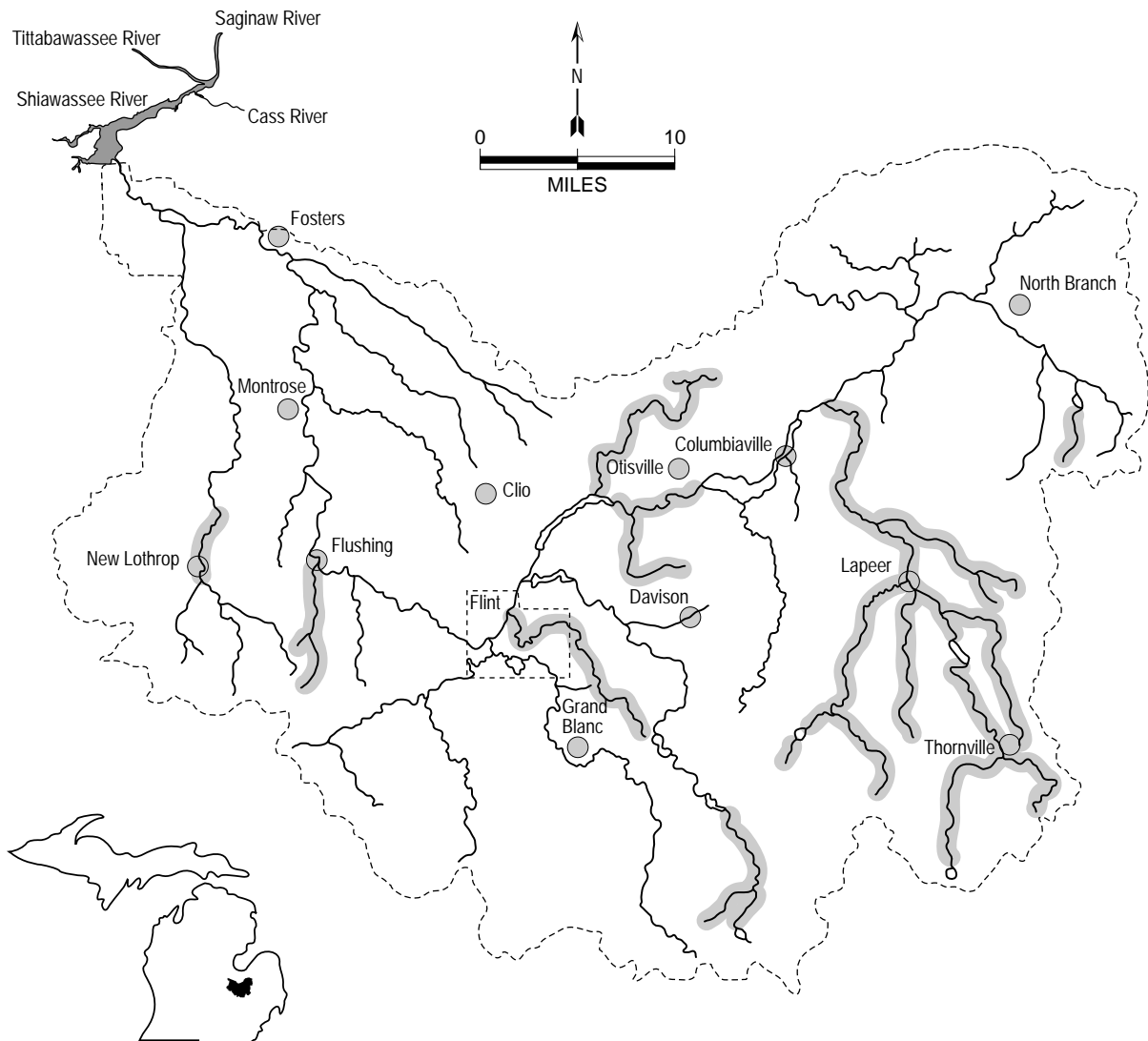


**Brook stickleback (*Cluaea inconstans*)**

**Habitat:**

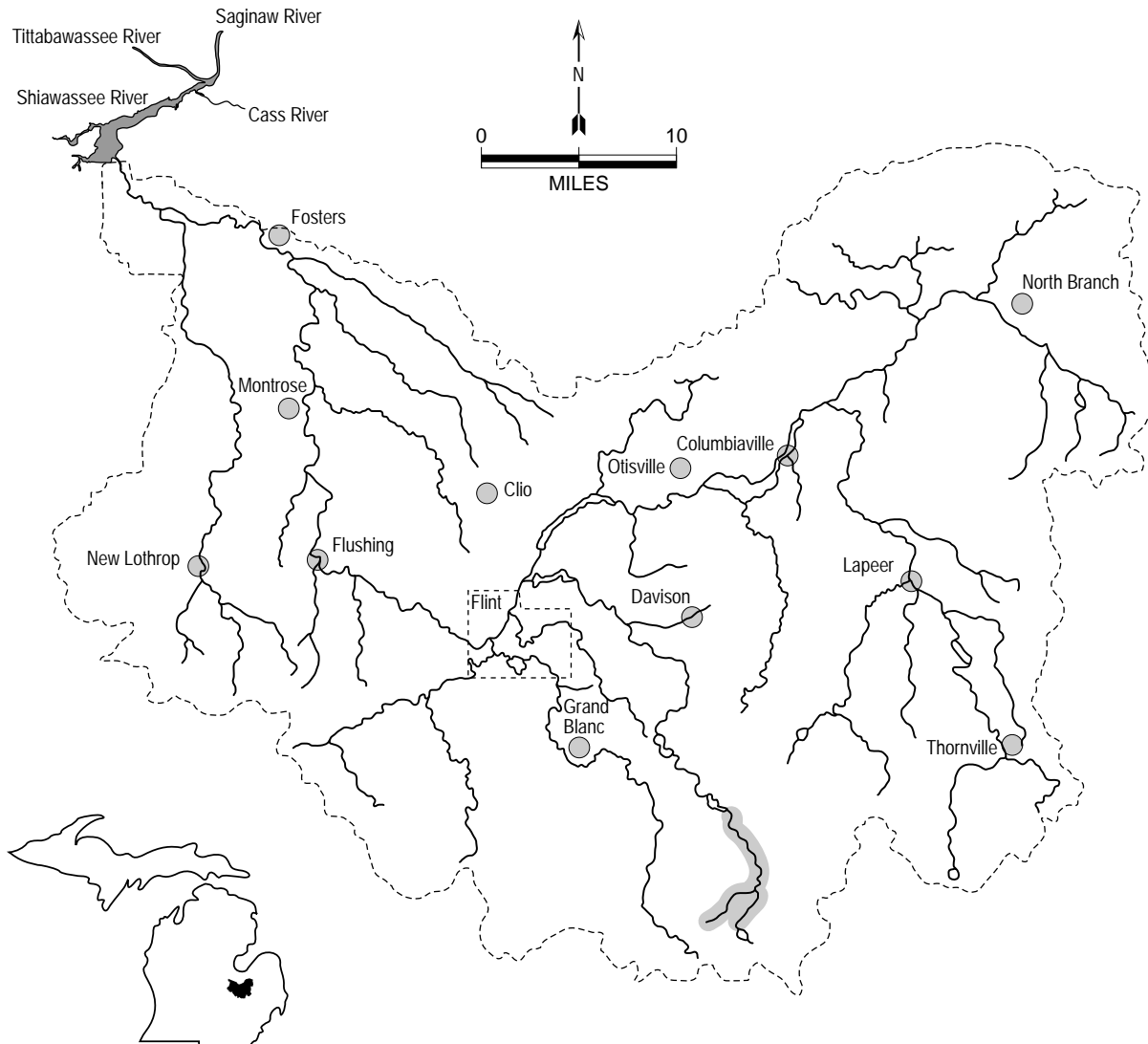
- feeding - clear, cold, densely vegetated streams, and swampy margins of lakes
- low gradient
- muck, peat, or marl substrate
- not tolerant of turbidity
  
