

Impacts of an Invasive Snail on Native Invertebrate Biomass

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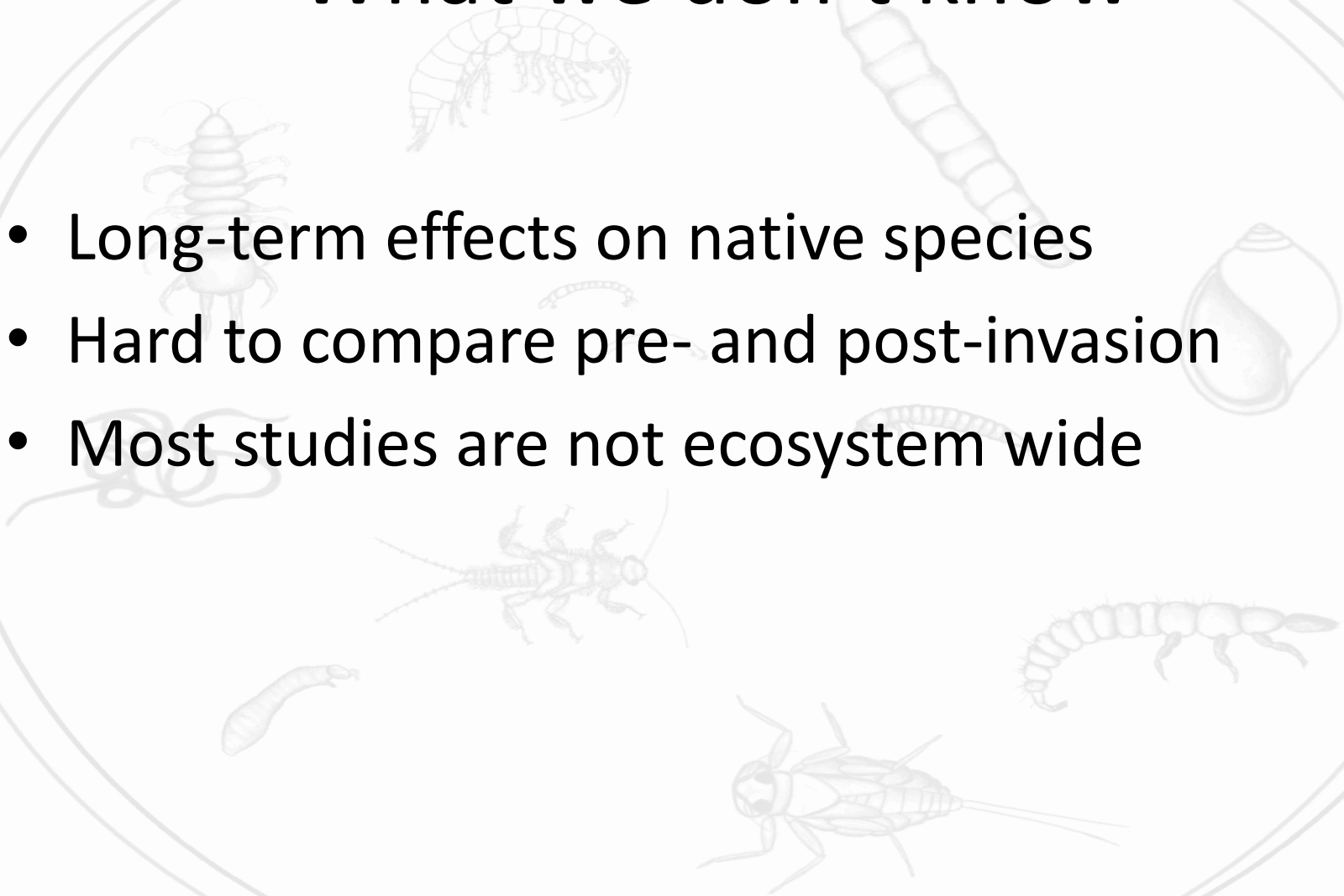
Invasive Species

- Not native to the ecosystem
- Invasive species can alter the abundance and distribution of native species (Simon and Townsend 2003)
- Example: Zebra Mussels in the United States



