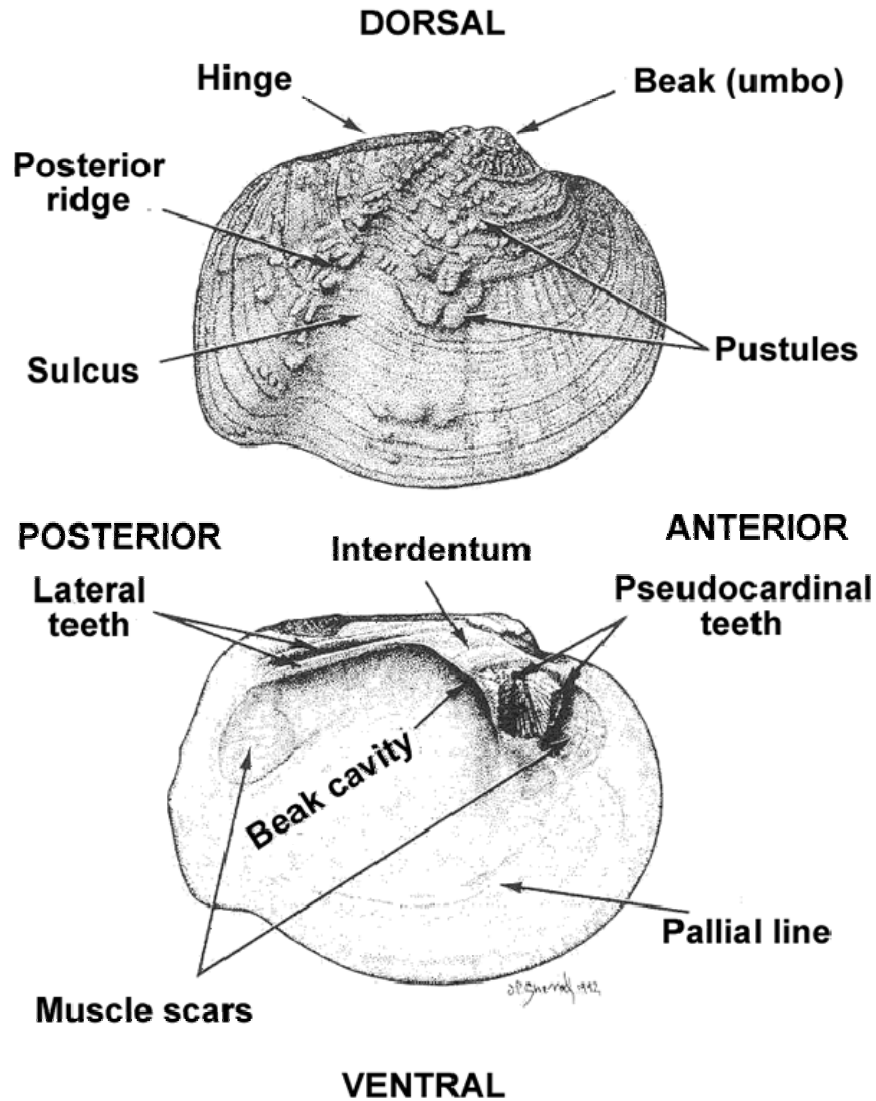


## Some Confusing Michigan Mussel Species

Below are some Michigan mussel species that are easily confused with one another. This brief guide uses both internal and external shell characteristics. It also mentions species range where that is useful for identification, although it must be emphasized that these are just *known* ranges; mussel faunas are better-known in some watersheds than in others. Pictures are courtesy of Kurt Stepnitz, Michigan State University, unless otherwise noted.

