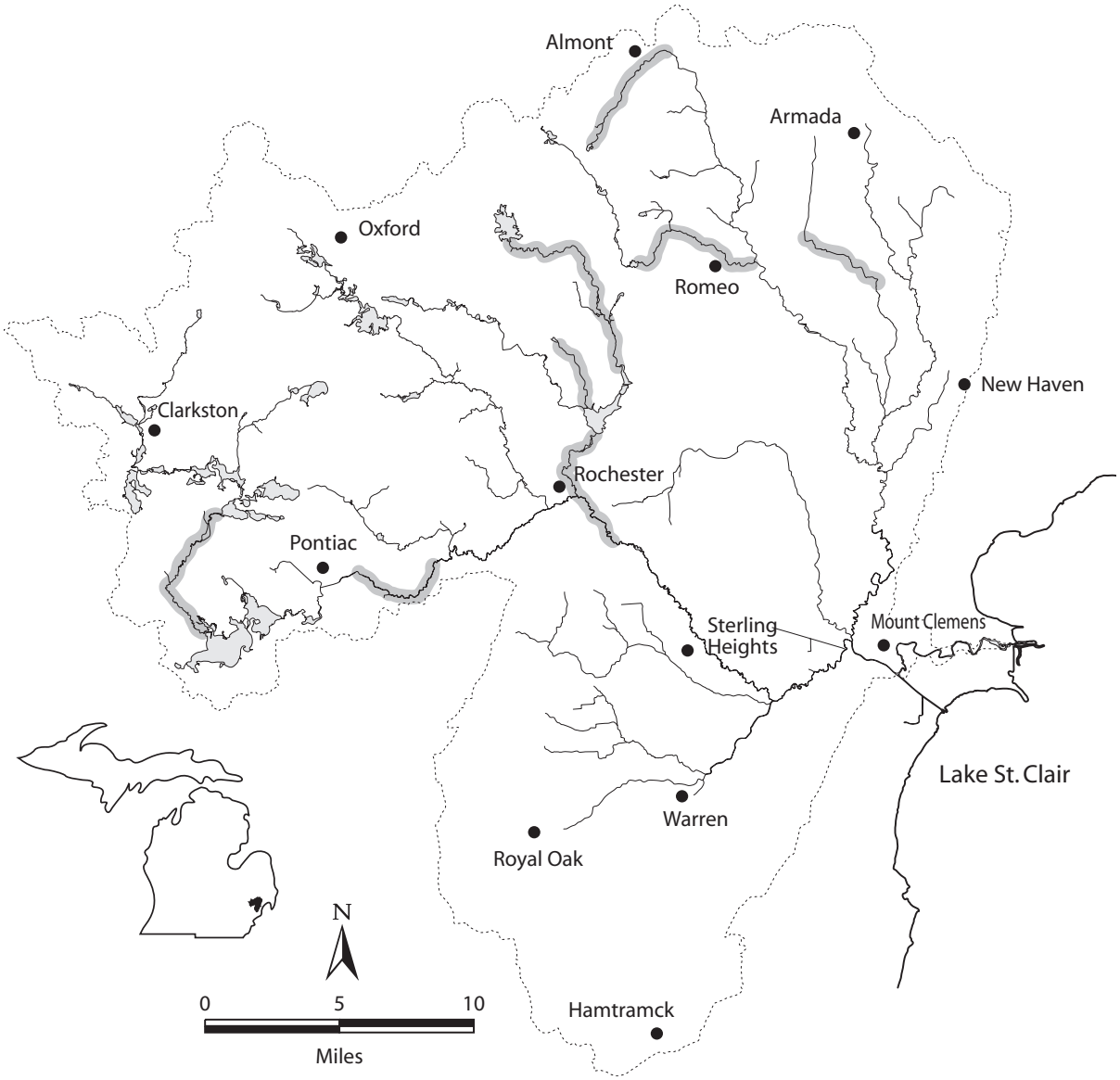
Fantail darter *Etheostoma flabellare*

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

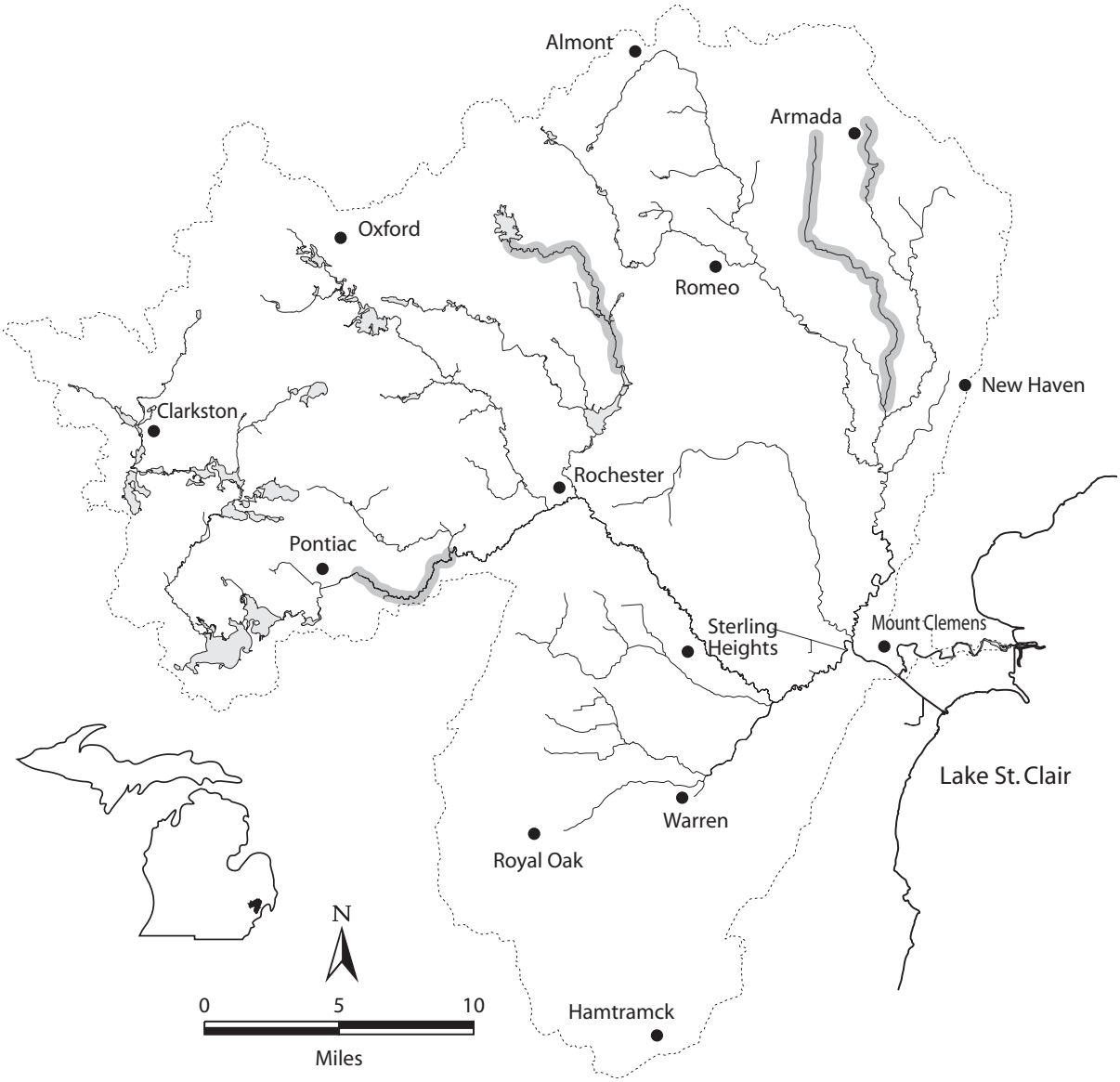


Least darter *Etheostoma microperca*

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

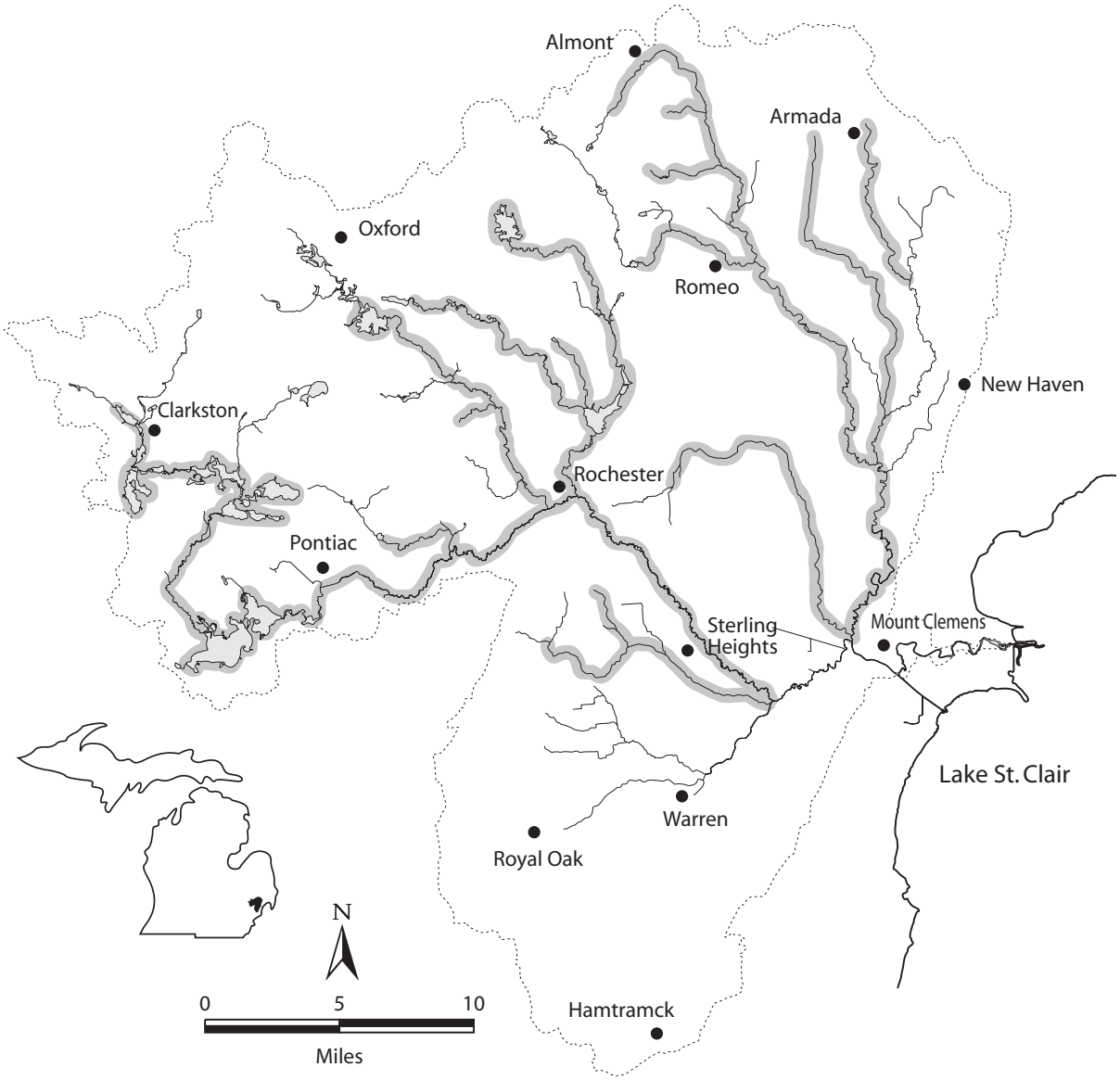


