



Brazos Basin Freshwater Mussel Candidate Species Update

***Presented by
Tiffany Morgan***



Proposed Listing of Freshwater Mussels as Endangered in Brazos River Basin

- **Three species in basin candidates for Endangered Species Act (ESA) protection**
 - Smooth pimpleback
 - Texas fawnsfoot
 - False spike
- **Texas fawnsfoot and false spike part of larger Central Texas Mussel Group under consideration by USFWS now**
 - Final decision anticipated in 2018
- **Consideration of smooth pimpleback delayed until 2020**



USFWS Schedule for Texas Mussels under Review

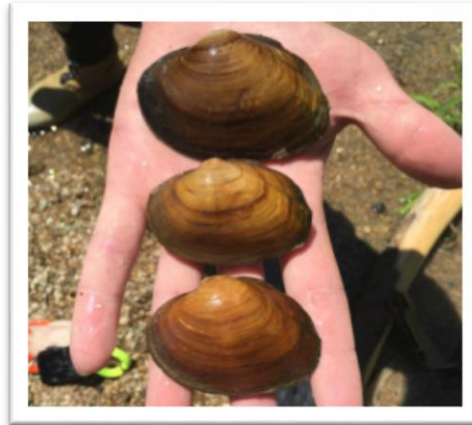
Mussel Species	Package Name and Grouping	Historical Range in Texas River Basin	Federal ESA Listing Status
False Spike	Central Texas Mussels (2018)	Brazos, Colorado, Guadalupe	Petitioned
Texas Fatmucket		Colorado, Guadalupe	Candidate
Texas Pimpleback		Colorado, Guadalupe	Candidate
Texas Fawnsfoot		Brazos, Colorado	Candidate
Triangle Pigtoe	East Texas Mussels (2019)	Neches, San Jacinto	Petitioned
Louisiana Pigtoe		San Jacinto, Trinity, Neches, Sabine	Petitioned
Texas Heelsplitter		Neches, Trinity, Sabine	Petitioned
Golden Orb	Texas Quadrula Species (2020)	Guadalupe, San Antonio, Nueces-Frio	Candidates
Smooth Pimpleback		Brazos, Colorado	Candidate
Mexican Fawnsfoot	Rio Grande Mussels (2022)	Rio Grande, Pecos, Rio Salado	Petitioned
Salina Mucket		Rio Grande	Petitioned
Texas Hornshell	-	Rio Grande	Proposed Endangered



