



Summary of Freshwater Mussel Studies and Apple Snail Removal

Environmental Advisory Committee Meeting
March 12, 2021



Holistic Mussel Project (HMP)

- Determine freshwater mussel densities and species richness in the San Antonio River Basin
- Freshwater mussels mostly extirpated from the Mission Reach
- Found in remnant channels
 - Espada and San Juan
- Healthy populations in Lower San Antonio River



Holistic Mussel Project (HMP)

- Quantitative and qualitative surveys
- Habitat surveys
 - Substrate type
 - Water velocity
- Mantle clips for genetic testing
 - Used for future genetic management plan



Mission Reach Mussel Survivability Study (MRMS)

- Determine the feasibility of a future mussel reintroduction effort in restored Mission Reach
 - Survival and growth
- 4 species of mussels
 - Threeridge, Pimpleback, Yellow Sandshell, Pistol Grip



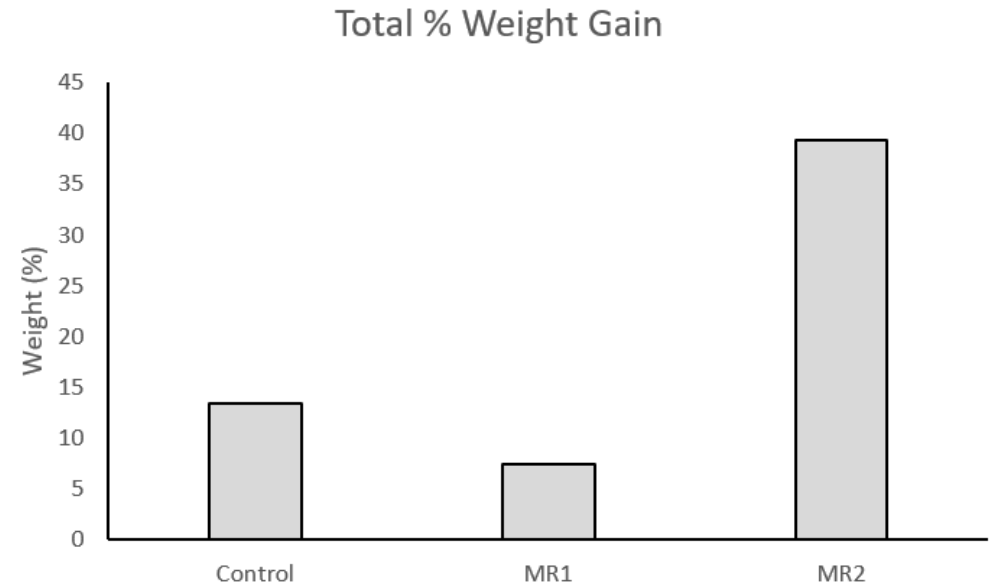
Mission Reach Mussel Survivability Study (MRMS)

- Two experimental sites in the Mission Reach
- One control site in Goliad County in the Lower San Antonio River
 - Healthy mussel populations



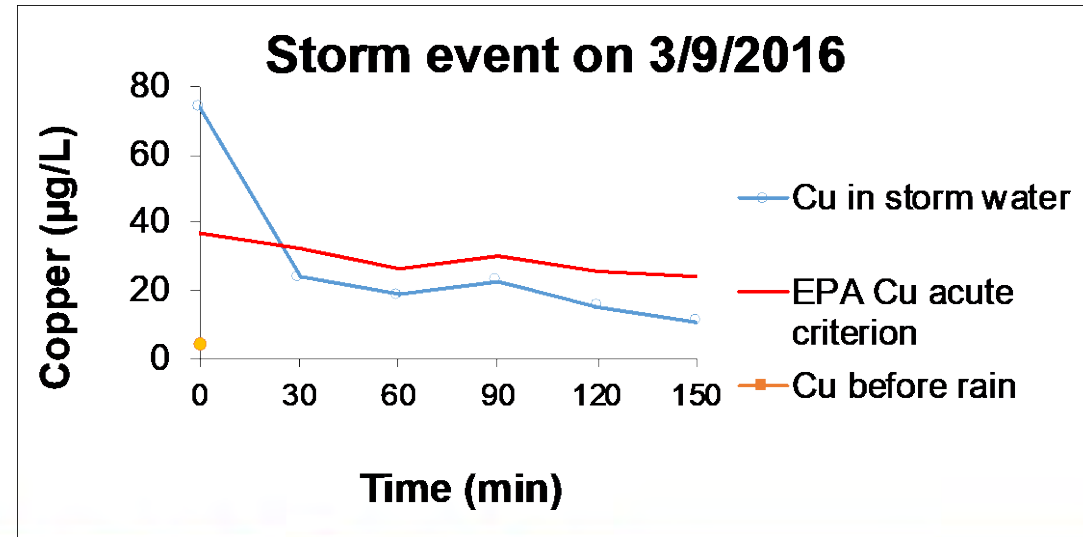
Mission Reach Mussel Survivability Study (MRMS)