Johnny darter *Etheostoma nigrum*

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

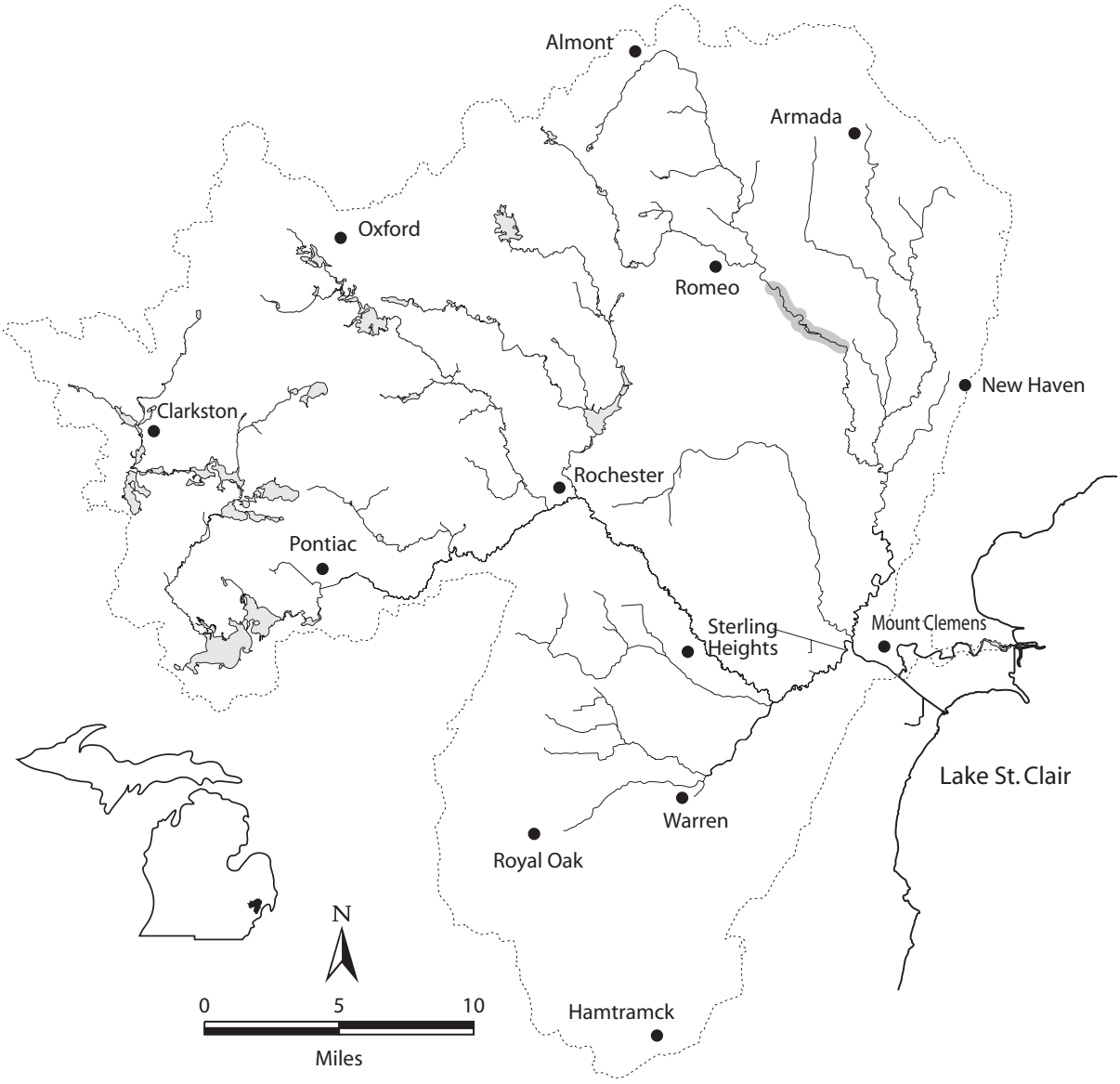


Orangethroat darter *Etheostoma spectabile*

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 to turbidity
- low to moderate gradient