Smooth Pimpleback



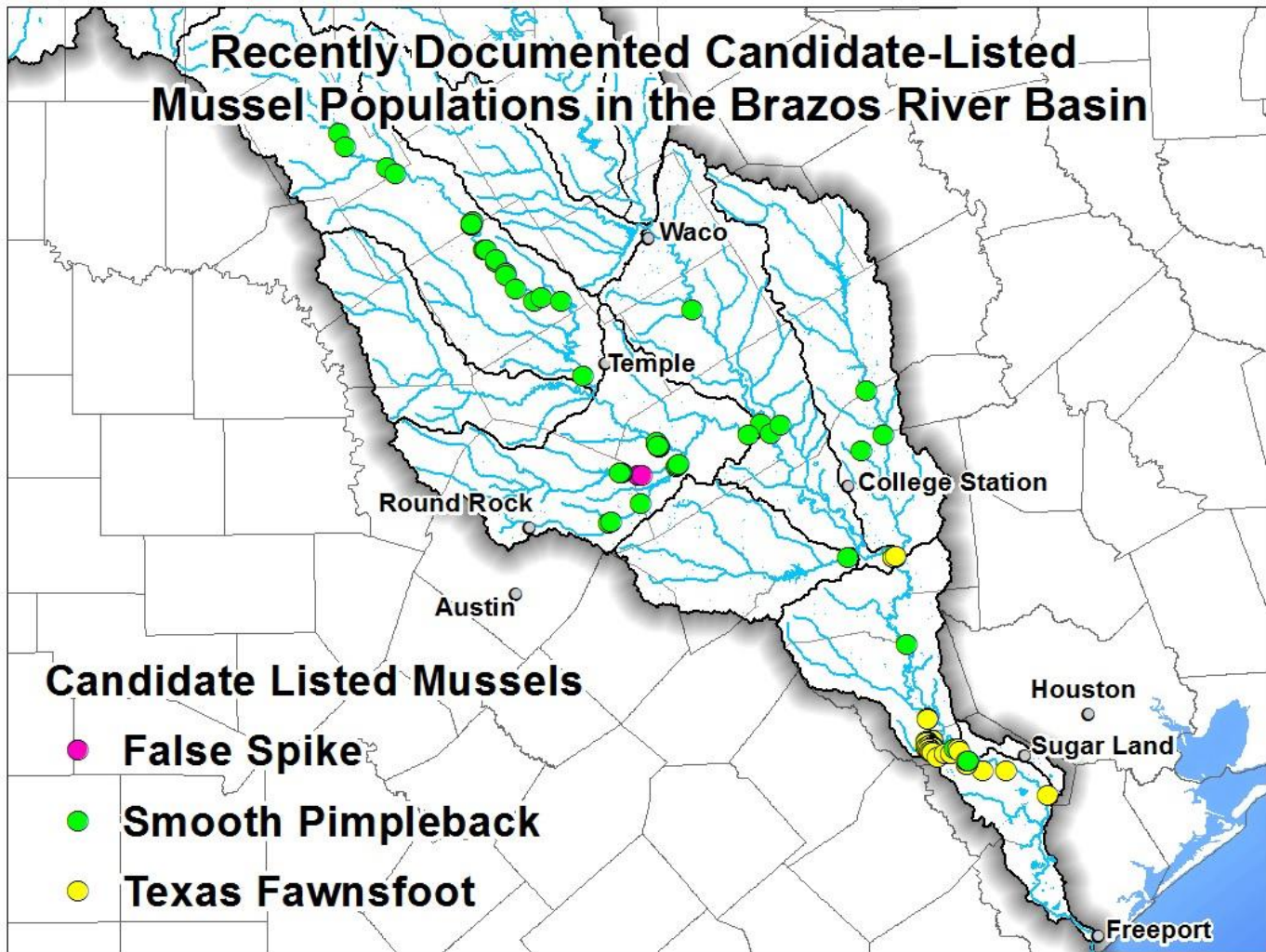
Texas Fawnsfoot



False Spike



Recently Documented Candidate-Listed Mussel Populations in the Brazos River Basin





Why do We Care?



Power of the ESA

- **Since 1973, the ESA has proven to be one of the nation's strongest conservation laws**
 - Has been widely upheld in the court system
 - Never substantially defeated
- **ESA can affect state-based water rights and regulations**
 - Can limit the traditional exercise of established water rights
 - Restrict or modify new water projects
 - Any water use that results in the direct or incidental take or harm of listed species falls within the ESA's reach
- **ESA's ability to preempt state law derives from US Constitution's Supremacy Clause**



USFWS Status Review Finding

- **All mussels face the same or similar threats**
- **Decline of mussels in Texas and nationwide is due to habitat loss and degradation**
 - **Impoundments**
 - Reduced flow/Change in flow regime
 - Scouring and erosion
 - Impairs water quality
 - **Sedimentation**
 - Cattle grazing/removal of riparian vegetation
 - Urbanization/population growth
 - **Dewatering**
 - Surface water and groundwater use
 - Hydropower
 - Drought
 - **Sand and gravel mining**
 - **Chemical contaminants**
 - Municipal effluent/Industrial wastes
 - Chemical spills
 - Fertilizers/pesticides
 - Emerging contaminants
 - **Nonnative species**
 - Golden Algae
 - Zebra Mussels
 - Black Carp
 - **Climate change**
 - **Existing regulatory mechanisms inadequate**



Brazos River Authority

What's Being Done?



Interagency Task Force on Economic Growth and Endangered Species

- 2009 - Legislature established Comptroller as presiding officer
- Provides assistance to stakeholders to develop effective strategies to comply with the Endangered Species Act
- Stakeholder work groups: freshwater mussels, monarch butterfly, spot-tailed earless lizard

Member Agencies





Comptroller's Species Research Program

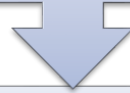
- **2013 and 2015 - Legislature appropriated a total of \$10 million for research by state universities on petitioned or listed species**
- **To date, approximately \$8 million has been allocated for research on 24 species, including 12 freshwater mussels**
- **Priorities are identified based on:**
 - **Immediacy of listing decision**
 - **Existing data gaps**
 - **Potential impacts of listing**



Comptroller's Species Research Objectives

Ensure accurate science is available to inform listing decisions

If listings occur, ensure that compliance is cost-effective



Assist in the development of voluntary conservation measures if stakeholders are interested in pursuing



Central Texas Mussel Research Project

- **Surveys**
 - Brazos
 - Colorado
 - Guadalupe
- **Applied Research**
 - Tolerance tests
 - Temperature
 - Ammonia
 - Salinity
 - Sedimentation
 - Desiccation
 - Fish host species
- **Desktop Environmental Flow Standards Analysis**
- **Mark Recapture Studies**
 - Evaluate how mussels move and utilize different habitats
- **Captive Propagation**
 - Reproductive studies
 - Raising juveniles



Research Team

- **Texas State University**
 - Dr. Timothy Bonner (Primary)
- **BIO-WEST**
- **U.S. Fish and Wildlife Service**
 - San Marcos Aquatic Resource Center
 - Inks Dam
 - Uvalde Hatcheries
- **Auburn University**
 - Dr. Jim Stoeckle





Comptroller's Freshwater Mussel Stakeholder Work Group

- Listing status updates
- Discussions about options for voluntary conservation
- Research updates
- Currently focused on the species with 2018 listing deadlines

Upcoming Meetings

April 17, 2017

May 16, 2017

June 20, 2017

July 19, 2017



Work Group Contacts

Meghan Hope

Meghan.Hope@cpa.texas.gov

(512) 936-8554

Kimberly Horndeski

Kimberly.Horndeski@cpa.texas.gov

(512) 305-9827

<http://comptroller.texas.gov/programs/species-economy/>



**Brazos
River
Authority**