

S.A.L.T.

SHARKS AQUACULTURE LIFE TRAINING

Ornamental Fish Culture



**2018 Summer SALT Schedule:**  
**Introduction to Florida Aquaculture Commodities**

All sessions are scheduled on Mondays from 10 – 11:30 am  
and will be held at the FWC Marine Lab conference room.

June 18<sup>th</sup> – Recirculating Aquaculture Systems

Meet with Brian Catanzaro, Pentair Aquatic Ecosystems, Apopka, FL

Website: <https://pentairaes.com>

June 25<sup>th</sup> – Molluscan Shellfish Aquaculture

Meet with Leslie Sturmer, UF/IFAS Shellfish Extension, Cedar Key, FL

Website: <http://shellfish.ifas.ufl.edu>

July 2<sup>nd</sup> – No session due to holiday week

July 9<sup>th</sup> – *Any suggestions for topic?*

July 16<sup>th</sup> – Aquatic Plant Culture

Meet with Brandon McLane, Florida Aquatic Nurseries, Davie, FL

Website <http://www.floridaaquatic.com/>

July 23<sup>rd</sup> – Food Fish Culture

Meet with Geno Evans, Evans Fish Farm, Pierson, FL

Website: <http://evansfishfarm.com/>

July 30<sup>th</sup> – Ornamental Fish Culture

Meet with Eric Cassiano, UF/IFAS Tropical Aquaculture Lab, Ruskin, FL

Website: <http://tal.ifas.ufl.edu>

August 6<sup>th</sup> – Alligator and Reptile Culture

Meet with Allen Register, Gatorama, Palmdale, FL

Website: <http://gatorama.com/>

# Florida Aquaculture Ornamental Fish



Produced by the Division of Aquaculture - 2017



# *Where do aquarium fish come from?*



Some are collected  
from the wild...

