

# Freshwater Bivalves of Maryland

## Field Identification Information

Maryland Department of Natural Resources

Natural Heritage Program

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## Section 3

### Mussels and Clams (Bivalvia)

Many families of Bivalvia have common names. These names are given in the key immediately before the Latin name.

- a. Shell with lateral teeth (longer ridges inside the shell near the hinge) only on one side of pseudo-cardinal teeth (pointed nobs nearest the hinge); adults generally > 25 mm  
..... Freshwater Mussels, Unionidae

**1**

The Unionidae are diverse and abundant in suitable habitat of lakes, rivers and ponds. [X, X/23/C]

- b. Shell with lateral teeth on both sides of cardinal teeth; size variable  
..... 2

- a. Shell large (adults usually 25-50 mm), thick and massive with prominent concentric growth rings, hinge of shell with serrated lateral teeth  
..... Asian Clams, Corbiculidae

The Asian clam (genus *Corbicula*) is not native to Maryland. [M/13/C]

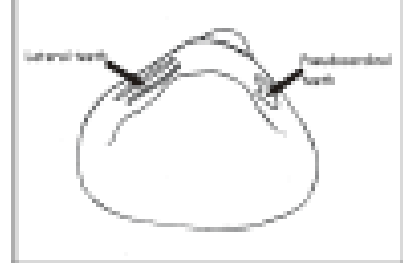
**2**

- b. Shell small (adults usually < 25 mm), thin and usually fragile  
..... Freshwater Clams, Sphaeriidae (a.k.a. Pisidiidae)

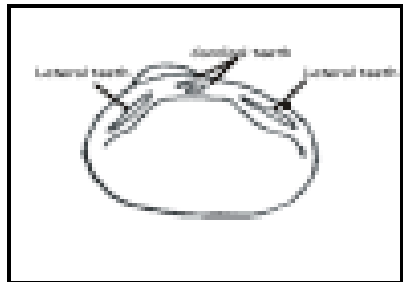
The Sphaeriidae are also known as "pigmy clams" because of their size and iridescent shell. [H/23/C]

Unionidae

(1a)

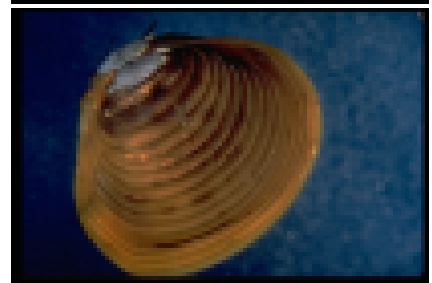


Corbiculidae and Sphaeriidae (1b)



Corbiculidae

(2a)



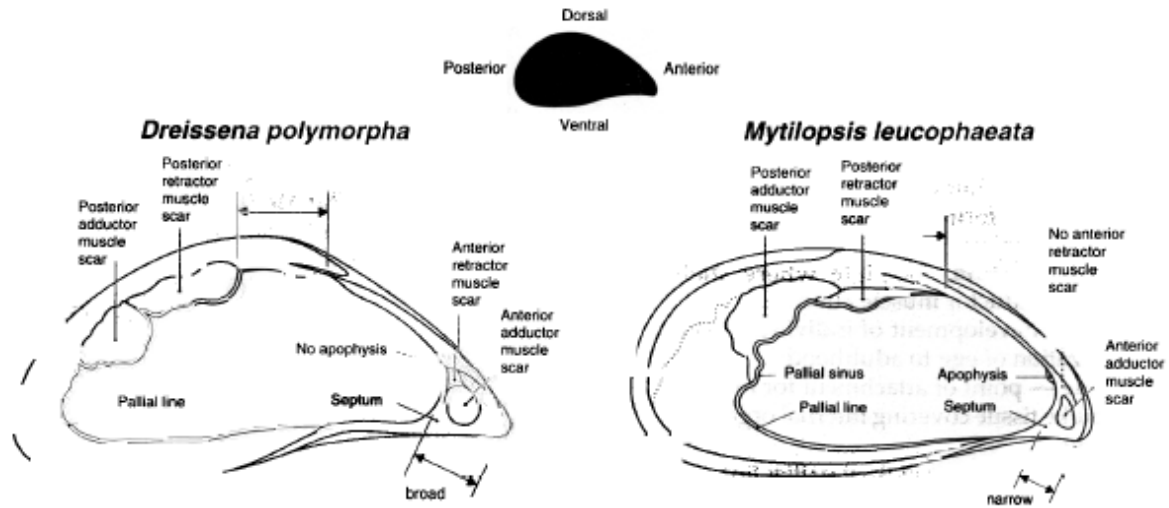
Corbiculidae's serrated lateral teeth

(2b)



# Zebra Mussels

## COMPARATIVE SHELL FEATURES



### Internal Microscopic Features of Shell

#### Posterior Retractor Muscle:

- does not extend to anterior shell margin.
- extends to anterior shell margin.

#### Pallial Line:

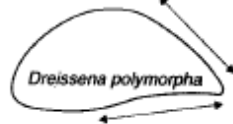
- rounded at posterior portion, no sinus.
- may be invaginated forming a sinus.

#### Myophore Plate (Septum):

- broad, scars of both anterior muscles present on septum; no apophysts present.
- narrowed, only anterior adductor scar present on septum; anterior retractor attached to inward-facing apophysis.

### External Shell Characteristics

more flattened at anterior margin and ventrally.



5:

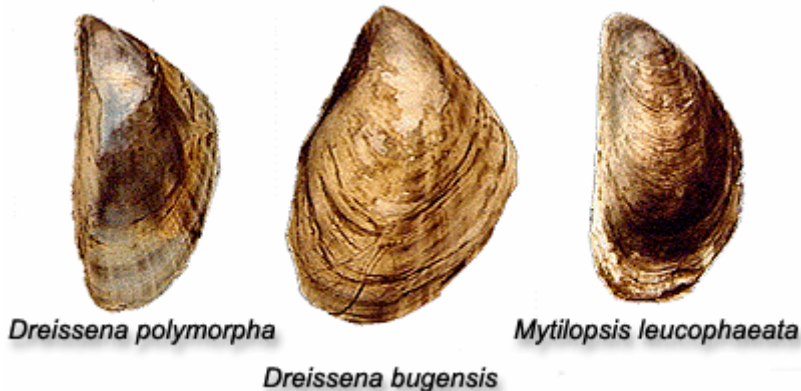
typically have herringbone patterns, may be radially striped or show diffuse striping.

- more rounded and broad laterally.