### General Shell Anatomy



(Cummings and Mayer, 1992)

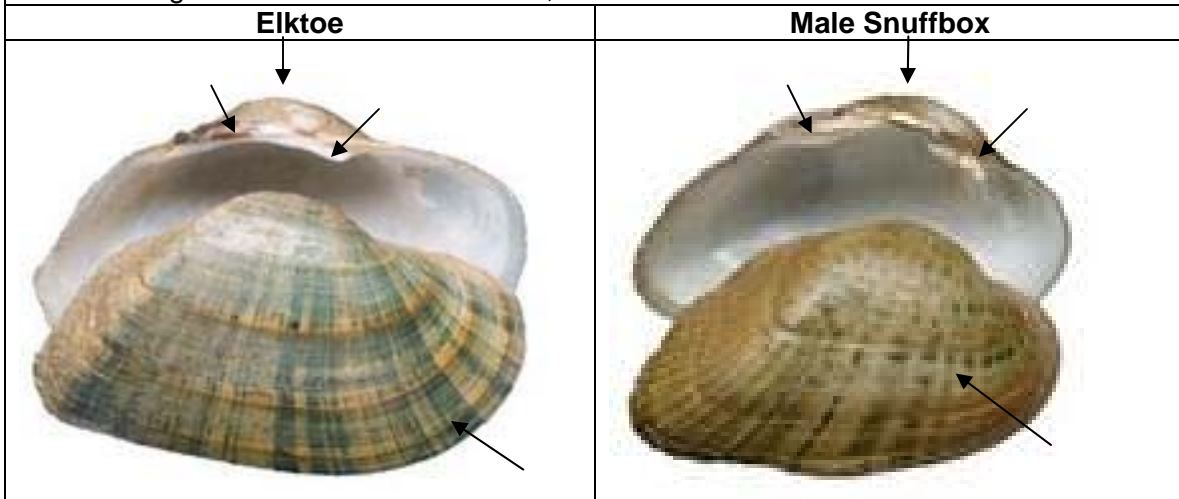
## Elktoe vs. male Snuffbox

### Elktoe (*Alasmidonta marginata*)

1. Larger; up to 90 mm long
2. Beak close to center of shell
3. Pseudocardinal teeth = 1 in each valve, dorso-ventrally compressed; lamellated interdental projection in left valve
4. Lateral teeth absent
5. Beak sculpture = 5-6 very coarse double-looped bars
6. Rays usually solid, or broken into small dots
7. Range = most of state, including UP

### Male Snuffbox (*Epioblasma triquetra*)

1. Smaller; up to 55 mm long
2. Beak closer to anterior end
3. Pseudocardinal teeth = 2 in each valve, sharp, ragged, inclined forward
4. Lateral teeth short, serrated, blade-like
5. Beak sculpture = 3-4 faint, fine bars, more or less double-looped
6. Rays often broken into chevrons
7. Range = central and southern LP; not in UP



## Ellipse vs. Rainbow

### Ellipse (*Venustaconcha ellipsiformis*)

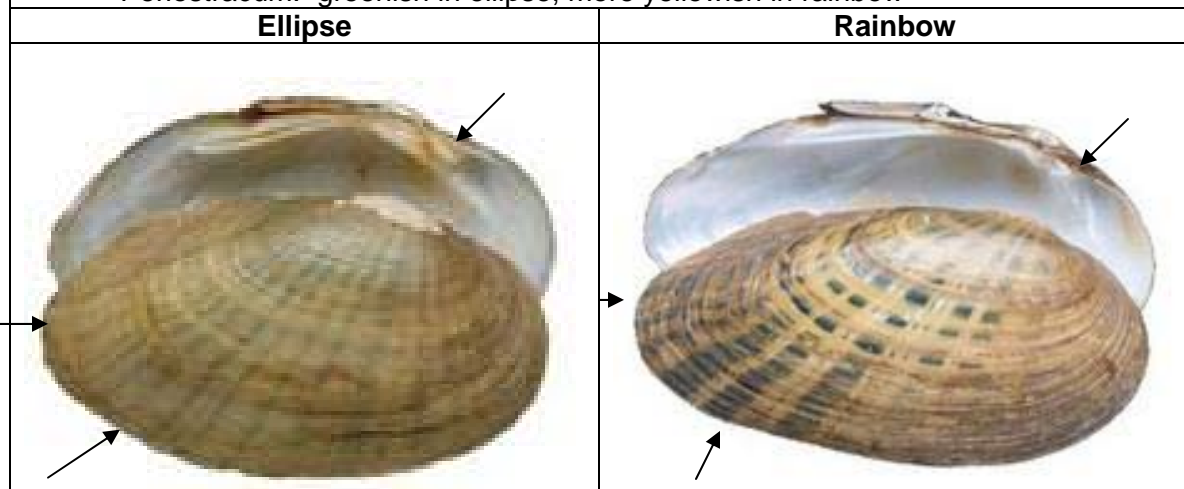
1. Numerous wavy green rays on posterior half of shell
2. Beak sculpture = 2-4 very fine double-looped ridges
3. Pseudocardinal teeth = heavy, triangular, roughened, divergent
4. Farthest posterior point close to middle of shell; "pointing down"
5. Lateral teeth shorter than in rainbow