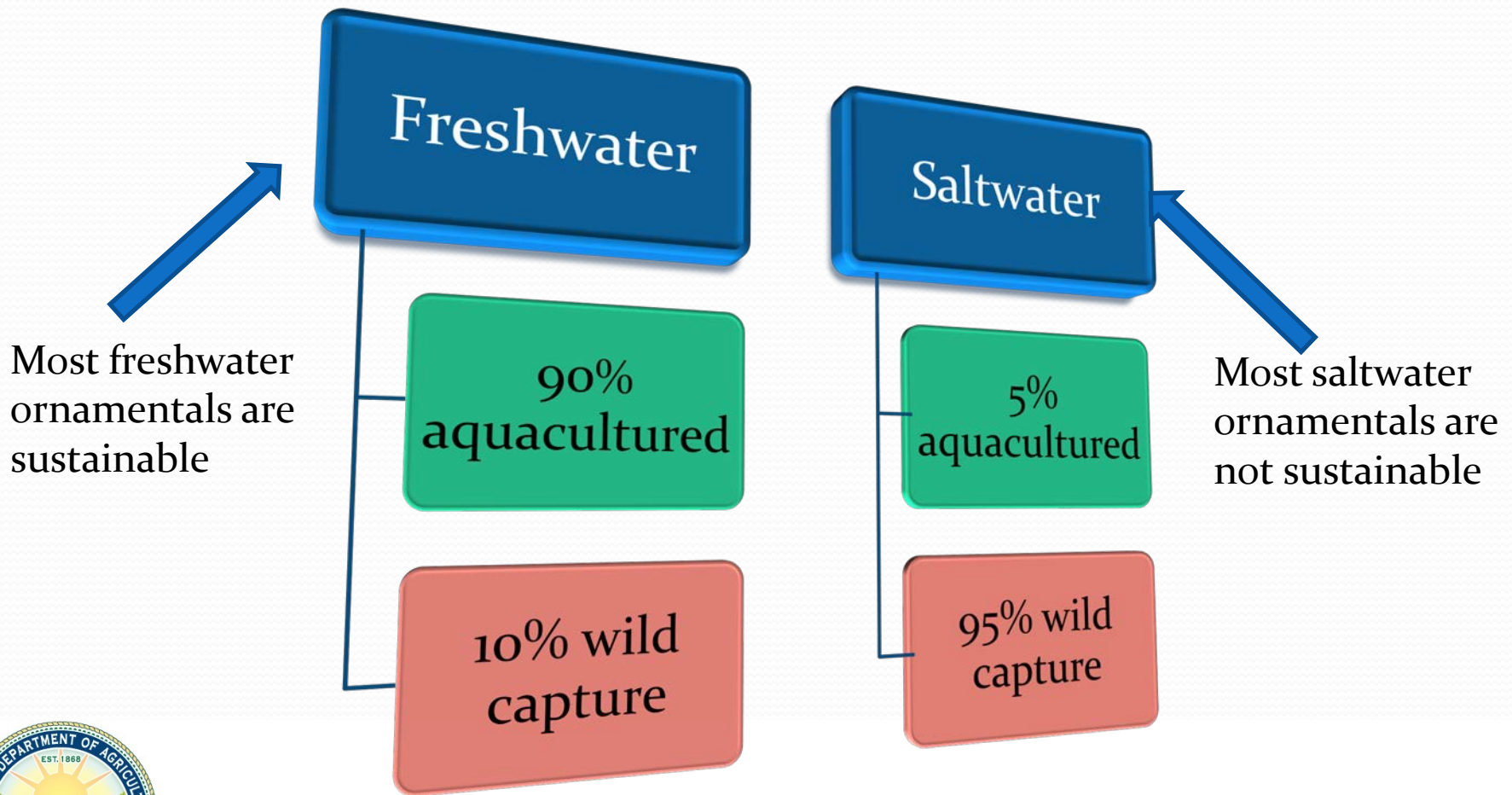


Some are from  
farms...





# *Where do aquarium fish come from?*



*Do you have a freshwater aquarium at home?*



If you do, odds are you the fish in your tank were produced by an aquaculture farm in Florida!