spawning
- gravel riffles
- slow current

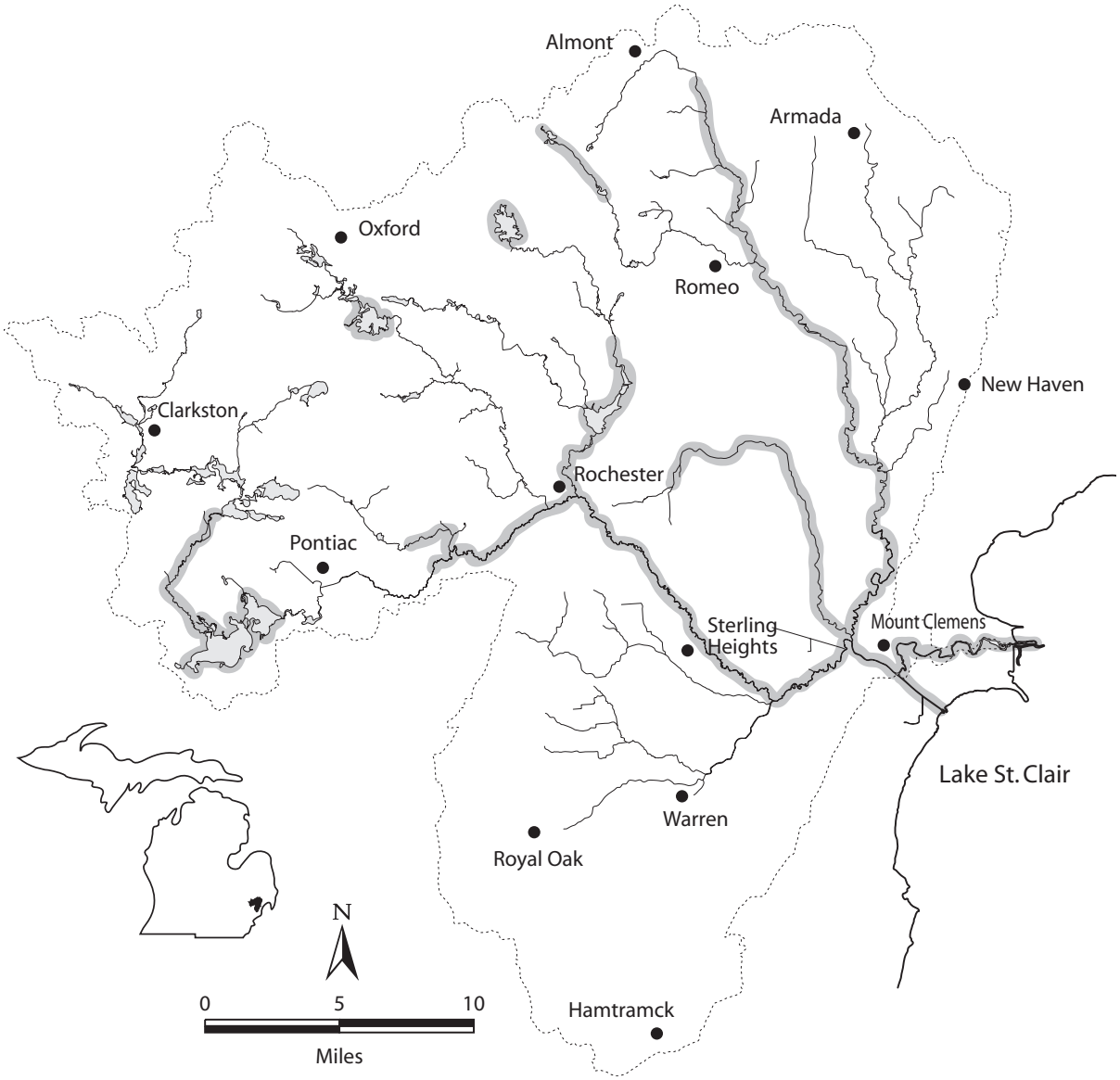


Yellow perch *Perca flavescens*

Habitat:

feeding
- clear lakes and impoundments; also Lake St. Clair
- 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

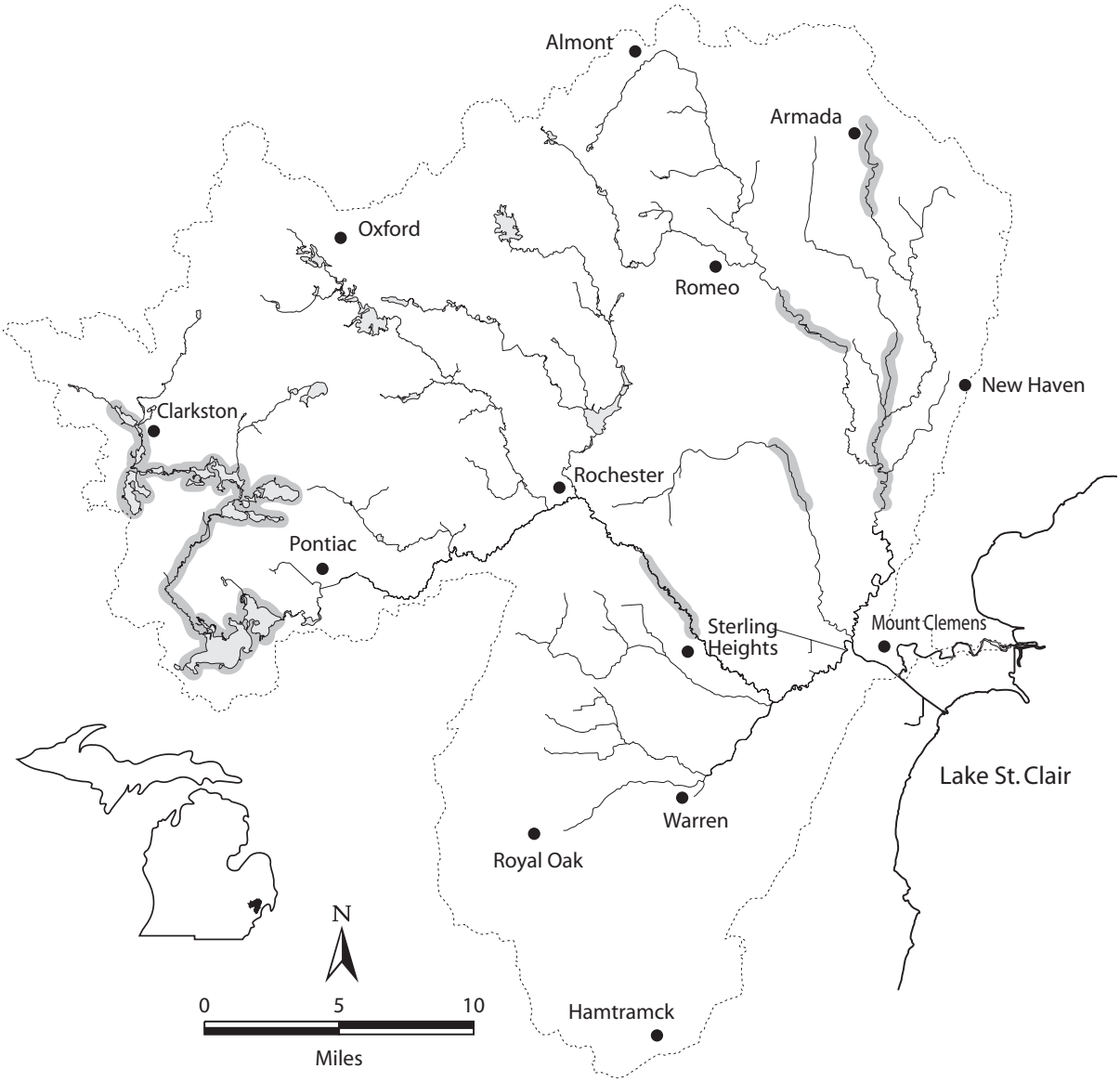


Logperch *Percina caprodes*

Habitat:

feeding
- gravel riffles, deeper slower sections of rivers
- medium size streams; also lakes, impoundments, and Lake St. Clair
- sand, gravel, or rock substrate
- avoids turbidity and silt

spawning
- riffles or sandy in-shore shallows

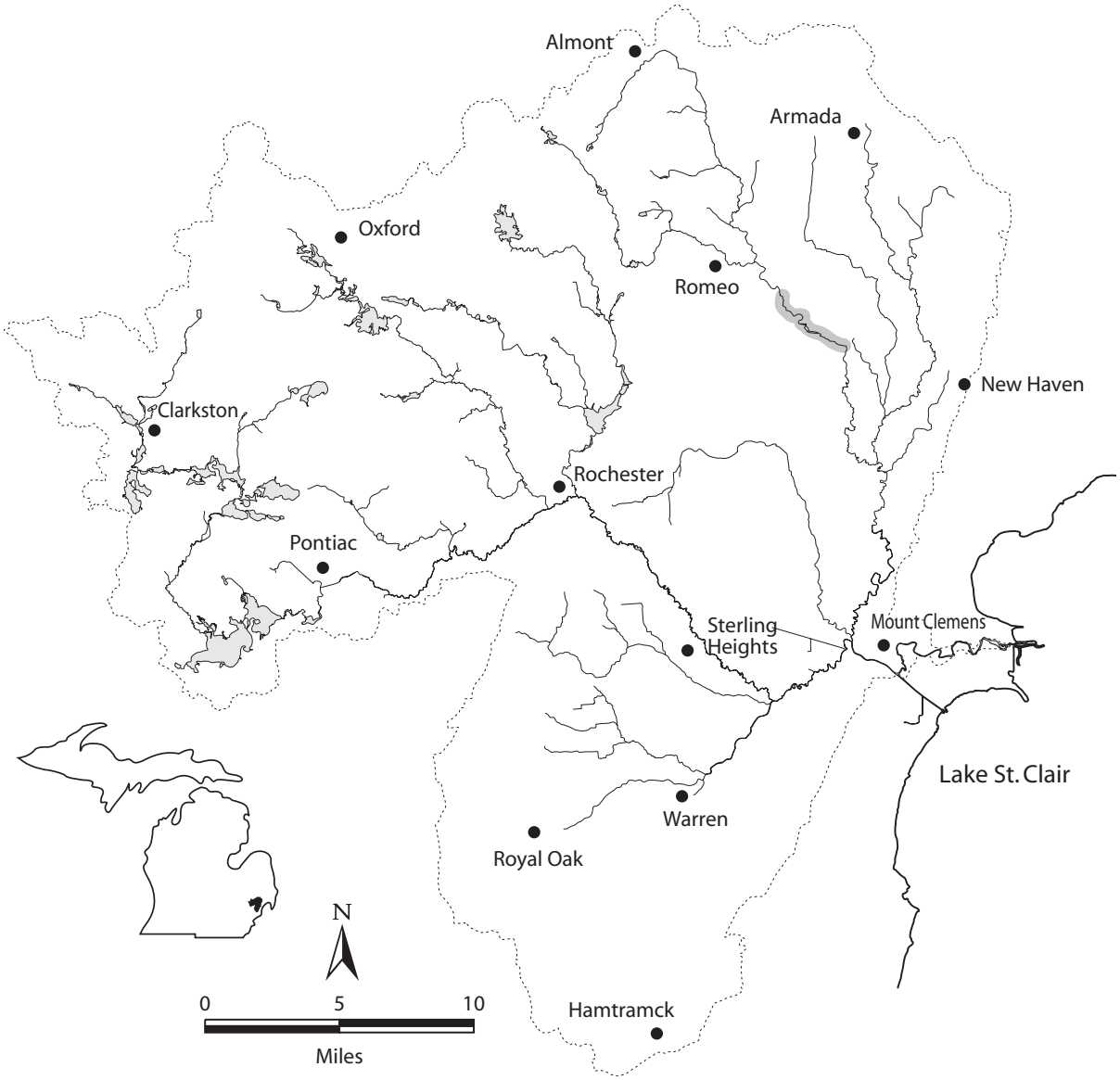


Channel darter *Percina copelandi* – **endangered**

Habitat:

feeding
- sand and gravel bars
- slow current
- large rivers

spawning
- some current is essential
- a territory is established over gravel

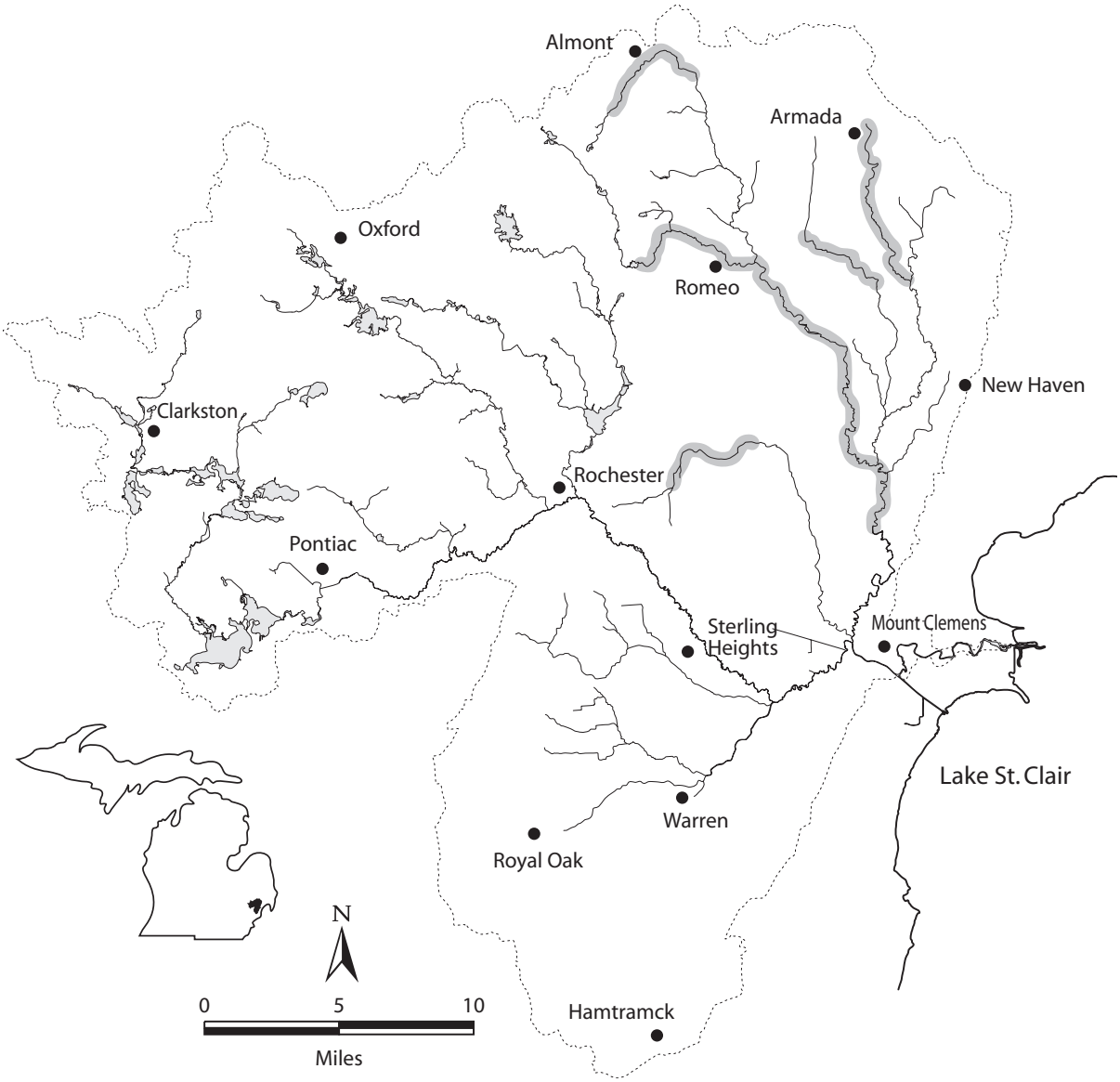


Blackside darter *Percina maculata*

Habitat:

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

spawning
- gravel and sand substrate



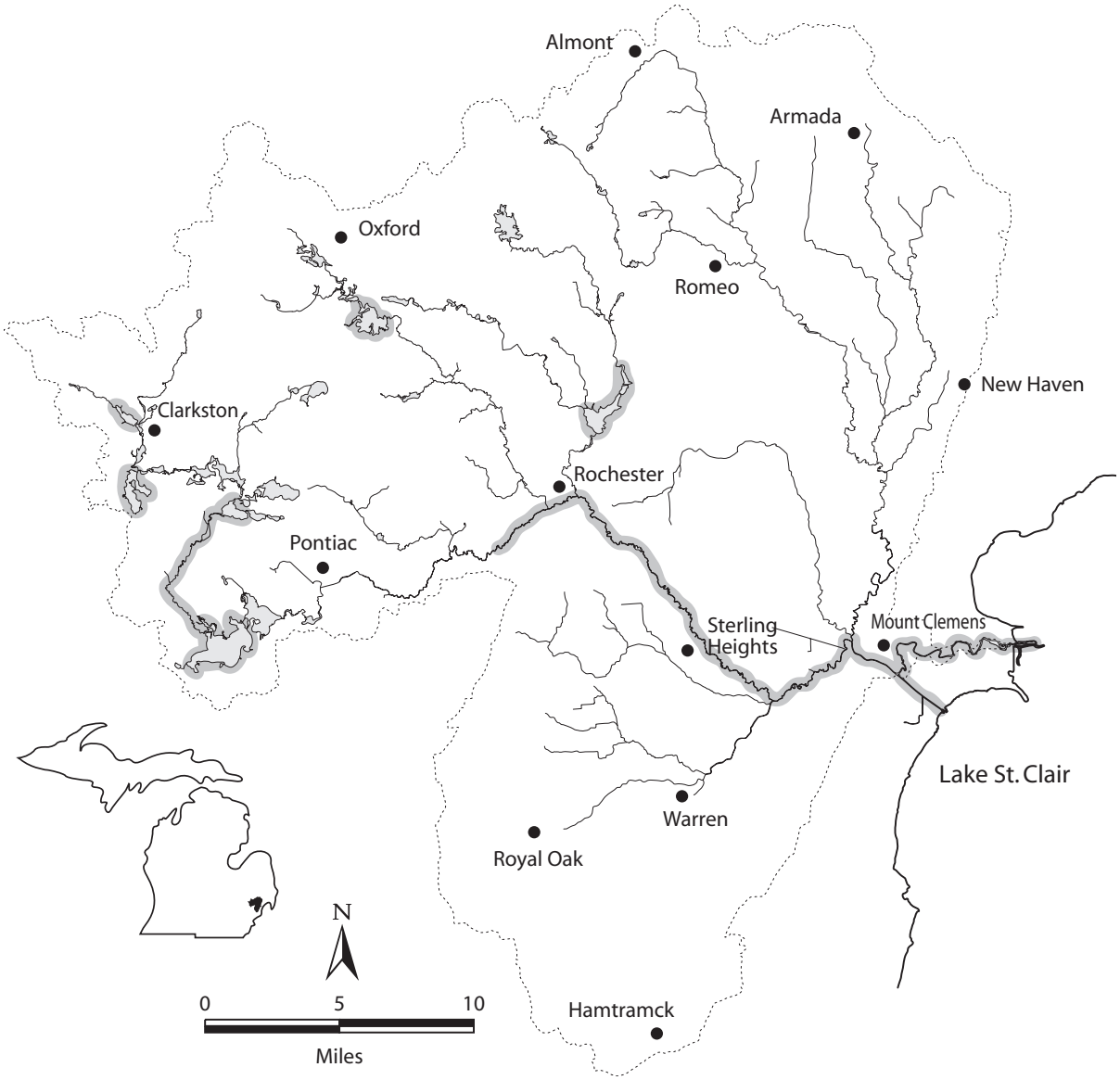
Walleye *Sander vitreus*

Habitat:

feeding
- larger, deeper streams and in large, shallow, turbid lakes and impoundments; also Lake St. Clair
- 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