### Rainbow (*Villosa iris*)

1. Numerous broken green rays all over shell
2. Beak sculpture = 3-6 sharply defined, double-looped bars
3. Pseudocardinal teeth = small, triangular, somewhat divergent
4. Farthest posterior point above midline of shell, closer to ventral edge; "pointing up"
5. Lateral teeth longer than in ellipse

### Other:

- Shell thicker in ellipse than in similar sized rainbow
- Periostracum: greenish in ellipse, more yellowish in rainbow



**Brook Lasmigona (Brook or Creek Heelsplitter) vs. Strange Floater (Squaw-foot, Creeper)**

**Brook Heelsplitter** (= Brook Lasmigona; *Lasmigona compressa*)

1. Shell trapezoid or rhomboid-ovate, with a low to moderate wing in immature specimens; posterior end angled
2. Beak in line with or barely raised above hinge line; narrow compared to shell width
3. Beak sculpture = 5-8 prominent double-looped ridges
4. Nacre white or bluish white, cream or salmon-colored near beak cavities
5. Pseudocardinal teeth = strong, narrow, with prominent interdental projection in left valve
6. Lateral teeth = long and narrow

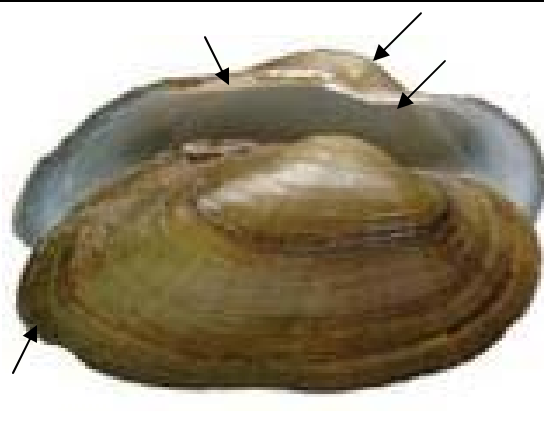
**Strange Floater** (= Creeper, Squawfoot; *Strophitus undulatus*)

1. Shell elliptical to trapezoid, more inflated than brook heelsplitter; no wing; posterior end bluntly pointed
2. Beak projects well above hinge line; broad compared to shell width
3. Beak sculpture = several rough, thick, raised, U-shaped concentric lines, not double-looped
4. Nacre same as brook heelsplitter
5. Pseudocardinal teeth = vestigial, usually just a swelling along hinge line
6. Lateral teeth = absent