# Where does the U.S. import fish from?

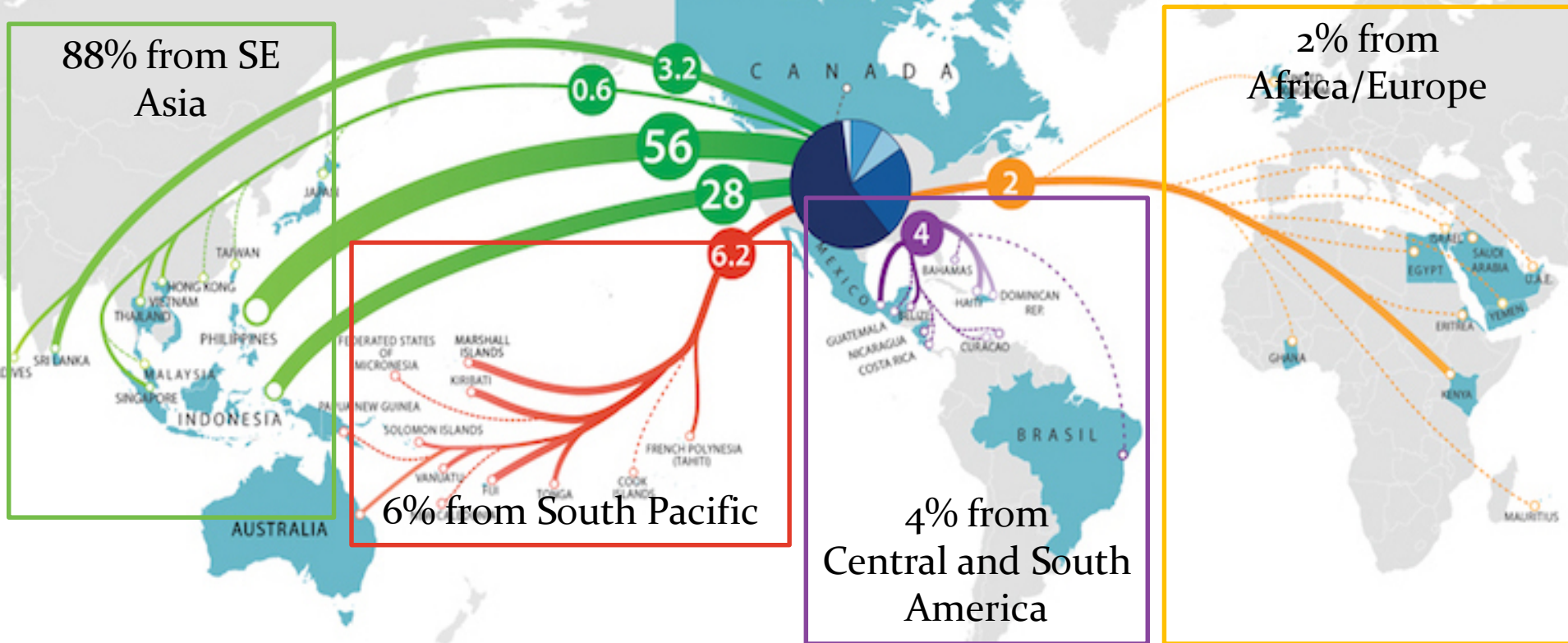


Photo credit: Andrew Rhyne, Roger Williams University

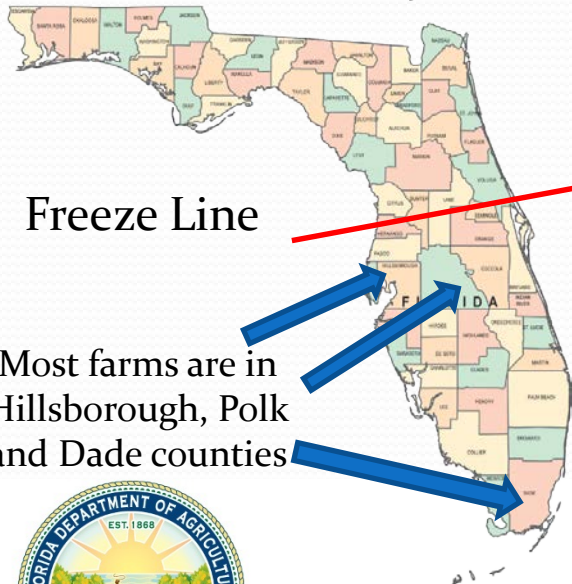




# Florida's Ornamental Industry

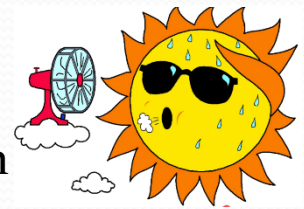
*Florida is by far the biggest ornamental producer in the nation!*

- 127 farms in Florida (2013) – 45% of U.S. industry!
- 2013 sales in Florida = \$ 27 million
- 95% of ornamentals produced in U.S. come from Florida
- ~500 varieties of freshwater fish produced



## Why Florida?

- Warm climate ideal for tropical fish
- Proximity to ports and airports
- Local infrastructure – feed/supplies

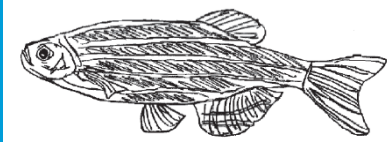




## Minnows

Family: *Cyprinidae*

Over 2000 species



*zebra danio*

### Common Species in FL

- Barbs
- Danios
- Goldfish
- Koi
- Rasboras
- Freshwater sharks

### Reproduction:

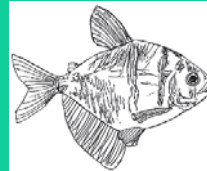
Egg layers/Broadcast spawner

Feeding: Omnivore

## Tetras

Family: *Characidae*

Over 900 species



*black tetra*

### Common Species in FL

- Neon tetra
- Black tetra
- Pacu
- Lemon tetra
- Mexican tetra
- Firehead tetra

### Reproduction:

Egg layers/Broadcast spawner

Feeding: Omnivore

## Armored Catfish

Family: *Callichthyidae*

Over 130 species



*leopard corydora*

### Common Species in FL

- Leopard corydora
- Bronze corydora
- Panda corydora
- Hoplo catfish
- Tons of color variants

### Reproduction:

Adhesive eggs/bubble nests

Feeding: Insectivore

# Commonly Cultured Freshwater Fish Groups

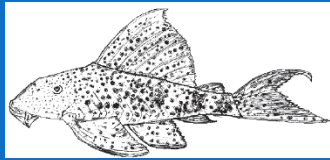


Photo credit: UF-IFAS Publication Circular #54

# Suckermouth Catfish

Family: *Loricariidae*

Over 550 species



*Pleco catfish*

## Common Species in FL

- Common pleco
- Bristle-nose pleco
- Sailfin pleco

## Reproduction:

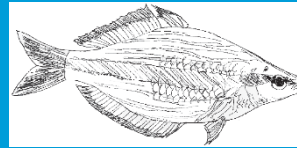
Adhesive eggs/Male guards eggs

**Feeding:** Algae/insects

# Rainbowfishes

Family: *Melanotaeniidae* etc.