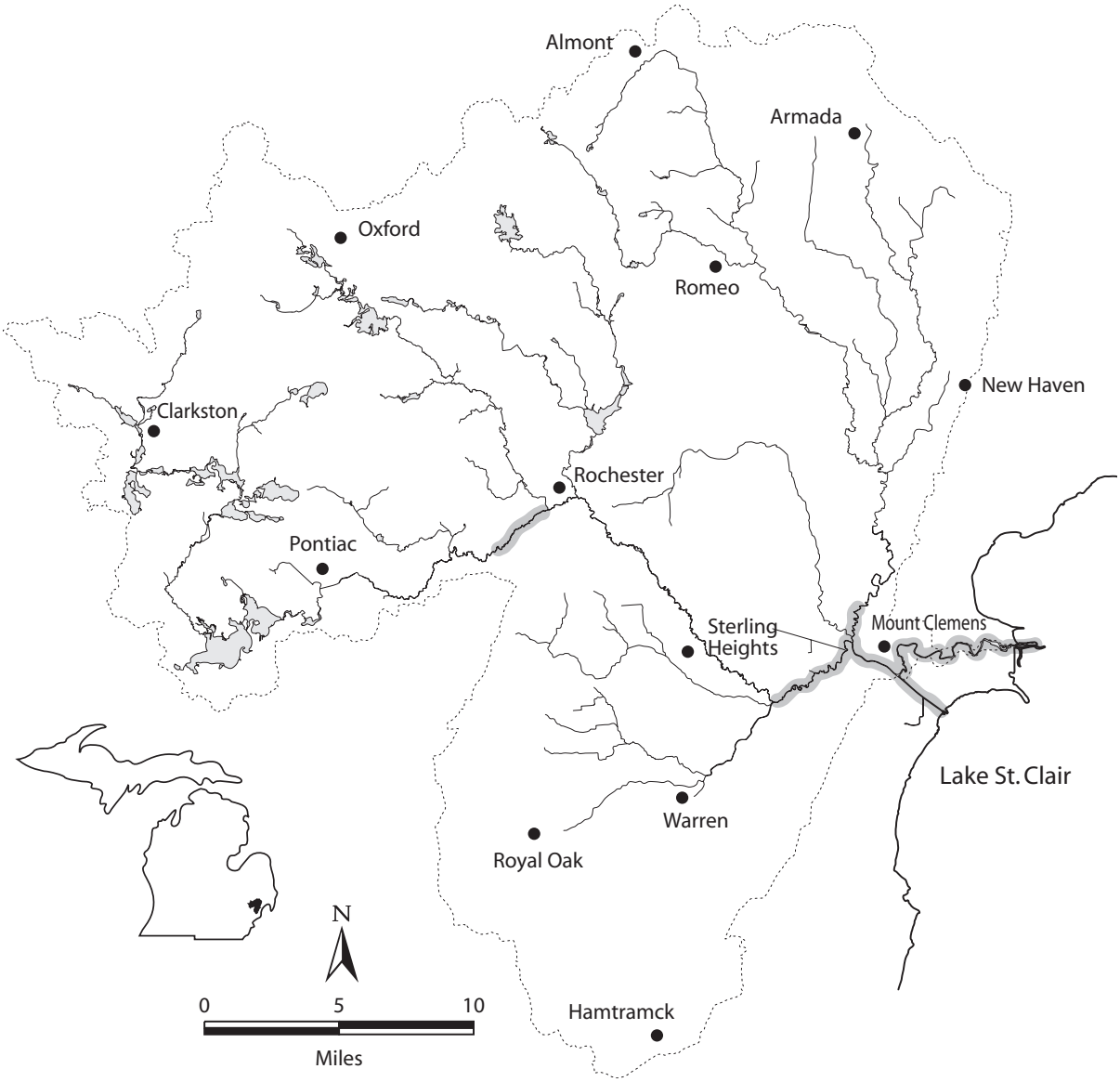


Freshwater drum *Aplodinotus grunniens*

Habitat:

feeding
- deeper pools of rivers and Lake St. Clair
- 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



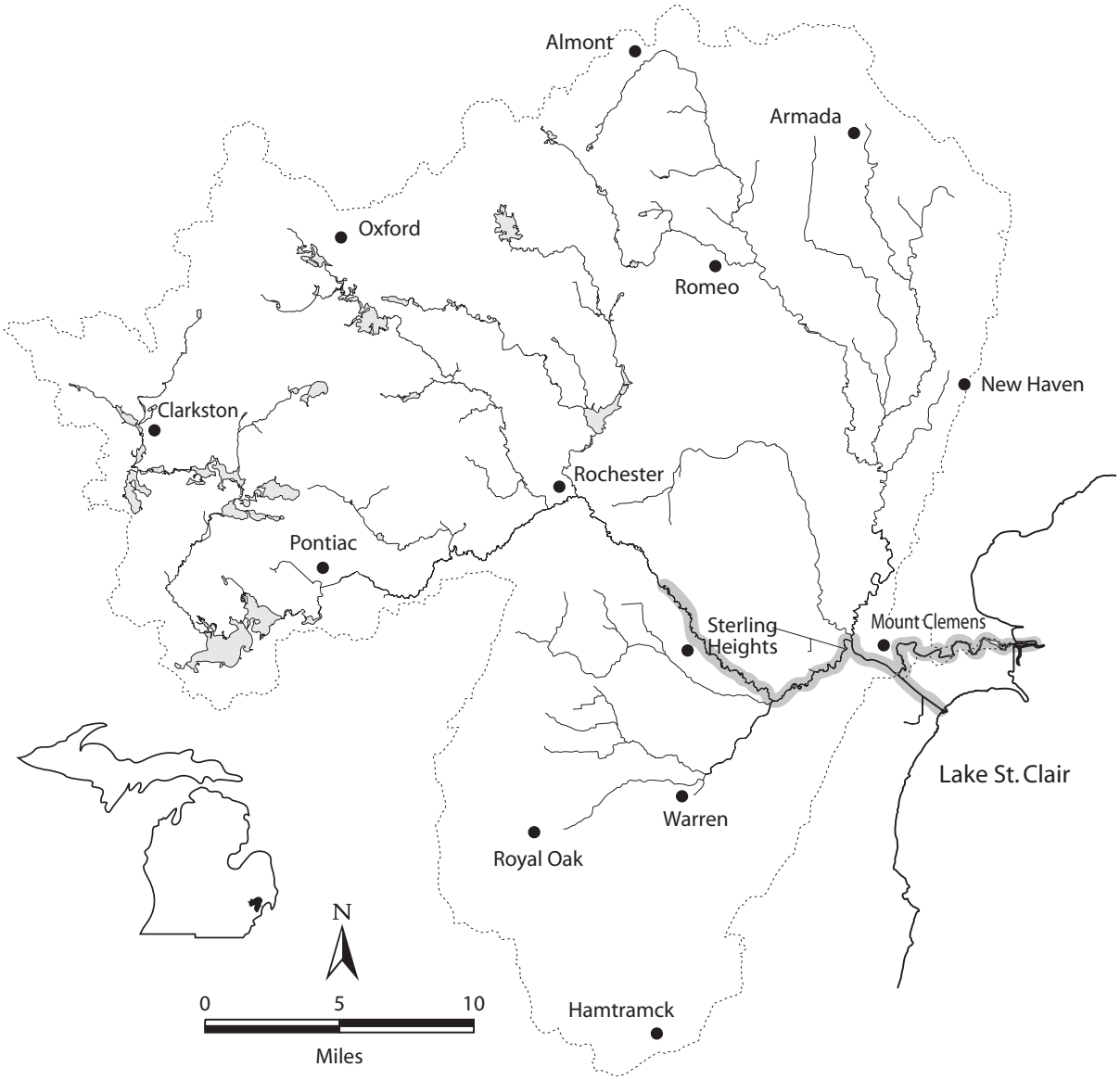
Round goby *Neogobius melanostomus*

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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Appendix 2

Miscellaneous Historical Creel Data

This appendix contains miscellaneous creel data 1928–68 for the Clinton River and tributaries. These data were compiled from records located at Michigan Department of Natural Resources, Institute for Fisheries Research. Species codes: Bkt=brook trout, Bnt=brown trout, Rbt=rainbow trout, Smb=smallmouth bass, Lmb=largemouth bass, Blg=bluegill, Psf=pumpkinseed sunfish, Rkb=rock bass, Bcr=crappie, Yep=yellow perch, Suk=sucker, Bhd=bullhead, Nop=northern pike, Crp=carp, Ccf=channel catfish, Bfn=bowfin, Whb=white bass, Crc=creek chub.