- spawning - shallow cool (<66°F) water
- aquatic reeds or grasses necessary



**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

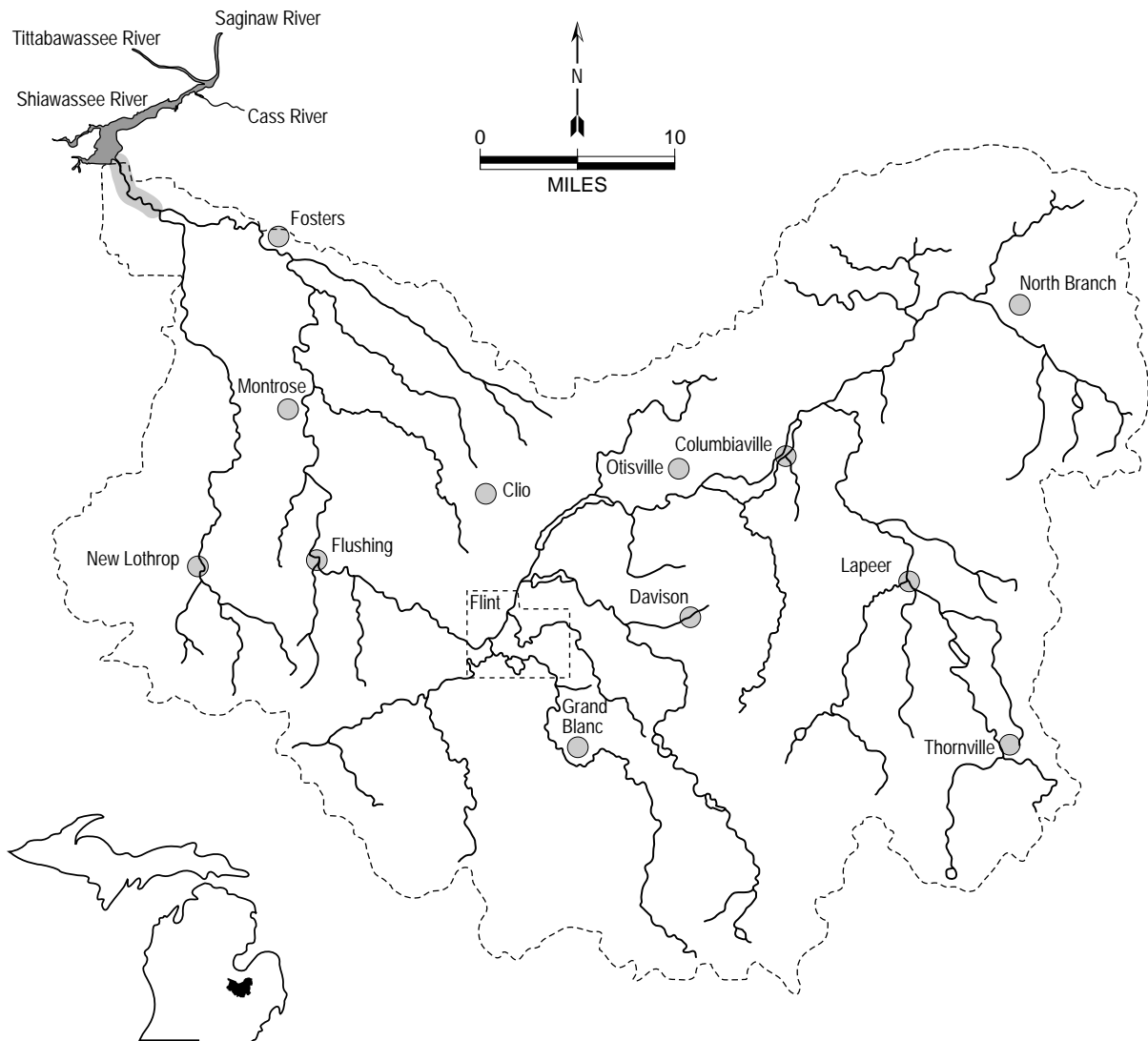


**White perch (*Morone americana*)**

**Habitat:**

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

spawning - shallow water over firm substrate

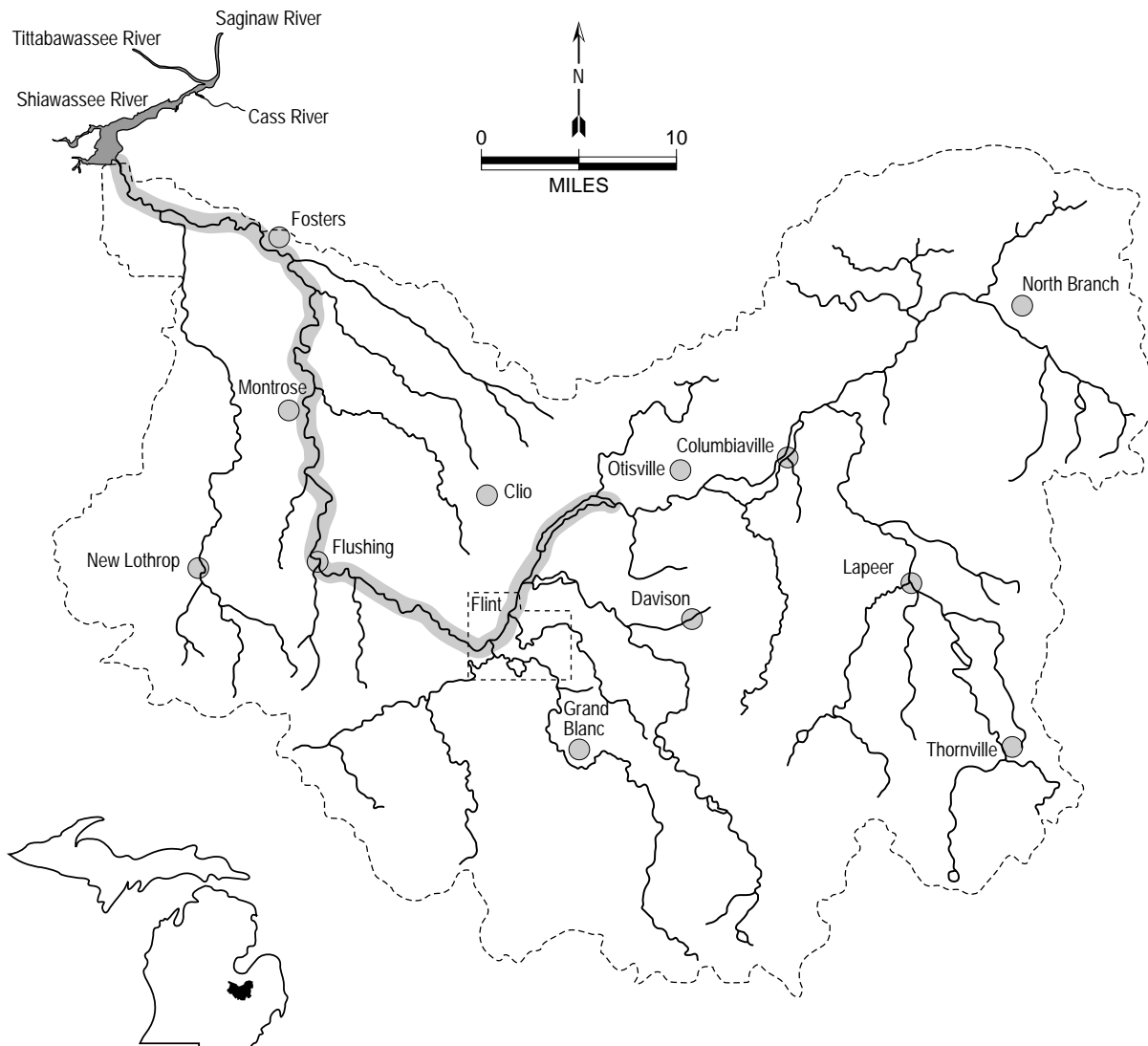


# Flint River Assessment Appendix

## White bass (*Morone chrysops*)

### Habitat:

- feeding - large lakes, impoundments, and Lake Huron
- clear water of 30 feet or less depth
- firm substrate
  
- spawning - tributary streams or



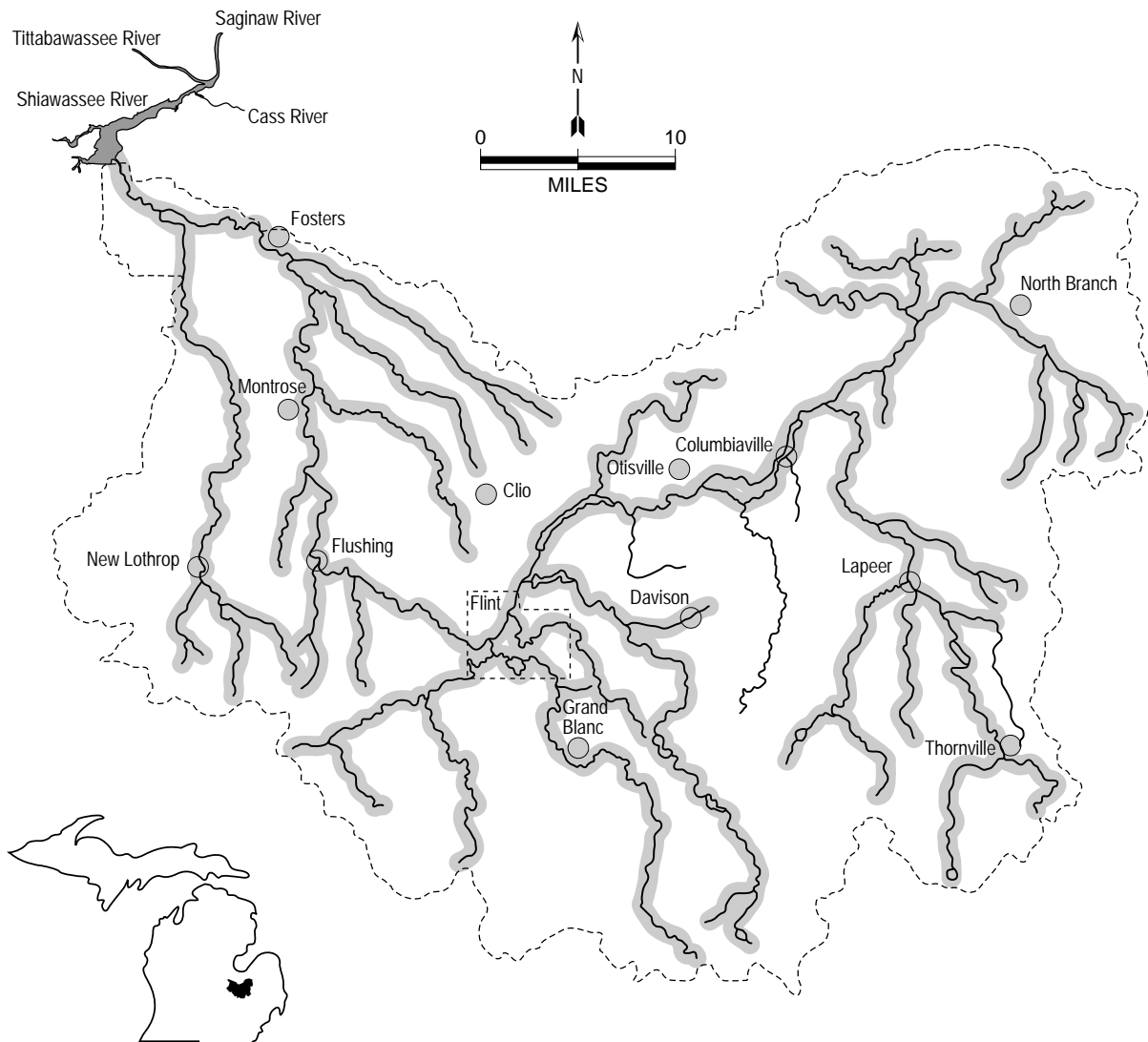
**Rock bass (*Ambloplites rupestris*)**

**Habitat:**

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

- spawning - sand or gravel nests
- shallow water

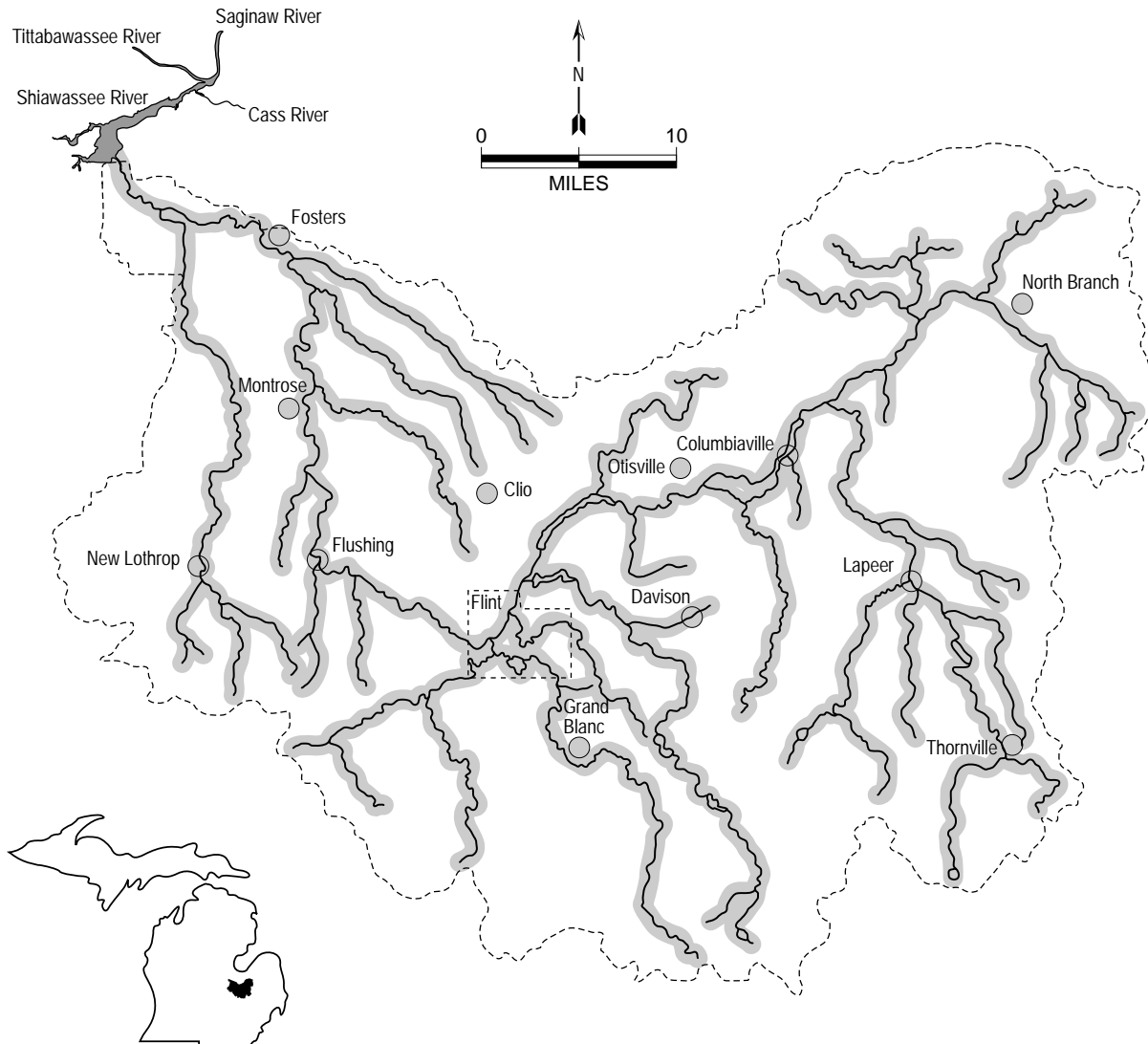
- winter refuge - deep water



**Green sunfish** (*Lepomis cyanellus*)

**Habitat:**

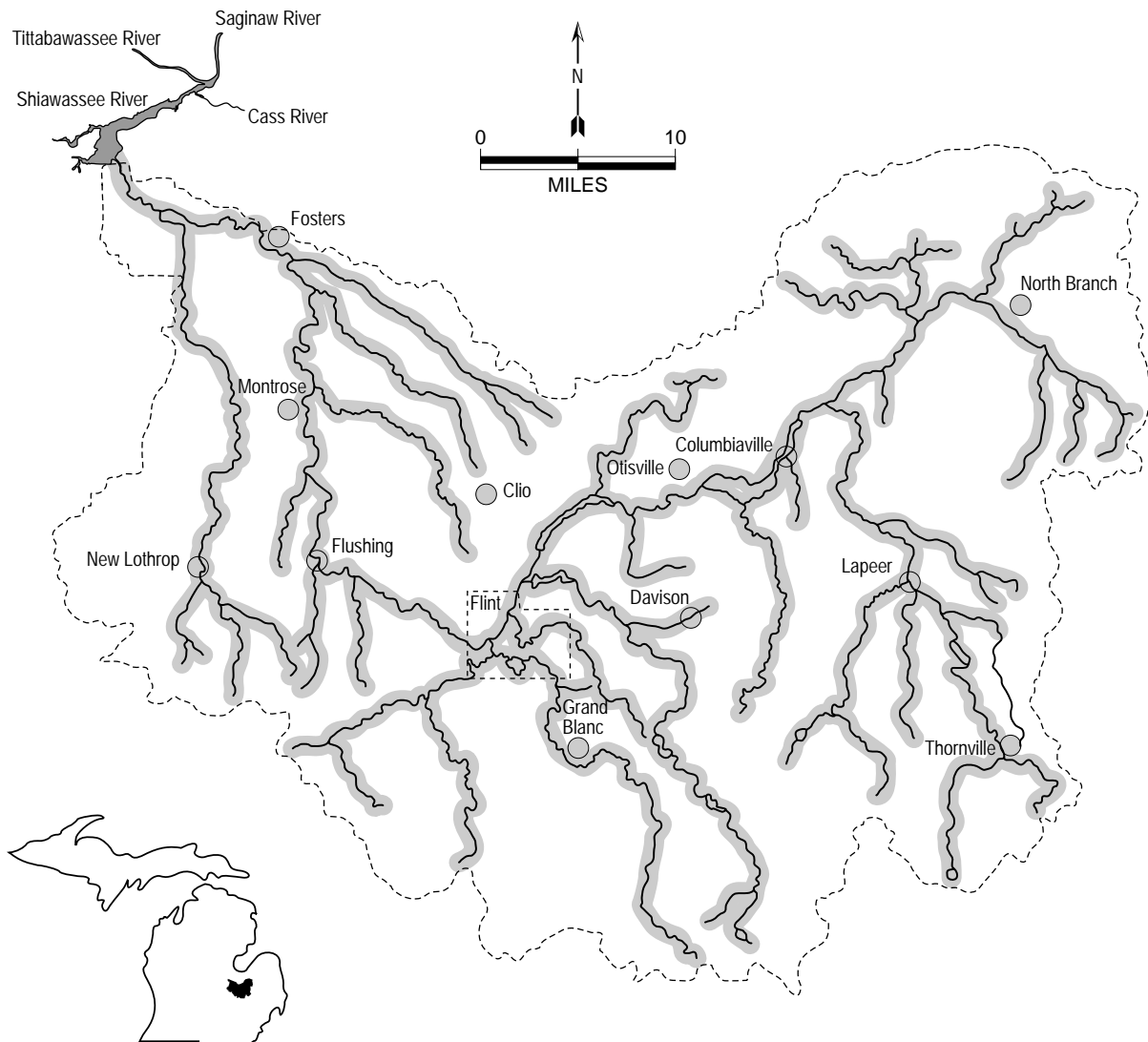
- feeding - impoundments and lakes, and low-current streams and rivers
- no substrate preference
  
