BIOLOGICAL INVASIONS

ALL TRICKS NO TREATS
Invasive Species of the Mississippi Gulf Coast

Mike Pursley
Mississippi Department of Marine Resources
What Are Invasive Species?

- Non-Native
- Rapid, Aggressive Growth
- Few natural predators
- Can be a plant, animal, parasite or pathogen
- Not all non-native species are invasive
How Invasive Species Harm The Environment

- 2nd Largest threat to native biodiversity
- Bring foreign animal/plant diseases and parasites
- Decreased fishing opportunity
- Economic losses to communities
- Harmful to human health
A Man Made Problem

- **Ecological Harm**
  - Threat to Endangered Species

- **High Cost**
  - $1.4 Trillion Damage Worldwide
  - $120 Billion in U.S.
  - Agriculture and Forestry Losses

- **Vectors of Disease**
  - West Nile Virus, Rat Lung Worm, Schistosomiasis
How Do New Aquatic Species Arrive?

- Ballast Water
- Hull Fouling
- Currents
- Marine Debris
- Aquarium Releases
- Aquaculture Escapes

Photo Credit: TAMU

Photo Credit: Lindsey Hoshaw
How Do New Terrestrial Invasive Species Arrive?

- Direct Introduction
- Accidental Introduction
- Equipment Relocation
- Horticultural Hitchhikers
- Pet Release
- Exotic Animal Escapes
Types of Invasive Species

Already Here:
- Chinese Tallow
- Asian Tiger Shrimp
- Cogon Grass
- Giant Apple Snail

Nearby:
- Silver Carp
- Hydrilla

Potential:
- Estimated 8.7 Million Species Living on Earth
Non-Invasive Exotic Plants
Invasive Species- Increasing Threat

- Florida reports about 15 new invasive species every year.
- South Mississippi has had three new invasive species in the last year and seven since 2009.

![Graph showing introduced species in Mississippi](image-url)
Invasive Export – American Bullfrog

- Introduced into over 40 countries
- Invasive in Europe, Asia, Africa, North America and South America
- Aggressive competitor
- Immune to a amphibian fungal disease they carry
WANTED
FOR EATING NATIVE
SPECIES!

AMERICAN BULLFROG

REWARD
MORE NATIVE SPECIES

studentposters.co.uk
Invasive Export - Red-Eared Slider

- 52 million exported
  1989-1997
- Now found on every continent except Antarctica
- Live for decades
- Out competes native turtles in Europe and Spain

Greg Hume/Wikimedia Commons
Invasive Export – Red Swamp Crawfish

- Native to Southern US and Mexico
- Commercial introductions
- Invasive in Europe, Asia, Africa, North America and South America
- Aggressive competitor
- Crayfish plague

Wally Gobetz – Flickr, Creative Commons
Procambarus clarkii
red swamp crawfish

- States in native range
- States with introductions
Salvinia

Common Salvinia

Giant Salvinia

Ted D. Center, USDA Agricultural Research Service

UGA0002133

Larry D. Hodge
Water Hyacinth
Chinese Tallow Tree

- In US Since 1700’s
- Popular Ornamental Tree
- Forms Dense Monoculture Forests
- Rapid Population Expansion Post-Katrina

- 500,000 Acres in TX and LA
- Seed Bank > 5 Years
- Biofuel Candidate
- Can purchase seeds on Ebay
Cogon Grass

- New infestations can appear as circular patches
- Federal Noxious Weed
- Very rapid expansion
- Difficult to control

Chris Evans, Illinois Wildlife Action Plan, Bugwood.org
Kudzu

- Planted for erosion control 1930’s
- Smothers trees
- Increasing 150,000 acres/year
- Vines root to the ground
- Roots 40% of biomass
Eurasian Watermilfoil

- Popular 1940’s aquarium plant
- Reproduces primarily by fragmentation
Alligator Weed

- South American emergent plant
- Accidently introduced 1894
- Forms dense mats
- Edible
- Can be found all over South Mississippi
Common Reed

- Invasive European sub-species
- Used for thatching, livestock feed and cellulose production
- Difficult to control
- Creates toxin harmful to native wetland plants

Jil Swearingen, USDI National Park Service, Bugwood.org
Torpedo Grass

- Intentional introduction
- Turf grass pest
- Salt tolerant
- Not cold tolerant

John D. Byrd, Mississippi State University, Bugwood.org
Wild Taro

- Native to Africa
- Arrived with slave trade
- Sold as ornamental plant
- Crowds out native species
Giant Applesnail

- Aquarium Pet
- Destructive plant-eating snail
- Can breathe in air and water
- High reproductive rate
- Host of rat lungworm parasite
- Live movement prohibited in MS
- Control options limited
Tilapia

- Aquaculture escape
- Avoids net capture
- Pascagoula River
- Reported since 1997
- Not cold tolerant
Feral Hogs

- In 39 States
- Estimated Population 5 Million
- Cost $1.5 Billion /Year
Nutria

- Intentional introduction – 1930’s
- Transplanted to control aquatic weeds – 1940’s
- Damage to marshes and levees first noticed – 1950’s
- Population explosion after fur price collapse
- 20,000 nutria found dead on MS beaches after Issac
Lionfish

- First US Sighting in 1985
- Super-Predator, no Natural Enemies
- Venomous Spines
- Fast rate of reproduction
- Eggs drift with current to infest new areas
- Can live at depths of up to 980 feet