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Appendix 2.–This appendix contains miscellaneous creel data 1928–68 for the Clinton River and tributaries. These data were compiled from records located at Michigan Department of Natural Resources, Institute for Fisheries Research. Species codes: Bkt=brook trout, Bnt=brown trout, Rbt=rainbow trout, Smb=smallmouth bass, Lmb=largemouth bass, Blg=bluegill, Psf=pumpkinseed sunfish, Rkb=rock bass, Bcr=crappie, Yep=yellow perch, Suk=sucker, Bhd=bullhead, Nop=northern pike, Crp=carp, Ccf=channel catfish, Bfn=bowfin, Whb=white bass, Crc=creek chub.

Date	Township	No. anglers	No. hours	Species																	
				Bkt	Bnt	Rbt	Smb	Lmb	Blg	Psf	Rkb	Bcr	Yep	Suc	Bhd	Nop	Crp	Ccf	Bfn	Wbs	Crc
OaklandCounty																					
Clinton River																					
7/4/1928			3.5					2	15	5											
4/24/1934	Waterford		2						8		5		7								
4/4/1939	Waterford	2	3											1							
4/3/1939	Waterford	2	4								1			3							
4/27/1939	Waterford	2	5								2			1							
5/13/1039	Waterford	1	2.5								6				12						
5/13/1939	Waterford	1	2.2												17						
5/15/1939	Waterford	2	0.5												4						
5/17/1939	Waterford	2	8	1		5															
5/19/1939	Waterford	1	1												7						
5/27/1939	Waterford	2	2												21						
6/15/1939	Waterford	1	0.5																		
6/15/1939	Waterford	1	2										1								
5/20/1945	Waterford	4	8			2										1					
4/24/1948	Waterford	3	2.5								1										
4/25/1948	Waterford	1	1.5								2		1								
4/26/1948	Waterford	1	1.5																		
5/2/1948	Waterford	5	11						6												
5/18/1948	Waterford	5	7.5																		
5/23/1948	Waterford	4	6																		
5/31/1948	Waterford	10	8.5																		
4/24/1955	Waterford	4	6			3			1												
4/28/1957		12	40.5			2															
4/24/1960	Avon	12	20								4		3								
4/30/1960	Waterford	12	21			5															
5/15/1960	Pontiac	14	27								5		4								

Appendix 2.–Continued.

Date	Township	No. anglers	No. hours	Species																	
				Bkt	Bnt	Rbt	Smb	Lmb	Blg	Psf	Rkb	Bcr	Yep	Suc	Bhd	Nop	Crp	Ccf	Bfn	Wbs	Crc
6/12/1960	Waterford	10	18								1		6								
4/9/1961	Avon	11	17										5								
4/29/1961	Avon	7	15.5		3																
4/30/1961	Waterford	6	11		1																
5/4/1961	Waterford	10	20													1					
5/4/1961	Avon	10	20							1	3										
5/13/1961	Waterford	14	35								3		4								
5/14/1961	Waterford	10	20								2		3								
5/14/1961	Avon	13	31								6										
5/21/1961	Waterford	9	16			2															
5/21/1961	Waterford	10	20						8												
6/11/1961	Avon	20	37						4		12										
8/18/1961	Waterford	12	26						4												
3/18/1962	W. Bloomfield	19	32								1	9									
4/1/1962	Avon	9	18									5	3								
4/6/1962	Avon	11	22								4		6								
4/8/1962	Avon	10	16								8										
4/9/1962	Avon	9	15								5		6								
5/11/1962	Avon	11	17										9								
5/20/1962	Avon	30	51								4	3	7								
5/26/1962	W. Bloomfield	10	17						4		6										
5/27/1962	Avon	21	33								11		10								
6/30/1962	Waterford	13	21						4		7										
4/1/1963	Avon	10	18																		
4/1/1963	Pontiac	12	23								4		8								
4/28/1963		9	15			3															
5/11/1963		11	18								6										
4/13/1964	Waterford	7	9																		
4/25/1964	Waterford	34	114		3	33															
5/2/1964	Waterford	11	18			5															
5/16/1964	Waterford	11	22			3															

Appendix 2.–Continued.

Date	Township	No. anglers	No. hours	Species																	
				Bkt	Bnt	Rbt	Smb	Lmb	Blg	Psf	Rkb	Bcr	Yep	Suc	Bhd	Nop	Crp	Ccf	Bfn	Wbs	Crc
Paint Creek																					
6/17/1928			3.5					1							1						
6/29/1939	Orion	1	4																		
7/9/1939	Orion	1	4.5																		
7/13/1939	Orion	1	3																		
7/22/1939	Orion	1	3		1																
4/25/1940	Orion	21	66.2																		
4/26/1940	Orion	5	11.5			1															
5/4/1940	Orion	1	3	1	2																
5/4/1940	Orion	1	3																		
5/5/1940	Orion	1	3																		
5/5/1940	Orion	1	3																		
6/9/1940	Orion	2	3		1																
4/29/1944	Orion	77	176																		
4/30/1944	Orion	59	162.5			1															
5/3/1944	Orion	1	2.5																		
5/7/1944	Orion	7	20.5		8																
4/30/1949	Orion	28	64			2															
7/6/1949	Orion	5	8	1																	
4/26/1952	Oakland	9	19			6															
4/27/1952	Oakland	12	15			3															
5/9/1957	Orion	7	11																		
5/28/1957	Orion	4	5			4															
5/29/1957	Orion	5	8			3															
4/30/1960	Oakland	27	58		12	6															
4/30/1960	Oakland	25	62		10	10															
5/1/1960	Avon	8	21			3															
4/28/1962	Orion	7	20		3	4															
4/27/1968	Orion	36	94			36															
5/11/1968	Orion	7	13		2	8															

Appendix 2.–Continued.

Date	Township	No. anglers	No. hours	Species																	
				Bkt	Bnt	Rbt	Smb	Lmb	Blg	Psf	Rkb	Bcr	Yep	Suc	Bhd	Nop	Crp	Ccf	Bfn	Wbs	Crc
Sashabaw Creek																					
4/4/1942	Independence																				
5/1/1948	Independence	3	6											1		1					
Trout Creek																					
8/26/1946	Orion	4	7	3																	
7/6/1949	Orion	3	5.5	3																	
4/27/1952	Orion	11	21	4																	
5/29/1957	Orion	3	3																		
4/30/1960	Orion	18	32	11																	
6/30/1960	Orion	7	17	9																	
4/28/1962	Orion	23	70	40																	
4/27/1963	Orion	14	36	20																	
4/28/1963	Orion	7	27	4																	
5/12/1963	Orion	7	10																		
Lapeer County																					
Townsend Creek																					
4/27/1957																					
Macomb County																					
Townsend Creek																					
5/1/1930	Bruce	1	6	18																	
5/1/1930	Bruce	1	5	6																	
5/1/1930	Bruce	1	0.5	6																	
5/1/1930	Bruce	1	5	5																	
5/1/1930	Bruce	1	6	10																	
5/1/1930	Bruce	1	5	6																	
5/3/1930	Bruce	1	6	8																	
4/26/1947	Bruce	28	89	86																	
4/27/1947	Bruce	4	6	5																	
4/29/1947	Bruce	2	5	4																	
4/30/1948	Bruce	14	33	12																	
5/1/1948	Bruce	14	47	16																	
4/28/1951	Bruce	13	32	36																	

Appendix 2.–Continued.

Date	Township	No. anglers	No. hours	Species																	
				Bkt	Bnt	Rbt	Smb	Lmb	Blg	Psf	Rkb	Bcr	Yep	Suc	Bhd	Nop	Crp	Ccf	Bfn	Wbs	Crc
4/29/1951	Bruce	10	15	3																	
5/19/1951	Bruce	2	5	1																	
5/28/1951	Bruce	2	6	5																	
4/26/1952	Bruce	11	21	25																	
4/27/1952	Bruce	2	6	4																	
4/30/1955	Bruce	15	31	29																	
5/1/1955	Bruce	5	17	9																	
5/3/1955	Bruce	2	4	3																	
4/28/1956	Bruce	9	18	4																	
5/3/1956	Bruce	2	4	5																	
8/4/1956	Bruce	2	4	3																	
4/26/1957	Bruce	4	7	5																	
4/26/1958	Bruce	7	22	26																	
4/27/1958	Bruce	7	14	6																	
5/4/1958	Bruce	4	10	12																	
5/10/1958	Bruce	6	12	3																	
5/16/1958	Bruce	1	2	5																	
4/25/1958	Bruce	20	55	86																	
4/26/1958	Bruce	9	15	9																	
5/2/1958	Bruce	7	16	8																	
5/16/1958	Bruce	5	8	18																	
4/30/1960	Bruce	48	101	112																	
4/29/1961	Bruce	21	45	4																	
4/30/1961	Bruce	5	10	2																	
5/21/1961	Bruce	5	5	4																	
4/28/1962	Bruce	18	24	9																	
4/28/1962	Bruce	10	23	16																	
5/6/1962	Bruce	3	2																		
5/15/1962	Bruce	1	1	2																	
5/20/1962	Bruce	2	2	10																	
4/27/1963	Bruce	10	19	46																	
4/28/1963	Bruce	3	3	3																	
5/4/1963	Bruce	4	10	13																	

Appendix 2.–Continued.

