Black bullhead (*Ameiurus melas*)

**Habitat:**

- **feeding**
  - turbid water
  - silt bottom
  - low gradient small to medium streams, pools, and headwaters of large rivers; also in lakes and impoundments
  - can tolerate very warm water and very low dissolved oxygen

- **spawning**
  - nest in moderate to heavy vegetation or woody debris and under overhanging banks
Yellow bullhead (*Ameiurus natalis*)

**Habitat:**

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

- spawning - nest under a stream bank or near stones or stumps
Brown bullhead (*Ameiurus nebulosus*)

**Habitat:**

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

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

- **winter refuge** - in muddy bottoms
Channel catfish (*Ictalurus punctatus*)

**Habitat:**

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

- **spawning** - secluded semi-dark areas such as holes, under banks, log jams, or rocks
Stonecat (*Noturus flavus*)

**Habitat:**

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

- **spawning**
  - eggs deposited beneath stones
  - shallow rocky areas of streams or lakes
Tadpole madtom (*Noturus gyrinus*)

**Habitat:**

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

- **Spawning:** mostly in rivers, sometimes shallows of lakes
  - nests in dark cavities (ex: beneath boards, logs, crayfish burrows)
Brindled madtom (*Noturus miurus*) - special concern

**Habitat:**

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

- **spawning** - silt or mud substrate
- emergent vegetation
**Grass pickerel** (*Esox americanus vermiculatus*)

**Habitat:**

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

- **spawning** - broadcast spawner over submerged vegetation
Northern pike (*Esox lucius*)

**Habitat:**

- **feeding**  - cool to moderately warm streams, rivers, lakes, and impoundments
  - vegetation in slow to moderate current

- **spawning**  - submerged vegetation with slow current in shallow water
Muskellunge (*Esox masquinongy*)

**Habitat:**

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

- **spawning**
  - clear shallow waters (15-20") in heavily vegetated areas
**Tiger muskellunge** *(Esox masquinongy x E. lucius)* - rare

**Habitat:**

- **feeding** - intermediate between muskellunge and northern pike

- **spawning** - hybrid species; muskellunge x northern pike
  - occasionally produced in wild, but most often from hatcheries
  - males are sterile, females may be fertile
Central mudminnow (*Umbra limi*)

**Habitat:**
- **feeding** - undisturbed clear, low-gradient streams or rivers and lakes and impoundments
  - organic debris, muck, or peat substrates
  - aquatic vegetation
- **spawning** - floodplain areas, on vegetation

![Map of River Raisin and vicinity](map.png)
Rainbow Smelt (*Osmerus mordax*)

**Habitat:**

- **feeding** - midwater of lakes; 42-192 ft. in Lake Erie
- **spawning** - in streams or off-shore shoals in Lake Erie
  - gravel substrate
  - swift current
Cisco {Lake herring} (*Coregonus artedi*) - special concern

**Habitat:**

- **feeding** - deep cool lakes, preferably oligotrophic
- **spawning** - usually in lakes
  - 3 to 6 feet of water with no vegetation
  - often over gravel or stony substrate
Lake whitefish (*Coregonus dupeaformis*)

**Habitat:**
- **feeding** - cold deep lakes; Lake Erie
- **spawning** - shallow water (<25 feet)
  - hard or stony substrate
Coho salmon (*Oncorhynchus kisutch*)

**Habitat:**

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

- **spawning** - cold streams and rivers
  - swifter water of shallow gravelly substrate
Rainbow trout (*Oncorhynchus mykiss*)

**Habitat:**

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

- **spawning** - gravelly riffles above a pool
  - smaller tributaries
Chinook salmon (*Oncorhynchus tshawyscha*)

**Habitat:**

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

- **spawning**
  - gravelly substrate in cool streams
**Brown trout** (*Salmo trutta*)

**Habitat:**

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

- spawning - gravelly riffles; shallow headwater areas
Brook trout (*Salvelinus fontinalis*) - locally extirpated

Habitat:

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

- **spawning** - gravelly riffles; shallow or headwater streams
Lake trout (*Salvelinus namaycush*)

