

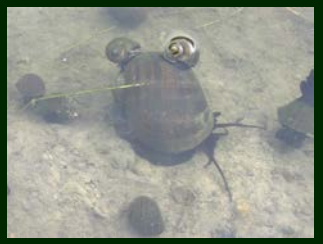


Aquatic Nuisance Species Initiatives of the Lower Galveston Bay Watershed

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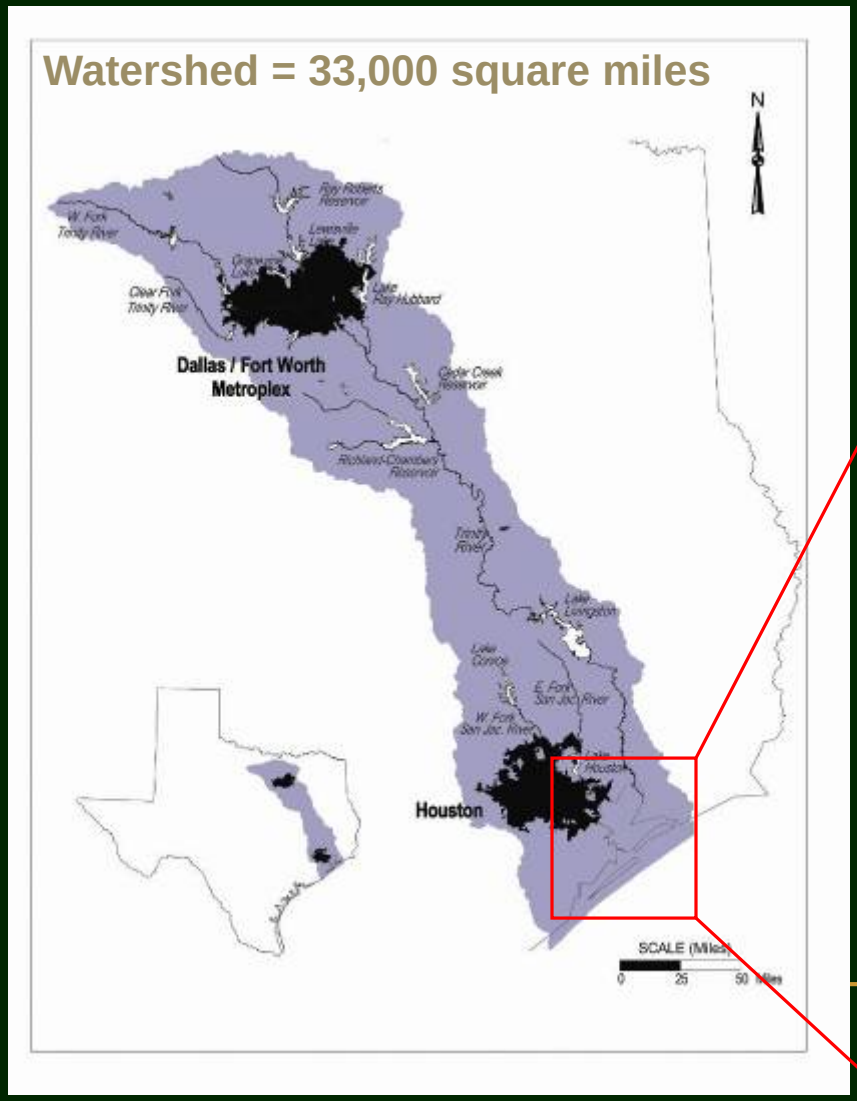
Gulf & South Atlantic Regional Panel on Aquatic Invasive Species
Charleston, South Carolina, October 4-5, 2006

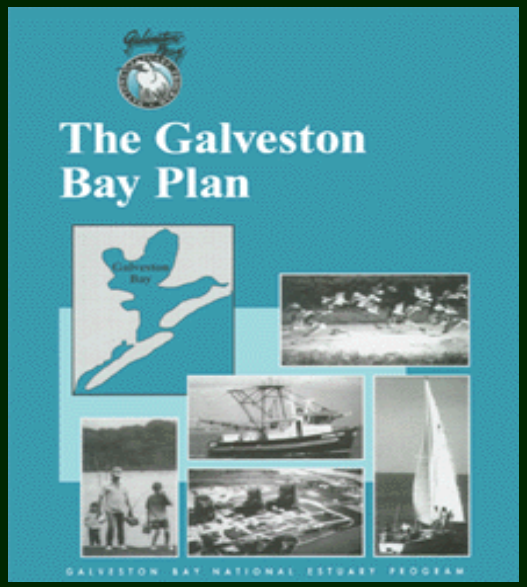
Galveston Bay

- Largest estuary in Texas
- Population of 4 million people
- 3 ports with 15,000 vessels per year
- 600 square miles of open water
- 1,500 miles of shoreline
- 6-8 feet average depth