What we don't know

- Long-term effects on native species
- Hard to compare pre- and post-invasion
- Most studies are not ecosystem wide



Kelly Warm Springs

- Located in Grand Teton National Park
- Warm throughout the year (exceeds 30°C in the summer)
- The invasive snail showed up between 2001 and 2004
- Comparing pre- and post-invasion biomass of the invertebrates in the stream



Photos by E. R. Hotchkiss



Melanooides tuberculata

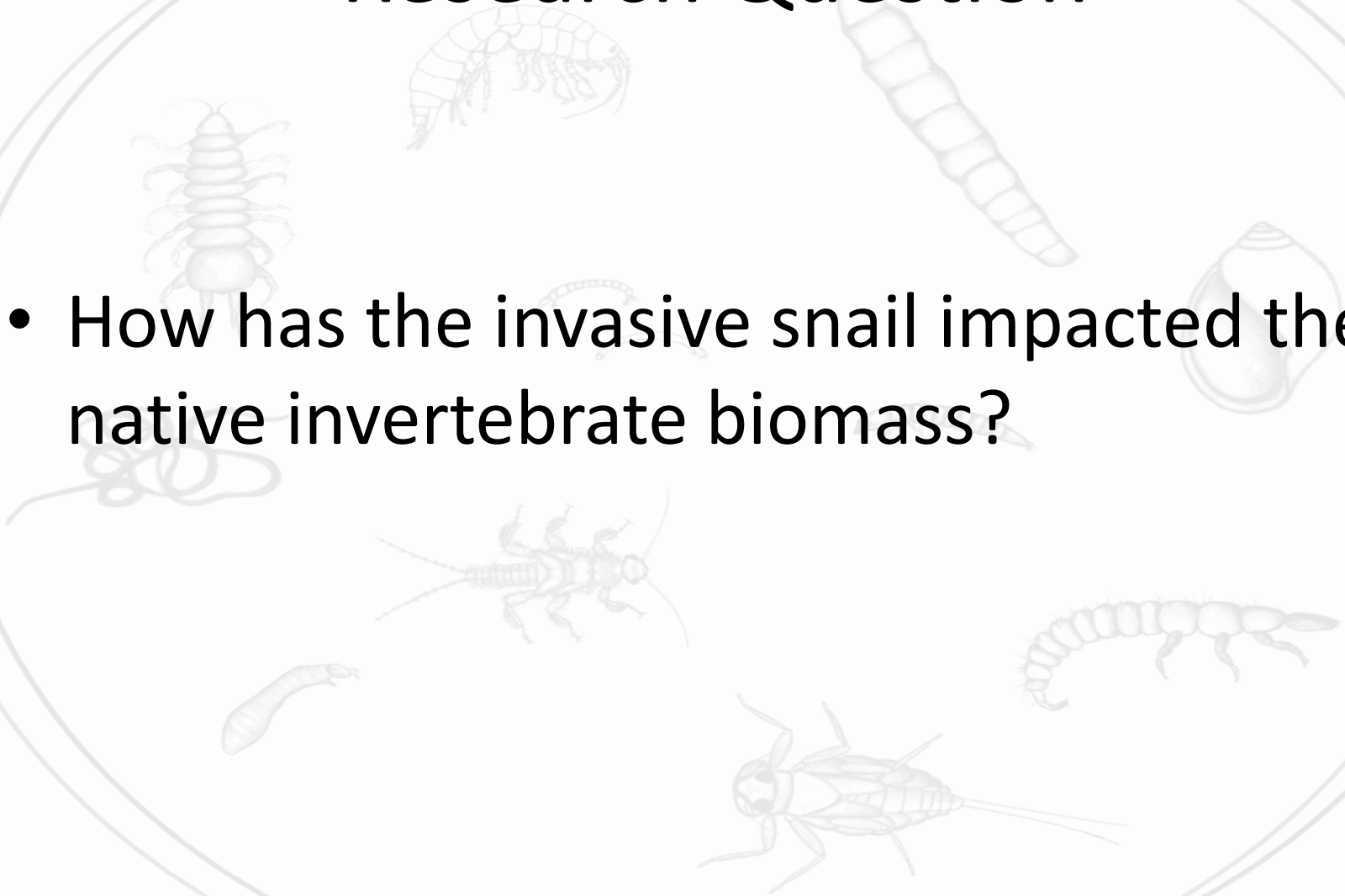
Malaysian Trumpet Snail

- Big in the aquarium trade
- Population has increased drastically since being introduced
- 80% of the invertebrate biomass in 2006 (Hotchkiss and Hall 2010)