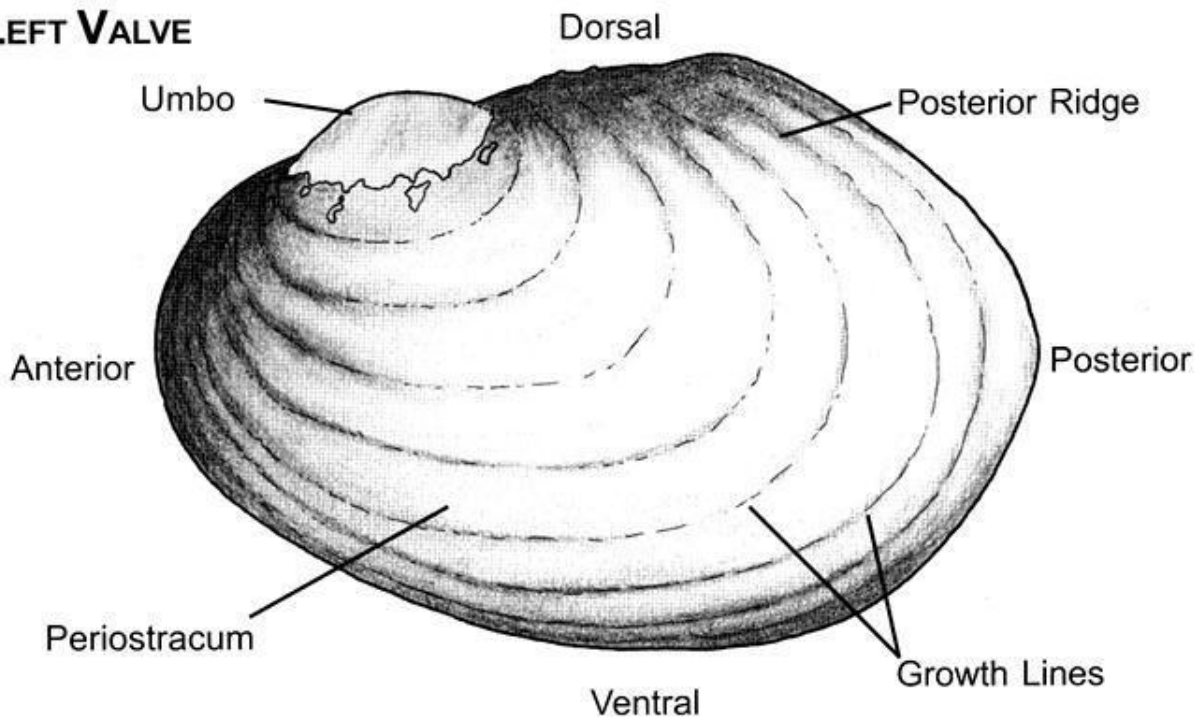


- often have herringbone pattern; generally darker coloration.

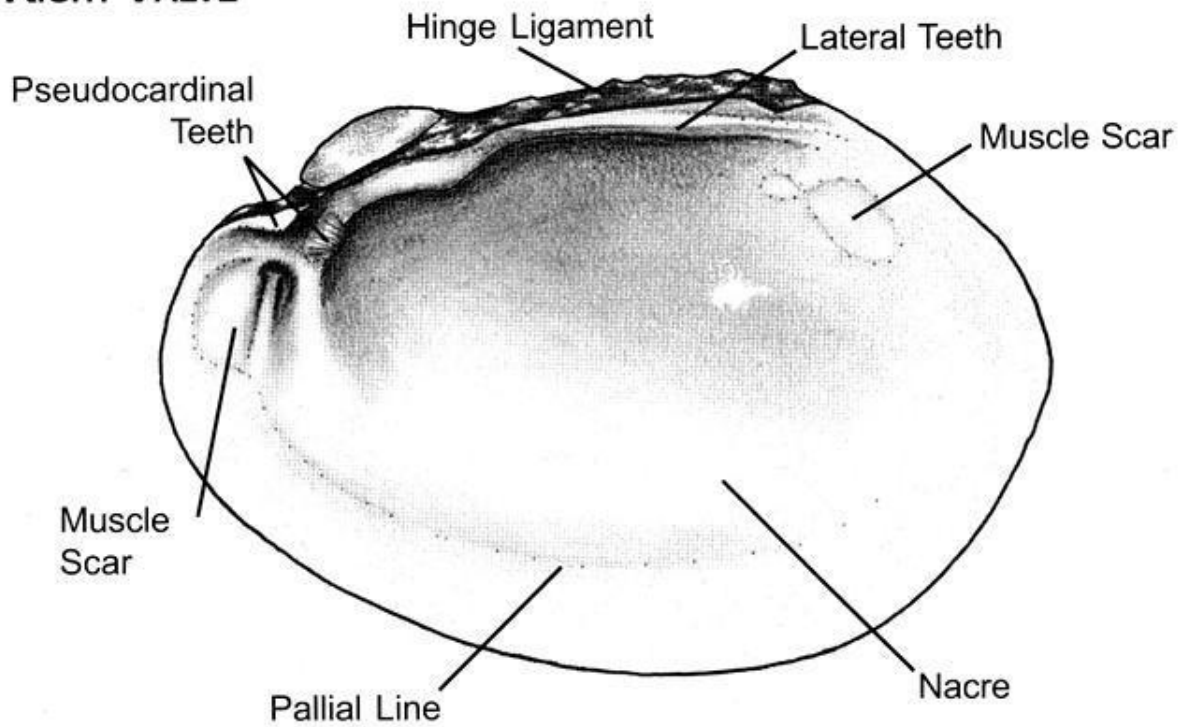
Illustrations by Norm Frisch  
Adapted from Morton (1969)  
and Marelli and Gray (1983)



**LEFT VALVE**



**RIGHT VALVE**



**FIGURE 2. SHELL MORPHOLOGY OF A TYPICAL FRESHWATER MUSSEL**

## Left Valve

*Dorsal*

Umbo

Posterior Ridge

Periostracum

*Anterior*

*Posterior*

Growth Lines

*Ventral*

## Right Valve

Hinge Ligament

Lateral Teeth

Pseudocardinal Teeth

Muscle Scar

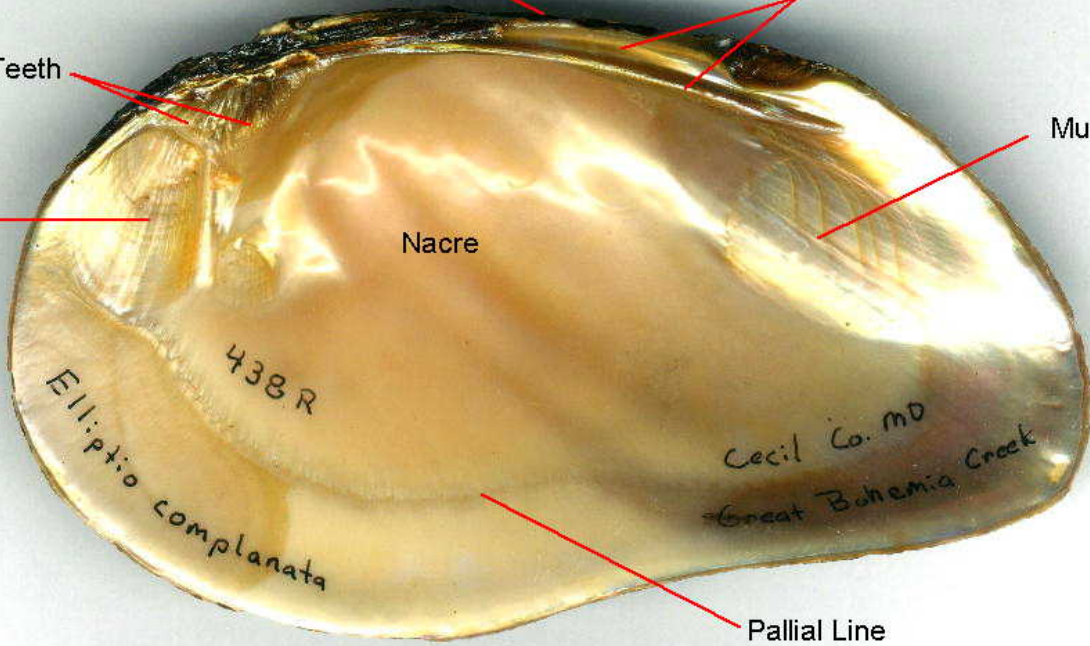
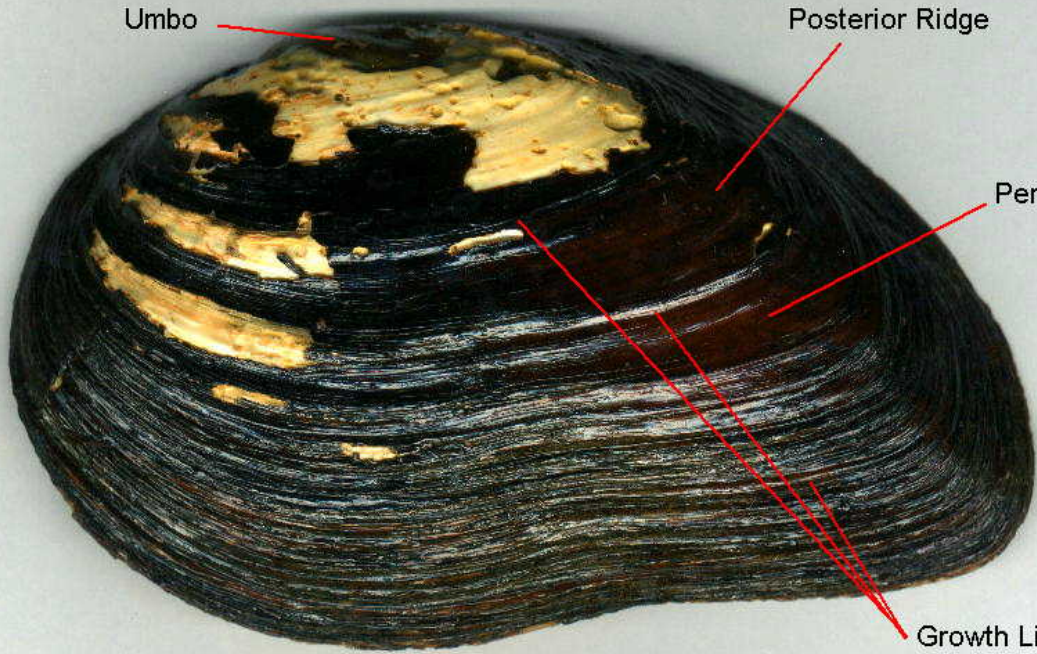
Muscle Scar

