

## Submitted by Dakota Raab

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### **Pennsylvania freshwater mussel surveys result in range expansion or reconfirmation of historic occurrences**

The Pennsylvania Fish and Boat Commission (PFBC) is charged with protecting, conserving, and enhancing freshwater mussel resources. The mussel communities of many Pennsylvania watersheds are unknown, underassessed, or have not been assessed in the last century. Staff routinely sample unassessed streams, understudied stream reaches, and reaches where historical species occurrence has not been confirmed by contemporary surveys. Since 2020, PFBC mussel surveys have resulted in range expansions, or reconfirmation of occurrence for several freshwater mussel species (Fig. 1).

#### *Honeoye Creek*

Honeoye Creek drains a 132 km<sup>2</sup> watershed in Potter County, before flowing into Oswayo Creek in the northern headwaters of the Allegheny River watershed. Previous surveys have identified federally endangered Rayed Bean (*Paetulunio fabalis*) in the Allegheny River upstream of Allegheny Reservoir and Oswayo Creek (internal data); however, the mussel community of Honeoye Creek was not previously assessed. Four qualitative surveys resulted in the collection of 11 species, including one fresh-dead *P. fabalis* and several PA species of greatest conservation need (SGCN; Table 1). This collection represents a new Pennsylvania locality for Rayed Bean.

#### *Tioga River*

The Tioga River flows north from Pennsylvania into the Chemung River, a New York tributary to the Susquehanna River. Despite the intriguing glacial history of this region, freshwater mussel resources were only previously assessed by A.E. Bogan in the 1990s with observation of *Elliptio complanata* and *Lampsilis cariosa* (Bogan 1996, unpublished data). In 2023, qualitative surveys were completed on the Cowanesque and Tioga Rivers. Seven species were collected including three SGCNs (Table 2). The collection of Eastern Lampmussel (*Lampsilis radiata*) represents the fifth locality for contemporary occurrence of live individuals within Pennsylvania's Susquehanna River watershed.

#### *West Branch Susquehanna River*

The freshwater mussel community in the 386 km-long West Branch Susquehanna River has been historically understudied with the exception of surveys completed by the Western Pennsylvania Conservancy (Walsh and Meyer 2012, unpublished data) and earlier surveys by A.E. Bogan (1996, unpublished data). Historical mining, logging, and industrial pollution contributed to the defaunation of much of the West Branch. PFBC staff completed 45 qualitative surveys across 73 river kilometers. Nine

species of freshwater mussel were collected including the Green Floater (*Lasmigona subviridis*) which is proposed for listing under the Endangered Species Act as threatened (Table 3). The *L. subviridis* collection extends the known range within the river by 50 kilometers. No live mussels or shells of any species have been collected in the West Branch Susquehanna River upstream of a low head dam in Lock Haven, PA suggesting that aquatic organism passage is hindering recolonization despite water quality improvements.

### *Delaware Estuary*

The Delaware Estuary in Pennsylvania represents a unique riverine habitat due to its tidal influence. Dredging and industrialization have undoubtedly impacted the freshwater mussel community of the Delaware Estuary. Data available from contemporary surveys showed that three species found in or just above the estuary a century ago remained undetected as of 2020 (Kreeger et al. 2020). From 2020 to 2022, PFBC staff completed 57 qualitative surveys in the 46 km reach between the Richmond Power Plant (River mile 104.87) and the Trenton-Morrisville Railroad Bridge (River mile 133.25) and documented seven species of freshwater mussels (Table 4). Collection of *L. radiata* at two sites represented the first confirmed Pennsylvania occurrences in the Delaware Estuary and the first in the Pennsylvania portion of the basin since the early 1900s (Ortmann 1919).

### **Literature Cited**

Kreeger, D. A., M. Walsh, K. M. Cheng and R. L Thomas. 2020. The Distribution and Population Status of Tidewater Mucket (*Leptodea ochracea*), in the Delaware Estuary Watershed. PDE Report No. 20-02. 62 p.

Ortmann, A. E. 1919. Monograph of Naiades of Pennsylvania Part III. Systematic Account of the Genre and Species, 343+ pp. Memoirs of the Carnegie Museum.

## Tables and Figures

**Table 1: Species occurrence for Honeoye Creek  
River Mile**

Species	4.92	3.45	2.08	0.30
<i>Actinonaias ligamentina</i>				x
<i>Alasmidonta marginata</i>	x	x		x
<i>Anodontoides ferussacianus</i>		x	x	x
<i>Eurynia dilatata</i>	x	x		x
<i>Lasmigona compressa</i>		x		x
<i>Lasmigona costata</i>	x	x		x
<i>Paetulunio fabalis</i>				x
<i>Pleurobema sintoxia</i>	x	x		x
<i>Pyganodon grandis</i>		x		x
<i>Strophitus undulatus</i>	x	x	x	x
<i>Utterbackia imbecillis</i>			x	