Research Question

- How has the invasive snail impacted the native invertebrate biomass?

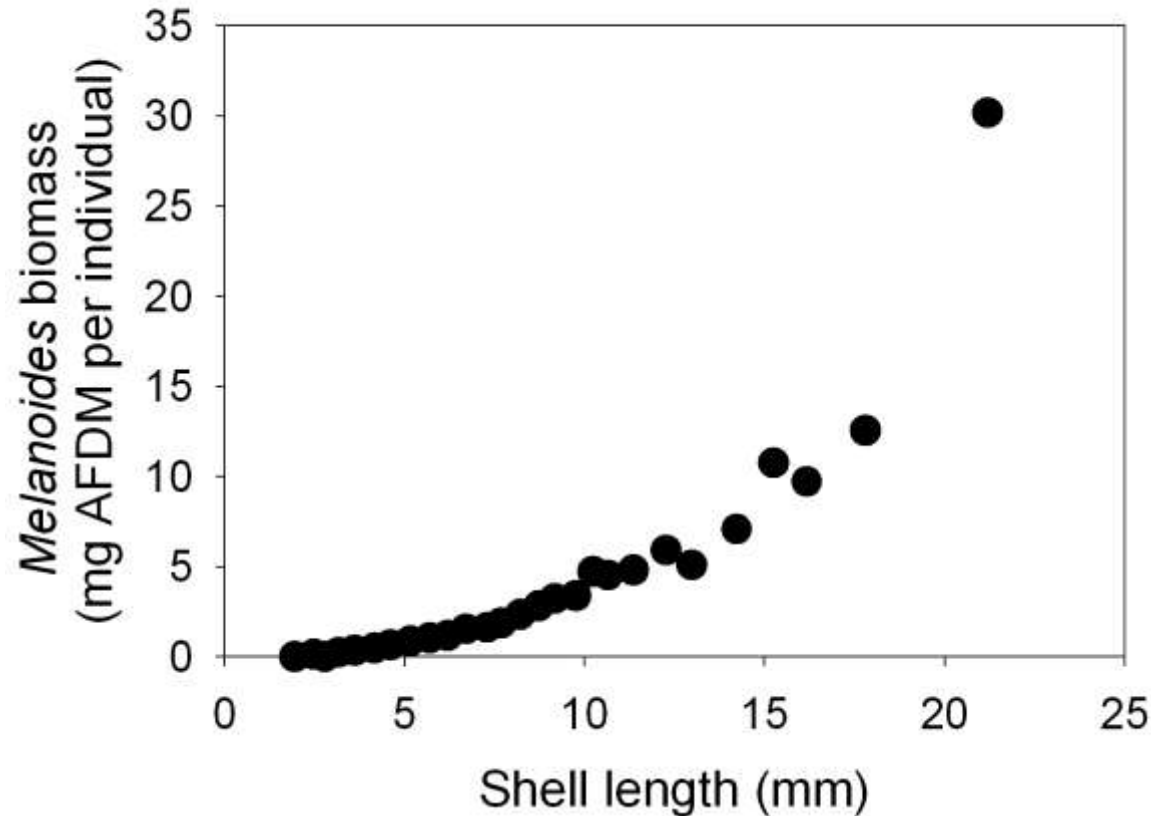


Methods

- Stovepipe sampler 15.2 cm in diameter was used to collect benthic invertebrates
- Each sample was sorted using a 1-mm and 250- μm sieves and preserved in 95% ethanol
- Each invertebrate was measured to the nearest .5 mm to calculate biomass