53 species in 6 genera



*banded rainbowfish*

## Common Species in FL

- Red rainbowfish
- Australian rainbowfish
- Boeseman's rainbowfish
- Neon dwarf rainbowfish

## Reproduction:

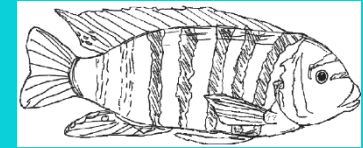
Adhesive eggs/broadcast spawner

**Feeding:** Insects/Crustaceans

# Cichlids

Family: *Callichthyidae*

Over 1500 species



*zebra cichlid*

## Common Species in FL

- Angelfish
- Discus
- Oscar
- Jewel cichlid
- Mbuna cichlid
- Kribs cichlid

## Reproduction:

Parental care/mouth brooders

**Feeding:** Very diverse

# Commonly Cultured Freshwater Fish Groups



# Types of Ornamentals

Ornamental fish are often divided by culture methods

3 main groups

Freshwater Egglayer  
e.g. *Cichlids*



Freshwater Livebearers  
e.g. Swordtails



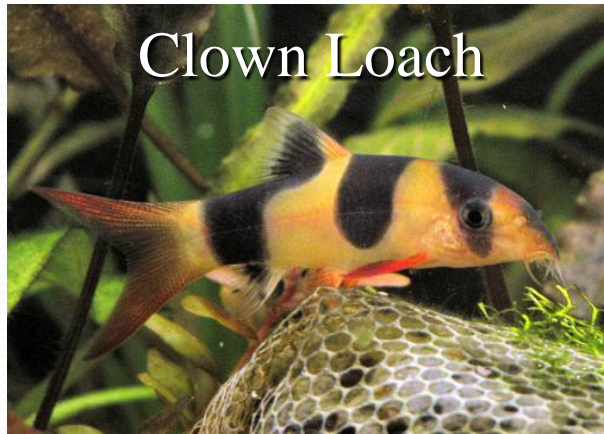
Marine Species  
e.g. clownfish





# Egglayers Culture

Almost 70% of land used for tropical fish culture in Florida is for egglayers.  
61% of U.S. tropical sales are from egg-laying, freshwater ornamental species.



Clown Loach



Neon Tetras



Kissing Gouramies



Rainbow Shark





# Cichlid Culture Techniques

African cichlids are a great egglayer example.  
Florida is the #1 producer of cichlids in the world!



*African cichlid are highly diverse, with 2000-3000 species globally.*



# Cichlid Culture Techniques

A typical culture system for cichlids uses concrete, glass or plastic tanks.



*This farm uses burial vaults as tanks for raising cichlids!*





# *Did you know?*

*Most cichlids are mouthbrooders!*



*Adults hold their eggs and LIVE young in their mouths until they are large enough to swim freely!*



# Cichlid Culture Techniques

The diversity of shape and coloration found in cichlids makes them very valuable, freshwater fish.



*Wholesale prices range from \$2 to \$30 per fish!!*

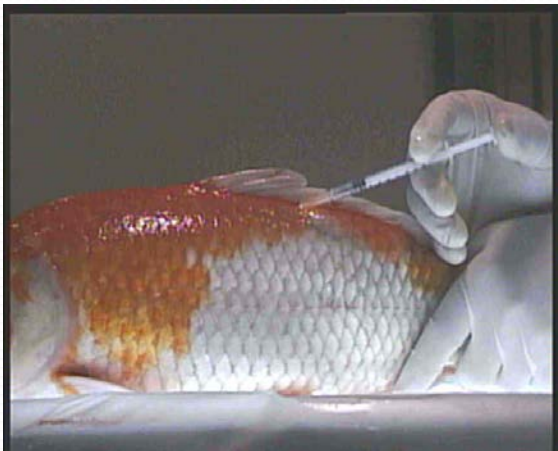
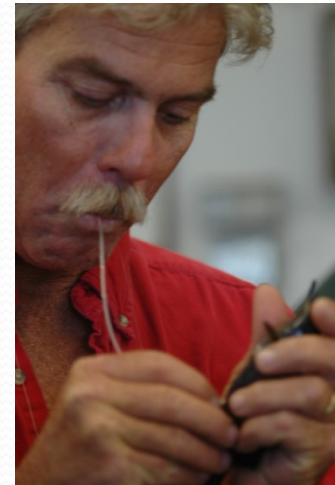
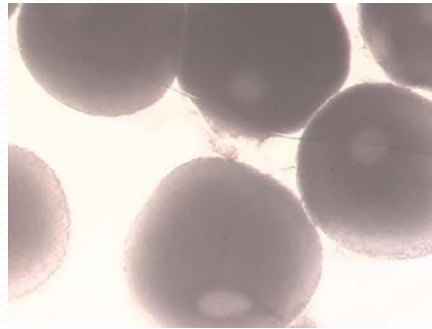