**Brook Lasmigona**



**Strange Floater**



## Wabash Pigtoe vs. Round Pigtoe

### Wabash Pigtoe (*Fusconaia flava*)

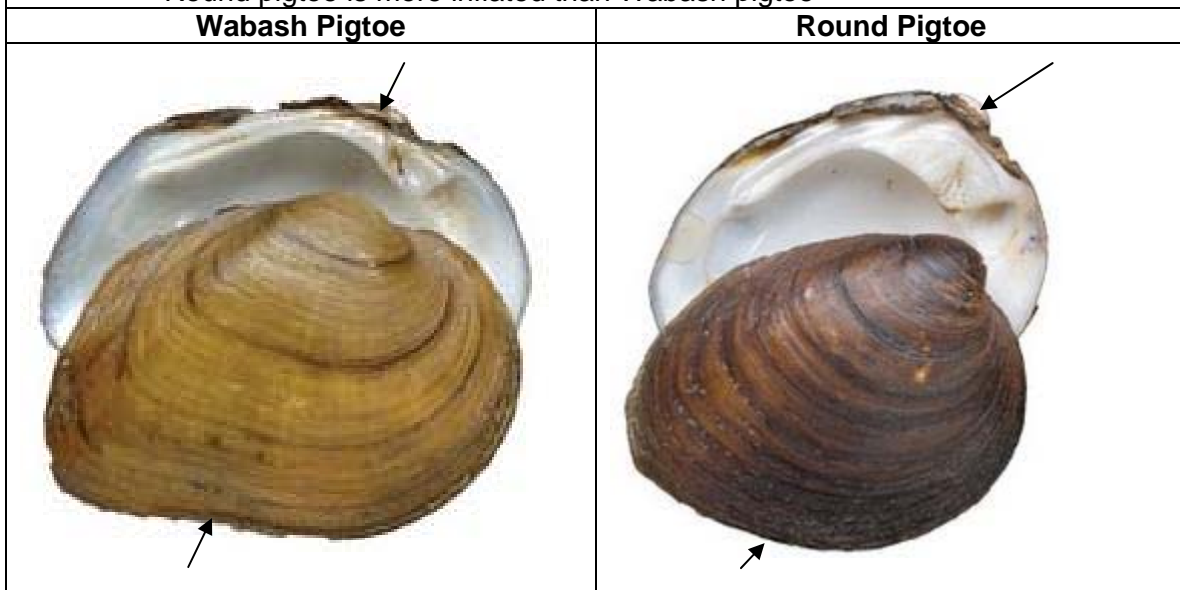
1. Beak somewhat closer to center of shell
2. Ventral margin straight or slightly concave posteriorly
3. Posterior ridge prominent, with a shallow sulcus
4. Beak only slightly elevated above hinge line
5. Beak cavity deep

### Round Pigtoe (*Pleurobema sintoxia*)


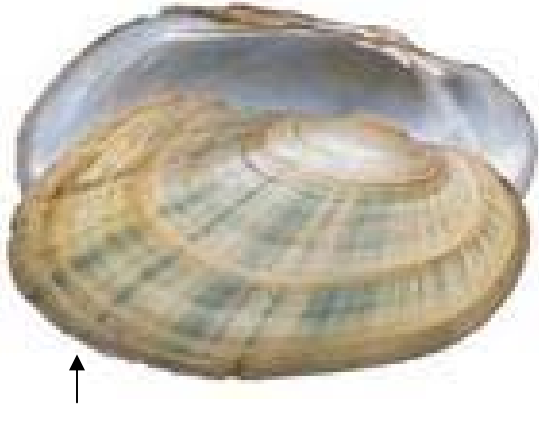

1. Beak very close to anterior margin
2. Ventral margin rounded/convex throughout
3. Posterior ridge obscure and rounded; no sulcus
4. Beak elevated above hinge line
5. Beak cavity shallow to moderately deep

