**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
**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
Slimy sculpin (*Cottus cognatus*)

**Habitat:**

- **feeding** - cool lakes, impoundments, rivers, and streams
  - gravel or rock substrate
- **spawning** - nest in shallow areas of lakes
  - gravel substrate or rock ledge
  - male parental care
**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 Michigan
  - clear water of 30 feet or less depth
  - firm substrate

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

Muskegon River Watershed Assessment

Muskegon

Big Rapids

Newago

Merrit

Evart

Hersey

78
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
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
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
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 Michigan  
  - 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 Michigan
- 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 Michigan
  - 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 Michigan
  - 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