Invasive Species Initiatives in the Houston-Galveston Region

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Texas Invasive Species Coordinating Committee
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HARC

HARC Mission

Mission

Using science to help people thrive and nature flourish

Approach

To people seeking scientific answers, HARC is a nonprofit, research hub that provides independent analysis for building a sustainable future

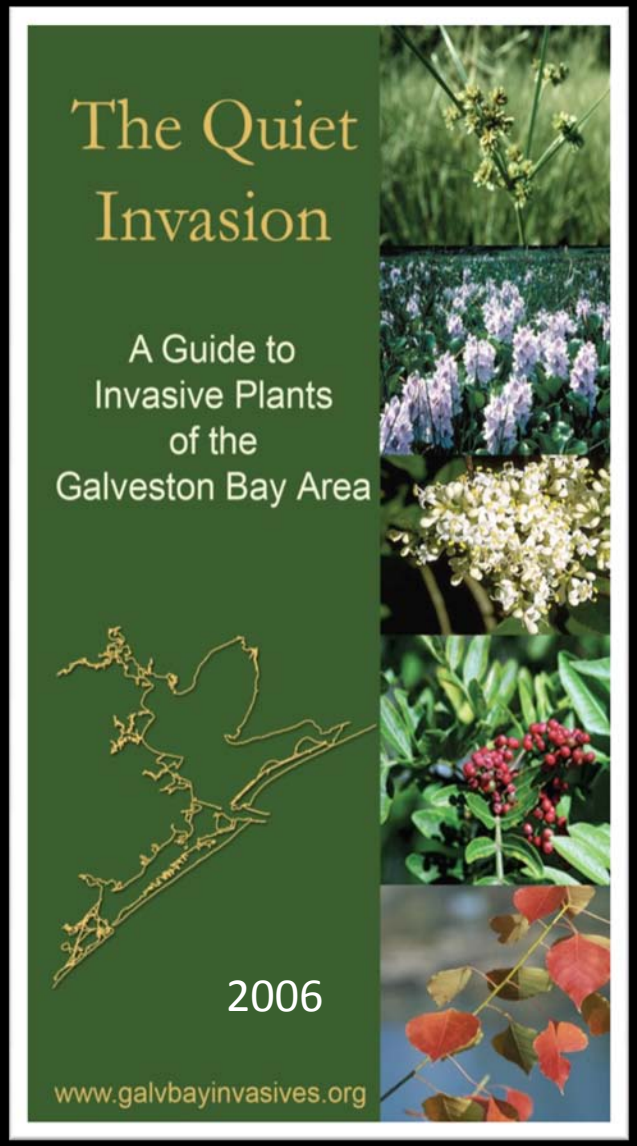
Program Areas

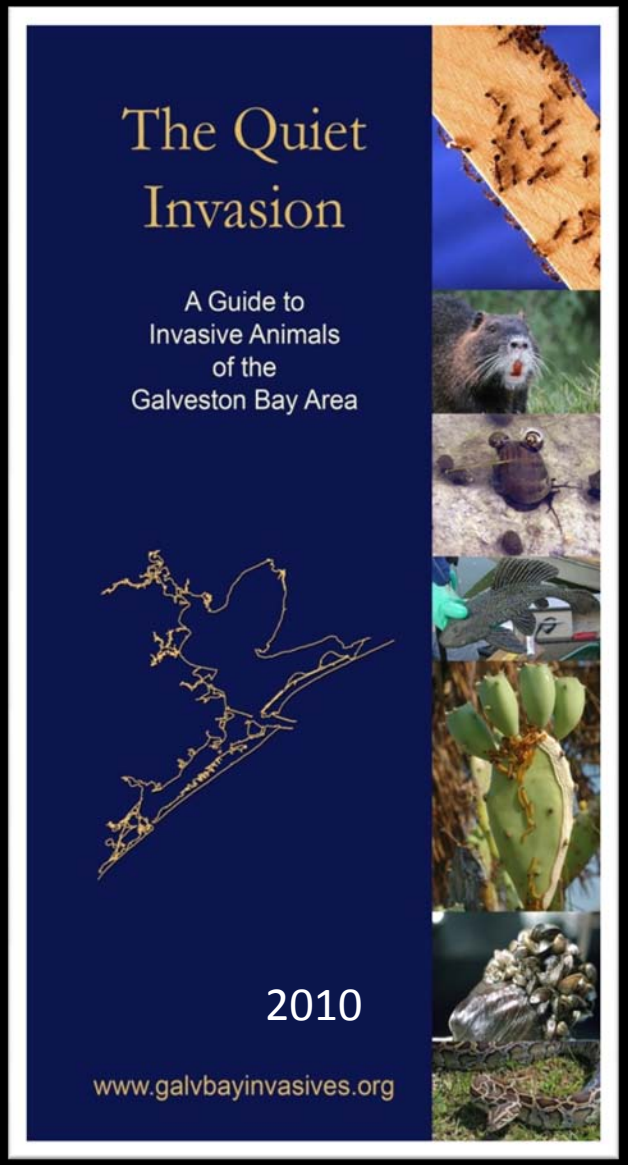
- **Water**
  - Water quality and ecological assessment
  - Watershed planning
  - Freshwater inflows strategies
  - Groundwater quality and quantity assessment
- **Air**
  - Air quality monitoring and modeling
  - Clean engine emissions
  - Texas Climate News
- **Energy**
  - Energy efficiency & clean energy technologies
  - Combined heat and power
  - Environmentally friendly oil and gas exploration

HARC

Quiet Invasion Field Guides

- **14,000+ copies distributed**
- **206,000 website visits**
- **Houston-Galveston Invaders Citizen Scientists**





GALVESTON BAY ESTUARY PROGRAM
A PROGRAM OF THE TCEQ

TCEQ

An Invasion Potential Scorecard