### Other:





- Round pigtoe is more inflated than Wabash pigtoe




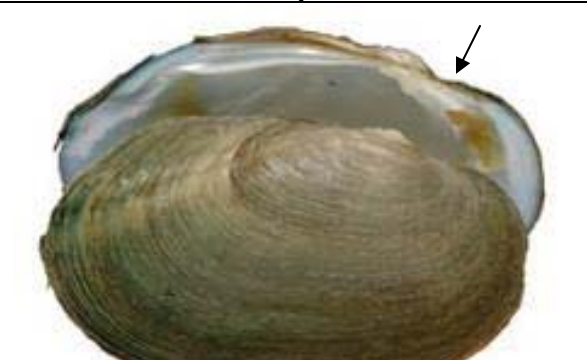

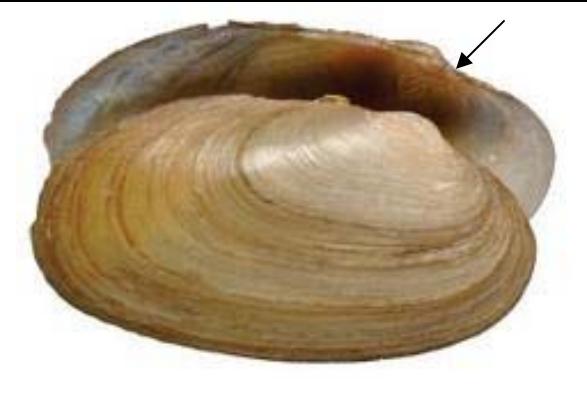
**Young Mucket vs. Male Fat Mucket vs. Wavy-Rayed Lampmussel**

<p><u>Young Mucket</u> (<i>Actinonaias ligamentina</i>)</p> <ol style="list-style-type: none"> <li>1. Shell ovate or ovate-elliptical; most compressed of the three species</li> <li>2. Rays wide, straight</li> <li>3. Beak sculpture = poorly developed; a few narrow concentric bars, single-looped or double-looped</li> <li>4. Range = southern two-thirds of LP</li> </ol>	
<p><u>Male Fat Mucket</u> (<i>Lampsilis siliquoidea</i>)</p> <ol style="list-style-type: none"> <li>1. Shell elliptical; compression intermediate</li> <li>2. Rays narrow, straight</li> <li>3. Beak sculpture = numerous coarse concentric bars, sinuous or broken in center</li> <li>4. Range = throughout state</li> </ol>	
<p><u>Wavy-Rayed Lampmussel</u> (<i>Lampsilis fasciola</i>)</p> <ol style="list-style-type: none"> <li>1. Shell ovate; most inflated of the three species</li> <li>2. Rays narrow or wide, interrupted and wavy</li> <li>3. Beak sculpture = ~ 6 fine concentric broadly curved bars, sinuous or broken in center</li> <li>4. Range = Lake Erie and St. Clair River drainages</li> </ol>	
<b>Mucket</b>	<b>Male Fat Mucket</b>
	