- spawning - nests in shallow areas sheltered by rocks, logs, or aquatic vegetation



**Pumpkinseed sunfish (*Lepomis gibbosus*)**

**Habitat:**

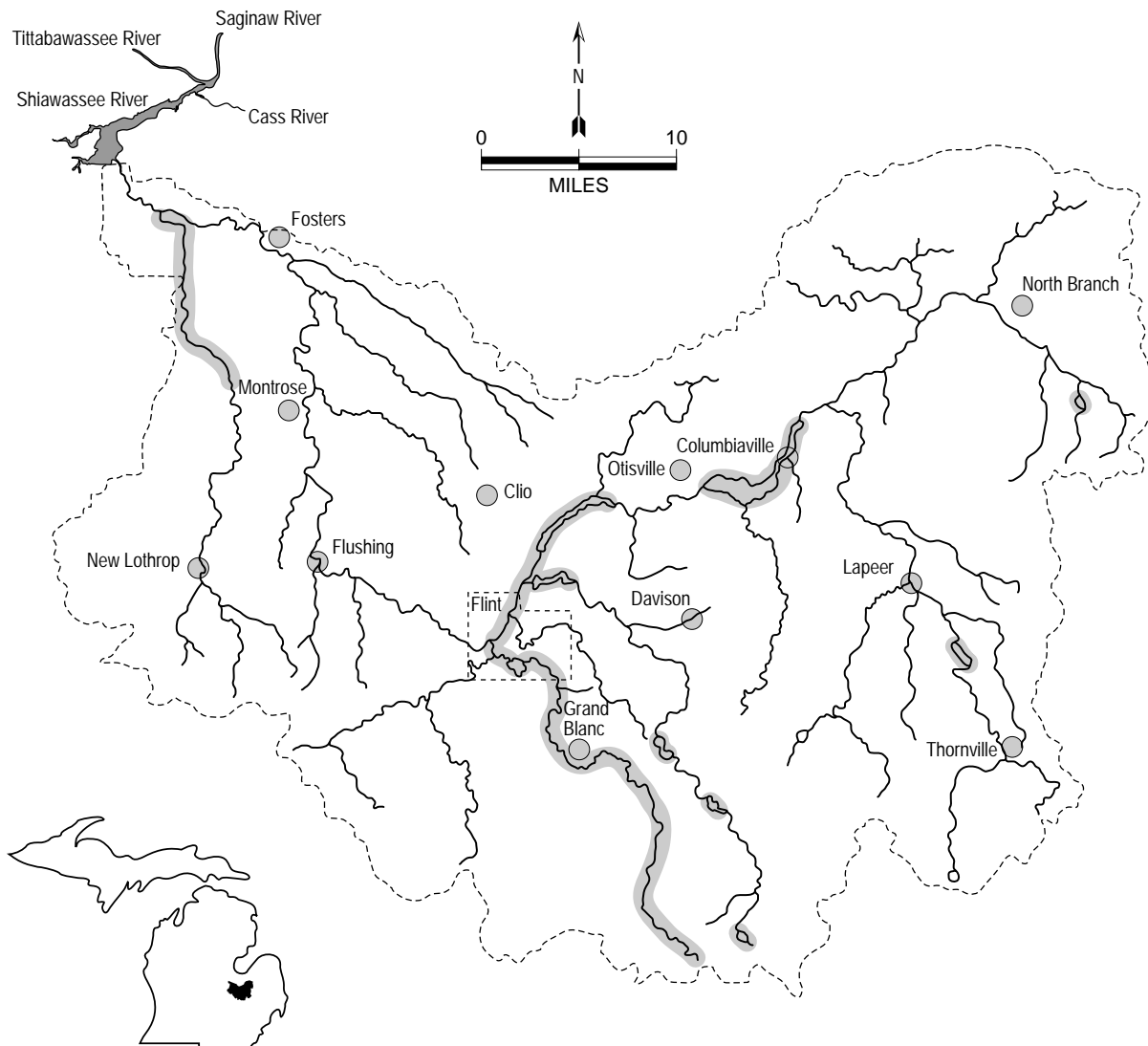
- feeding - non-flowing clear water in streams and rivers; also lakes and impoundments
- muck or sand partly covered with organic debris substrate
- dense beds of submerged aquatic vegetation
  
- spawning - nest in sand, gravel, or rock substrate
- in shallow water near submerged vegetation