Incorporating Human and Ecological Dimensions of Aquarium Species Release

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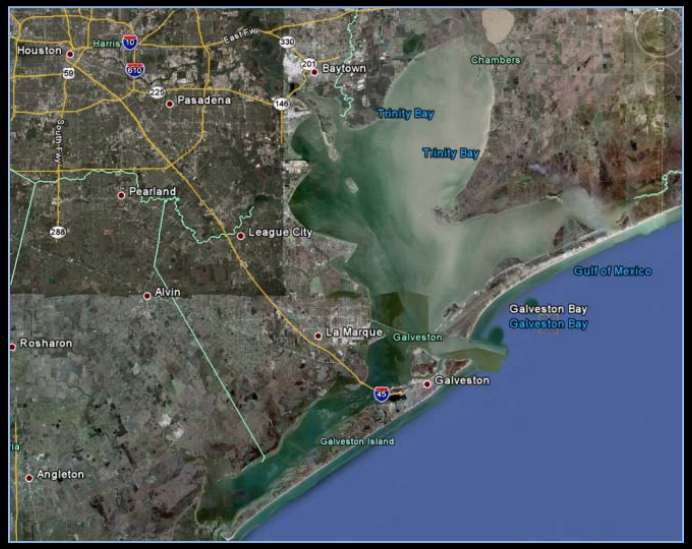
Background

- Numerous invasive species introduction pathways in the Houston-Galveston Region including aquarium trade
- Relatively few introduced aquarium species
- Aquarium trade and consumer outreach presents challenge; *plants ≠ pets*
- Assumptions associated with aquarium releases



Project Goals & Objectives

- Develop an invasion potential scorecard for aquarium fishes integrating ***social*** and ***ecological*** information
  - Availability potential – Identify social and market networks for aquarium species exchange
  - Release potential – Identify factors driving aquarium species release by aquarium owners
  - Survival/reproduction potential – Determine regional potential of invasion for a released species

Availability Potential

- Species inventories Based on:
  - LEMIS import data for major Texas ports
  - Chain pet and discount stores
  - Local, independent fish stores
  - Local breeders
  - Aquarium club auctions
  - Informal web sales: Craig's List and aquarium club web sites

Cichlasoma octofasciatum

Pterygoplichthys sp.