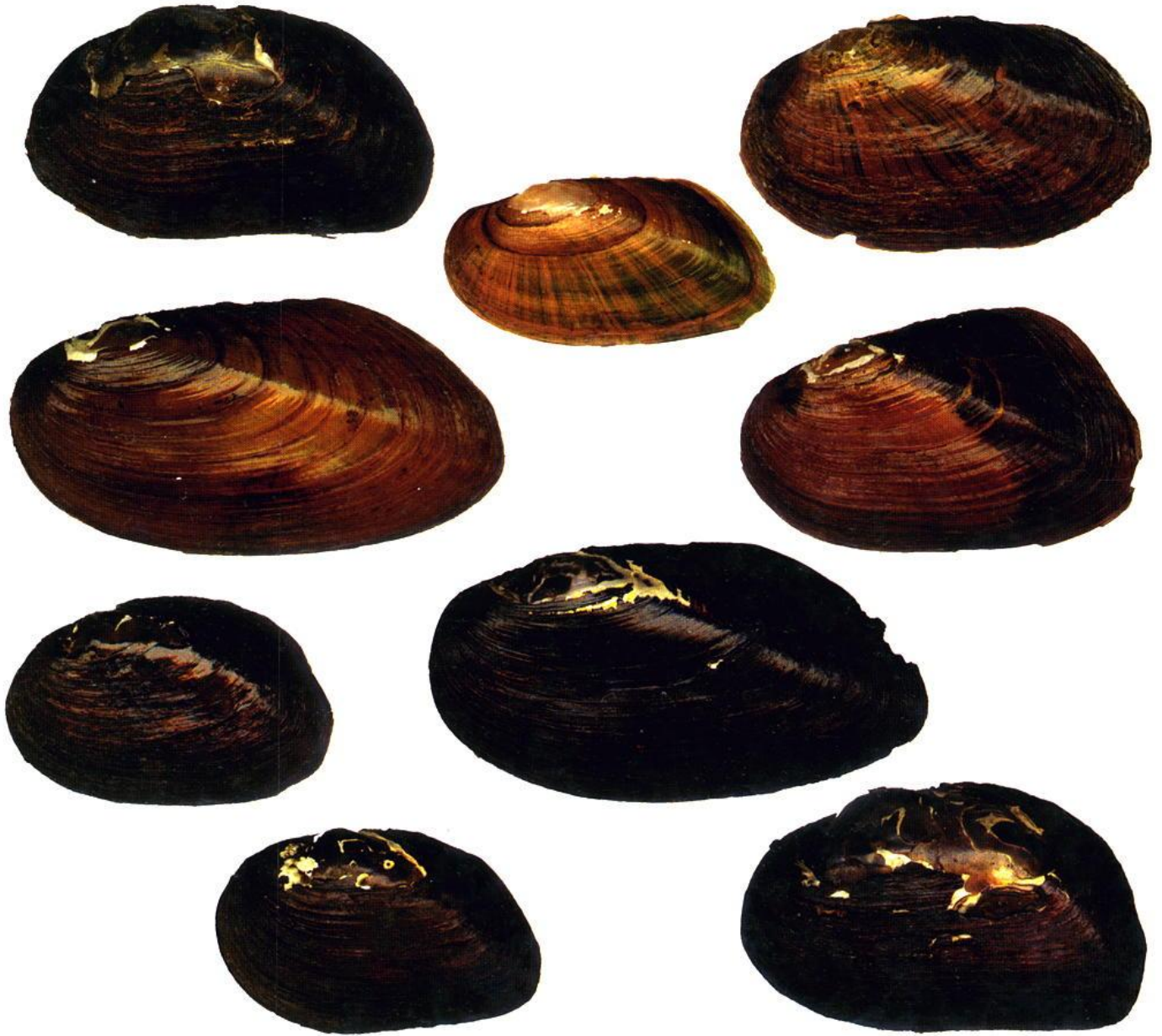
Nacre

438 R  
*Elliptio complanata*

Cecil Co. MD  
Great Bohemia Creek

Pallial Line

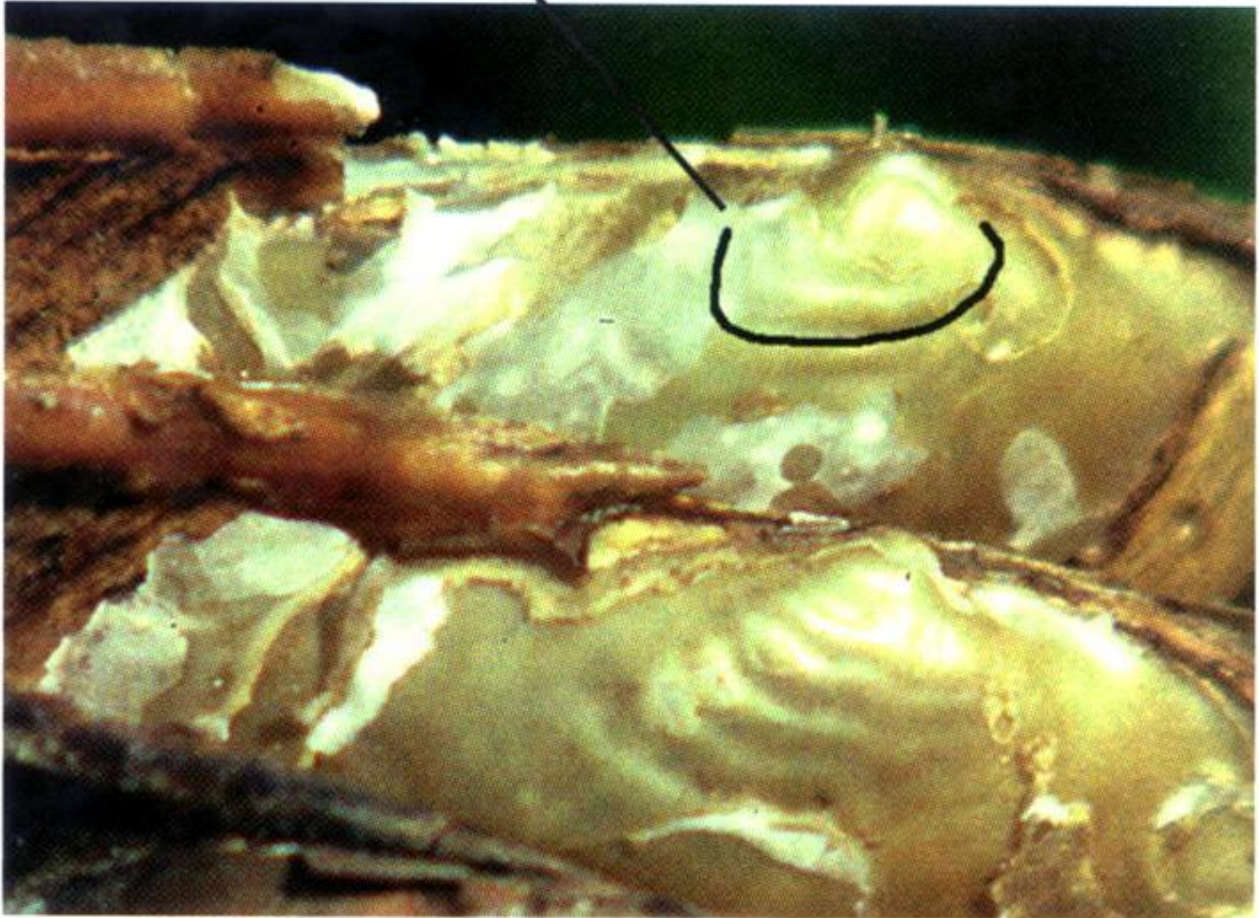




*These are all eastern elliptios. Notice the variability in shape and color!*

Nedea et al. 2000

④ Single-looped bars. (line traced for emphasis)



### **Eastern Floater (*Pyganodon cataracta*)**

- Thin shelled
- Lacks thickening along antero-ventral margin
- Relatively long, straight hinge line
- Usually medium-large size (< 16 cm)

### **Alewife Floater (*Anodonta implicata*)**

- Thick shelled
- Distinct thickening along antero-ventral margin
- Relatively long, straight hinge line
- Usually medium-large size (< 16 cm)

### **Creeper (*Strophitus undulatus*)**

- Moderately thick shelled
- Lacks thickening along antero-ventral margin
- Kidney shaped
- Usually small-medium size (< 8 cm)







**Brook Floater (*Alasmidonta varicosa*)**

- Transverse ridges (raised wrinkles) on posterior slope
- Pseudocardinal teeth reduced and elongate with smooth surfaces
- Moderately inflated, distinctive posterior ridge (“roman nose”)
- Small-medium size (< 8 cm)



**Triangle Floater (*Alasmidonta undulata*)**

- No transverse ridges (raised wrinkles) on posterior slope
- Pseudocardinal teeth large with rough surfaces
- Very inflated, ‘squat’ appearance, lacks “roman nose”
- Small-medium size (< 8 cm)



**Dwarf Wedge Mussel (*Alasmidonta heterodon*)**

- Right valve with TWO lateral teeth
- Distinctly wedge shaped
- Inflated, swollen posterior slope
- Small size (< 5 cm)



## Elongate, Height/Length Ratio < 0.5



### **Northern Lance (*Elliptio fisheriana*), E of Chesapeake Bay Atlantic Spike (*Elliptio producta*), W of Chesapeake Bay**

- Postero-ventral margin does NOT turn abruptly upward
- Posterior tip bluntly pointed
- Periostracum usually not yellow or waxy
- Usually medium-large size (< 16 cm)