**Habitat:**

- **feeding** - cold lakes and rivers
- **spawning** - large boulder or rubble substrate
- shallow water of lakes and rivers
**Trout-perch* (*Percopsis omiscomaycus*)

**Habitat:**
- **feeding** - clean sand or fine gravel substrate
  - long deep pools in low gradient streams and Lake Erie
  - highly intolerant of clayey silts
  - avoids rooted aquatic vegetation
- **spawning** - over rocks in shallows
  - over sand and gravel substrates in Lake Erie
**Burbot (Lota lota)**

**Habitat:**

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

- **Spawning:**
  - in 1 to 4 feet of water in shallow bays or on shoals 5-10 feet deep usually in lakes, sometimes rivers
  - over sand or gravel substrate
  - under ice
Banded killifish (*Fundulus diaphanus*)

**Habitat:**

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

- **spawning** - quiet areas of weedy pools
Blackstripe topminnow (*Fundulus notatus*)

**Habitat:**

- **feeding** - clear waters of lakes, impoundments and in low-gradient streams
  - aquatic or submerged land vegetation
  - somewhat tolerant of turbid water

- **spawning** - in vegetation or algae

- **winter refuge** - in deeper water with bottom vegetation
**Brook silverside** (*Labidesthes sicculus*)

**Habitat:**

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

- **spawning** - in and around aquatic vegetation or over gravel substrate with a moderate current
**Brook stickleback** (*Cluaea inconstans*)

**Habitat:**

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

- **spawning** - shallow cool (<66°F) water
- aquatic reeds or grasses necessary
Mottled sculpin (*Cottus bairdi*)

**Habitat:**

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

- **spawning** - nests under logs or rock
White perch (*Morone americana*)

**Habitat:**

- **feeding** - clear, warm water of low-gradient streams, lakes, and impoundments
- **spawning** - shallow water over firm substrate
White bass (*Morone chrysops*)

Habitat:

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

- **spawning** - tributary streams or shallow water of lakes
- over firm substrate
Rock bass (*Ambloplites rupestris*)

**Habitat:**
- **feeding** - clear, cool streams, rivers, and lakes
  - rocky to sand substrate
  - woody or vegetative cover
- **spawning** - sand or gravel nests
  - shallow water
- **winter refuge** - deep water
Green sunfish (*Lepomis cyanellus*)

**Habitat:**

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

- **spawning** - nests in shallow areas sheltered by rocks, logs, or aquatic vegetation
Pumpkinseed sunfish (*Lepomis gibbosus*)

**Habitat:**

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

- **spawning**
  - nest in sand, gravel, or rock substrate
  - in shallow water near submerged vegetation
Warmouth (*Lepomis gulosus*)

**Habitat:**

- **feeding** - clear lakes and impoundments and very low-gradient streams
  - abundant aquatic vegetation
  - silt-free water
  - mucky substrate often covered with organic debris

- **spawning** - nesting sites in loose silt, sand with silt, or rubble over silt near stumps, roots, or vegetation
**Orangespotted sunfish** (*Lepomis humilis*) - non-native species

**Habitat:**

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

- **spawning**  
  - shallow water  
  - gravel, sand, or mud substrate
Bluegill \textit{(Lepomis macrochirius)}

\textbf{Habitat:}

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

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

- **winter refuge** - deep water
**Longear sunfish** (*Lepomis megalotis*)

**Habitat:**
- **feeding** - clear moderate-sized shallow streams with moderate vegetation
  - rocky substrates
  - little to no current
- **spawning** - nests in gravel, sand, or hard rock substrate
Redear sunfish (*Lepomis microlophus*)

**Habitat:**

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

- **spawning**: nest in silt or gravel substrate
Smallmouth bass (*Micropterus dolomieu*)

**Habitat:**

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

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

**winter refuge** - larger deeper waters with gradients between 3 to 7 feet per mile
Largemouth bass (*Micropterus salmoides*)

**Habitat:**

- **feeding** - non-flowing clear waters - lakes, impoundments, and pools of streams
  - abundant aquatic vegetation
  - soft muck, organic debris, gravel, sand, and hard non-flocculent clay substrates