**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





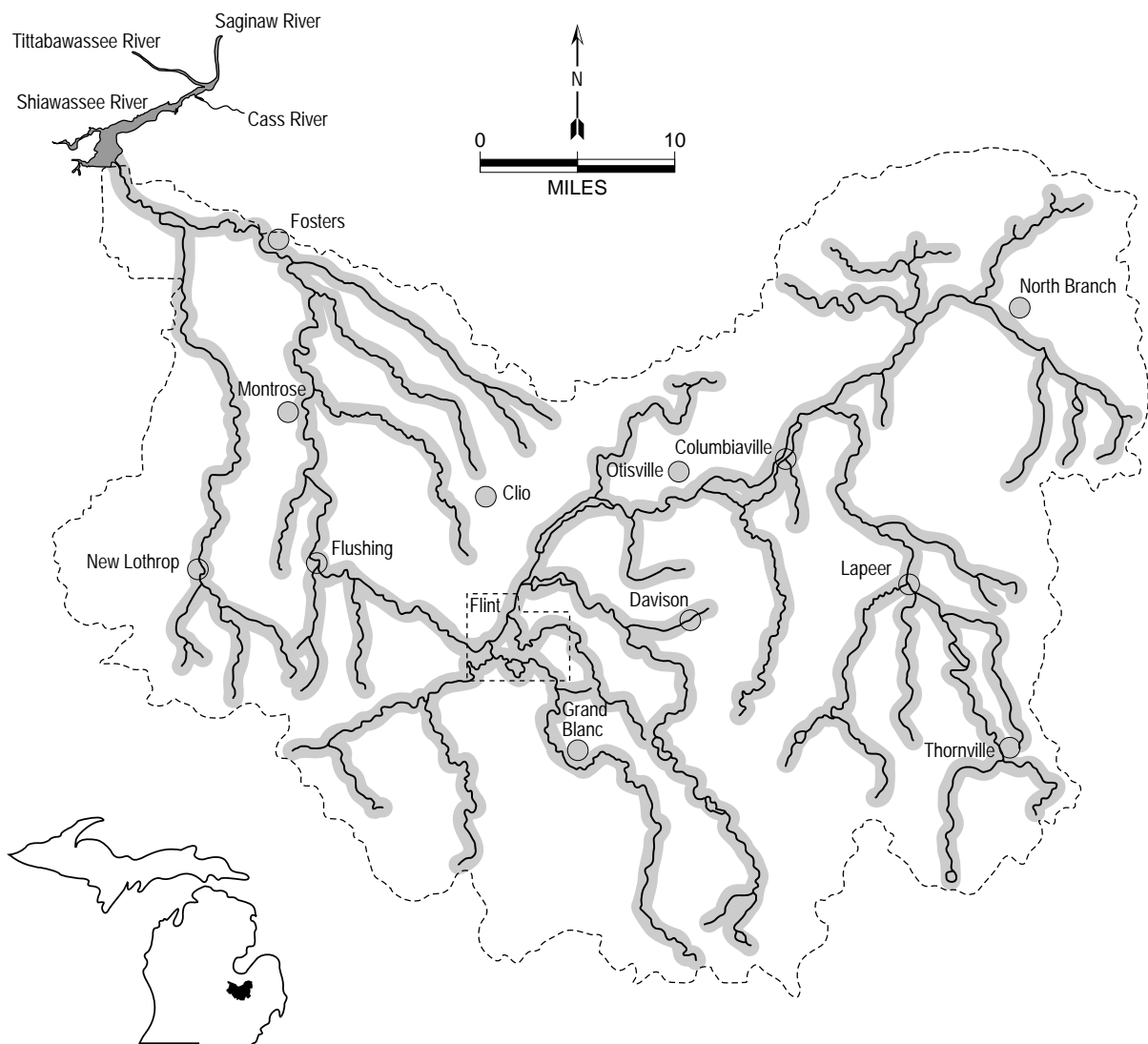
**Bluegill (*Lepomis macrochirus*)**

**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

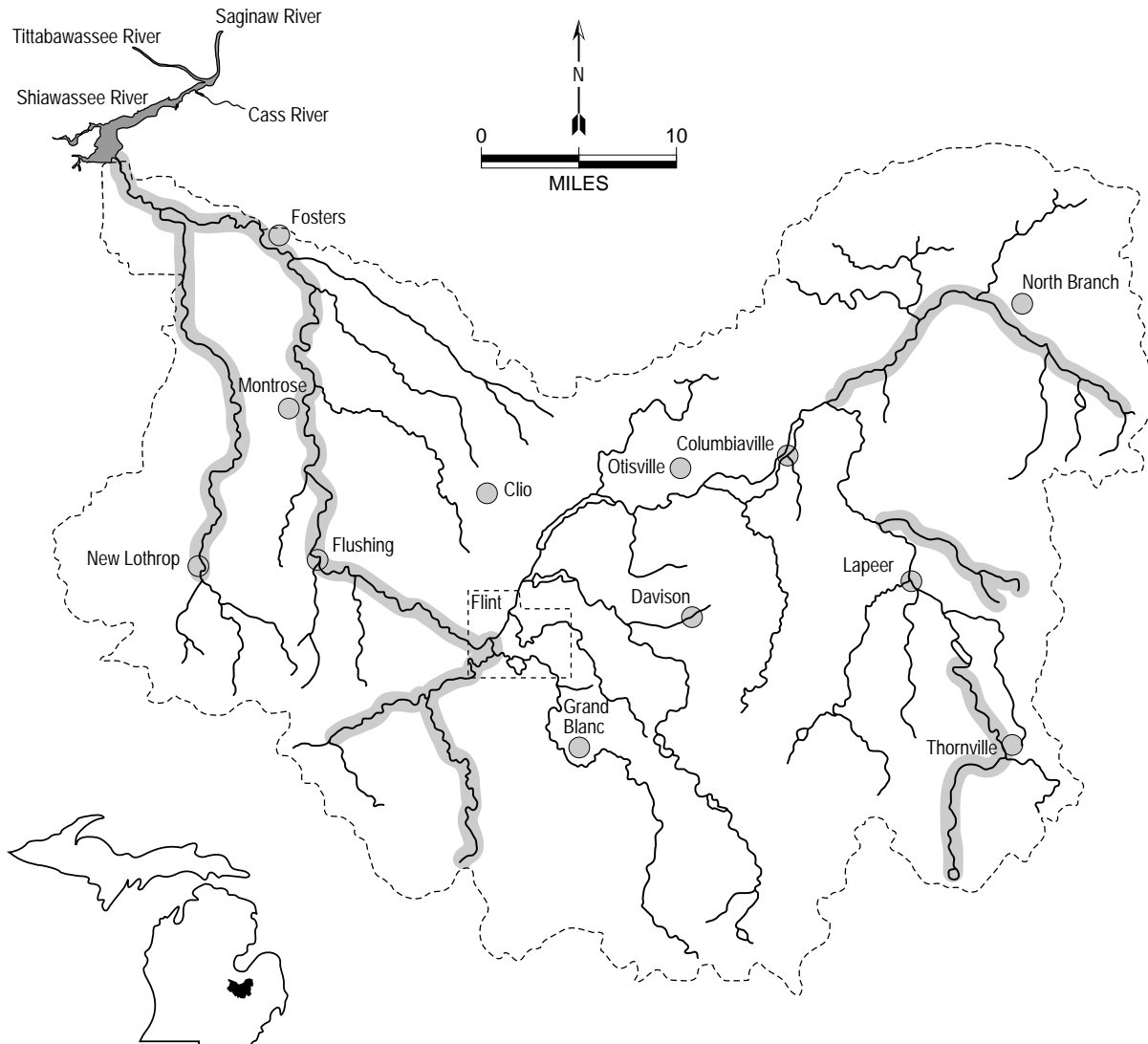
winter refuge - deep water



**Longear sunfish** (*Lepomis megalotis*)

**Habitat:**

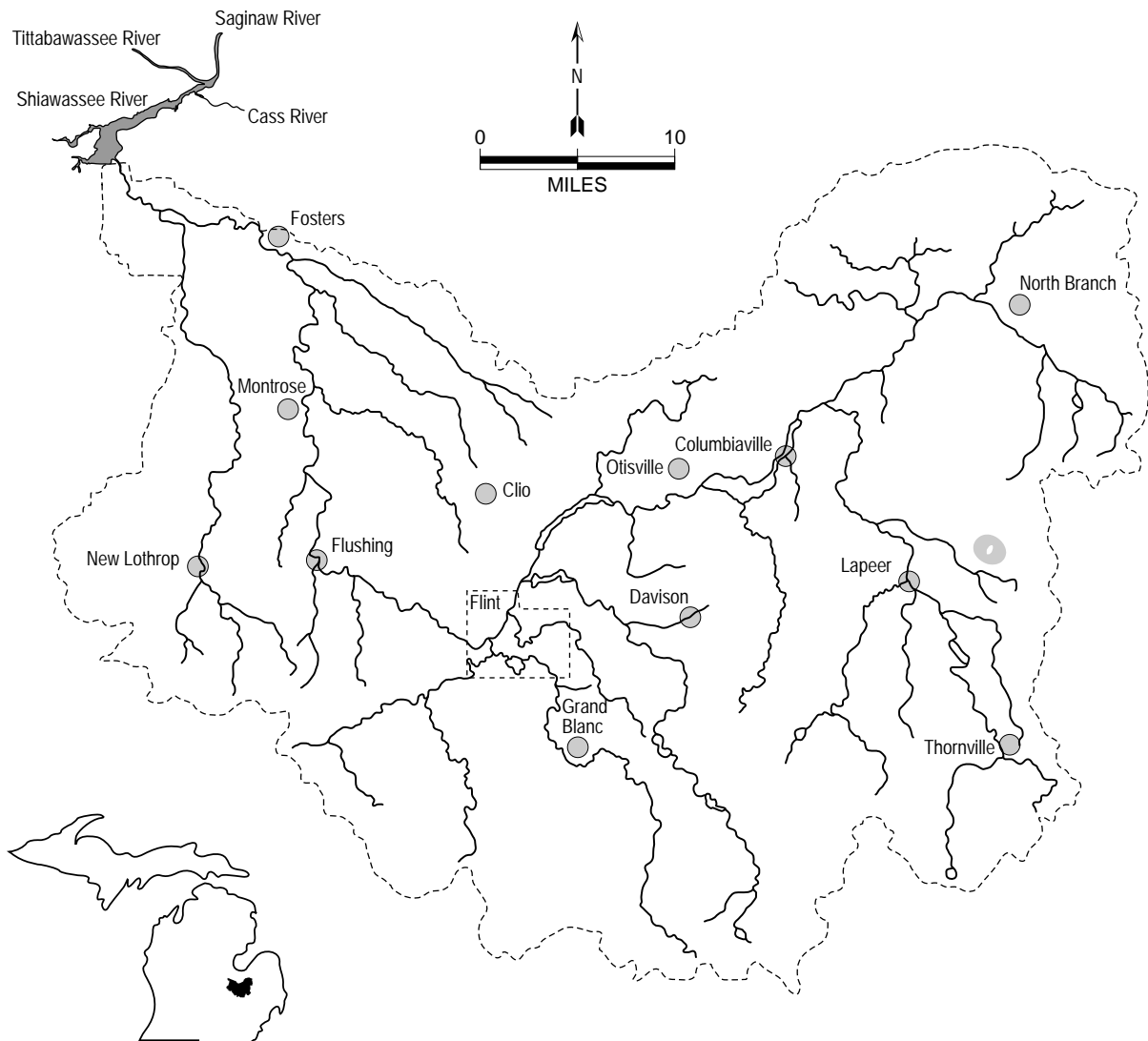
- feeding - clear moderate-sized shallow streams with moderate vegetation
- rocky substrates
- little to no current
  
- spawning - nests in gravel, sand, or hard rock substrate



**Redear sunfish (*Lepomis microlophus*)**

**Habitat:**

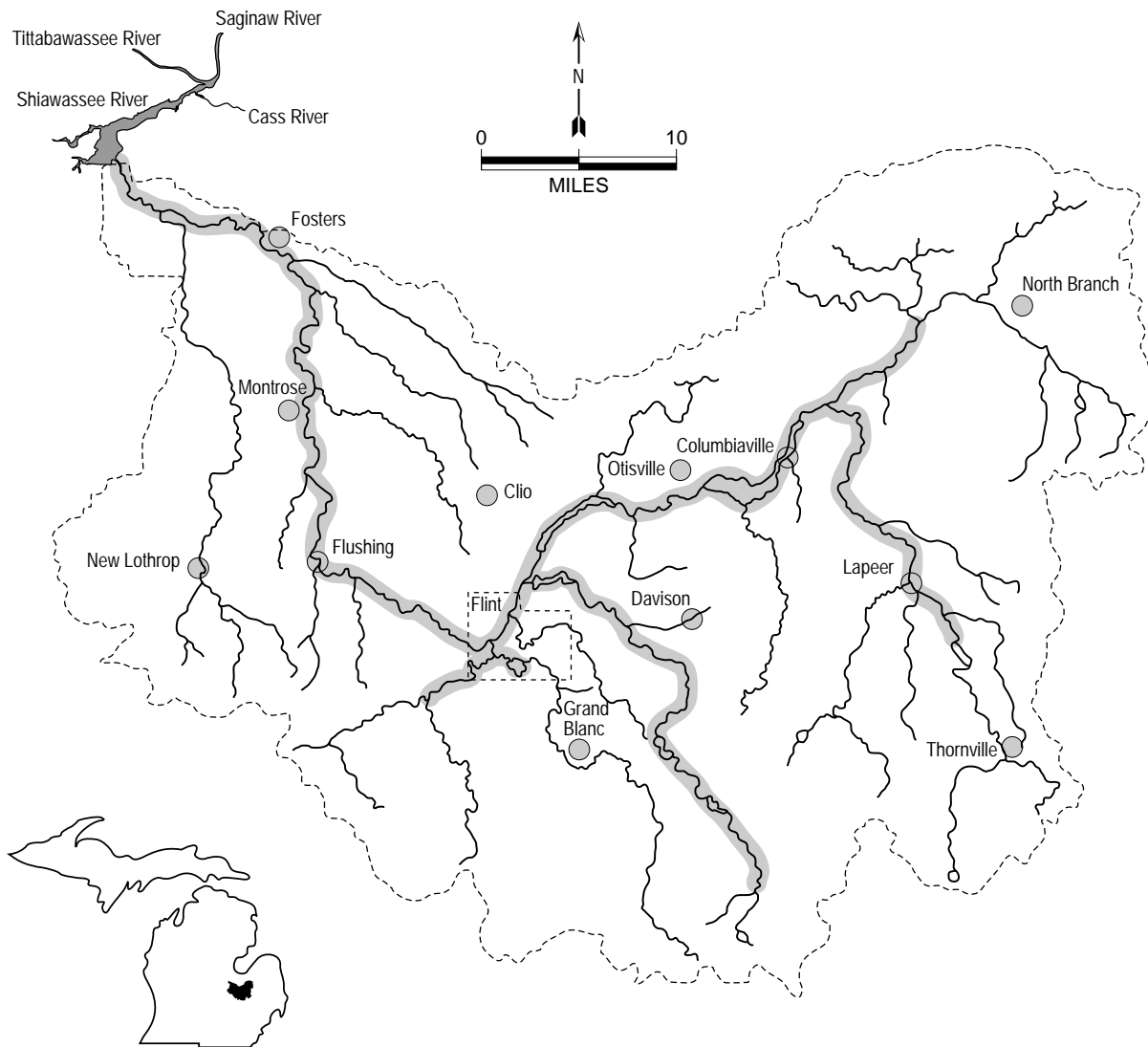
- feeding - non-flowing clear waters of streams and lakes
- some aquatic vegetation
  
- spawning - nest in silt or gravel substrate



**Smallmouth bass (*Micropterus dolomieu*)**

**Habitat:**

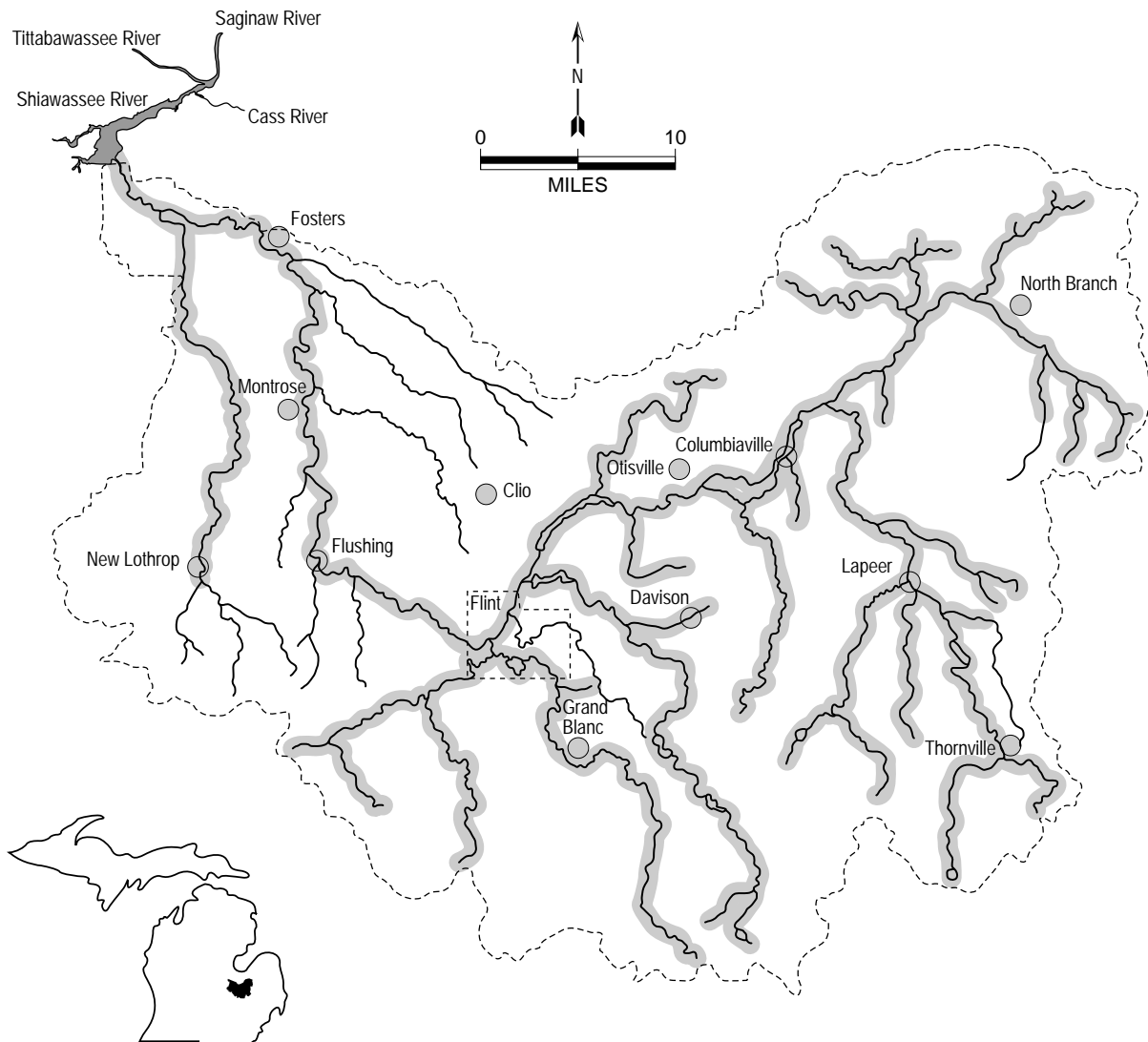
- feeding
  - clear, cool, deep lakes and rivers
  - streams where 40% consists of riffles over clean gravel, boulder, or bedrock substrate
  - in pools with a current and >4 feet of depth
  - gradients between 4 and 25 feet per mile
- spawning
  - nest in sandy, gravel, or rocky substrate
  - gradients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