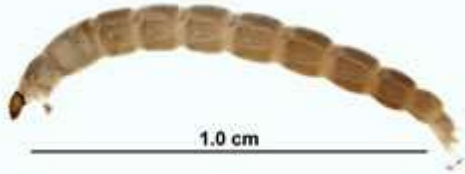


Biomass tells more of how much is in the stream than the number of individuals

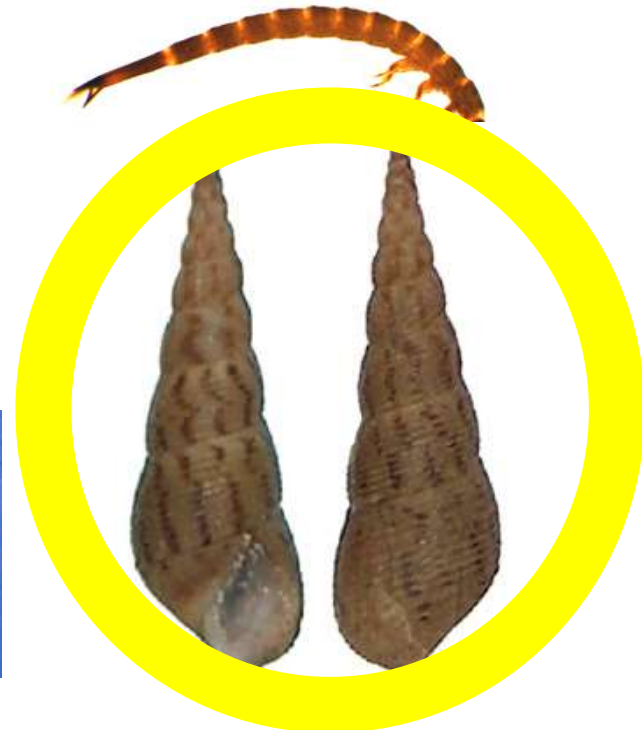
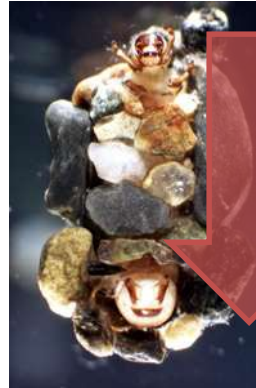
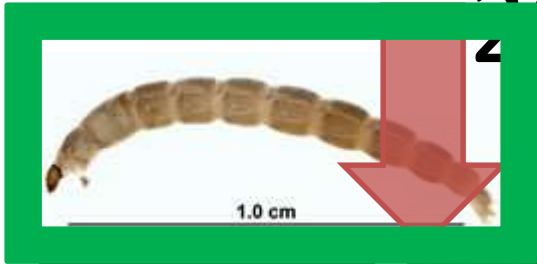


- Ash-free Dry Mass (AFDM): Is the amount of organic matter that an individual is composed of.

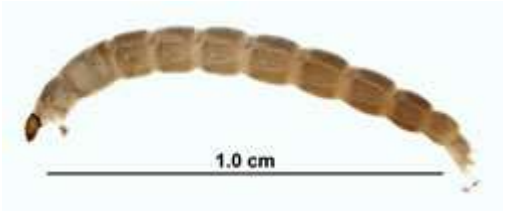
2001 Native Invertebrates



2006 Invertebrates



Feeding Habits



Omnivores: feed on animals, detritus, plants, and algae

- Easy to compare because their feeding habits are the same and will be found in the same parts of the stream