# Induced Spawning

- Check the eggs

Inject the fish

When Female Ovulates, strip the eggs and sperm into a bowl...



# Livebearer Culture Techniques

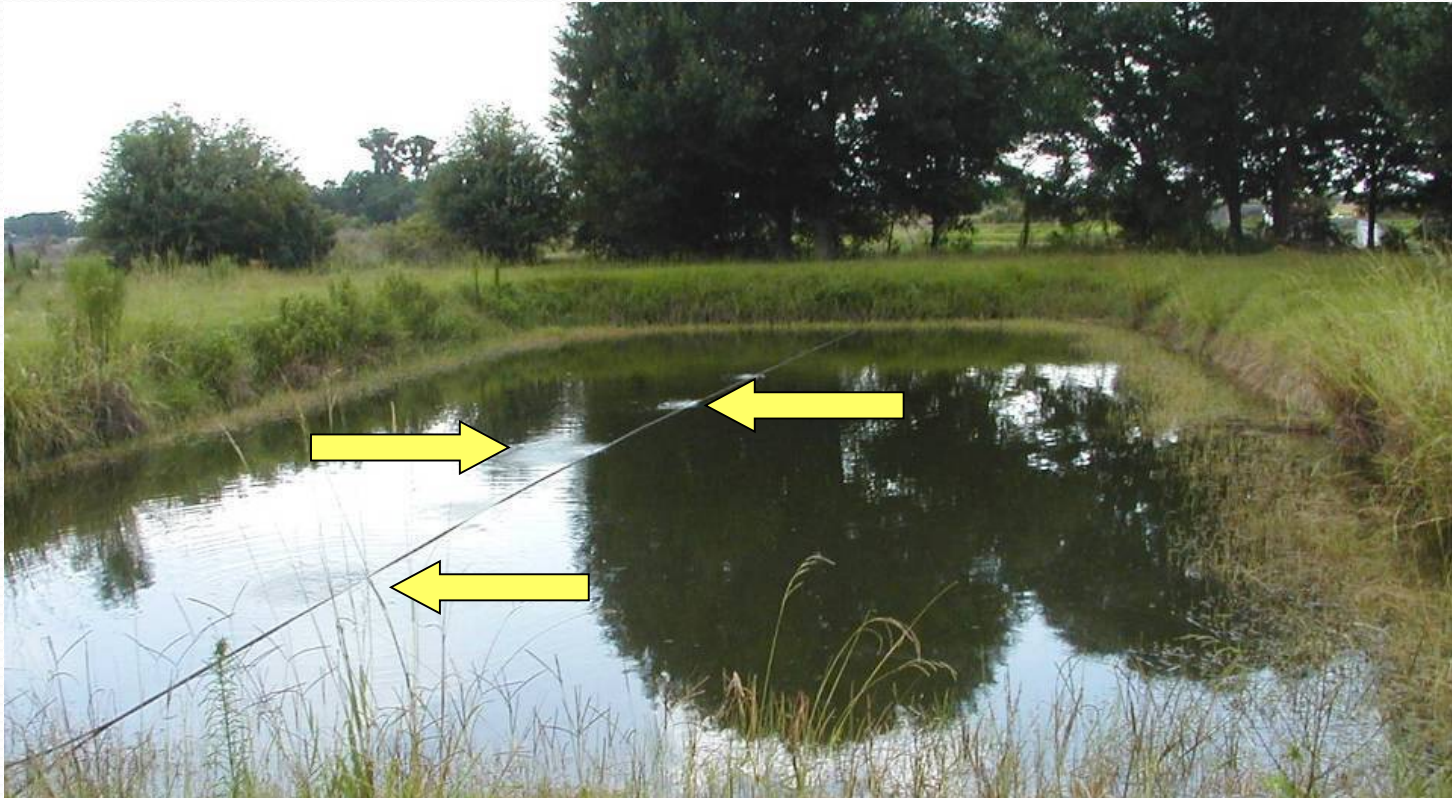
- Typical livebearer farm has 50-300+ small (~1/10<sup>th</sup> acre) earthen ponds
  - Spawning occurs naturally in ponds
  - Natural pond productivity feeds fish (fertilizer often added)
  - Supplemental feeding rates vary
    - Depends on species, time of year and pond conditions