### **Yellow Lance (*Elliptio lanceolata*)**

- Postero-ventral margin does NOT turn abruptly upward
- Posterior tip bluntly pointed
- Periostracum usually waxy yellow
- Usually small-medium size (< 8 cm)



### **Eastern Pondmussel (*Ligumia nasuta*)**

- Postero-ventral margin turns abruptly upward
- Posterior tip sharp-pointed
- Usually medium-large size (< 16 cm)



Eastern Elliptio (*Elliptio complanata*)

- Not elongate, height/length ratio  $> 0.5$
- Typical shell shape is quadrate or rectangular
- With or without rays
- Umbos not prominent, barely above hinge line
- Usually not inflated or with swollen posterior slope
- Relatively heavy-shelled
- Nacre distinctly purple in fresh dead specimens, variable otherwise
- Usually medium-large size ( $< 16$  cm)
- Highly variable – when in doubt, call it *E. complanata* ???



*These are all eastern ellipticos. Notice the variability in shape and color!*



Green Floater (*Lasmigona subviridis*)

- Left valve with small intercardinal teeth, giving appearance of 3 pseudocardinal teeth
- Laterally compressed, not inflated
- Usually dark green or brown rays present
- Small size (< 7 cm)



Tidewater Mucket (*Leptodea ochracea*)

- Periostracum dull yellow, sometimes with fine rays over part or most of shell
- Nacre usually pinkish to salmon-colored
- Ventral margin rounded
- Moderately thin-shelled
- Inflated appearance
- Hinge teeth thin and delicate
- Pseudocardinal teeth located well anterior of beak
- Usually medium-large size (< 16 cm)



Eastern Lampmussel (*Lampsilis radiata*)

- Periostracum usually yellow to yellowish green, with green rays over most of shell
- Laterally compressed
- Palmate shaped, distinctly wider posterior to umbo
- Hinge ligament prominent posterior to umbo
- Relatively heavy-shelled
- Usually medium-large size (< 16 cm)



# MUSSELS BEWARE!!!

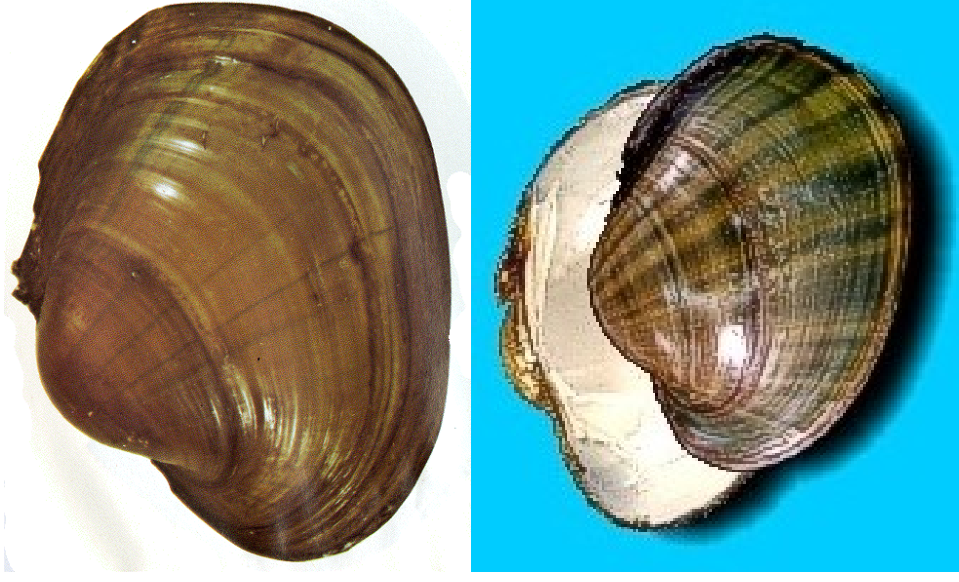
## Yellow Lampmussel (*Lampsilis cariosa*) vs. Plain Pocketbook (*L. cardium*)

