New Zealand Mudsnail (NZM) - Invasion of the East Coast

Pennsylvania Fish & Boat Commission

Bob Morgan
Lead AIS Ecologist
PA Fish and Boat Commission
NZM Biology and Ecology 101
(The Really Short Version)
A Tiny Critter That Can Cause BIG Problems
What they lack in size they can make up for in numbers

- In high densities, NZM consume much of a stream’s primary producer (plant) biomass.
- Can destroy the base of the stream’s food web upon which higher organisms, such as fish, depend.
Other NZM Problem Characteristics

- Foot
- Operculum
If that wasn’t bad enough, NZM in the U.S. are almost all parthenogenetic female clones!

- There are 3 different NZM clones known in the U.S., each found in a different region
  - **US1** (Western US)
  - **US2** (Great Lakes)
  - **US3** (Snake River, ID)
Brief chronology of the discovery of NZM in Spring Creek

- New Zealand Mudsnails (*Potamopyrgus antipodarum*) (NZM) were discovered on the U.S. Atlantic Slope for the first time in Spring Creek – **US1 clone**
- PFBC was first made aware of the situation when PA DEP received confirmation from an expert in early October 2013 of NZM in Spring Creek
- Upon confirmation, a press release went out and warning posters were installed along Spring Creek
- Preliminary surveys were conducted in other streams in the region to attempt to assess if NZM had spread out of the Spring Creek watershed
Spring Creek Watershed

Bellefonte, PA

Bellefonte SFH

~ northern extent of NZM in 2013

Benner Spring SFH

~ southern extent of NZM in 2013
Fisherman's Paradise (epicenter)

Many Public Fishing Accesses

Bellefonte SFH

Stackhouse
Typical 2013 NZM density in Spring Creek at Fishermans Paradise ~ 1,000/m$^2$

2016 - estimated densities of ~ 24,000/m$^2$
Biosecurity – Slowing the NZM Invasion
NZM are very hard to detect on gear

Photos: Ashley Wilmont, Pennsylvania Council of Trout Unlimited
New Zealand mudsnail requires specialized disinfection measures:

- Visually inspect gear and remove and dispose of any clinging matter in the trash. Do not move mud, organic matter or NZM from this area!

- To kill NZM, three methods are effective:
  - Freeze gear for a minimum of 6 hours
  - Soak gear in hot water (120°F to 140°F) for 5 minutes. This method is not recommended for GOR-TEX®
  - Soak gear for 5 minutes in a 1 to 1 solution of Formula 409® Cleaner Degreaser Disinfectant and water. After soaking, thoroughly rinse the gear with plain water. Simply spraying gear with the disinfectant or the mixture does not work. Also, general cleaners (including other 409 products) have not been shown to be effective against NZM.
Questions?
Public Fishing Access

Farthest southern extent of NZM

Benner Spring SFH

Warm water rearing ponds

Spring Creek water intake for rearing ponds
Upper Spring Creek Rearing Ponds

Creek water intake for rearing ponds
Summary

- NZM were not found at the Benner Spring or Bellefonte hatcheries.
- NZM were not found in Spruce Creek, the Little Juniata River, Fishing Creek (Clinton County), or in Bald Eagle Creek near the confluence with Spring Creek.
- NZM were found in the Upper Spring Creek Rearing Ponds infrastructure.
- The apparent heaviest infestations of NZM are in the Fisherman’s Paradise reach of Spring Creek.
- Only recourse at this time is to try to limit the spread of NZM primarily through public education and outreach.