# Livebearer Culture Techniques

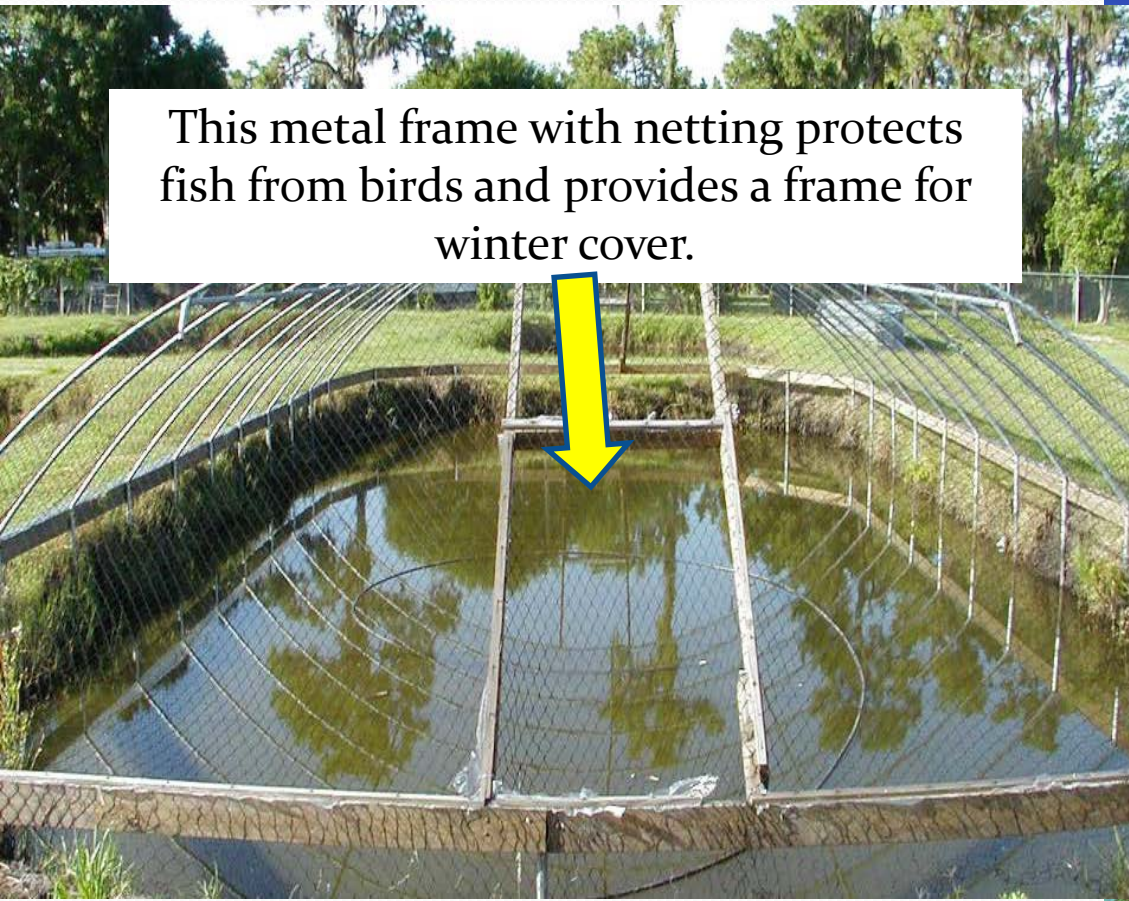
Supplemental aeration decreases stress and improves pond productivity.





# Livebearer Culture Techniques

This metal frame with netting protects fish from birds and provides a frame for winter cover.