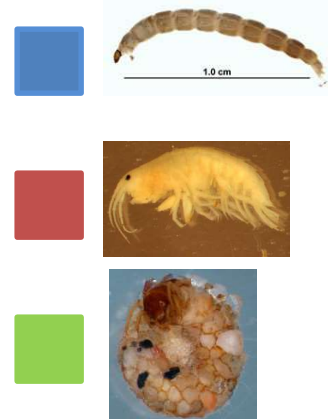
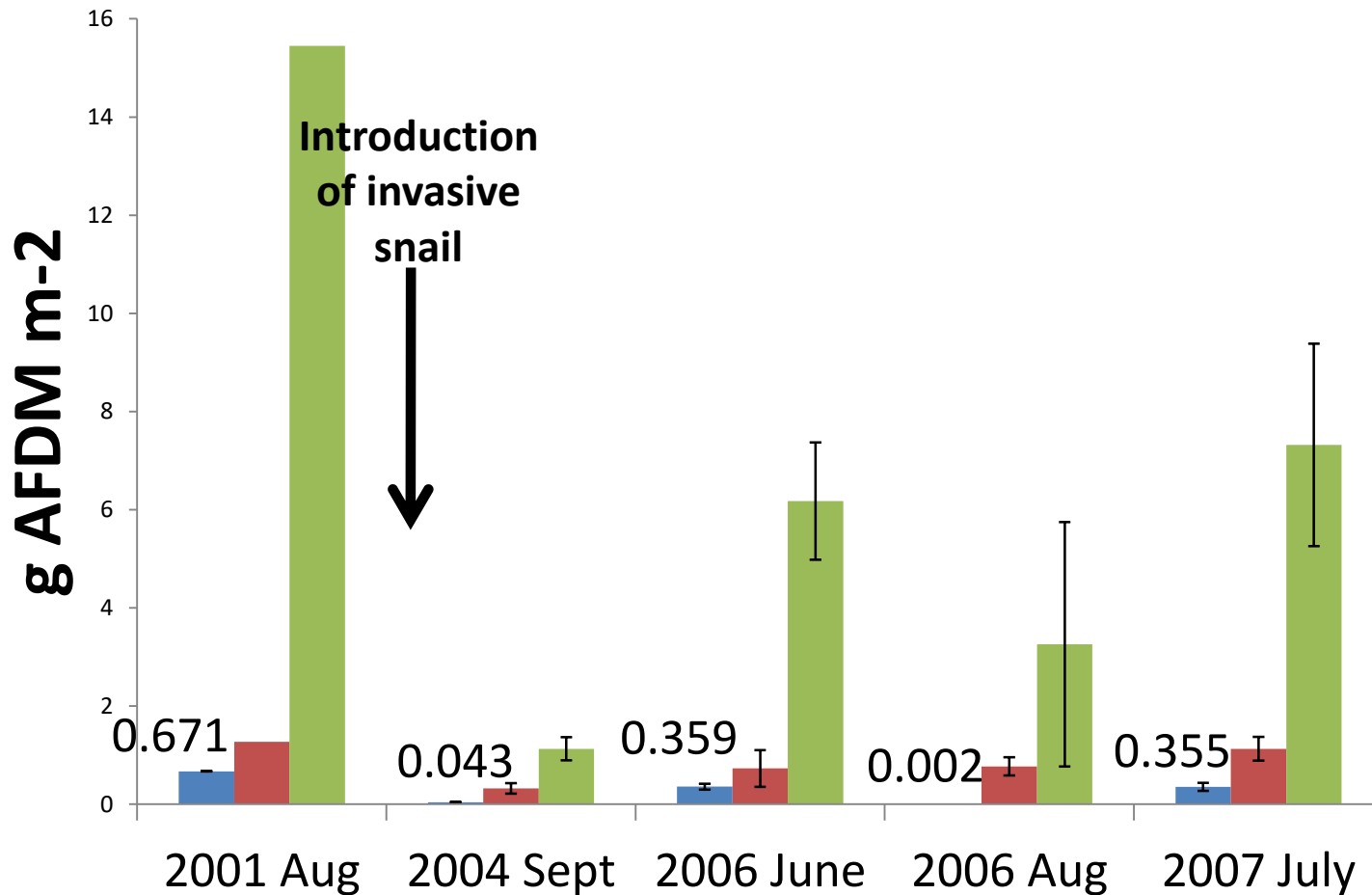
VS.



VS.