**Table 2: Species occurrence for Tioga River**

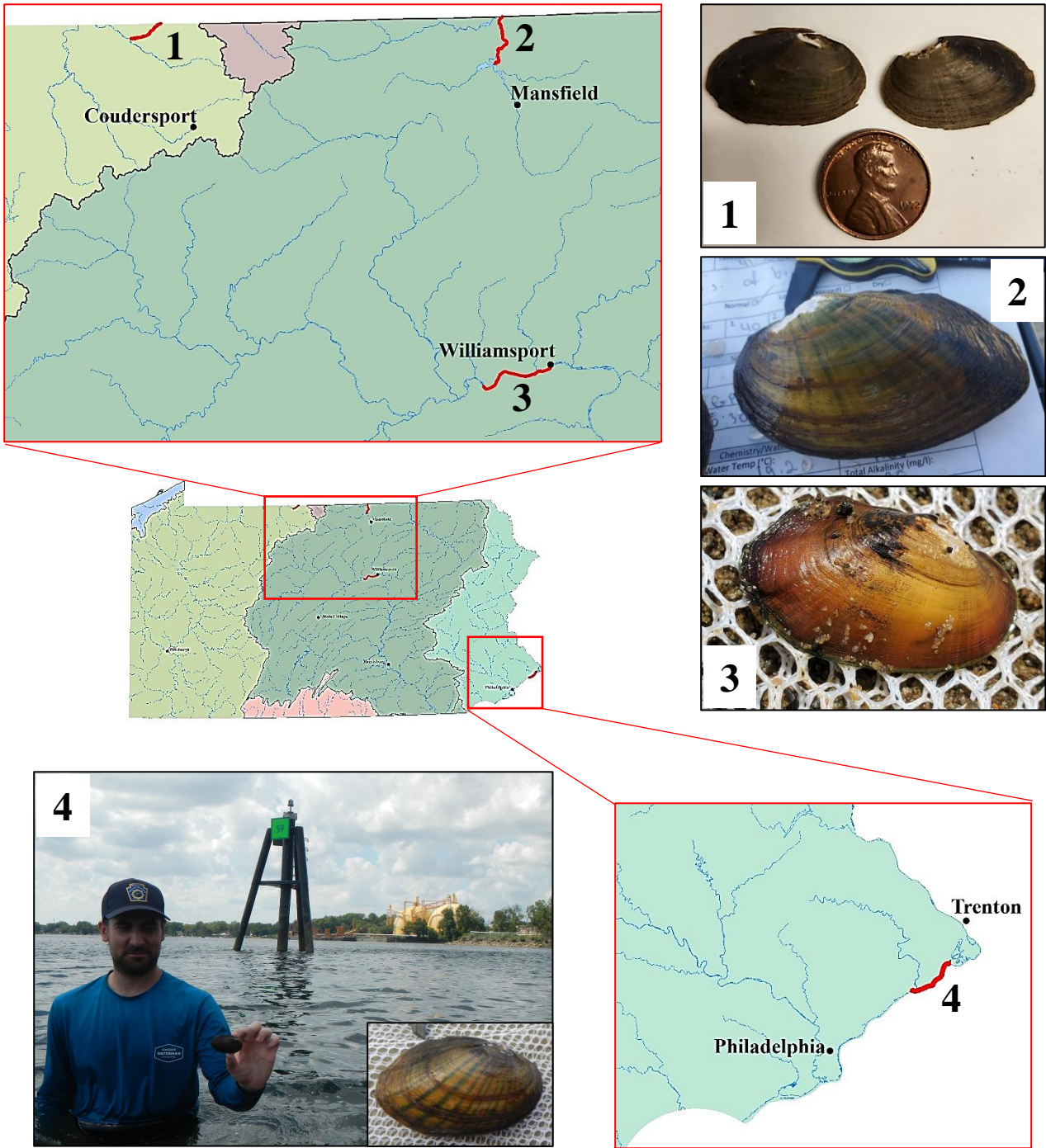
Species	Park Street	SR287 Islands	Mouth Bentley Run	SR15 Island	Georgia Pacific Yard	Junction Crossroads	Mouth Harts Creek
<i>Alasmidonta marginata</i>					x		
<i>Alasmidonta undulata</i>	x	x	x	x	x	x	x
<i>Lampsilis cariosa</i>	x	x	x	x	x	x	x
<i>Lampsilis radiata</i>	x	x	x		x		
<i>Pyganodon cataracta</i>			x	x			
<i>Strophitus undulatus</i>		x	x	x	x	x	x
<i>Utterbackia imbecillis</i>			x				

**Table 3: Species occurrence for West Branch  
Susquehanna River sites where *L. subviridis* or *L.  
radiata* occurred**

Species	Site		
	River Mile 47.72	River Mile 44.43	River Mile 39.80
<i>Alasmidonta marginata</i>			X
<i>Alasmidonta undulata</i>			X
<i>Alasmidonta varicosa</i>			X
<i>Elliptio complanata</i>	X	X	X
<i>Lampsilis cariosa</i>	X	X	X
<i>Lampsilis radiata</i>	X	X	X
<i>Lasmigona subviridis</i>			X
<i>Pyganodon cataracta</i>			X
<i>Strophitus undulatus</i>			X

**Table 4: Species occurrence for  
Delaware Estuary sites where *L.  
radiata* occurred**

Species	River Mile	
	122.45	115.10
<i>Atlanticoncha ochracea</i>	X	X
<i>Elliptio complanata</i>	X	X
<i>Lampsilis cariosa</i>	X	
<i>Lampsilis radiata</i>	X	X
<i>Pyganodon cataracta</i>	X	
<i>Sagittunio nasutus</i>	X	
<i>Utterbackiana implicata</i>	X	X



**Figure 1:** Range expansions or reconfirmation of historic range for freshwater mussels in Pennsylvania.

1: Honeoye Creek, Potter County. Fresh-dead *Paetulunio fabalis* (27mm) collected near Shinglehouse, PA. Pending deposition into the Carnegie Museum of Natural History.

2: Tioga River, Tioga County. *Lampsilis radiata* collected (returned) near Tioga, PA.

3. West Branch Susquehanna River, Lycoming County. *Lasmigona subviridis* collected (returned) near Williamsport, PA.
4. Delaware Estuary, Bucks County. PFBC Biologist Gregory Lech holding a *Lampsilis radiata* collected (returned) in the Delaware River Estuary near Tulleytown, PA.