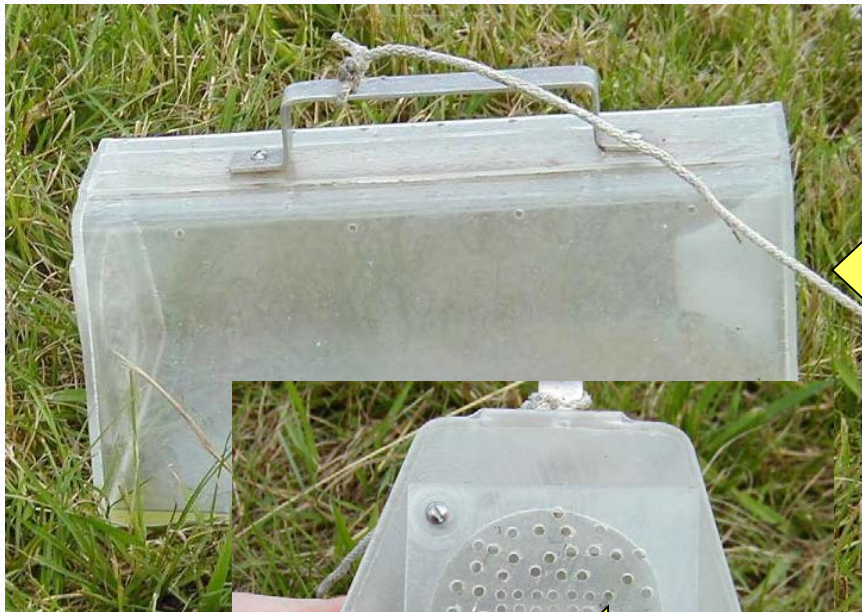
Some ponds are covered with plastic during the winter to keep water temperatures warm.





# Livebearer Culture Techniques

Harvest involves trapping or seine netting ponds.



Fish enter trap  
through funnel  
entrance

They are removed  
through a trap door.



# Livebearer Culture Techniques

Harvest involves trapping or seine netting ponds.



Some ponds are harvested all at once with a seine net.





# Fish Shipping Techniques

Fish are “graded” or sorted by size as they grow to a marketable size.



Fish are placed in plastic bag with water and oxygen, then placed in insulated boxes for shipping.



Tropical fish are the #1 air cargo item passing through Tampa International Airport!

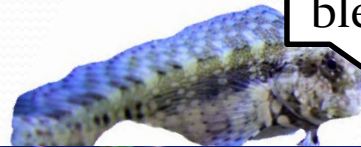
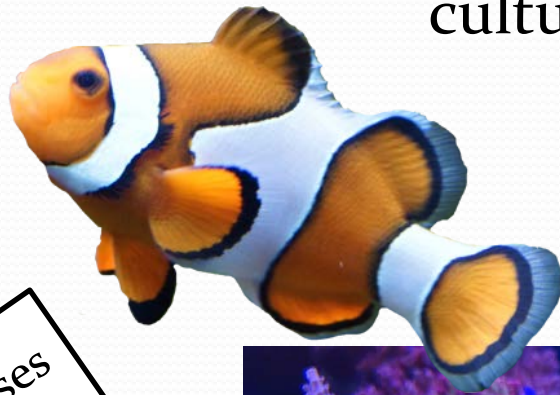


Commercial fish grader

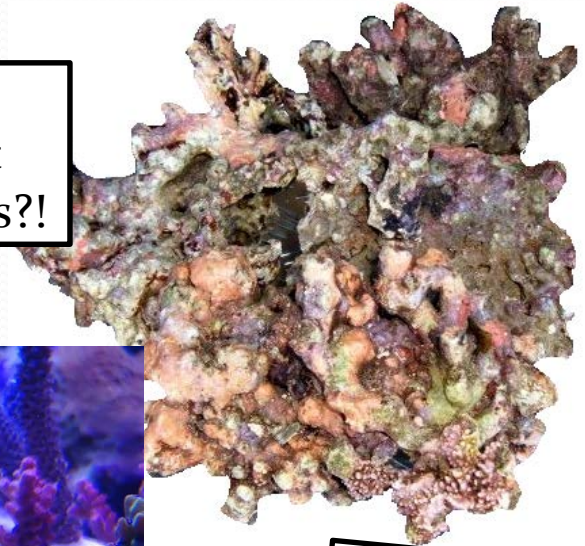


# Marine Culture Techniques

Primarily clownfish, dottybacks, corals / live rock are cultured in Florida.