Date	Township	No. anglers	No. hours	Species																	
				Bkt	Bnt	Rbt	Smb	Lmb	Blg	Psf	Rkb	Bcr	Yep	Suc	Bhd	Nop	Crp	Ccf	Bfn	Wbs	Crc
7/20/1963	Bruce	1	4	4																	
4/25/1964	Bruce	26	78	28																	
4/26/1964	Bruce	7	13	13																	
5/1/1964	Bruce	3	7	9																	
Coon Creek																					
4/11/1959	Lenox	6	5								11			4							
4/17/1959	Lenox	8	10											20							
5/8/1959	Lenox	9	7											14							
5/10/1959	Lenox	10	25											10							
6/13/1959	Lenox	2	2																		
6/18/1959	Lenox	2	4												4						
7/31/1959	Lenox	6	6														2				
Clinton River																					
1934		2	12										1		3						
1938		5	22														7				
1939		8	36				1	1			8		1	4		1	4				
1942		55	238								23		585	30		5					
1943		1	4										22								
1944		8	38										5	51							
1945		41	118						7					2	5	1	8				
1946		48	164											1	3		10	4	1		
1948		44	129											19		1	3	1			
1951		20	65										1	10							
1953		40	47																2	13	
1954		252	493									308	486	22	19	1			2	9	
1956		152	315						9	3	24	70	85		20		19				
1958		418	1307									1	2,203		1		15				
1959		246	386								18	10	950	1			2	4			
Clinton River																					
7/17/1934	Harrison	1	6										1								
7/17/1934	Harrison	1	6												3						
4/10/1938	Mt. Clemens	4	11.5														6				

Appendix 2.–Continued.

Date	Township	No. anglers	No. hours	Species																	
				Bkt	Bnt	Rbt	Smb	Lmb	Blg	Psf	Rkb	Bcr	Yep	Suc	Bhd	Nop	Crp	Ccf	Bfn	Wbs	Crc
4/30/1938	Mt. Clemens	1	10.8														1				
5/13/1939	Mt. Clemens	2	2													1					
5/18/1939	Mt. Clemens	2	4								8			4							
6/29/1939	Mt. Clemens	2	8				1														
6/29/1939	Mt. Clemens	1	5					1									4				
6/29/1939	Mt. Clemens	1	3										1								
3/26/1942	Mt. Clemens	25	82								2		397								
3/27/1942	Mt. Clemens	13	77										173	30							
5/19/1942	Mt. Clemens	2	6										1			1					
5/31/1942	Mt. Clemens	2	7								4		3			1					
6/7/1942	Mt. Clemens	2	7								2		9			2					
6/11/1942	Mt. Clemens	2	5								4		1			1					
6/12/1942	Mt. Clemens	2	6								1		1								
6/14/1942	Mt. Clemens	8	26								2										
6/16/1942	Mt. Clemens	2	5																		
3/30/1943	Harrison	1	4										22								
3/10/1944	Harrison	2	4																		
3/15/1944	Harrison	4	28											51							
3/16/1944	Harrison	2	6										5								
8/9/1945	Harrison	2	6																		
8/25/1945	Shelby	6	17																		
8/25/1945	Shelby	8	27						7					1		1	3				
8/29/1945	Harrison	3	11														3				
8/30/1945	Harrison	17	44																		
8/30/1945	Harrison	5	13											1	5		2				
5/19/1946	Harrison	2	6																1		
6/6/1945	Harrison	6	18														2	1			
6/9/1945	Harrison	7	28															2			
6/15/1945	Harrison	4	16												1						
6/17/1945	Harrison	6	18.5																		
6/22/1945	Harrison	3	12														2	1			
6/26/1945	Ray	2	8											1	1						
7/13/1945	Harrison	3	9														2				

Appendix 2.–Continued.

Date	Township	No. anglers	No. hours	Species																
				Bkt	Bnt	Rbt	Smb	Lmb	Blg	Psf	Rkb	Bcr	Yep	Suc	Bhd	Nop	Crp	Ccf	Bfn	Wbs	Crc
7/15/1945	Harrison	2	7																		
8/3/1945	Harrison	4	10												1		3				
8/6/1946	Harrison	7	27														1				
8/10/1946	Harrison	2	4																		
4/27/1948	Clinton	13	36											3							
5/1/1948	Shelby	12	41											16							
6/5/1948	Macomb	5	17													1		1			
7/7/1948	Harrison	14	35														3				
5/28/1951	Shelby	20	65										1	10							
5/31/1953	Harrison	37	38																2		
8/8/1953		3	9																	13	
1/3/1954	Harrison	66	143									236	92								
1/8/1954	Harrison	14	16										19								
1/9/1954	Harrison	39	108									59	159							7	
1/9/1954	Chesterfield	15	37									4	128							2	
1/10/1954	Harrison	18	40									3	69								
4/3/1954	Harrison	2	2										4								
4/10/1954	Harrison	8	7										4		5						
4/10/1954	Harrison	13	13										7		5						
4/11/1954	Sterling Heights	6	9											2							
4/12/1954	Harrison	10	21										4		2						
4/13/1954	Macomb	2	4																		
4/15/1954	Harrison	4	7											9							
4/15/1954	Shelby	5	10											3							
4/23/1954	Chesterfield	20	33												7						
4/25/1954	Sterling Heights	10	17									6		5							
4/25/1954	Sterling Heights	8	13											3							
4/25/1954	Shelby	1	2																		
5/2/1954	Harrison	11	11													1			2		
1/14/1956	Harrison	11	19									9	27								
4/8/1956	Harrison	11	17								4		1								
4/8/1956	Harrison	10	32									15	28		3						
4/8/1956	Harrison	10	18										1				7				

Appendix 2.–Continued.

Date	Township	No. anglers	No. hours	Species																
				Bkt	Bnt	Rbt	Smb	Lmb	Blg	Psf	Rkb	Bcr	Yep	Suc	Bhd	Nop	Crp	Ccf	Bfn	Wbs	Crc
4/15/1956		39	96										2		5		10				
4/15/1956		24	35									8	14		6						
5/4/1956		18	42						1	1	20		8		6		1				
5/26/1956		29	56						8	2		38	4				1				
1/4/1958		76	110										63								
1/8/1958		7	11																		
1/10/1958		15	23										26								
1/11/1958	Harrison	18	36								1		24								
1/31/1958	Harrison	9	20										51								
3/15/1958	Harrison	3	6																		
3/23/1958	Harrison	82	217										688								
3/28/1958	Harrison	112	186									1	611								
3/29/1958	Harrison	114	494										637								
3/30/1958	Harrison	68	129										201								
4/11/1958	Harrison	30	68										66		1		13				
4/13/1958		3	6														2				
4/1/1959		113	184										726								
4/12/1959		29	44									8	115								
4/12/1959		12	16									2	50					4			
4/13/1959		31	54								12		34	1							
5/2/1959		38	51								4		11								
5/2/1959		23	37								2	10	950	1			2	4			
Middle Branch																					
4/12/1954	Macomb	18	26											28							
4/25/1954	Macomb	2	4											7			5				
4/6/1956	Macomb	3	3																		
North Branch																					
5/12/1940	Ray	2	6								1		23								
7/2/1940	Ray	2	4.5							2			2								
7/2/1940	Ray	4	2							2			1								
6/17/1946	Ray	2	6.5								4		2								
8/5/1948	Ray	4	10																		

Appendix 2.–Continued.

Date	Township	No. anglers	No. hours	Species																	
				Bkt	Bnt	Rbt	Smb	Lmb	Blg	Psf	Rkb	Bcr	Yep	Suc	Bhd	Nop	Crp	Ccf	Bfn	Wbs	Crc
4/16/1949	Ray	2	4											4			2				
4/23/1949	Ray	5	10											6							
4/24/1949	Ray	7	16											6							
5/6/1949	Ray	2	6								3			3	6						
5/11/1949	Ray	12	17											8			10				
5/14/1949	Ray	3	8											2							
5/22/1949	Ray	6	8											4							
5/23/1949	Ray	6	6																		
4/5/1954	Macomb	2	4											11			5				
4/9/1954	Clinton	9	31										1	42							
4/12/1954	Macomb	7	13											19							
4/20/1954	Macomb	11	15										1	16							
4/25/1954	Clinton	13	23											19							
4/25/1954	Macomb	7	6											4							
5/16/1954	Macomb	12	27											12		1					
5/16/1954	Macomb	10	26											7		3					
3/31/1956	Mt. Clemens	11	17											2							
4/4/1956	Mt. Clemens	2	8											26							
4/6/1956	Mt. Clemens	5	8										1	19							
4/8/1956	Clinton	8	25										7	6							
4/15/1956		14	27											9							
4/15/1956		16	49											8							
3/15/1958	Clinton	3	4.5											15							
3/16/1958	Clinton	4	4											12							
3/17/1958	Clinton	5	13											3							
3/23/1958	Clinton	7	23											16							
3/30/1958	Clinton	6	5														1				
4/13/1958	Clinton	6	8																		
4/4/1959	Ray	3	6																		
4/6/1959	Ray	9	7											7							
4/11/1959	Ray	7	8								11										
4/15/1959	Ray	9	19											2							
4/17/1959	Ray	12	21											32							

Appendix 2.–Continued.