- Promising results
- Mission Reach Sites
 - 78% average survival
 - One site grew significantly better than control



Mussel Toxicology Research

- Concerns for introduction in an urban environment
- Stormwater runoff into SAR
 - Copper and ammonia
- Copper value above EPA criteria has been observed



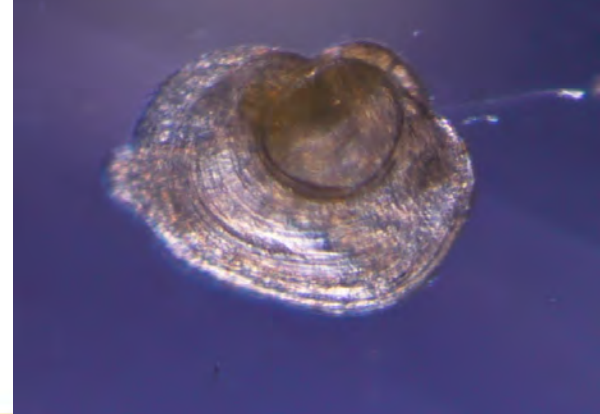
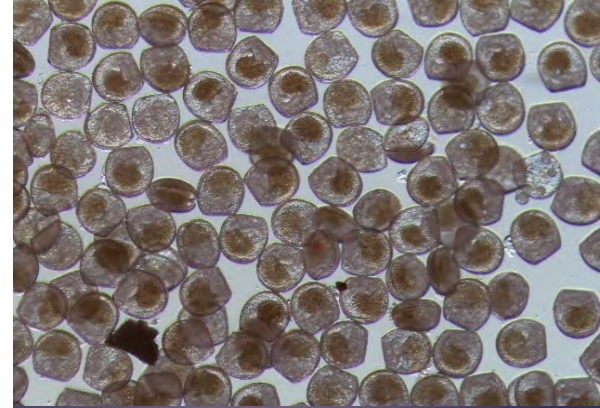
Mussel Toxicology Research

- Stormwater trials are ongoing through United States Fish and Wildlife Service
- Juveniles exposed to treatment water
 - San Antonio water for 28 days
 - Storm water for 48 hours
 - 100% survival



Freshwater Mussel Propagation and Production Project (MP3)

- Develop propagation methodology for four species
- Produce individuals for potential introduction in Mission Reach
- Genetic management plan



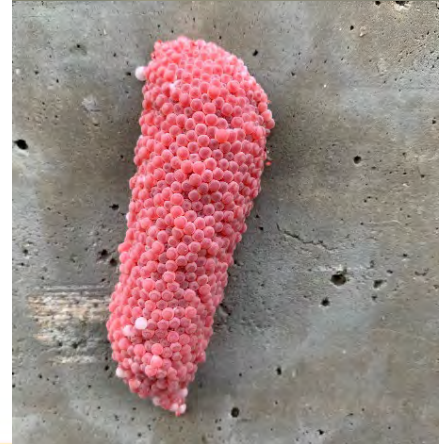
Freshwater Mussel Reintroduction

- Many ecological benefits of freshwater mussels
- Is reintroduction feasible?
 - HMP, MRMS, toxicology, MP3
 - Presence of host fish
 - Habitat suitability modeling
 - Genetic management plan