Photo Credit: Rebekah D. Wallace
Lionfish

- Territorial with densities of 1,100 fish/acre
- Infestations reduce reef fish populations by 90%
- Full control not considered feasible
Lionfish Invasion
Asian Tiger Shrimp

*Penaeus monodon*

- Eats native shrimp and shellfish
- Possibility of disease introduction
- Potential to disrupt reef food chain
- Large size, fast growth rate
- First MS sighting in 2009
- Appear to be reproducing in Gulf
- Found at depths of up to 300 feet
Asian Tiger Shrimp Sightings

1999 - 2004

2009

2014
Australian White Spotted Jellyfish

- First appeared in great numbers in 2000
- Can weight up to 25 lbs in Gulf of Mexico
- Eat eggs and larvae of fish
- Filters 13,000 gallons seawater/day
- Potential to disrupt reef food chain
- Foul fishing gear and nets
- Cause of “jellyfish blooms” unknown

Photo Credit: Dan Martin/Dauphin Island Sea Lab
Future Threat: Silver Carp

Have You Seen This Fish?

Silver Carp (*Hypophthalmichthys molitrix*)

- Silver carp are invasive fish possibly spreading into Coastal Mississippi waters due to recent flood events.
- Adults may be more than 60 lbs. in weight and 4 ft. in length.
- May jump out of water when disturbed by boat motors.

Report All Sightings With Location

REPORT.INVASIVE@DMR.MS.GOV
(228) 374-5000

Aquatic Invasive Species Coordination, Assessment and Control Plan Implementation
Mississippi Department of Marine Resources

This conservation project was funded with qualified outer continental shelf oil and gas revenues by the Coastal Impact Assistance Program, Bureau of Ocean Energy Management, Regulation and Enforcement, U.S. Department of the Interior through a grant award to the Mississippi Department of Marine Resources.
Spread of Silver Carp

Source: USGS – NAS Database
Future Threat: Hydrilla

- Aquarium escape from Asia
- Millions spent annually in FL on “maintenance control”
- Grows in all light and nutrient conditions
- Thrives in up to 7% salinity
- Highly cold tolerant
Current Distribution: Hydrilla
Future Threat: Tegu Lizards

- Grow to 4 feet long
- Eats anything
- Prefers bird and reptile eggs
- Damaging teeth and claws
- More cold tolerant than Burmese python

Joseph LaForest, University of Georgia, Bugwood.org
Future Threat – Python Snakes

- Grow to 23 feet long / 200 lbs.
- No natural enemies
- Federally listed as injurious wildlife
- Destroying ecology of the everglades
- Recent sighting in Ocean Springs

Lori Oberhofer, National Park Service, Bugwood.org
Skip Snow, National Park Service, Bugwood.org
Future Threat - Orange Cup Coral

- Native to Puerto Rico
- Displaces native corals
- Not dependant on photosynthesis
- Grows on oil and gas production platforms
- Massive expansion predicted
- Manual removal only known control

Photo Credit: Hickerson/FGBNMS
DEADLY SEA-ALGAE RAGES AGAINST COAST!

KILLER ALGAE: THE MEDITERRANEAN CLONE

Starring CAULERPA TAXIFOLIA Previously Filmed in CALIFORNIA

Original Plant Photography by RACHEL WOODFIELD of MERKEL & ASSOCIATES, INC., INVASIVE.ORG

AN ALIEN PLANT WORKING GROUP MOTION PICTURE • WWW.NPS.GOV/PLANTS/ALIEN
Killer Algae- Clone of *Caulerpa taxifolia*

- Man-made genetic mutant
- Popular aquarium plant
- Gulf of Mexico ideal habitat
- Contains poison toxic to fish
- Reproduces by fragmentation
- Able to completely cover reef structures
- Tolerant of cold water and depths of up to 100 feet
- Displaces native species
How To Help

DON'T LET IT LOOSE!
It's bad for your pets. It's bad for the environment.

DISPOSE OF CLASSROOM PLANTS AND ANIMALS PROPERLY!
What Can We Do?

- Spear Fishing
- Lionfish Rodeos
- Report Sightings
STOP AQUATIC HITCHHIKERS!

PROTECT NATIVE FISH HABITAT

When you leave a body of water:

- **Remove** any visible mud, plants, fish or animals before transporting equipment.
- **Eliminate** water from equipment before transporting.
- **Clean** and dry anything that comes into contact with water (boats, trailers, equipment, clothing, dogs, etc.).
- **Never** release plants, fish or animals into a body of water unless they came out of that body of water.

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Help Spread the Word!

INVASIVE LIONFISH

REPORT ALL SIGHTINGS WITH LOCATION

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(228) 374-5000

Mississippi Department of Marine Resources

http://www.dmr.ms.gov
Help Spread The Word!

Black and White Banding on Tail

INVASIVE
ASIAN TIGER SHRIMP

Please Report All Sightings With Location
Large Size - Can Grow to Over 10" in Length
(228) 374-5000
REPORT.INVASIVE@DMR.MS.GOV

Mississippi Department of Marine Resources

http://www.dmr.ms.gov
BUY IT WHERE YOU BURN IT.

dontmovefirewood.org
Learn About Invasive Species and Report Sightings
Report Invasive Species

report.invasive@dmr.ms.gov

228 374-5000

- Include a picture
- GPS coordinates or location information