Date	Township	No. anglers	No. hours	Species																	
				Bkt	Bnt	Rbt	Smb	Lmb	Blg	Psf	Rkb	Bcr	Yep	Suc	Bhd	Nop	Crp	Ccf	Bfn	Wbs	Crc
4/18/1959	Ray	12	15						1		2			6							
4/19/1959	Ray	10	15						4		8			5							
4/25/1959	Ray	12	29											23							
5/2/1959	Ray	15	28								9			4							
5/8/1959	Ray	16	23											27							
5/9/1959	Ray	17	47						2		16			8							
5/10/1959	Ray	12	36								13			17							
5/16/1959	Ray	15	33								8			15							
5/18/1959	Ray	2	5								4			3		1					
5/24/1959	Ray	14	26								18			13							
6/6/1959	Ray	9	16								50										
6/9/1959	Ray	2	2																		
6/13/1959	Ray	5	9								12										
6/27/1959	Ray	6	3.5																		
8/4/1959	Ray	1	2																		
9/11/1959	Ray	2	2																		
4/22/1960	Ray	15	14											19							
4/23/1960	Ray	7	9								7			7							
4/24/1960	Ray	11	11								8			9							
5/1/1960	Ray	8	14																		7
5/14/1960	Ray	7	9														1				
5/15/1960	Ray	13	13											4							
5/21/1960	Ray	6	9								24			1							
6/5/1960	Ray	7	4.5								10										
6/19/1960	Ray	3	3								2			4							
6/30/1960	Bruce	2	1																		
7/3/1960	Bruce	2	1																		
8/8/1960	Ray	1	1																		
8/20/1960	Ray	5	6						22		16		22								
8/27/1960	Ray	3	6								2										
3/25/1961	Ray	2	2																		
4/7/1961	Ray	4	3																		
4/8/1961	Armada	3	3																		3

Appendix 2.–Continued.

Date	Township	No. anglers	No. hours	Species																	
				Bkt	Bnt	Rbt	Smb	Lmb	Blg	Psf	Rkb	Bcr	Yep	Suc	Bhd	Nop	Crp	Ccf	Bfn	Wbs	Crc
4/9/1961	Ray	2	1																		6
4/21/1961	Ray	2	2																		
4/22/1961	Ray	1	1																		
4/23/1961	Bruce	13	11											13							
4/28/1961	Washington	4	3										2	5							
5/1/1961	Ray	4	7											12							
5/5/1961	Armada	1	1																		
5/13/1961	Ray	9	15								4	3	6	10							
5/14/1961	Ray	7	28								13			5							
5/20/1961	Ray	6	5											4							
5/21/1961	Ray	4	4																		
5/28/1961	Armada	6	4								2			2							
5/30/1961	Ray	10	13											3							
6/21/1961	Washignton	4	3											2							
7/2/1961	Ray	1	1																		
7/4/1961	Ray	7	7												1						
7/26/1961	Ray	2	1																		
8/12/1961	Bruce	1	1																		
9/13/1961	Ray	3	2								1										
3/25/1962	Ray	2	2																		
4/8/1962	Ray	8	6																		
4/21/1962	Armada	10	8											6							
4/28/1962	Ray	4	8																		
4/29/1962	Washington	10	6								1			1							
5/5/1962	Ray	5	5																		
5/20/1962	Ray	2	1												2						
5/26/1962	Bruce	3	3																		
5/27/1962	Ray	10	7											4							
6/17/1962	Ray	4	3																		
6/24/1962	Ray	5	2																		
7/17/1962	Ray	12	9								3			9							
4/1/1963	Ray	5	2																		
4/7/1963	Ray	3	1																		

Appendix 2.–Continued.

Date	Township	No. anglers	No. hours	Species																	
				Bkt	Bnt	Rbt	Smb	Lmb	Blg	Psf	Rkb	Bcr	Yep	Suc	Bhd	Nop	Crp	Ccf	Bfn	Wbs	Crc
4/13/1963	Ray	14	11											5			2				
4/13/1963	Ray	12	11											4							
4/15/1963	Ray	8	6																		
4/21/1963	Ray	12	13											11							
4/21/1963	Ray	10	8								5			1							
5/12/1963	Ray	4	4														3				
5/13/1963	Ray	2	4								6										
6/30/1963	Ray	8	8								3										
7/20/1963	Ray	2	2																		
4/23/1964	Ray	1	1																		
4/25/1964	Ray	8	11														2				14
4/26/1964	Ray	7	11											13							
5/2/1964	Ray	7	15								13			1							
5/17/1964	Ray	4	3												1		1				
8/7/1964	Ray	3	2																		
9/12/1964	Armada	1	2																		
Coon Creek																					
4/22/1960	Ray	11	11											21							
4/23/1960	Ray										3	1		8							
5/15/1960	Lenox	15	15											5							
7/11/1960	Lenox	6	9												1		2				
4/7/1961	Ray	5	3.5											8							
4/23/1961	Ray	4	4											6							
5/8/1961	Ray	4	4											1							
5/13/1961	Ray	7	9												8						
5/20/1961	Ray	6	6																		
5/25/1961	Ray	1	2												3						
5/30/1961	Ray	11	19											2		1					
7/2/1961	Ray	3	3																		
7/4/1961	Ray	4	4												4						
8/12/1961	Ray	4	5				2		5		8				16						
4/4/1962	Ray	4	2											1							

Appendix 2.–Continued.

Date	Township	No. anglers	No. hours	Species																	
				Bkt	Bnt	Rbt	Smb	Lmb	Blg	Psf	Rkb	Bcr	Yep	Suc	Bhd	Nop	Crp	Ccf	Bfn	Wbs	Crc
4/7/1962	Ray	2	1											1							
4/8/1962	Ray	2	2																		
4/16/1962	Ray	5	6											7							
4/21/1962	Ray	5	10											13							
4/24/1962	Ray	2	1											3							
4/28/1962	Ray	8	11											4	12	1					
5/5/1962	Ray	8	7								3	3									
5/6/1962	Ray	6	5											1							
5/12/1962	Ray	7	7											5							
7/4/1962	Ray	5	3											2							
3/30/1963	Lenox	8	7											3							
4/1/1963	Lenox	5	3																		
4/6/1963	Ray	4	5													2					
4/14/1963	Ray	4	4											2							
4/14/1963	Lenox	3	3																		
4/21/1963	Ray	4	2											2							
5/5/1963	Ray	9	9											1							
5/11/1963	Ray	4	4																		
5/12/1963	Ray	5	5														1				
5/18/1963	Ray	2	2											3							
6/30/1963	Lenox	8	8											3							
Stony Creek																					
5/28/1939	Shelby	4	6																		
4/25/1940	Shelby	6	20	7	1																
4/28/1940	Shelby	2	6	5																	
5/2/1940	Shelby	2	6																		
5/3/1940	Shelby	7	16.5	7																	
5/9/1940	Shelby	1	0.5																		
5/10/1940	Shelby	7	25																		
6/23/1940	Shelby	2	5											10							
3/26/1944	Washington	5	12											20							
3/27/1944	Washington	8	15											26							

Appendix 2.–Continued.

Date	Township	No. anglers	No. hours	Species																	
				Bkt	Bnt	Rbt	Smb	Lmb	Blg	Psf	Rkb	Bcr	Yep	Suc	Bhd	Nop	Crp	Ccf	Bfn	Wbs	Crc
4/10/1944	Washington	6	17											26							
4/26/1944	Washington	7	16											30							
4/5/1959	Shelby	4	5								2			6							
5/23/1959	Shelby	5	10					2	2	4	2										
4/24/1960	Shelby	6	3						7												
5/5/1960	Shelby	2	2																		
5/8/1960	Shelby	2	2																		12
8/3/1960	Shelby	2	1																		
8/13/1960	Shelby	1	1																		
8/20/1960	Shelby	7	6								19										
8/21/1960	Shelby	9	10					2		12											
4/29/1961	Shelby	2	2																		
5/28/1961	Shelby	5	5																		
6/4/1961	Shelby	2	1						2												
6/11/1961	Shelby	1	1																		
7/4/1961	Shelby	10	5																		
5/13/1962	Shelby	2	1																		
4/17/1963	Washington	1	1											4							
4/20/196	Washington	2	4																		3
6/16/1963	Washington	3	3																		
5/17/1964	Washington	4	3				2														
6/16/1964	Washington	9	9					1							4	1					
7/22/1964	Washington	12	12												4	5					
9/2/1964	Washington	2	1				2	1							8	6					