<b>Wavy-Rayed Lampmussel</b>	
	

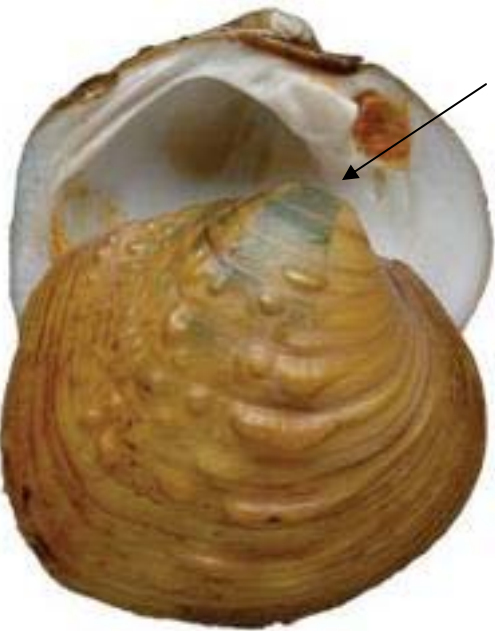

**Eastern Elliptio vs. Spike vs. Black Sandshell**

<p><u>Eastern Elliptio</u> (<i>Elliptio complanata</i>)</p> <ol style="list-style-type: none"> <li>1. Valves somewhat trapezoidal or elliptical; posterior margin obliquely flattened.</li> <li>2. Beak sculpture = concentric U-shaped ridges</li> <li>3. Range = UP &amp; Cheboygan County in LP</li> </ol>	
<p><u>Spike</u> (<i>Elliptio dilatata</i>)</p> <ol style="list-style-type: none"> <li>1. Valves long-ovate, not trapezoidal; posterior margin more tapered</li> <li>2. Beak sculpture = 4 or 5 rather heavy curved bars</li> <li>3. Range = LP &amp; Sturgeon River in UP</li> </ol>	
<p><u>Black Sandshell</u> (<i>Ligumia recta</i>)</p> <ol style="list-style-type: none"> <li>1. Valves elongate and quadrate, not trapezoidal; posterior point often above horizontal midline of shell (see second photograph, from INHS)</li> <li>2. Beak sculpture = 2 or 3 indistinct, double-looped bars</li> <li>3. Range: LP = south of Muskegon R.; UP = Menominee R. &amp; Sturgeon R.</li> </ol>	
<p><u>Other</u></p> <ul style="list-style-type: none"> <li>• Black Sandshell periostracum usually darker and more glossy than Eastern Elliptio or Spike.</li> <li>• Black Sandshell slightly sexually dimorphic: shell pointed posteriorly in males; shell more rounded posteriorly in females; females proportionately broader, especially posteriorly</li> </ul>	
<p><b>Eastern Elliptio</b></p>	<p><b>Spike</b></p>
	
<p><b>Black Sandshell</b></p>	
	
<p>(Illinois Natural History Society)</p>	

**Very Small Adult Species**



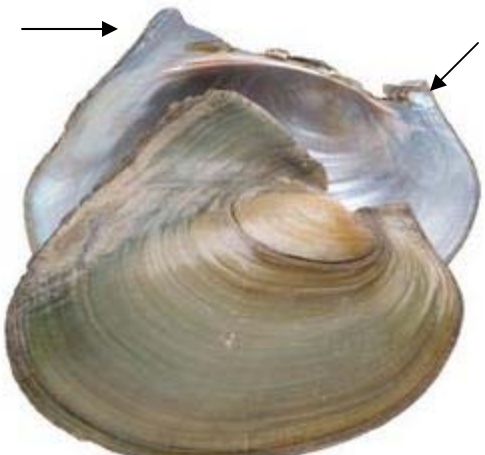
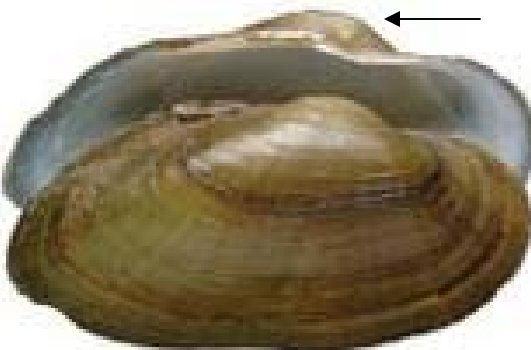
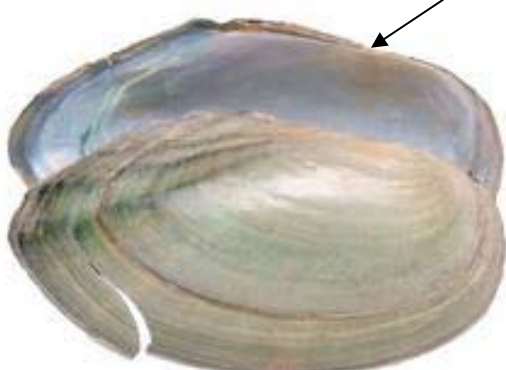