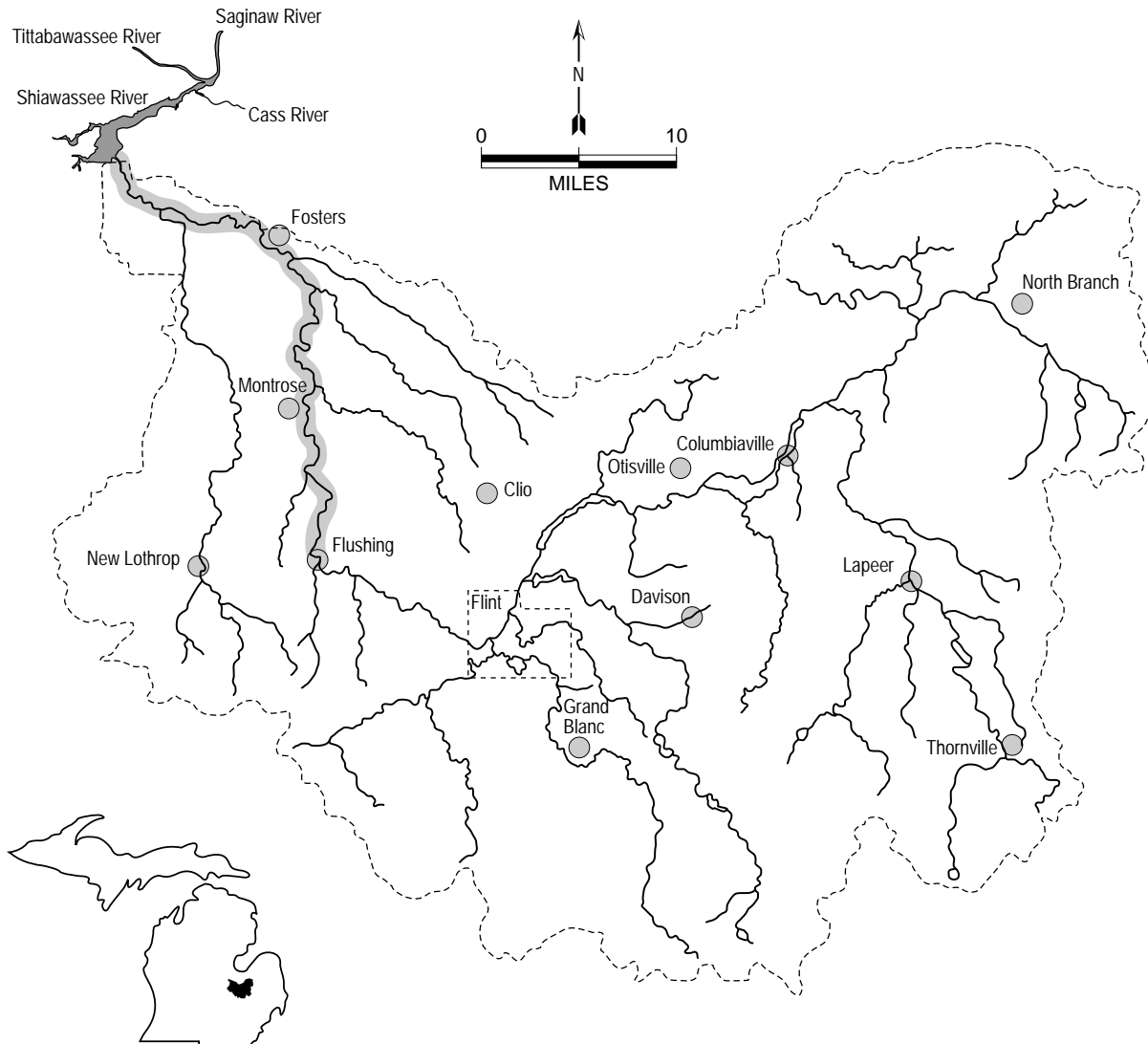
- feeding - non-flowing clear waters - lakes, impoundments, and pools of streams
- abundant aquatic vegetation
- soft muck, organic debris, gravel, sand, and hard non-flocculent clay substrates
  
- spawning - nest in gravelly sand to marl and soft mud substrates
- emergent vegetation
- quiet shallow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



**White crappie** (*Pomoxis annularis*)

**Habitat:**

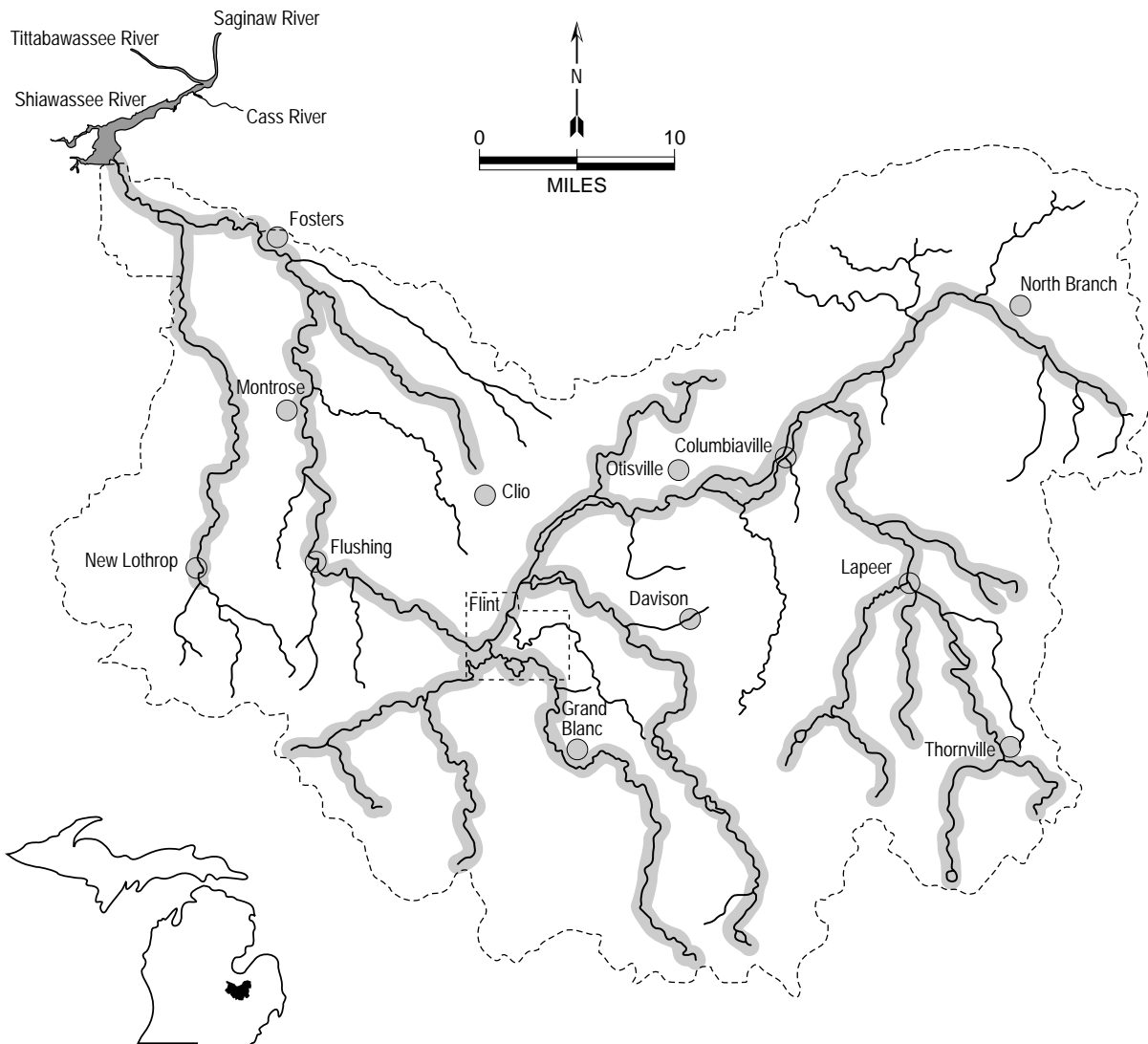
- feeding
  - lakes and impoundments >5 acres
  - sluggish pools of moderate to large low-gradient rivers
  - no substrate preference
  - can tolerate severe turbidity and rapid siltation
  
- spawning
  - various substrates usually beside rooted aquatic vegetation
  - sometimes under banks



**Black crappie** (*Pomoxis nigromaculatus*)

**Habitat:**

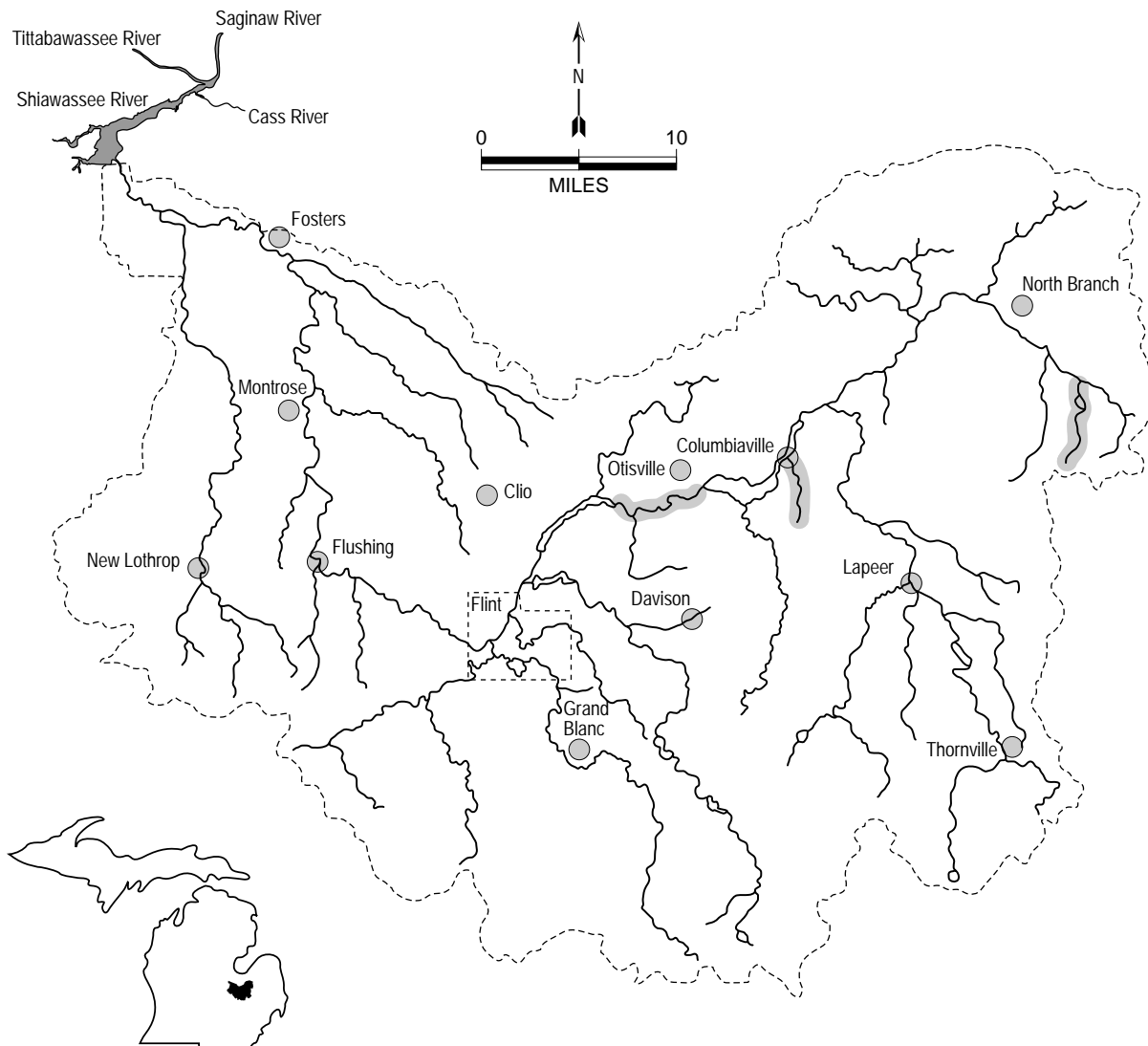
- feeding - larger clear non-silty low-gradient rivers; also in lakes and impoundments
  - clean hard sand or muck substrate
  - associated with submerged aquatic vegetation
  - does not tolerate silt or turbidity well
- 
- spawning - nests in gravel, sand, or mud substrate
  - some vegetation must be present
  - sometimes nests under banks



