



# Pearly mussels in NY State Susquehanna Watershed

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## Introduction

Pearly mussels (unionids) endangered native mollusks

- Life cycle complex
  - Includes fish parasitism
  - Involves watershed quality parameters
- 4 Species of Greatest Conservation Need (SGCN) historically found in NY State Susquehanna Watershed
  - Brook Floater (*Alasmidonta varicosa*)
  - Green Floater (*Lasmigona subviridis*)
  - Yellow Lamp Mussel (*Lampsilis cariosa*)
  - Elktoe (*Alasmidonta marginata*)
- Prior sampling done where convenient
  - normally at intersection of waterway & roadway
- Status of 4 SGCN unknown

## Preliminary Results

New unionid SGCN identified in Susquehanna River Watershed

- Eastern Pearlshell (*Margaritifera margaritifera*)
  - in Otselic River headwaters
- Historical SGCN found in many locations
- Regularly downstream of extended riffle
- Require minimally mobile substrates
- No observed wastewater treatment plant impact

NYSDEC freshwater pearly mussel "species of greatest conservation need" (SGCN) observed in the Upper Susquehanna Watershed while mapping and searching rivers in the summers of 2008 and 2009. Brook floater = *Alasmidonta varicosa*; elktoe = *Alasmidonta marginata*; green floater = *Lasmigona subviridis*; yellow lamp mussel = *Lampsilis cariosa*; L = live specimens observed; D = dead specimens observed; SGCN spp. = number of SGCN species found in each listed river and for the entire watershed (Total).

River Mapped	Brook Floater	Elktoe	Green Floater	Yellow Lamp Mussel	SGCN Spp.	SGCN Spp. Alive
Susquehanna River, Main Stem	L, D	L, D	L, D	L, D	4	4
Chemung River	L, D	L, D	L, D	L, D	4	4
Chenung River	L, D	L, D	L, D	L, D	4	4
Tioughnioga River, East Branch &	D	L, D	L, D	L, D	4	3
<b>TOTAL</b>	<b>3L; 4D</b>	<b>4L; 4D</b>	<b>4L; 4D</b>	<b>4L; 4D</b>	<b>4</b>	<b>4</b>

NYSDEC freshwater pearly mussel "species of greatest conservation need" (SGCN) observed in the vicinity of waste water treatment plants (WWTPs) in the Upper Susquehanna Watershed in the summer of 2009 with distances searched upstream and downstream noted in meters. L = live specimens observed; D = dead specimens observed; SGCN spp. = number of SGCN species found in river reach searched and in the three upstream and downstream reaches (Total).

WWTP	Upstream m Searched	Downstream m Searched	SGCN Found	Upstream SGCN Found	Downstream SGCN Found
Norwich	935	279	3L, 3D	0L, 1D	
Oxford	488	439	0L, 3D	2L, 3D	
Cortland	236	356	2L, 2D	2L, 3D	
<b>TOTAL</b>	<b>1659</b>	<b>1074</b>	<b>3L; 4D</b>	<b>3L; 3D</b>	

## Discussion

- Mobile substrates appear exacerbated by surge stormwater inputs
  - made worse by impervious surfaces
- Unionids impacted by  $1O_2$ , siltation, endocrine disrupting chemicals
  - from human watershed use
- River location consistency with old maps associated with  $\uparrow$  unionids
  - adult unionids more easily observed
  - immature unionids found in some mobile substrates

SCUBA diving for mussels



Searching riffle for mussels



Mussel in situ



High velocity water sampling



## Methods

Susquehanna, Chemung, Chenango, & Tioughnioga 2008-2009: Mapped rivers using kayaks & GPS

- Bottom character
- Riparian uses & buffers
- Identifying unionids when observed
- 2009-2010: Locate unionid beds
- Historical
- Newly identified from kayak survey
- Identified from SCUBA surveys
- 2010: Quantitatively sample populations
- Adults
- Juveniles

Sieve boxes for young mussels



Quantitative sampling



Searching for mussels



Field identification

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