- *L. cariosa* is native to the Atlantic slope
- *L. cardium* is native to the Mississippi drainage and NOT native to Md
- *L. cardium* is thought to be well established in the Md portion of the Potomac drainage and hybridizing with the native *L. cariosa*
- Distinguishing these two species in Md is problematic and awaits further genetic and morphometric evaluation



Yellow Lam mussel (*Lampsilis cariosa*)

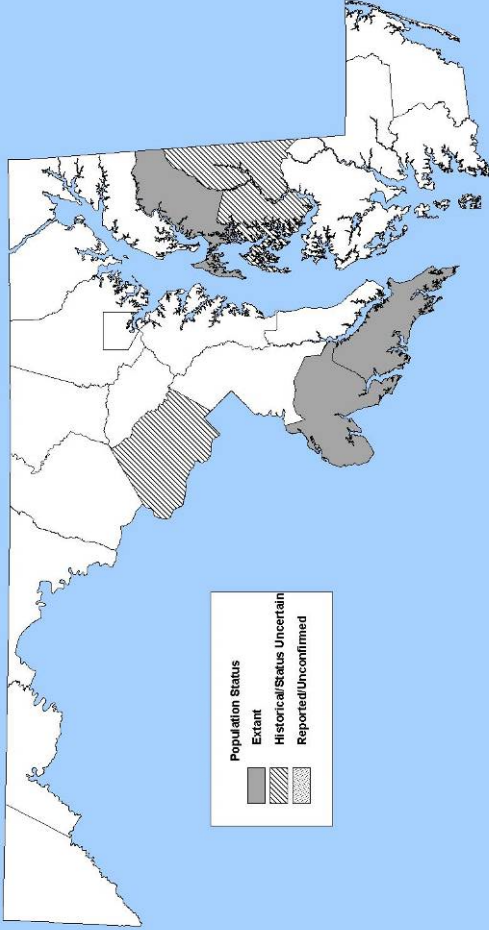
- Green rays, if present, thin and mostly confined to posterior half of shell
- Pseudocardinal teeth on left valve with striations and perpendicular to hinge line



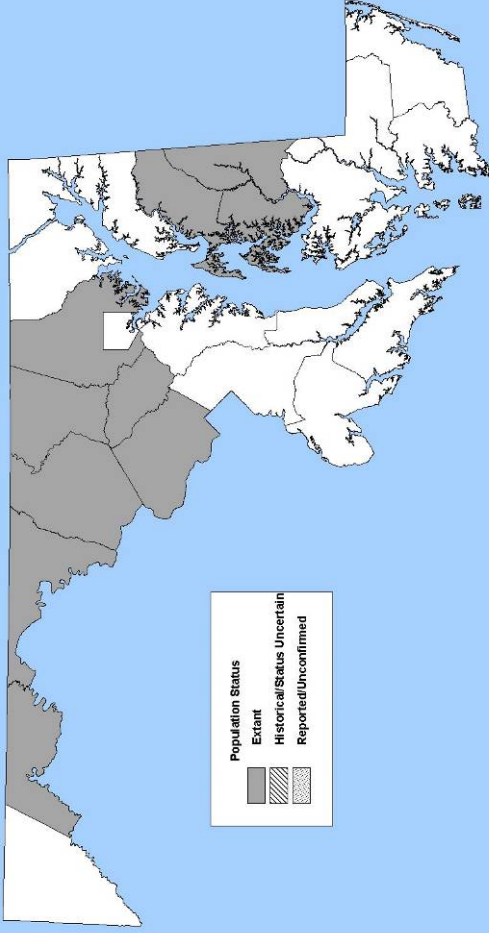
Plain Pocketbook (*Lampsilis cardium*)

- Green rays usually present, thick and not confined to posterior half of shell
- Pseudocardinal teeth on left valve without striations and parallel to hinge line

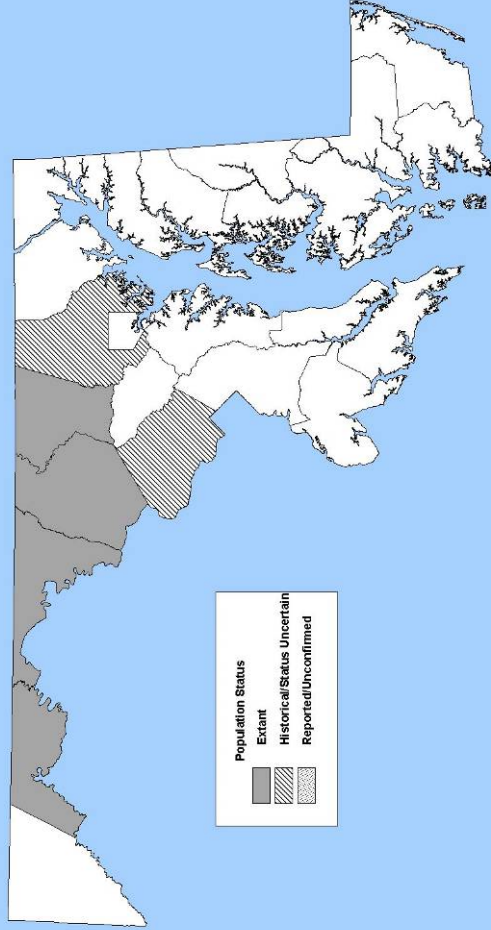
**Dwarf Wedge Mussel (*Alasmidonta heterodon*)  
State and Federally Endangered, G1G2/S1**



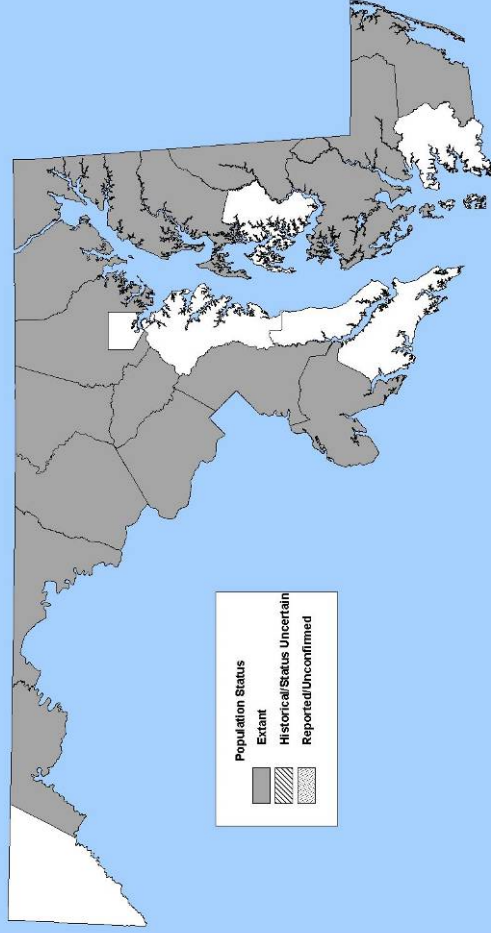
**Triangle Floater (*Alasmidonta undulata*)  
State Endangered, G4/S1**