Apple Snail Removal Project

- First observation along the Museum Reach in October 2019
- Giant Applesnails (*Pomacea maculata*) native to South America
- Egg clusters containing ~ 2,000 eggs
- Voracious herbivores



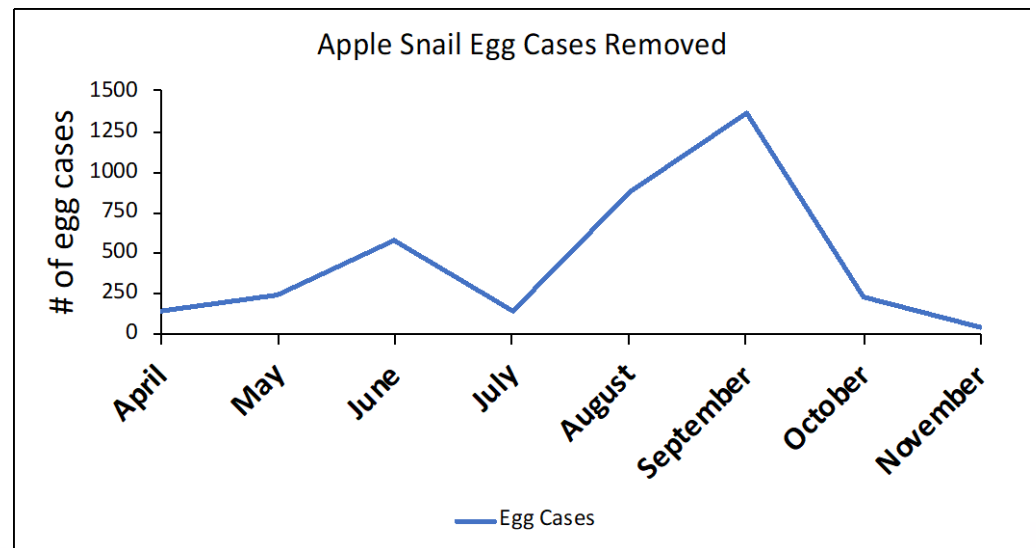
Apple Snail Removal Project

- Active Partner Status with Texas Parks and Wildlife Department
 - Make collection and disposal of adults and egg clutches much easier
- River Warriors
 - Volunteer organization
 - Potential apple snail removal training in the future



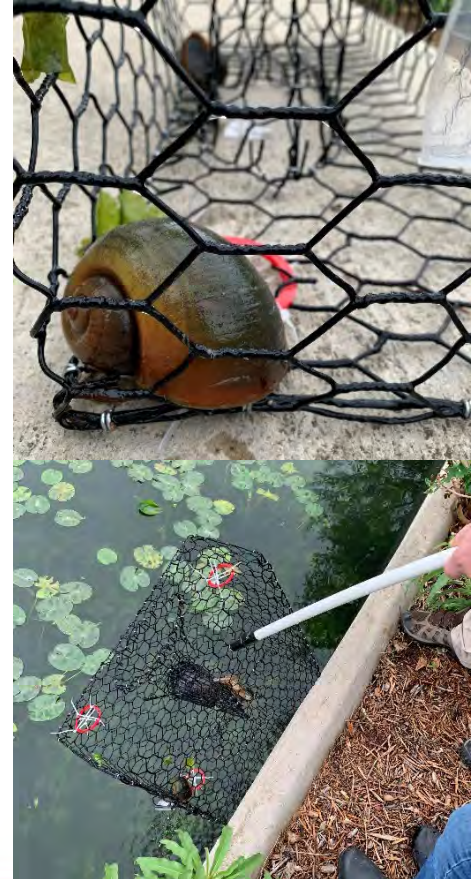
2020 Apple Snail Removal Results

- Combined effort of organizations
 - SWCA Environmental Consultants
- April - November 2020
 - 3,348 egg clutches
 - 226 adults removed



Snail Traps in Progress

- Apple snail traps are currently being developed
 - Testing various crab or fish traps
 - Bait preference
- Successfully captured adult snails
- By-catch prevention is needed



Questions?