Number of Species Available in Aquarium Fish Trade by Source

No species was available from all 7 venues

Source	Number of Species
LEMIS - International Import	233
Fish sales by Individuals on the Internet	78
Aquarium Society Auctions	75
Pet Stores (Chain)	53
Local Breeders	24
Local Fish Stores (Independent)	19
Discount Stores	12

Release Potential Social

- Club Auction Questionnaires (n=201)
  - 82% (165 respondents) would or have released fish
  - 30 “releasers” chosen for follow-up, in-depth interviews
- Web surveys
  - Aquarists’ values, perceptions and acceptance of scientific knowledge
- Decision model
  - Competing values (convenience vs. fish well-being)
  - Perceptions of consequences

Factors Affecting Release Potential

- Factors increasing release potential
  - Getting fish/information from discount stores/chain pet stores
- Factors decreasing release potential
  - Identity as a serious aquarist involved in an aquarium community or social network
  - Getting fish/information from the internet or trade shows
  - Getting fish or information from local fish stores (55% of hobbyists identified w/ this)
  - Shared sentiment that nature “belongs to everyone”

It's Not About 'Dumping' Fish in the Nearest Body of Water

- Well-being of fish is the primary value
  - "Survival of the fittest" - shared sentiment of strongest fish have a right to survive
  - Inconveniences, such as driving long distances and fines do not serve as deterrents
  - To sell or trade is preferred but release is a close second
- Environmental impact of release is a secondary value
  - Releasers believed that adding new species could add to biodiversity and slow species extinctions

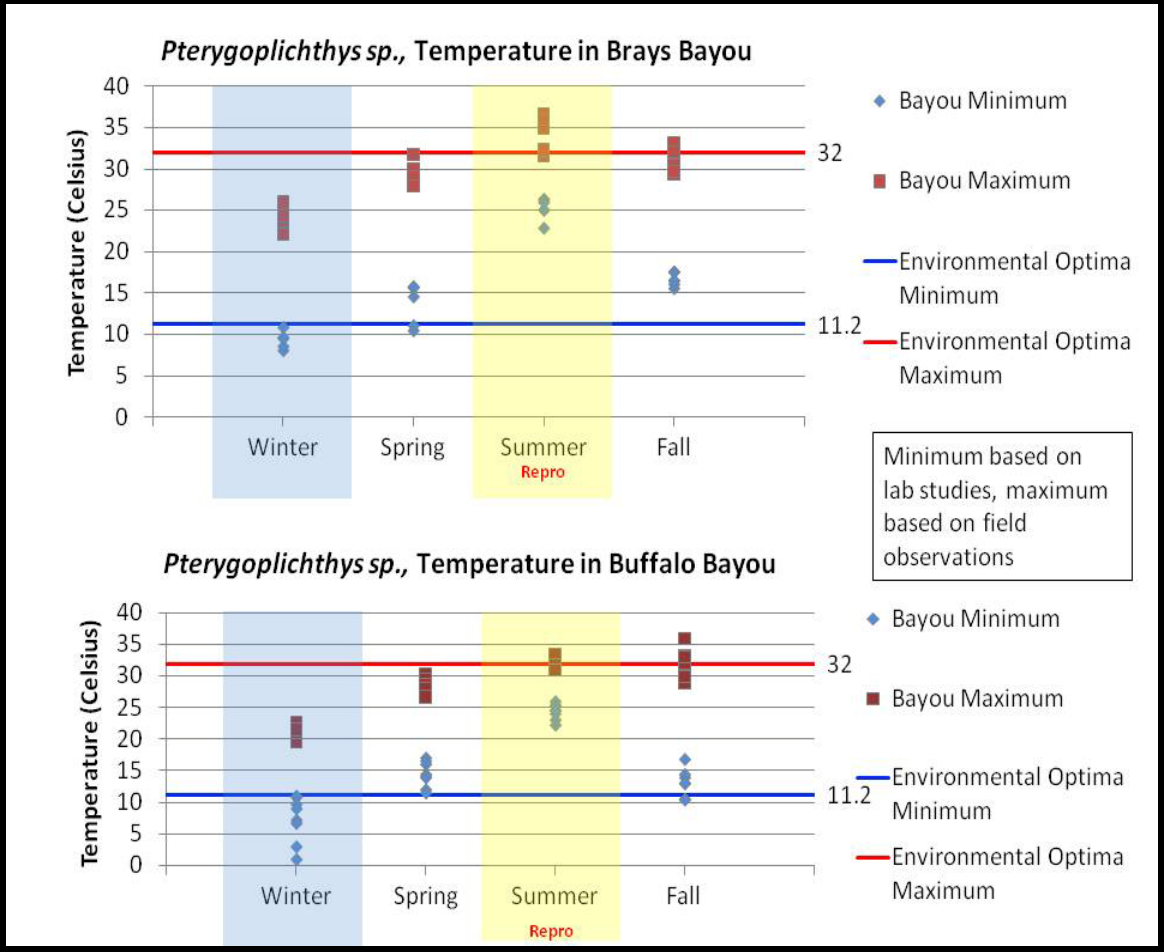
Survival & Reproduction Potential Test Species