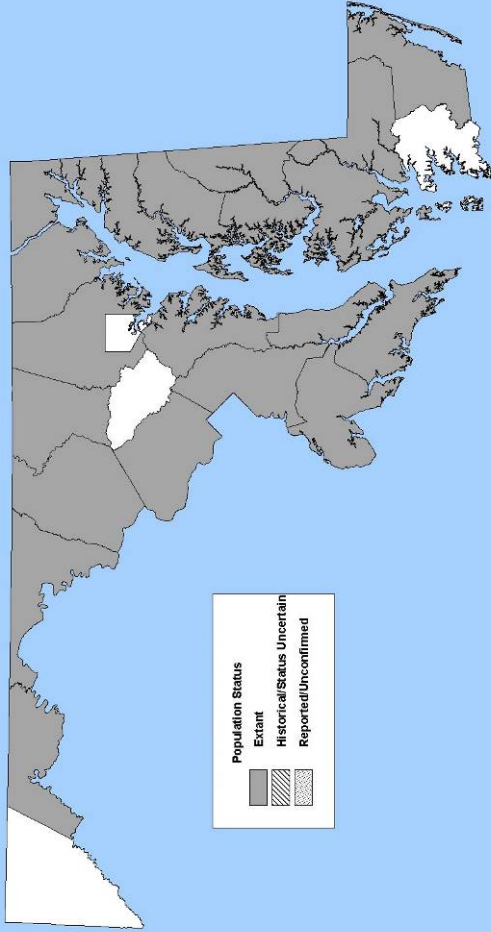
**Brook Floater (*Alasmidonta varicosa*)  
State Endangered, G3/S1**



**Alewife Floater (*Anodonata implicata*)  
Watchlist, G5/S3S4**

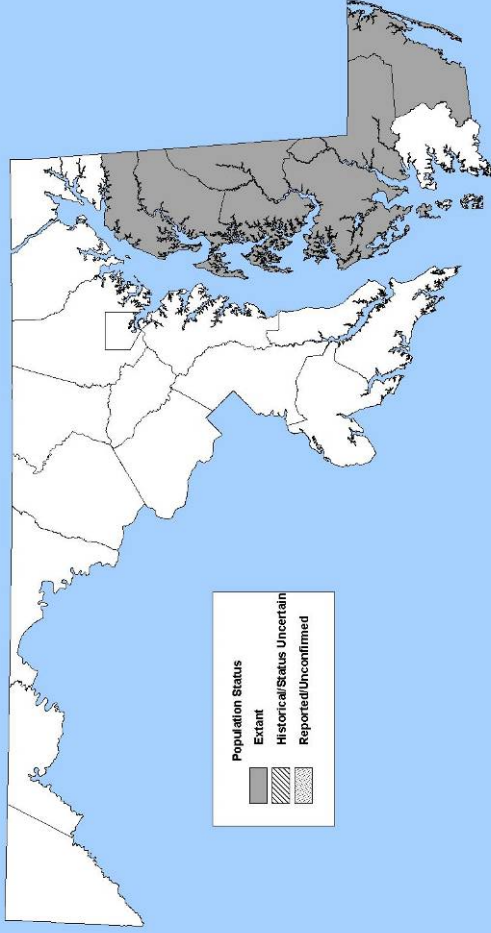


**Eastern Elliptio (Elliptio complanata)  
G5/S5**



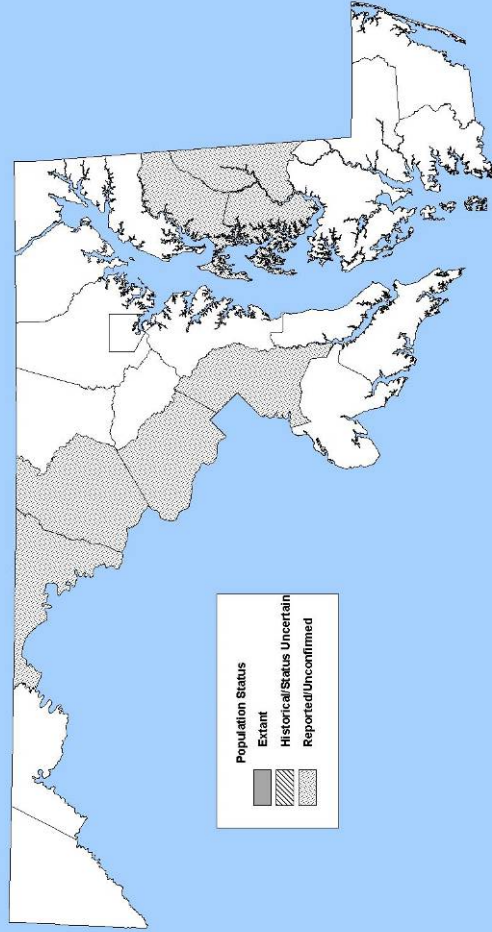
Population Status  
Extant  
Historical/Status Uncertain  
Reported/Unconfirmed

**Northern Lance (Elliptio fisheriana)  
Watchlist, G4/S3S4**



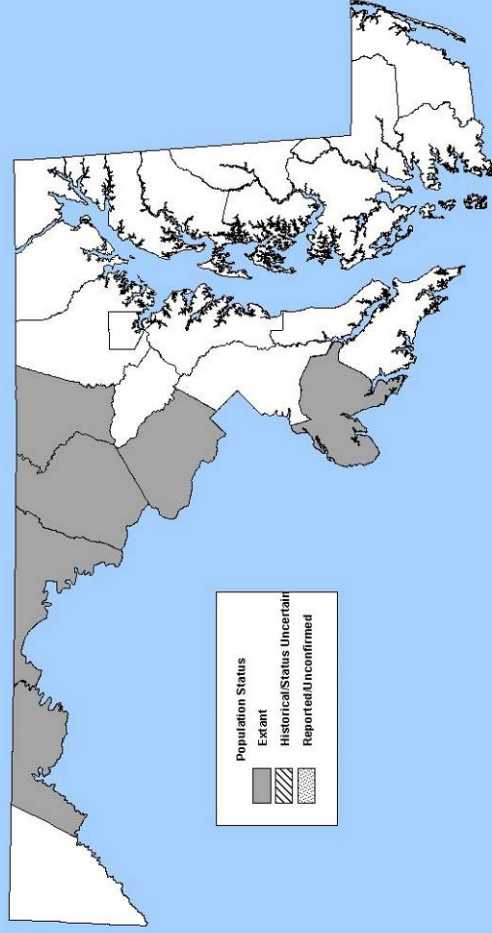
Population Status  
Extant  
Historical/Status Uncertain  
Reported/Unconfirmed

**Yellow Lance (Elliptio lanceolata)  
State Status Uncertain, G2G3/SU**



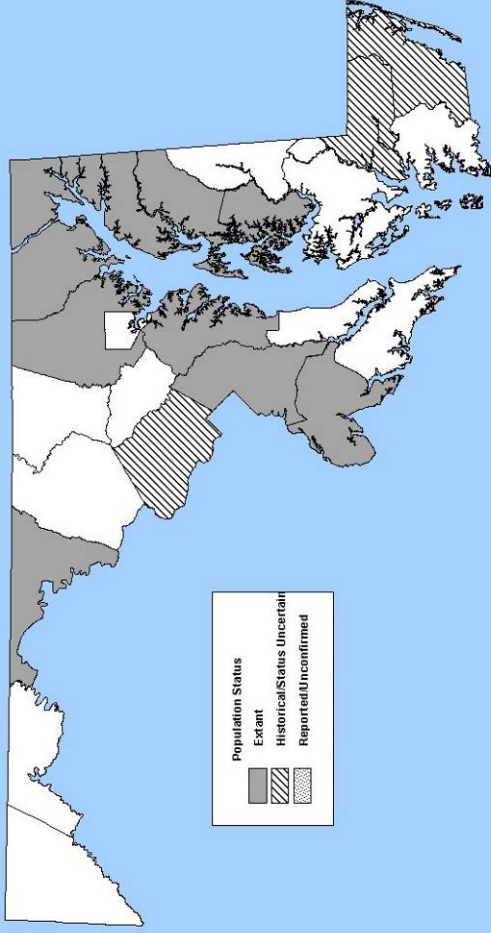
Population Status  
Extant  
Historical/Status Uncertain  
Reported/Unconfirmed