Invasives and The Galveston Bay Plan

- Number 2 priority problem for Species Population Protection
  - Goal #1: Eradicate or reduce populations of invasives that threaten native species, habitats, and ecological relationships.
  - Goal #2: Prevent the introduction of additional exotic, invasive species.



Regional Network

- GBEP Invasive Species Working Group
  - Facilitates communication and coordination among stakeholders:
    - Federal and state agencies
    - Local government
    - Port authority
    - Universities
    - NGO’s

Comparative Risk Assessment

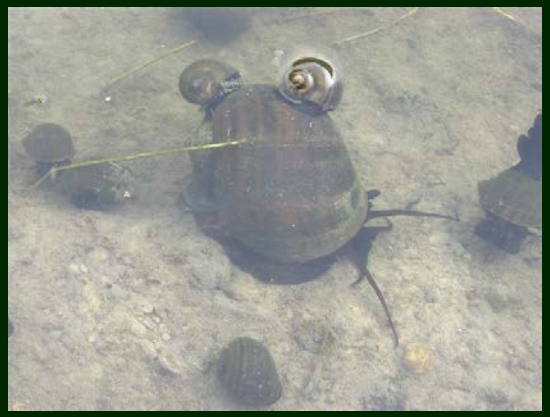
- Prioritize funding
- Literature and database review
- 296 species - current or potential invaders
- 4 expert workshops to rank species
- 84 species ranked according to risk criteria
  - Likelihood of impact at ecosystem level
  - Severity of impact, loss of biodiversity
  - Location of invasive relative to region
  - Immediacy of invasion
  - Irreversibility of damage
  - Impacts to human uses

Bryozoan, Sauerkraut grass in West Galveston Bay. Photo courtesy Jan Culbertson, TPWD.

50 aquatic species ranked

High Risk Aquatic Animal Species

Carcinus aestuarii	Mediterranean green crab
Carcinus maenas	European green crab
Channa argus	Northern snakehead
Ctenopharyngodon idella	Grass carp *
Dreissena polymorpha	Zebra mussel
Eriocheir sinensis	Chinese mitten crab
Limnoperna fortunei	Golden mussel
Monopterus albus	Asian swamp eel
Myocastor coypus	Nutria *
Oreochromis sp.	Hybrid tilapia *
Perna viridis	Asian green mussel
Phyllorhiza punctata	Australian spotted jellyfish**
Pomacea insularum	*A*pple snail ***
Zoobotryon verticillatum	Sauerkraut grass*



Apple snails (*P. insularum*) in Brazoria County, Texas. Photo courtesy Dr. Lyubov Burlakova, Stephen F. Austin University.

* Established population in Galveston Bay Estuary
** Species reported in Galveston Bay in 2006
*** Established population present; originally thought to be *P. canaliculatum*

High Risk Aquatic Plant Species

Eichhornia crassipes	Common water hyacinth*
Gymnodinium sp.	Exotic red tide**
Hydrilla verticillata	Hydrilla*
Ipomoea aquatica	Water spinach*
Lythrum salicaria	Purple loosestrife
Myriophyllum spicatum	Eurasian watermilfoil
Pistia stratiotes	Water lettuce*
Salvinia minima	Common Salvinia*
Salvinia molesta	Giant Salvinia*

Hydrilla invading Lake Conroe, north of Houston. Photo courtesy Dr. Earl Chilton, TPWD.

*Established population in Galveston Bay Estuary
**Reported in Texas

Research Activities

- Poorly understood, emerging species
  - Deep-rooted sedge
  - Applesnail
- Various Habitats
  - Bayous / riparian
  - Wetlands
  - Coastal prairie
- Introduction pathways (planned)
  - Analyze ballast discharge practices and locations
  - Risk assessment of vessel origins and trade routes
- Partners
  - Local universities
  - Federal and state agencies

Applesnails along Armand Bayou, west of Galveston Bay. Photo courtesy Brenda Weiser, UHCL/EIH.