Based on Availability Potential Data

Common Name	Scientific Name	Invasive/Exotic/Native
Armored catfish	*Hypostomus plecostomus / Pterygoplichthys sp.*	Invasive in Houston-Galveston Region
Red-bellied pacu	*Piaractus brachypomus*	Exotic in Houston-Galveston Region
Guppy	*Poecilia reticulata*	Exotic elsewhere in Texas
Jack Dempsey cichlid	*Cichlasoma octofasciatum*	Exotic elsewhere in the US
Bronze cory catfish	*Corydoras aeneus*	Exotic elsewhere in the US
Flavescent peacock	*Aulonocara stuartgranti*	Invasive potential unknown
Western mosquitofish	*Gambusia affinis*	Native to Houston-Galveston Region

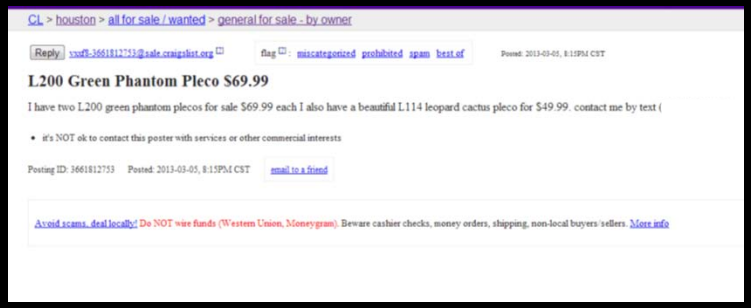
Compare Local Conditions to Species' Environmental Tolerances

- Conducted literature review of species characteristics
- Created species charts
- 20 years of TCEQ water quality data
- 14 stations
  - Buffalo Bayou
  - Brays Bayou
- Aligned environmental data with species tolerances



Invasion Potential Scorecard

- Quantitative Scoring
  - Yes/No responses & numerical values
  - Separate scores broken out for:
    - Availability – target outreach to suppliers
    - Release – target outreach to target consumers
    - Survival/reproduction –target information for eradication & control efforts
- Stakeholder input
  - Weighting & valuing unknowns
  - Link to management and education/ outreach strategies
  - Stakeholder workshop to be held late Spring 2013



Thank You

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