**Atlantic Spike (Elliptio producta)  
Proposed In Need of Conservation, G4Q/S2**

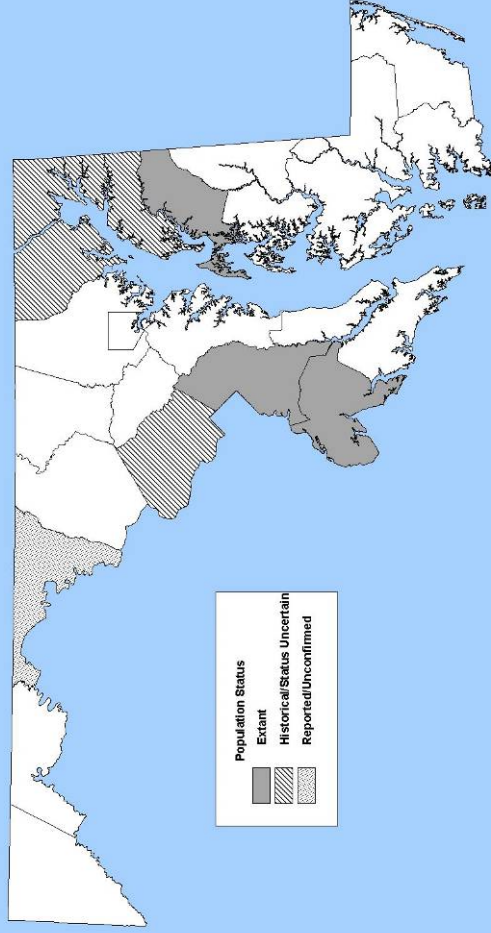


Population Status  
Extant  
Historical/Status Uncertain  
Reported/Unconfirmed

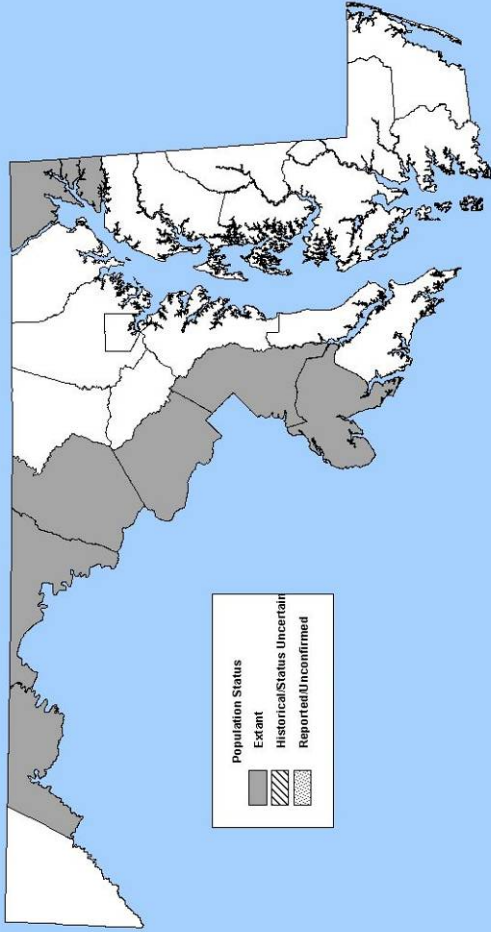
**Eastern Lampmussel (*Lampsilis radiata*)**  
State Rare, G5/S2



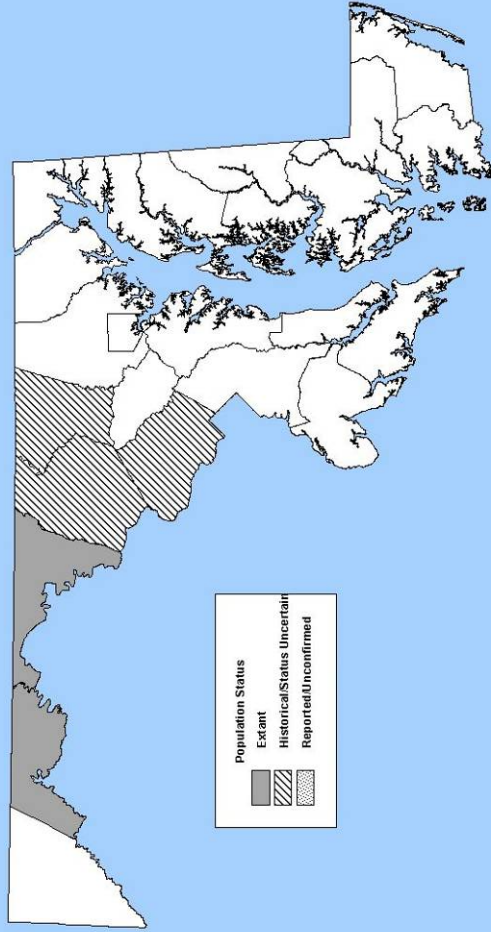
**Leptodea ochracea (*Leptodea ochracea*)**  
State Rare, G4/S1S2



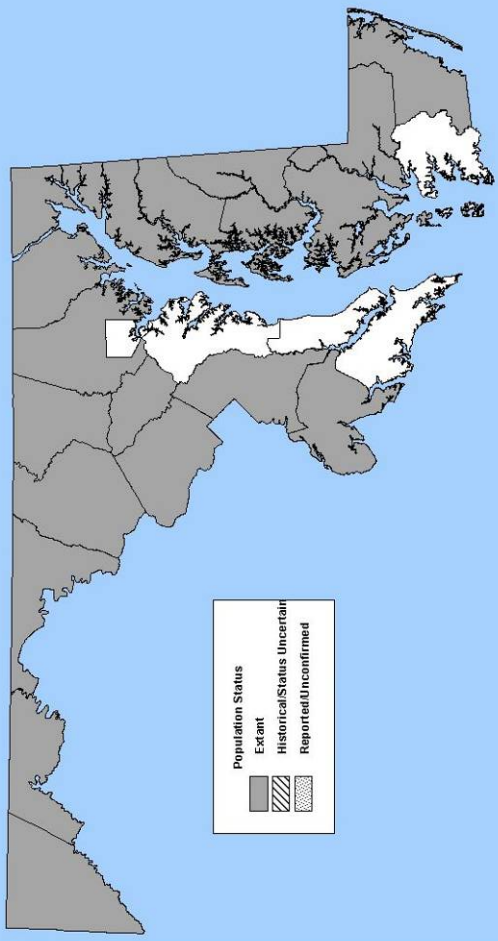
**Plain Pocketbook (*Lampsilis cardium*)**  
Non-native, G5/SE