**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

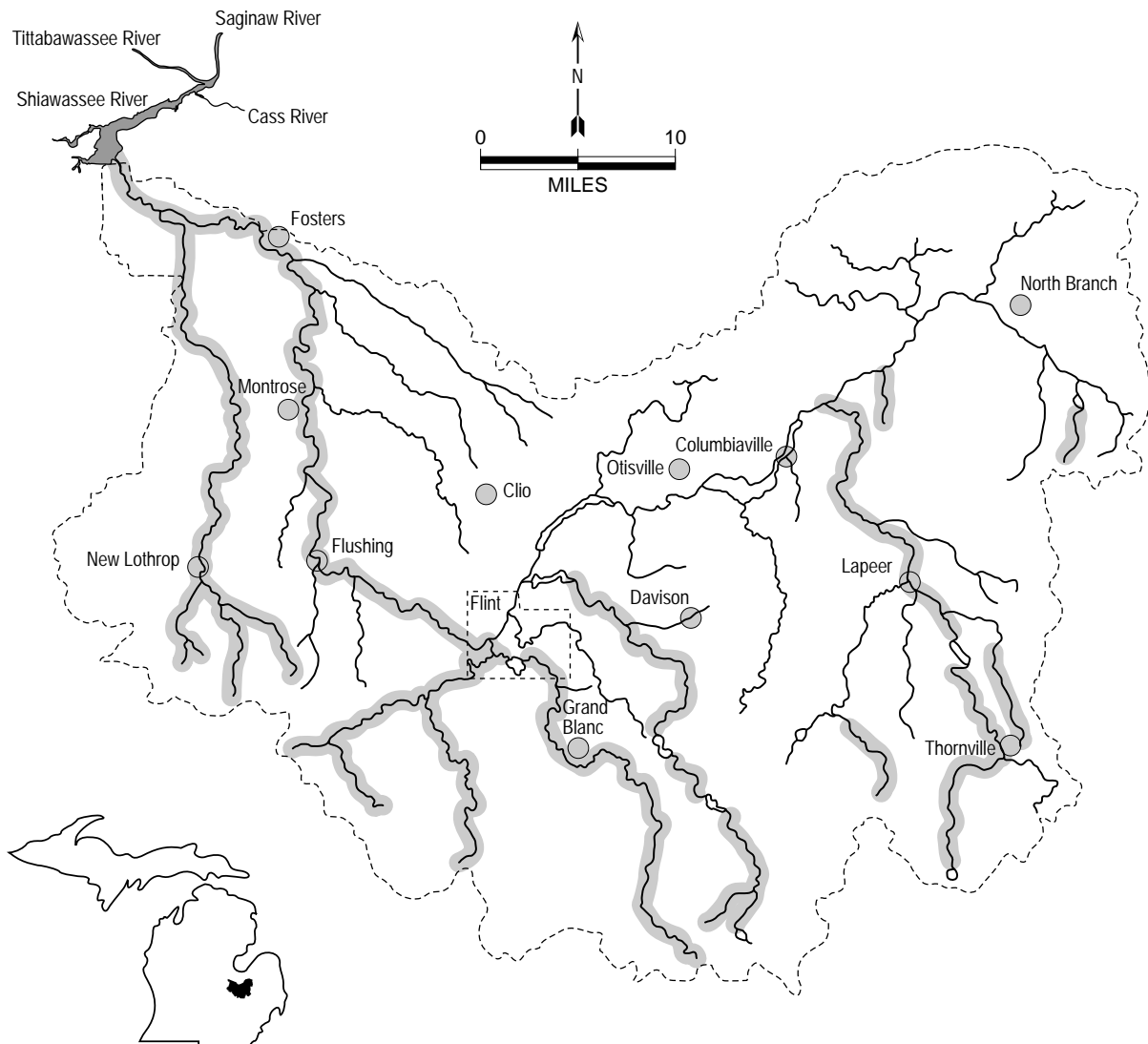




**Rainbow darter (*Etheostoma caeruleum*)**

**Habitat:**

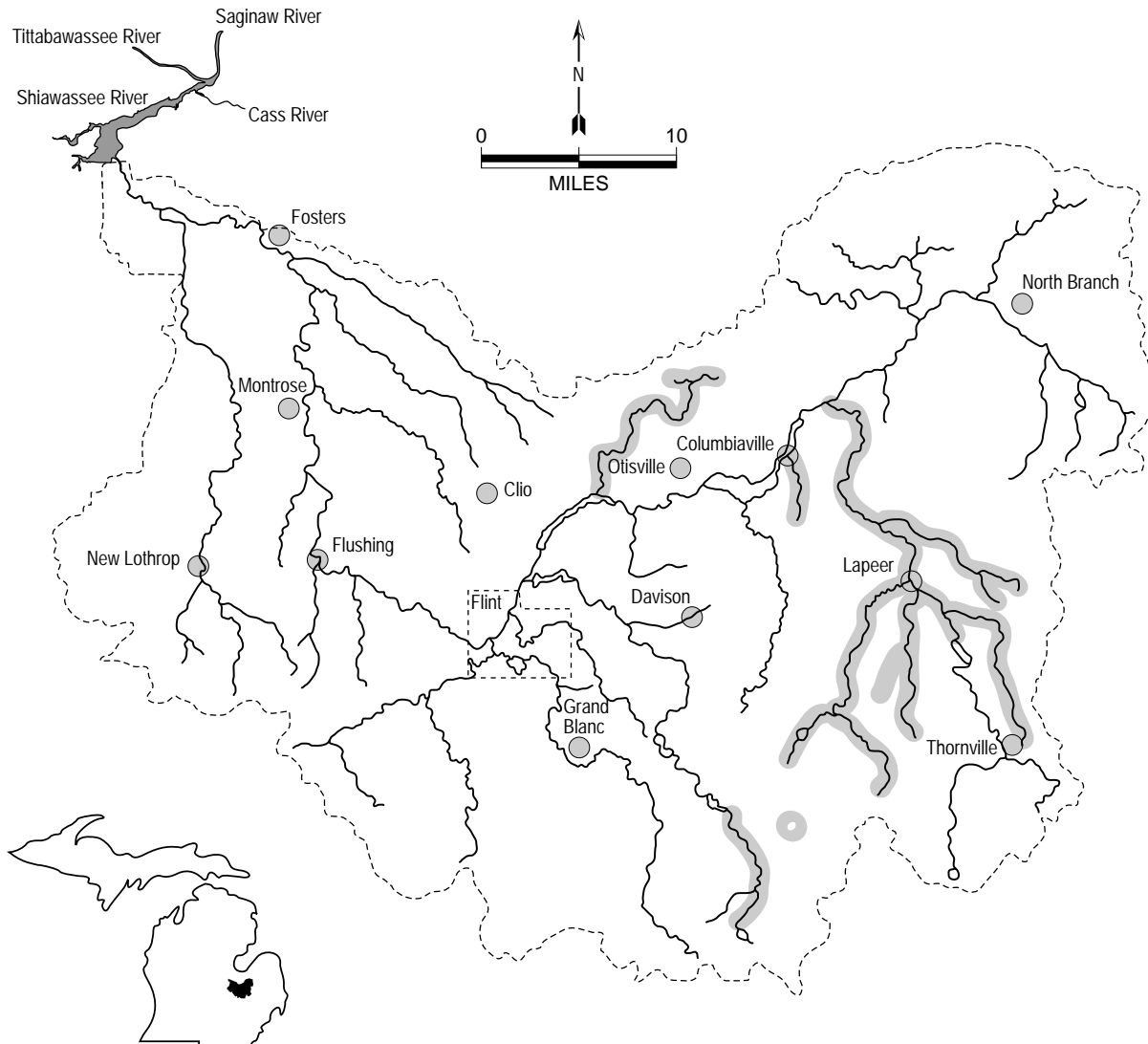
- feeding - gravelly high gradient riffles
- clear, moderate to large streams
- in shallows (average 1 foot)
  
- spawning - gravel or rubble riffles



**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



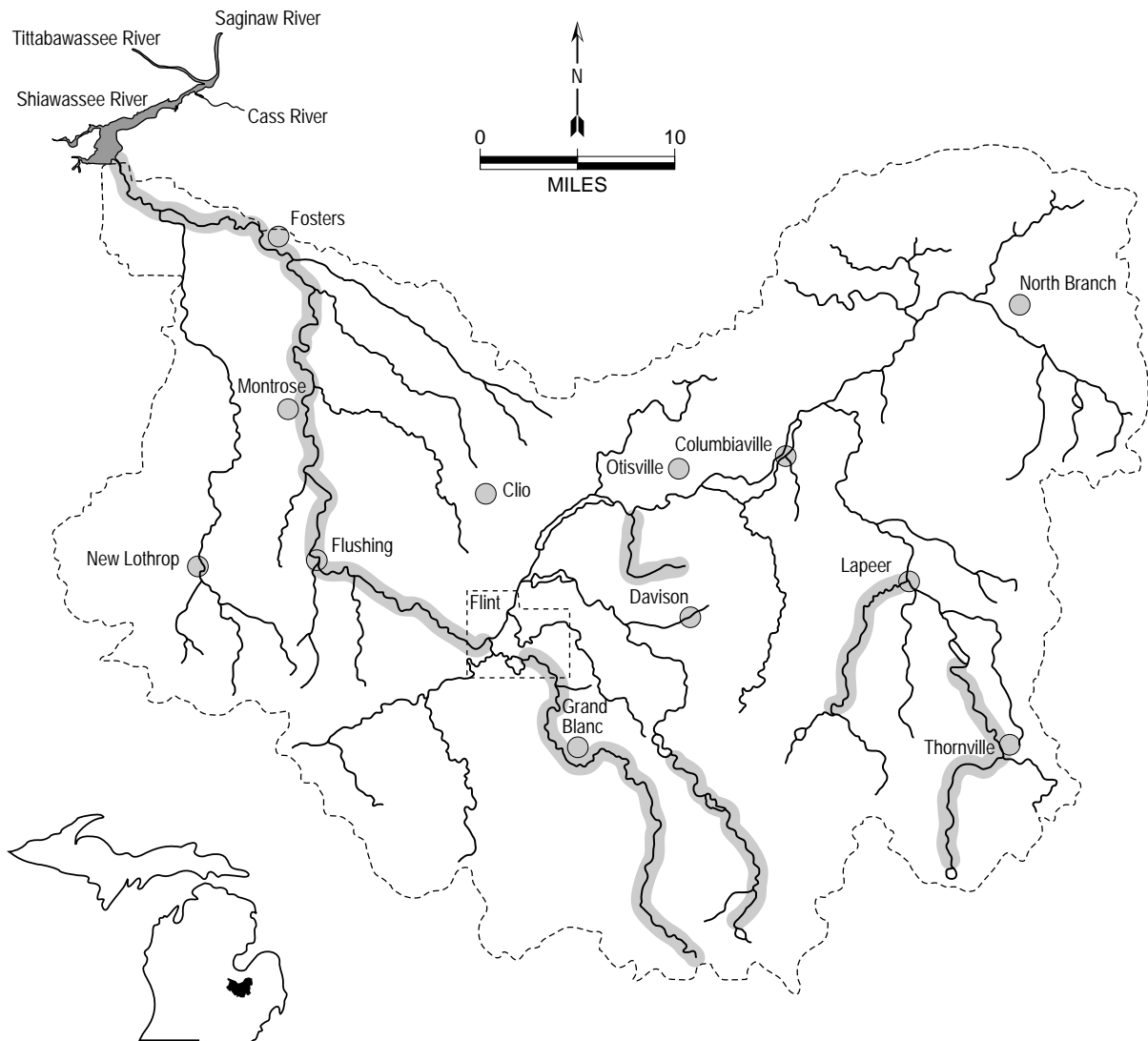
**Fantail darter (*Etheostoma flabellare*)**

**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

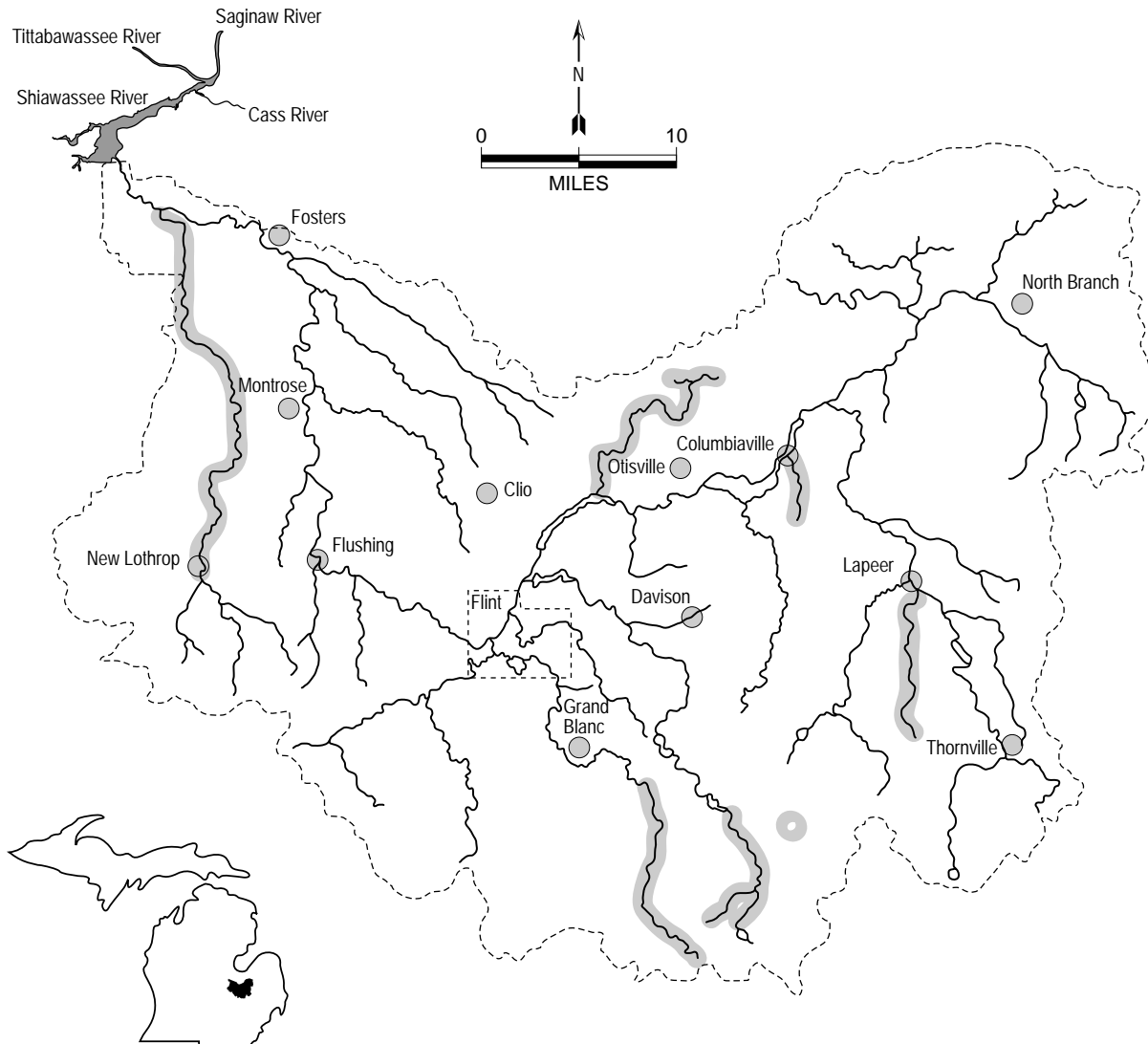
- winter refuge - moves downstream to larger and deeper waters