<p><u>Purple Lilliput</u> (<i>Toxolasma lividus</i>)</p> <ol style="list-style-type: none"> <li>1. Nacre purple</li> <li>2. Beak sculpture = 3 or 4 heavy bars</li> <li>3. Pseudocardinal teeth elevated and serrated</li> <li>4. Range = known only from the Clinton River, Oakland County</li> </ol>	
<p><u>Lilliput</u> (<i>Toxolasma parvus</i>)</p> <ol style="list-style-type: none"> <li>1. Nacre silvery or bluish white</li> <li>2. Beak sculpture = 5 or 6 heavy ridges, angled towards posterior end</li> <li>3. Pseudocardinal teeth thin, compressed, and serrated</li> <li>4. Range = southeastern LP, Raisin R. &amp; Huron R.</li> </ol>	
<p><u>Rayed Bean</u> (<i>Villosa fabilis</i>)</p> <ol style="list-style-type: none"> <li>1. Nacre white</li> <li>2. Beak sculpture = 2 or 3 heavy ridges, knobbed posteriorly</li> <li>3. Pseudocardinal teeth large, heavy, triangular</li> <li>4. Range = Lake Erie and St. Clair R. tributaries</li> </ol>	
<p><u>Salamander Mussel</u> (<i>Simpsonaias ambigua</i>)</p> <ol style="list-style-type: none"> <li>1. Nacre white</li> <li>2. Beak sculpture = 3 or 4 fine double loops</li> <li>3. Pseudocardinal teeth small, low and rounded</li> <li>4. Range = eastern LP; Lake Erie drainages, and perhaps the Black R. &amp; Pine R.</li> </ol>	
<p><b>Purple Lilliput</b></p>	<p><b>Lilliput</b></p>
	
<p>(Illinois Natural History Society)</p>	
<p><b>Rayed Bean</b></p>	<p><b>Salamander Mussel</b></p>
	

**Two Rows of Pustules**

<p><u>Pimpleback</u> (<i>Quadrula pustulosa</i>)</p> <ol style="list-style-type: none"> <li>1. Nodules distributed chiefly over central part of shell; if nodules are numerous, some may also be on the posterior slope.</li> <li>2. Broad green ray extends from beak through first or second growth ring (not always visible)</li> <li>3. Beak sculpture = 3 or 4 coarse ridges, when not corroded away</li> <li>4. Range = most of southern two-thirds of the LP</li> </ol>	
<p><u>Mapleleaf</u> (<i>Quadrula quadrula</i>)</p> <ol style="list-style-type: none"> <li>1. Nodules in 2 distinct bands, separated by a shallow sulcus</li> <li>2. No rays on periostracum</li> <li>3. Beak sculpture = tiny nodules radiating into nodule bands</li> <li>4. Range = Black R., Galien R., &amp; Grand R. in western LP; Cass R. &amp; Saginaw R. in eastern LP</li> </ol>	
<p><u>Other:</u></p> <ul style="list-style-type: none"> <li>• The Mapleleaf is more quadrate with a squared posterior margin, and less ovate than the Pimpleback.</li> <li>• The Pimpleback shell is heavier/thicker than the Mapleleaf shell</li> </ul>	
<p><b>Pimpleback</b></p>	<p><b>Mapleleaf</b></p>
	