Houston Ship Channel. Photo courtesy Stan Williams, TXDOT.

Management: Eradication & Restoration

- Conservation lands and adjacent waters
  - Wetlands
  - Coastal prairie
  - Barrier island
- Target species
  - Giant Salvinia
  - Hydrilla
  - Water hyacinth
  - Chinese tallow
  - Brazilian pepper
- Partners
  - Local governments
  - Local Council of Government
  - State and federal agencies
  - Nonprofits and conservation organizations

Common water hyacinth invading cypress stands along Trinity River Wallisville Lake Project just above Galveston Bay.

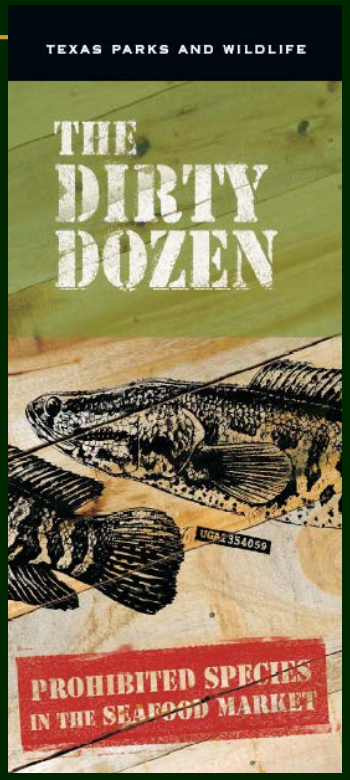
Invasives Monitoring

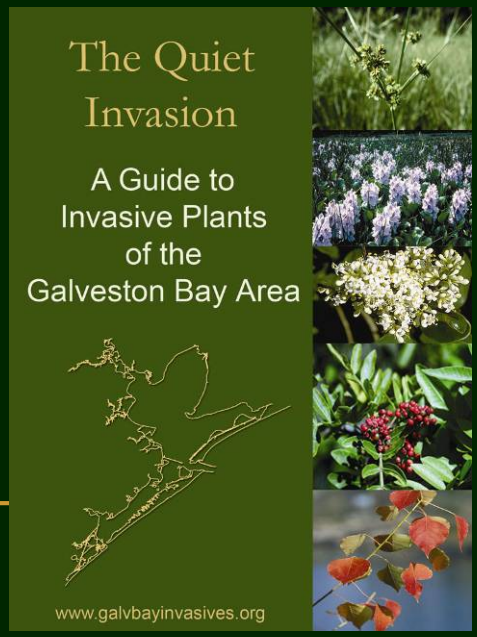
- TPWD Houston Urban Bayous Study
  - Snow pleco, tilapia, grass carp, Rio Grande cichlid
  - 3 local bayous (Greens, Brays, Buffalo)
- TPWD Fisheries Independent Monitoring
  - Grass carp
  - Sauerkraut grass
- Invaders of Texas: Citizen Scientist Invasive Species Monitoring Program
  - Phase 1-Aquatic and terrestrial plants; Phase 2-Animals
  - Citizen volunteers: Master naturalists, Master Gardeners, nature centers
  - Online data entry and mapping application
  - www.texasinvasives.org

Plecostomus and tilapia collected by TPWD in bayous of Houston, Texas. Photos courtesy of Steven Johnston, TCEQ/GBEP.

Education and Outreach

- TPWD and GBEP working with citizen groups and anglers to prevent additional introductions of aquatic plant species (hyacinth, hydrilla, salvinia)
- TPWD Dirty Dozen poster and brochure
  - Prohibited species in the seafood market
- The Quiet Invasion: A Guide to Invasive Plants in the Galveston Bay Area
  - 3000 copies printed; 2000 distributed
  - Interactive field guide www.galvbayinvasives.org
  - New guide planned to include animals





Conclusions

- Accomplishments
  - Multifaceted approach
  - Strong stakeholder coordination
  - Species prioritization
  - Control and restoration projects established
  - Public outreach and education started
- Challenges
  - Population and development increasing
  - Shipping traffic increasing
  - Regional land use planning lacking
- Additional needs
  - Additional monitoring - EDRR
  - Research emerging species – bay waters
  - Identify new ways to engage the public
  - $$

For More Information…

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