**Least darter (*Etheostoma microperca*)**

**Habitat:**

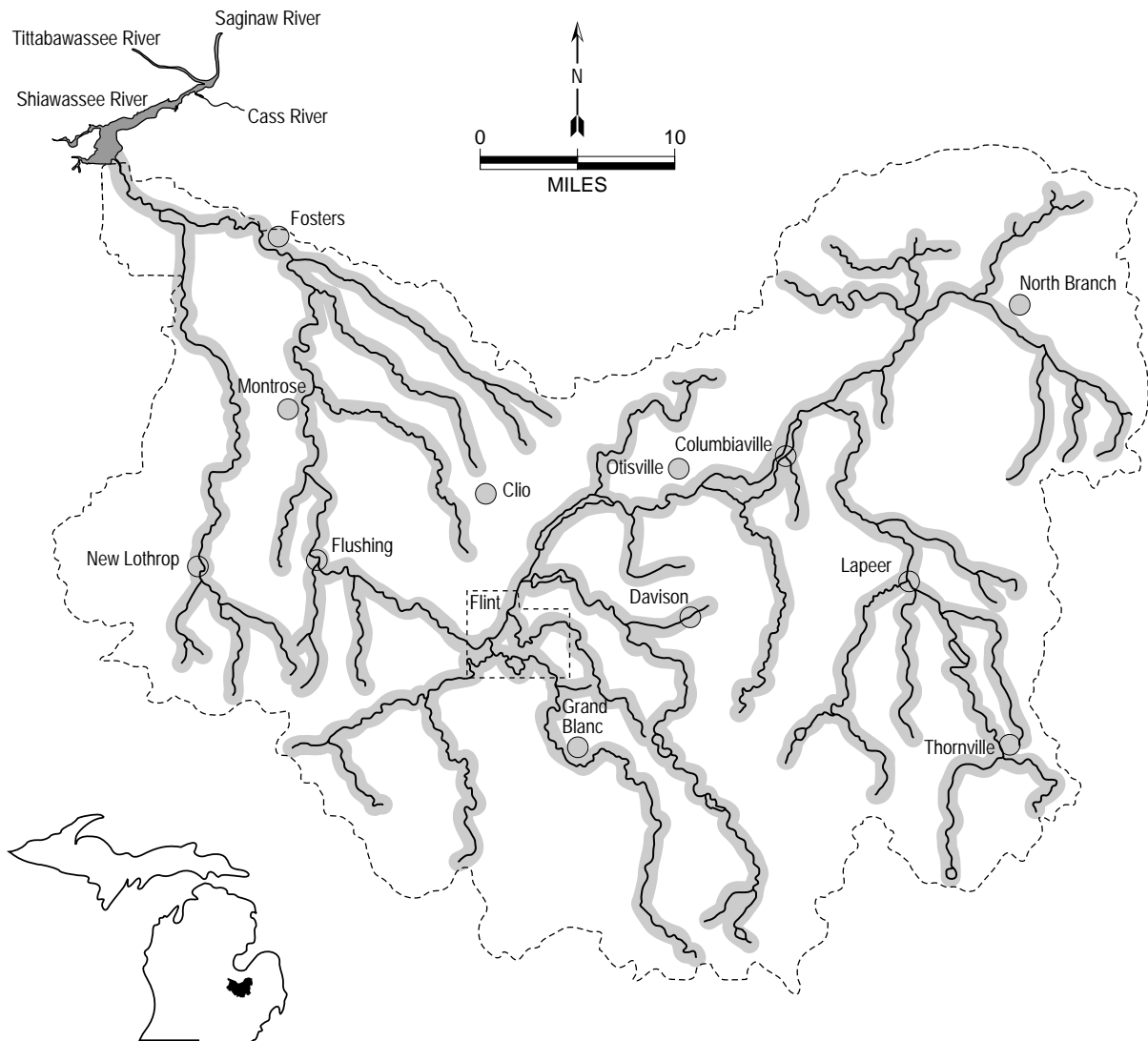
- feeding
  - moderate to warm temperature
  - clear quiet low-gradient vegetated streams (wetlands, floodplains)
  - soft substrate
- spawning
  - spawning occurs on stems of plants
  - male guards a territory in a vegetated area



**Johnny darter** (*Etheostoma nigrum*)

**Habitat:**

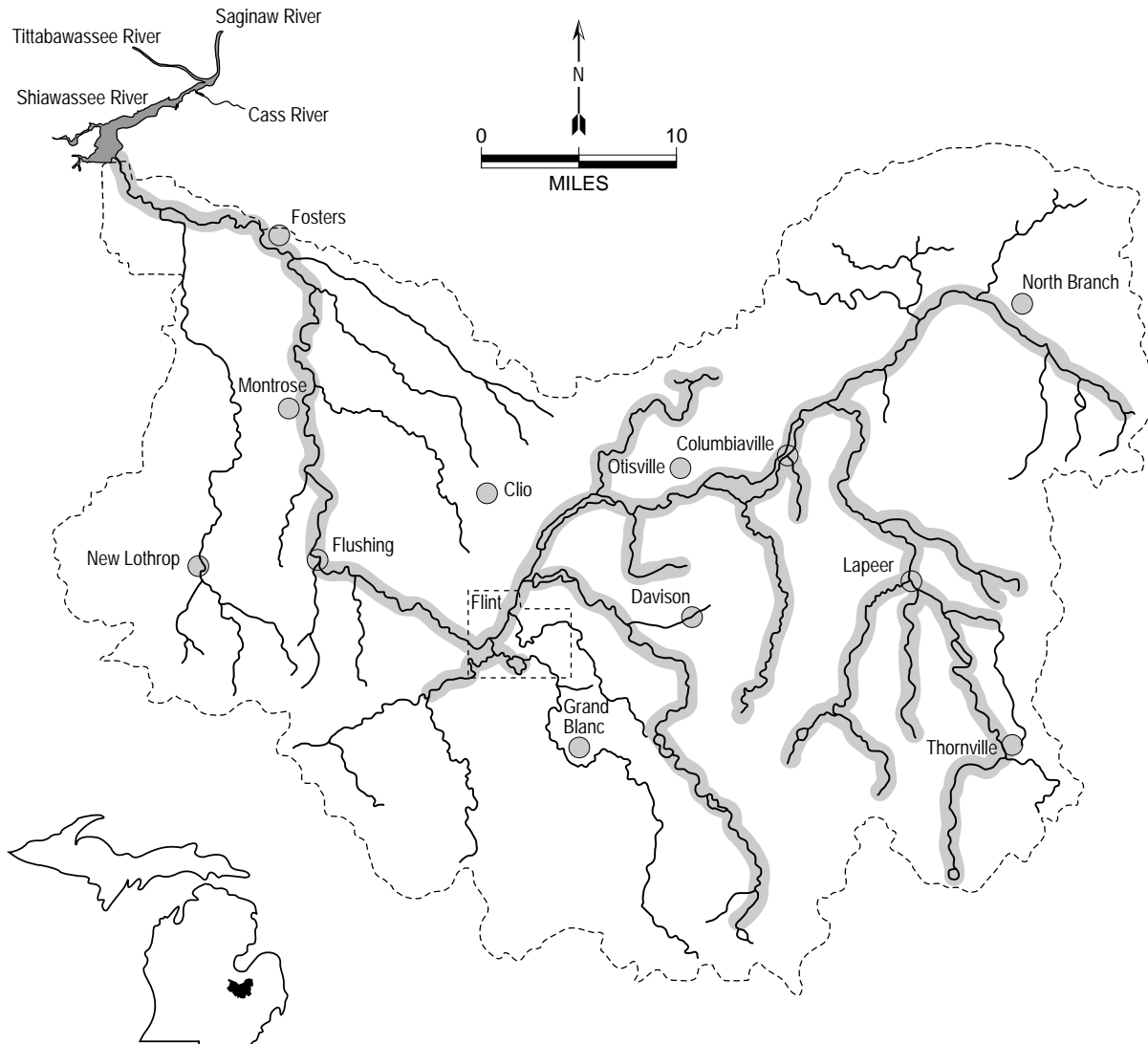
- feeding - sand and silt substrate
  - little to moderate current
  - shallow areas of streams, rivers, lakes, and impoundments
  - tolerant of many organic and inorganic pollutants and turbidity
- 
- spawning - underneath rocks
  - in stream pools or protected shallows of lakes



**Yellow perch (*Perca flavescens*)**

**Habitat:**

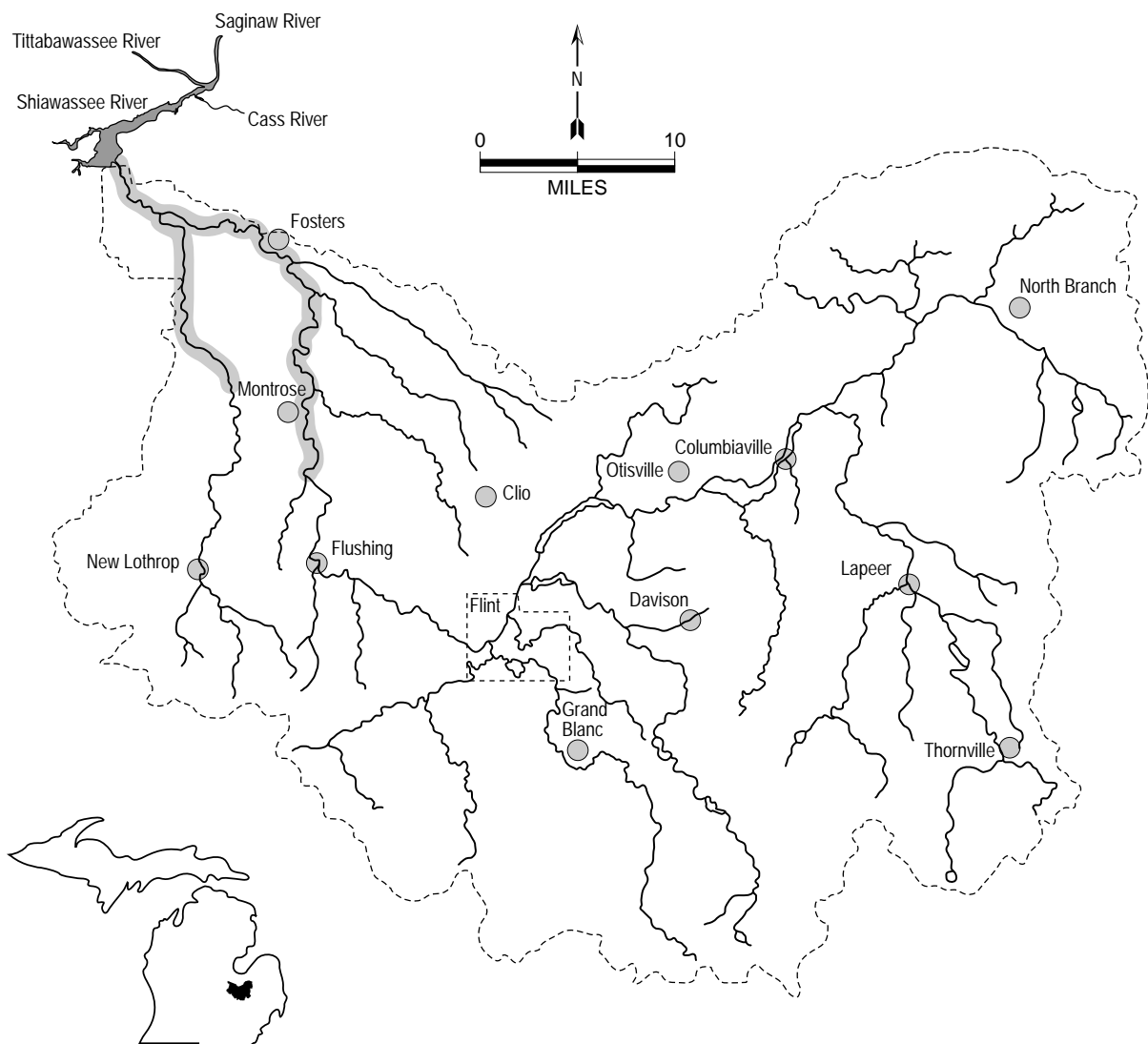
- feeding
  - clear lakes and impoundments; also Lake Huron
  - low gradient rivers
  - abundance of rooted aquatics
  - muck, organic debris, sand, or gravel substrate
  - does not tolerate turbidity and siltation
  