**“Toothless” Species (or almost toothless)**

<p><u>Fragile Papershell</u> (<i>Leptodea fragilis</i>)</p> <ol style="list-style-type: none"><li>1. Pseudocardinal teeth low, thin</li><li>2. Shell with prominent wing on posterior side of beak, especially in younger specimens</li><li>3. Beak slightly above hinge line; beak sculpture = 3 or 4 very fine V-shaped ridges</li><li>4. Nacre white and iridescent, sometimes with pink highlights near hinge</li><li>5. Range = southern LP</li></ol>
<p><u>Scaleshell</u> (<i>Leptodea leptodon</i>)</p> <ol style="list-style-type: none"><li>1. Pseudocardinal teeth reduced to small, thickened ridges</li><li>2. Shell with small wing on posterior side of beak</li><li>3. Beak very slightly elevated with hinge line; beak sculpture absent</li><li>4. Nacre pinkish white or light purple, and iridescent</li><li>5. Range = limited to the Grand R. in the LP; extirpated?</li></ol>
<p><u>Pink Papershell</u> (<i>Leptodea laevissima</i> or <i>Potamilus ohiensis</i>)</p> <ol style="list-style-type: none"><li>1. Pseudocardinal teeth narrow, delicate &amp; triangular</li><li>2. Shell with prominent wing on both sides of beak, especially in younger specimens</li><li>3. Beak very slightly elevated above hinge line; beak sculpture = 4 or 5 fine double loops</li><li>4. Nacre purple or pink, and iridescent</li><li>5. Range = limited; Grand R. in the LP, Pentwater Lake</li></ol>
<p><u>Strange Floater</u> (= Creeper, Squawfoot; <i>Strophitus undulatis</i>)</p> <ol style="list-style-type: none"><li>1. Pseudocardinal teeth vestigial, usually just a swelling along hinge line</li><li>2. Shell lacks wing</li><li>3. Beak well above hinge line; beak sculpture = 3 to 5 v-shaped ridges</li><li>4. Nacre white, often with salmon infusions in beak cavity</li><li>5. Range = throughout state</li></ol>
<p><u>Paper Pondshell</u> (<i>Utterbackia imbecillis</i>)</p> <ol style="list-style-type: none"><li>1. Pseudocardinal teeth lacking</li><li>2. Shell lacks wing</li><li>3. Beak flattened, below hinge line; beak sculpture = 2 or 3 fine double-looped ridges followed by fine concentric lines</li><li>4. Nacre white, silvery, or bluish-white</li><li>5. Range = southern LP; Clinton R., Huron R., St. Joseph (Maumee) R., Grand R., Kalamazoo R.</li></ol>
<p><u>Giant Floater</u> (= Common Floater; <i>Pyganodon grandis</i>)</p> <ol style="list-style-type: none"><li>1. Pseudocardinal teeth lacking</li><li>2. Shell lacks wing</li><li>3. Beak well above hinge line; beak sculpture = 3 to 5 double-looped ridges</li><li>4. Nacre white</li><li>5. Range = southern two-thirds of the LP</li></ol>
<p>Other:</p> <ul style="list-style-type: none"><li>• Posterior end pointed in Scaleshell; rounded in other species</li><li>• Beak cavity in Strange Floater and Giant Floater deeper than in other species</li><li>• Periostracum darker in Strange Floater and Giant Floater; rayed in Scaleshell</li><li>• Shell more inflated in Strange Floater and especially Giant Floater than other species</li></ul>

<p style="text-align: center;"><b>Fragile Papershell</b></p>  <p>A photograph of a Fragile Papershell clam. The clam is shown from a side-on perspective, slightly open. The upper shell is a pale, iridescent blue, while the lower shell is a mottled brown and tan. A black arrow points to the top edge of the upper shell.</p>	<p style="text-align: center;"><b>Scaleshell</b></p>  <p>A photograph of a Scaleshell clam. The clam is shown from a side-on perspective, slightly open. The upper shell is a pale, iridescent blue, and the lower shell is a mottled brown and tan. Two black arrows point to the top and bottom edges of the upper shell.</p>
<p style="text-align: center;"><b>Pink Papershell</b></p>  <p>A photograph of a Pink Papershell clam. The clam is shown from a side-on perspective, slightly open. The upper shell is a pale, iridescent blue, and the lower shell is a mottled brown and tan. Two black arrows point to the top and bottom edges of the upper shell.</p>	<p style="text-align: center;"><b>Strange Floater</b></p>  <p>A photograph of a Strange Floater clam. The clam is shown from a side-on perspective, slightly open. The upper shell is a pale, iridescent blue, and the lower shell is a mottled brown and tan. A black arrow points to the top edge of the upper shell.</p>
<p style="text-align: center;"><b>Paper Pondshell</b></p>  <p>A photograph of a Paper Pondshell clam. The clam is shown from a side-on perspective, slightly open. The upper shell is a pale, iridescent blue, and the lower shell is a mottled brown and tan. A black arrow points to the top edge of the upper shell.</p>	<p style="text-align: center;"><b>Giant Floater</b></p>  <p>A photograph of a Giant Floater clam. The clam is shown from a side-on perspective, slightly open. The upper shell is a pale, iridescent blue, and the lower shell is a mottled brown and tan.</p>