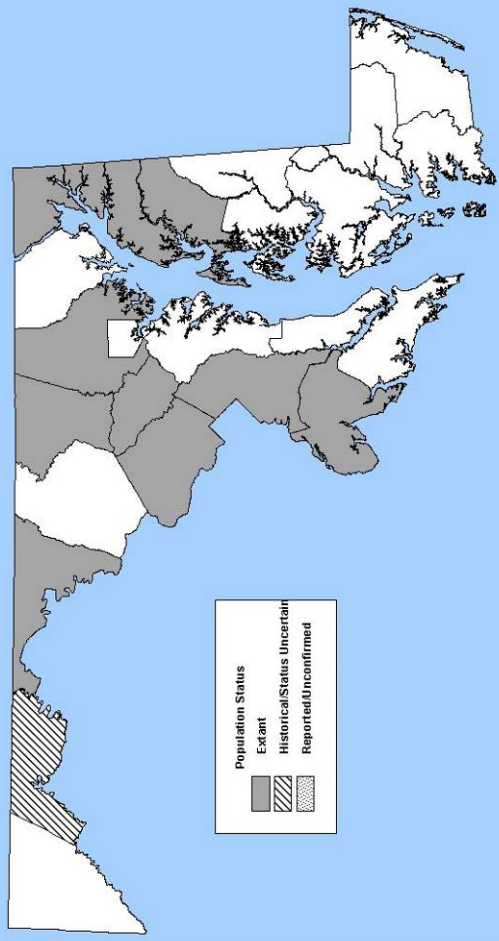
**Green Floater (*Lasmigona subviridis*)**  
State Endangered, G3/S1



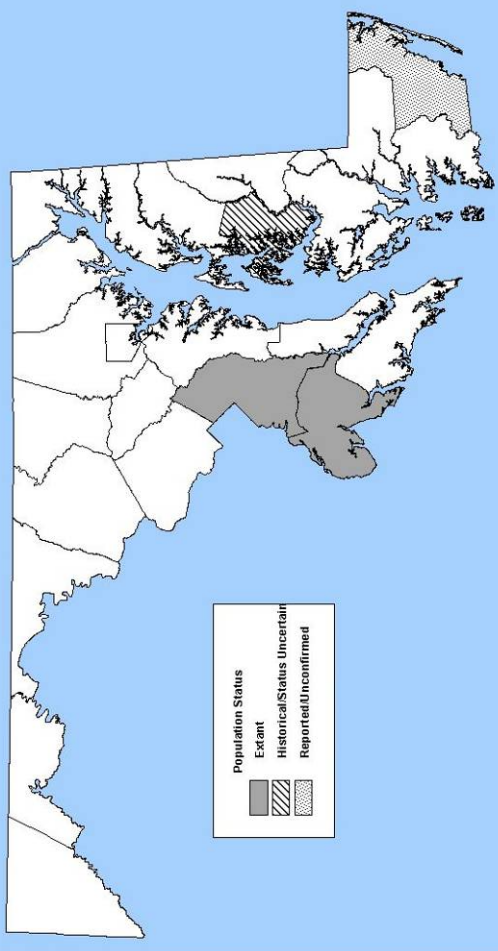
**Eastern Floater (*Pyganodon cataracta*)  
G5/S5**



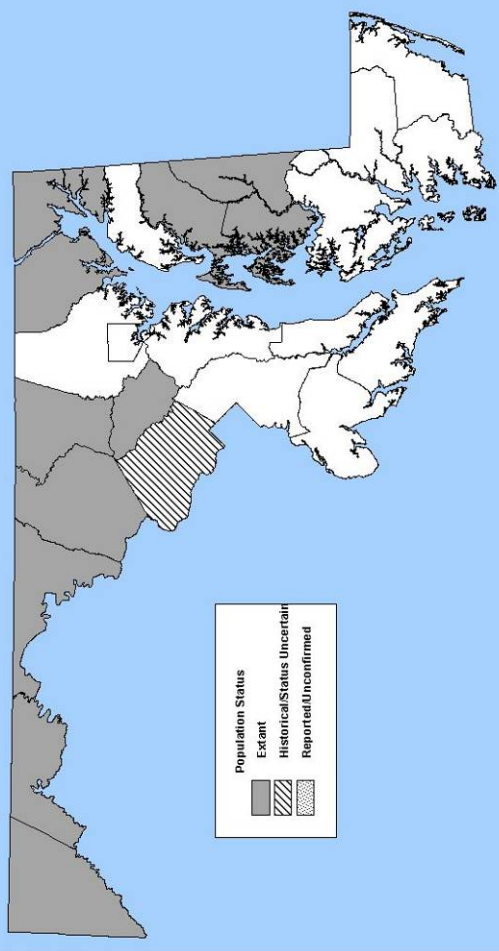
**Paper Pondshell (*Utterbackia imbecillis*)  
Watchlist, G5/S3**



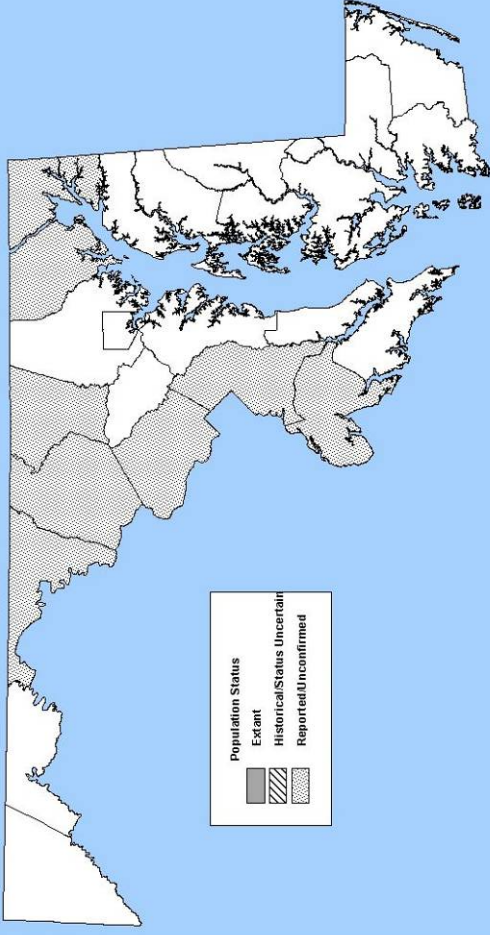
**Eastern Pondmussel (*Ligumia nasuta*)  
State Rare, G4G5/S1**



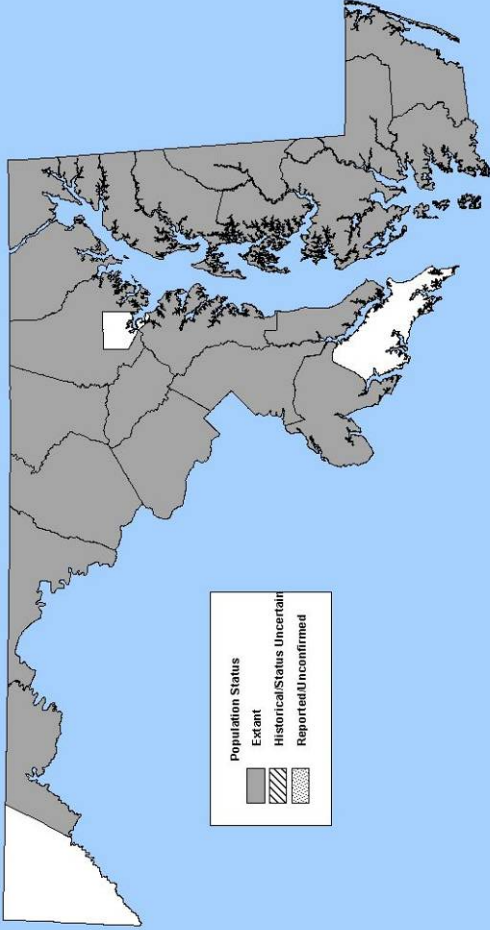
**Creeper (*Strophitus undulatus*)  
In Need of Conservation, G5/S2**



**Yellow Lampmussel (*Lampsilis cariosa*)**  
**State Endangered, G3G4/S1**  
**(Proposed Delisting, G3G4/SU)**



**Asian Clam (*Corbicula fluminea*)**  
**Non-native, G5/SE**



**Freshwater Mussel Species Richness by Watershed**