- **spawning** - nest in gravelly sand to marl and soft mud substrates
  - emergent vegetation
  - quiet shallow bays; no current
White crappie (*Pomoxis annularis*)

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

**Habitat:**

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

- **spawning** - nests in gravel, sand, or mud substrate
- - some vegetation must be present
- - sometimes nests under banks
Eastern sand darter (*Ammocrypta pellucida*) - threatened, may be locally extirpated

**Habitat:**

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

- **spawning** - sandy substrate
Greenside darter (*Etheostoma blennioides*)

Habitat:

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

- **spawning** - filamentous algae necessary for egg deposition
**Rainbow darter** (*Etheostoma caeruleum*)

**Habitat:**

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

- **spawning**: gravel or rubble riffles
Iowa darter (*Etheostoma exile*)

**Habitat:**

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

- **spawning**
  - in pond-like extensions of streams on organic matter or roots
  - in shallows
Fantail darter (*Etheostoma flabellare*)

**Habitat:**

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

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

- **winter refuge** - moves downstream to larger and deeper waters
Least darter (*Etheostoma microperca*)

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

- **spawning** - spawning occurs on stems of plants
  - male guards a territory in a vegetated area
Johnny darter (*Etheostoma nigrum*)

**Habitat:**

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

- **spawning** - underneath rocks
- in stream pools or protected shallows of lakes
Orangethroat darter (*Etheostoma spectabile*)

**Habitat:**

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

- **spawning** - gravel riffles
  - slow current
Yellow perch (*Perca flavescens*)

**Habitat:**

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

- **spawning**
  - shallows of lakes, tributaries of streams
  - occurs over rooted vegetation, submerged brush, fallen trees
  - may occur over sand or gravel
Logperch (*Percina caprodes*)

**Habitat:**
- feeding - gravel riffles, deeper slower sections of rivers
- medium size streams; also lakes, impoundments, and Lake Erie
- sand, gravel, or rock substrate
- avoids turbidity and silt

- spawning - riffles or sandy in-shore shallows
**Blackside darter** (*Percina maculata*)

**Habitat:**

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

- **spawning** - gravel and sand substrate
**Sauger (Stizostedion canadense) - threatened**

**Habitat:**

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

- **spawning**: shoals of gravel and rubble
Walleye (*Stizostedion vitreum*)

**Habitat:**

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

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

- **winter refuge** - avoids strong currents
Freshwater drum (*Aplodinotus grunniens*)

**Habitat:**

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

- **spawning:** pelagically, in open water, over sand or mud substrate
  - occurs in bays or lower portions of marshes
**Round goby** (*Neogobius melanostomus*) - non-native species