Biomass of Native Invertebrates





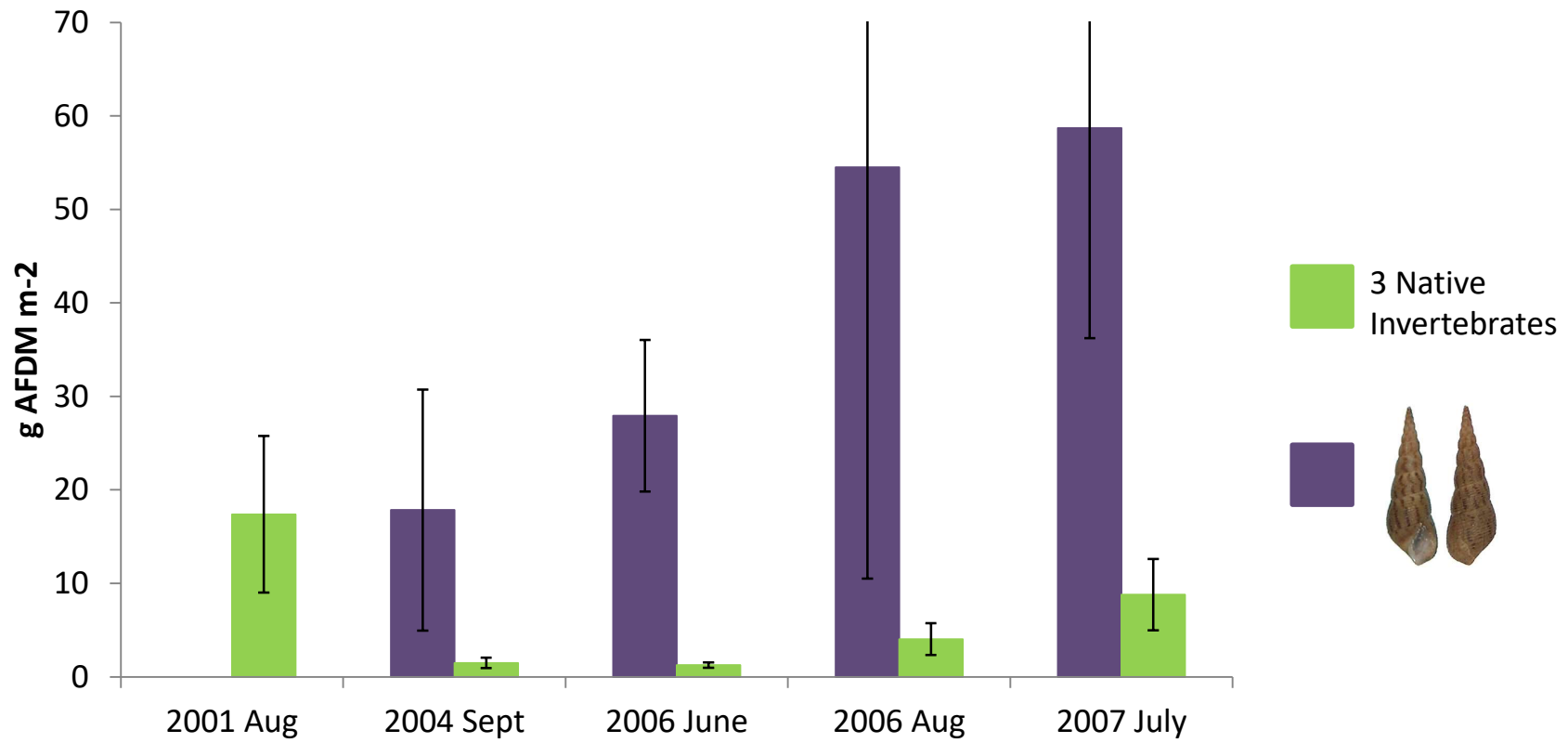
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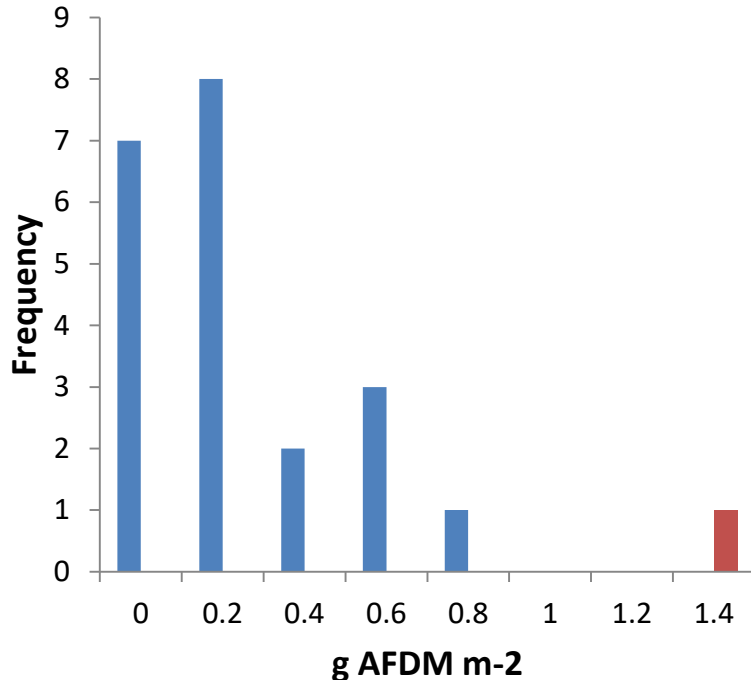