- spawning
  - shallows of lakes, tributaries of streams
  - occurs over rooted vegetation, submerged brush, fallen trees
  - may occur over sand or gravel



**Logperch (*Percina caprodes*)**

**Habitat:**

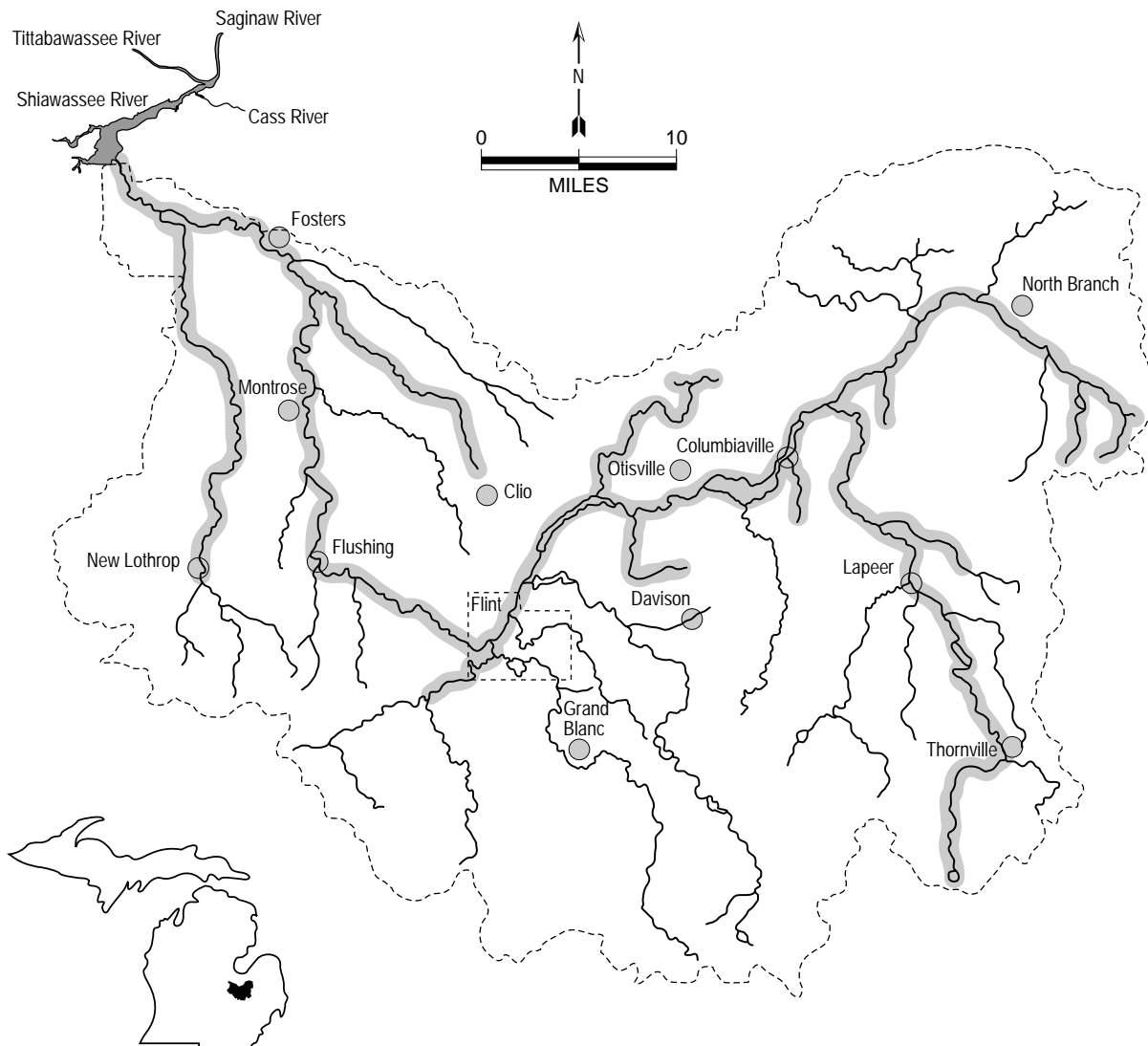
- feeding - gravel riffles, deeper slower sections of rivers
  - medium size streams; also lakes, impoundments, and Lake Huron
  - sand, gravel, or rock substrate
  - avoids turbidity and silt
- spawning - riffles or sandy in-shore shallows



**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





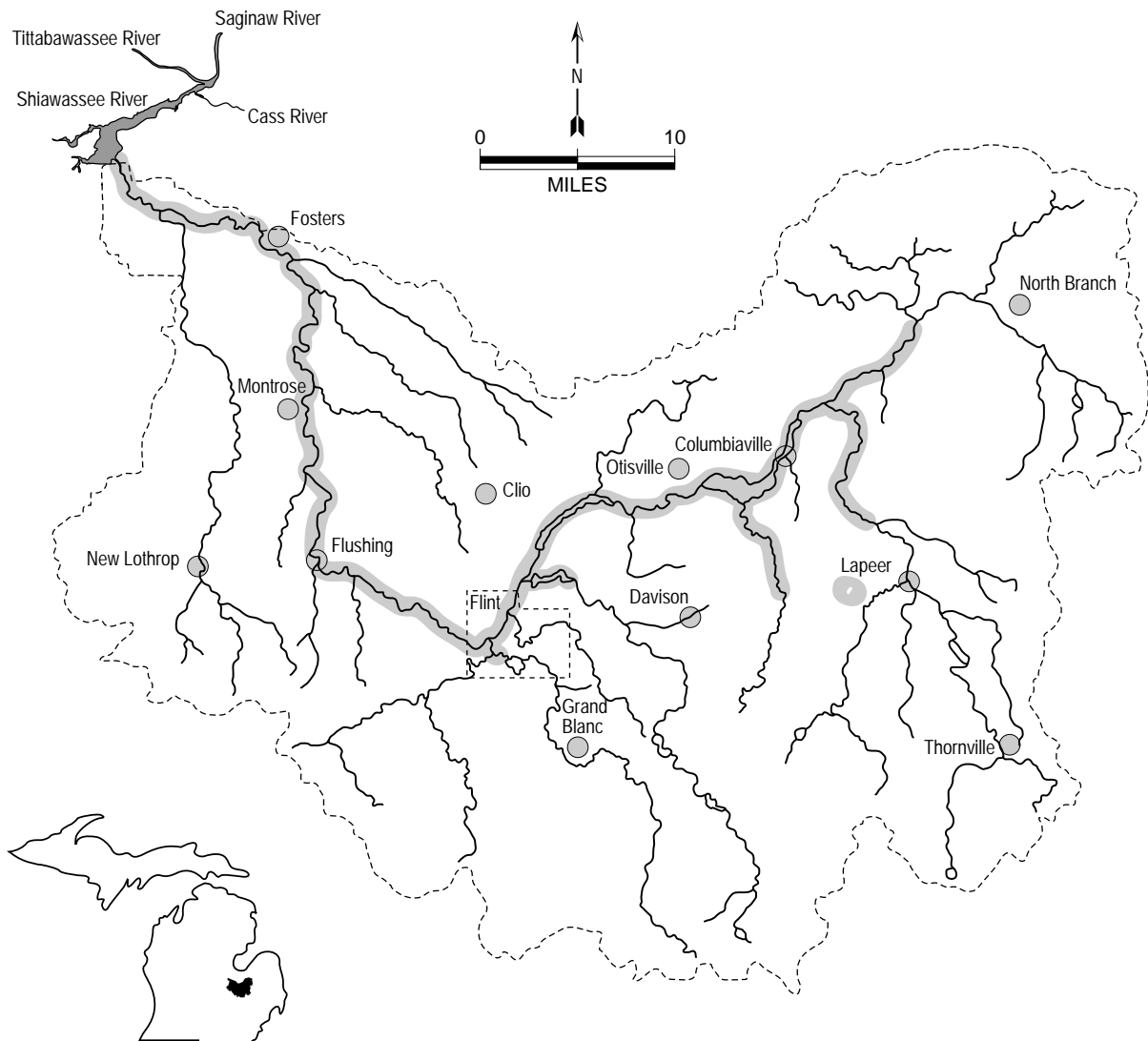
**Walleye (*Stizostedion vitreum*)**

**Habitat:**

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

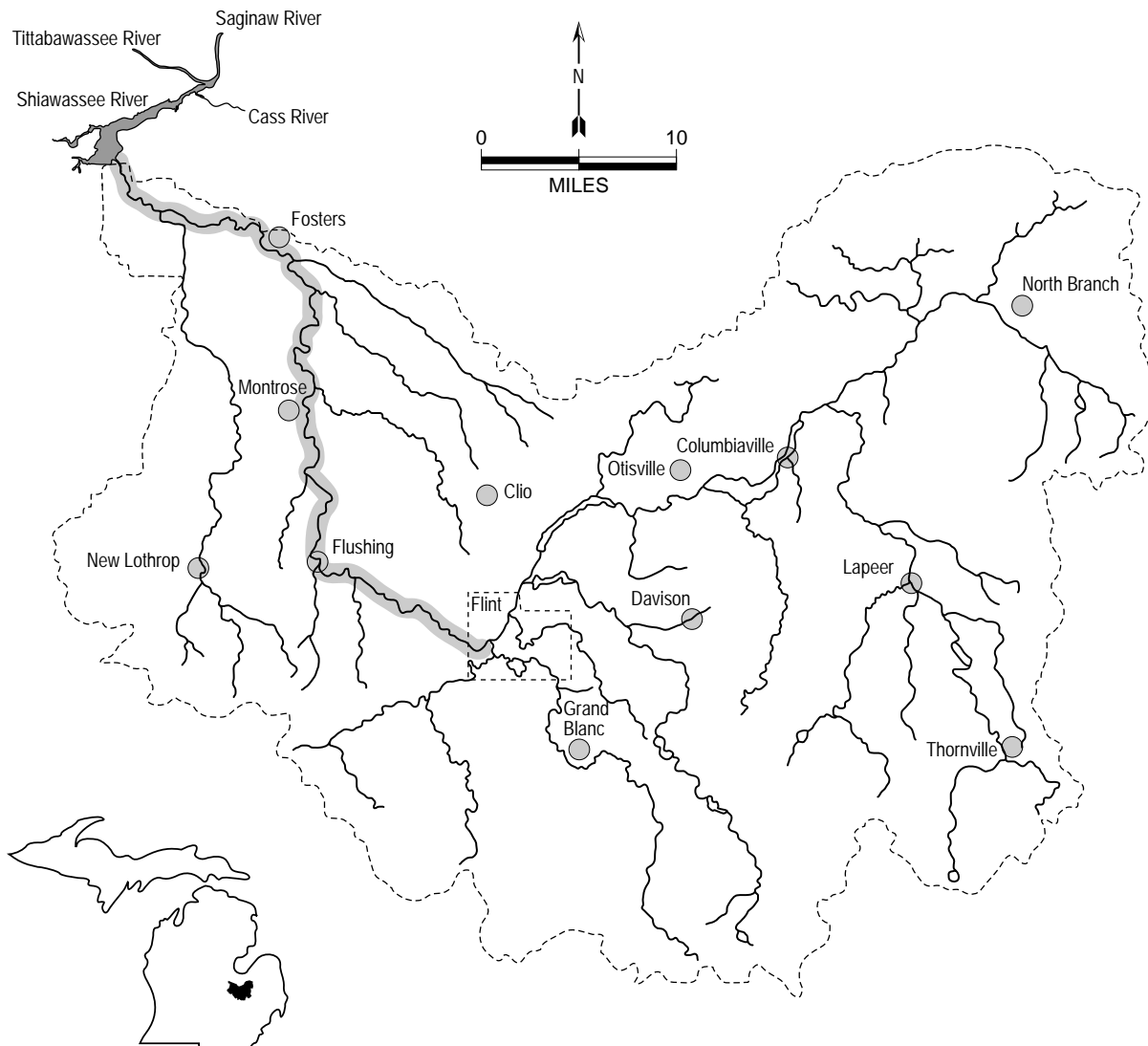
- winter refuge - avoids strong currents



**Freshwater drum** (*Aplodinotus grunniens*)

**Habitat:**

- feeding
  - deeper pools of rivers and Lake Huron
  - 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