**Habitat:**

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

- spawning - rocky substrate with large interstitial spaces

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

Alewive ................................................................. 12
American brook lamprey ........................................ 6
American eel ........................................................ 11
Banded killifish ....................................................... 76
Bigeye chub .......................................................... 25
Black bullhead ....................................................... 53
Black crappie ........................................................ 94
Black redhorse ....................................................... 49
Blackchin shiner .................................................... 29
Blacknose dace ..................................................... 40
Blacknose shiner ................................................... 30
Blacksid e darter .................................................... 105
Blacks strip e topminnow ........................................ 77
Bluegill ................................................................. 88
Bluntnose minnow .................................................. 38
Bowfin ................................................................. 9
Brindled madtom .................................................. 59
Brook silverside ..................................................... 78
Brook stickleback ................................................... 79
Brook trout ............................................................ 72
Brown bullhead ..................................................... 55
Brown trout ........................................................... 71
Burbot ................................................................. 75
Central mudminnow ............................................... 64
Central stoneroller ................................................... 14
Channel catfish ..................................................... 56
Chinook salmon .................................................... 70
Cisco (lake herring) ............................................... 66
Coho salmon ........................................................ 68
Common carp ..................................................... 17
Common shiner ..................................................... 19
Creek chub ............................................................ 41
Creek chubsucker .................................................. 44
Eastern sand darter ............................................... 95
Emerald shiner ..................................................... 27
Fantail darter ........................................................ 99
Fathead minnow .................................................... 39
Freshwater drum .................................................... 108
Gizzard shad ........................................................ 13
Golden redhorse .................................................... 50
Golden shiner ....................................................... 24
Goldfish ............................................................... 15
Grass pickerel ....................................................... 60
Greater redhorse .................................................... 52
Green sunfish ....................................................... 84
Greenside darter ................................................... 96
Hornyhead chub .................................................... 22
Iowa darter ............................................................ 98
<table>
<thead>
<tr>
<th>Fish Name</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walleye</td>
<td>107</td>
</tr>
<tr>
<td>Tiger muskellunge</td>
<td>63</td>
</tr>
<tr>
<td>Tadpole madtom</td>
<td>58</td>
</tr>
<tr>
<td>Striped shiner</td>
<td>18</td>
</tr>
<tr>
<td>Stonecat</td>
<td>57</td>
</tr>
<tr>
<td>Spotted sucker</td>
<td>47</td>
</tr>
<tr>
<td>Spottail shiner</td>
<td>31</td>
</tr>
<tr>
<td>Spotfin shiner</td>
<td>16</td>
</tr>
<tr>
<td>Southern redbelly dace</td>
<td>37</td>
</tr>
<tr>
<td>Silverjaw minnow</td>
<td>28</td>
</tr>
<tr>
<td>Silver shiner</td>
<td>32</td>
</tr>
<tr>
<td>Silver redhorse</td>
<td>48</td>
</tr>
<tr>
<td>Silver lamprey</td>
<td>5</td>
</tr>
<tr>
<td>Round goby</td>
<td>109</td>
</tr>
<tr>
<td>Sand shiner</td>
<td>34</td>
</tr>
<tr>
<td>Sauger</td>
<td>106</td>
</tr>
<tr>
<td>Shorthead redhorse</td>
<td>51</td>
</tr>
<tr>
<td>Silver chub</td>
<td>21</td>
</tr>
<tr>
<td>Redear sunfish</td>
<td>90</td>
</tr>
<tr>
<td>Redfin shiner</td>
<td>20</td>
</tr>
<tr>
<td>River chub</td>
<td>23</td>
</tr>
<tr>
<td>Rock bass</td>
<td>83</td>
</tr>
<tr>
<td>Rosyface shiner</td>
<td>33</td>
</tr>
<tr>
<td>Quillback</td>
<td>42</td>
</tr>
<tr>
<td>Rainbow darter</td>
<td>97</td>
</tr>
<tr>
<td>Rainbow smelt</td>
<td>65</td>
</tr>
<tr>
<td>Rainbow trout</td>
<td>69</td>
</tr>
<tr>
<td>Rainbow darter</td>
<td>97</td>
</tr>
<tr>
<td>Redear sunfish</td>
<td>90</td>
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<td>Redfin shiner</td>
<td>20</td>
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<td>Sand shiner</td>
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<td>Sauger</td>
<td>106</td>
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<td>Shorthead redhorse</td>
<td>51</td>
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<td>Silver chub</td>
<td>21</td>
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<td>Silver lamprey</td>
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<td>Smallmouth bass</td>
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<td>Southern redbelly dace</td>
<td>37</td>
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<td>Spotfin shiner</td>
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<td>Striped shiner</td>
<td>18</td>
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<td>Tadpole madtom</td>
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<tr>
<td>Tiger muskellunge</td>
<td>63</td>
</tr>
<tr>
<td>Trout-perch</td>
<td>74</td>
</tr>
<tr>
<td>Walleye</td>
<td>107</td>
</tr>
<tr>
<td>Fish</td>
<td>Page</td>
</tr>
<tr>
<td>------------</td>
<td>------</td>
</tr>
<tr>
<td>Warmouth</td>
<td>86</td>
</tr>
<tr>
<td>White bass</td>
<td>82</td>
</tr>
<tr>
<td>White crappie</td>
<td>93</td>
</tr>
<tr>
<td>White perch</td>
<td>81</td>
</tr>
<tr>
<td>White sucker</td>
<td>43</td>
</tr>
<tr>
<td>Yellow bullhead</td>
<td>54</td>
</tr>
<tr>
<td>Yellow perch</td>
<td>103</td>
</tr>
</tbody>
</table>