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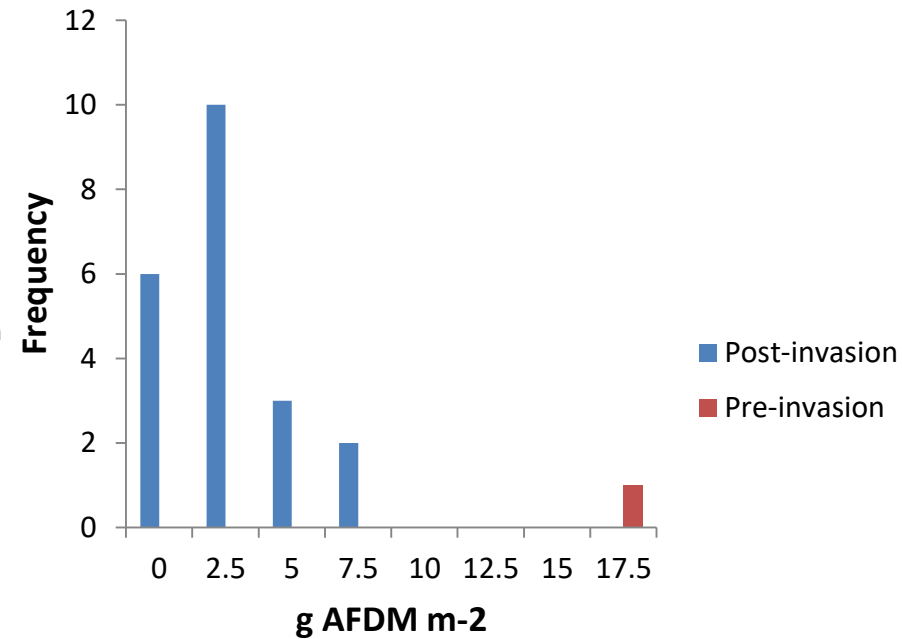
Melanoides has decreased the native invertebrate biomass

From Aug 2001 to Aug 2007

Hyalella azteca



Helicopsyche



Hyalella azteca
decreased by
26.5%



Chironomidae
decreased by
55.9%



Helicopsyche
decreased by
67.7%

Fishes in Kelly Warm Springs

Native Fishes

- Utah Chub



- Redside shiner

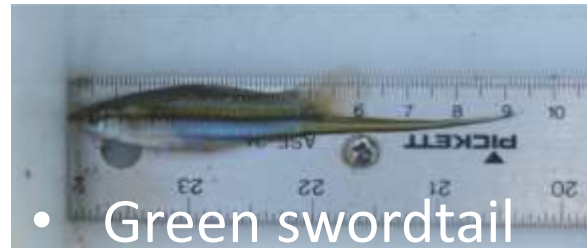


- Speckled dace



- Longnose dace

Invasive Fishes



- Green swordtail



- Madtom



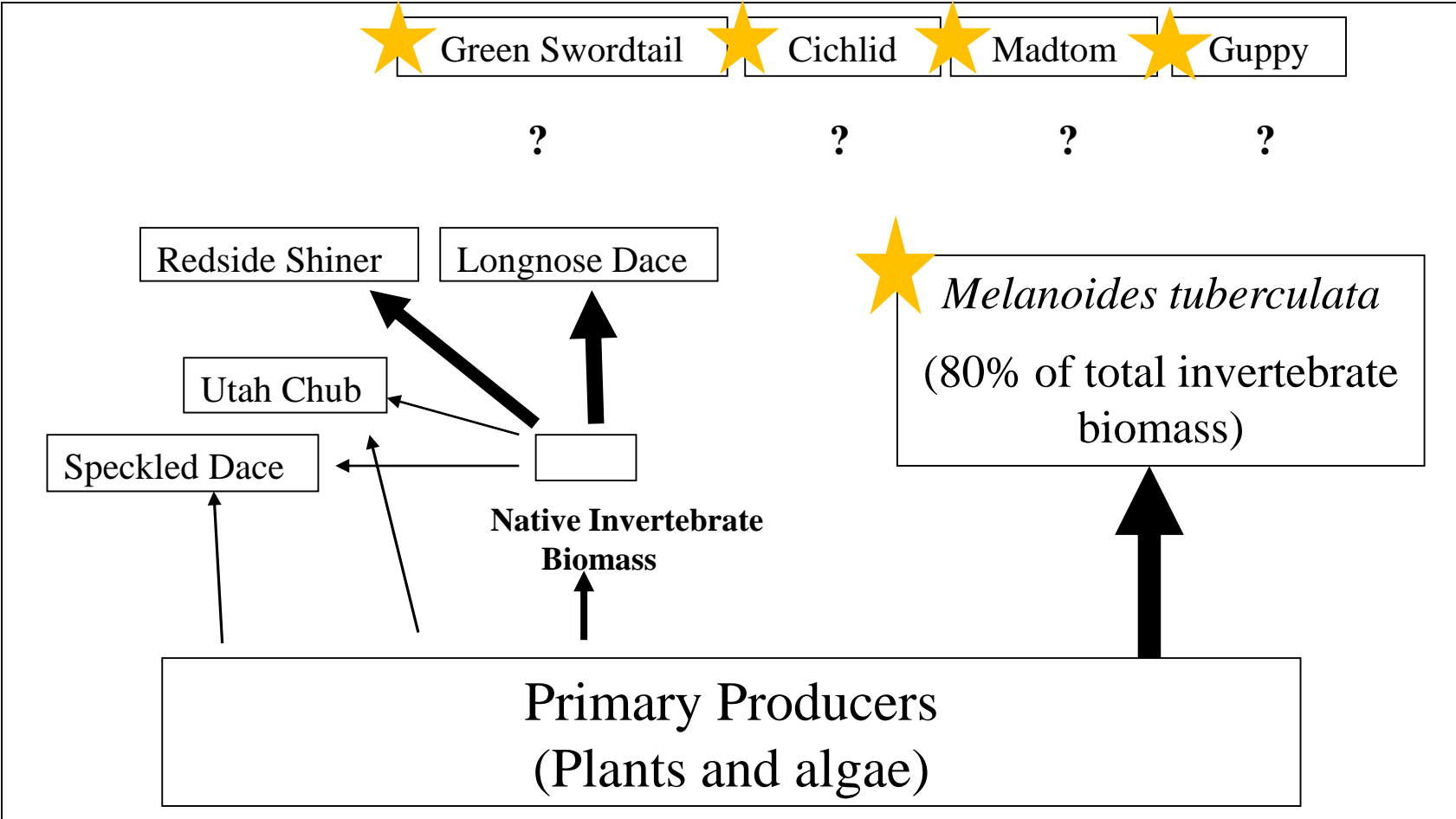
- Convict cichlid



- Guppy

Photos by
Chad
Whaley

How has *Melanoides* affected the foodweb?



Questions?