What about blennies?!



Seahorses too!



Don't forget shrimp!





# Clownfish Culture



Clownfish are relatively easy to spawn in captivity.

Male and females pair-off and are monogamous during breeding.



Once hatched, larvae are moved to a nursery tank for grow-out to a marketable size.



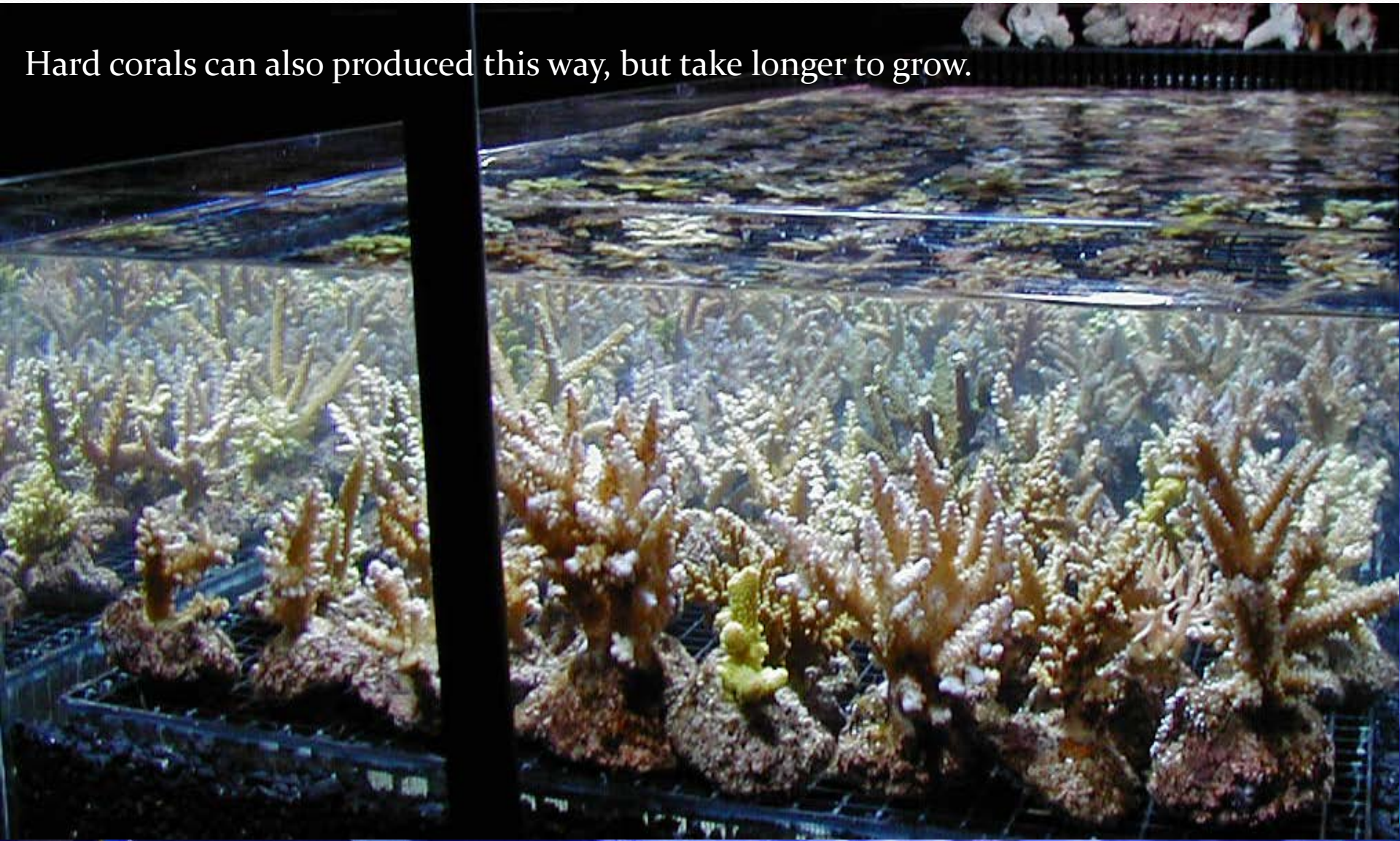
Clownfish eggs are adhesive and cling well to clay pots.





# Coral Culture

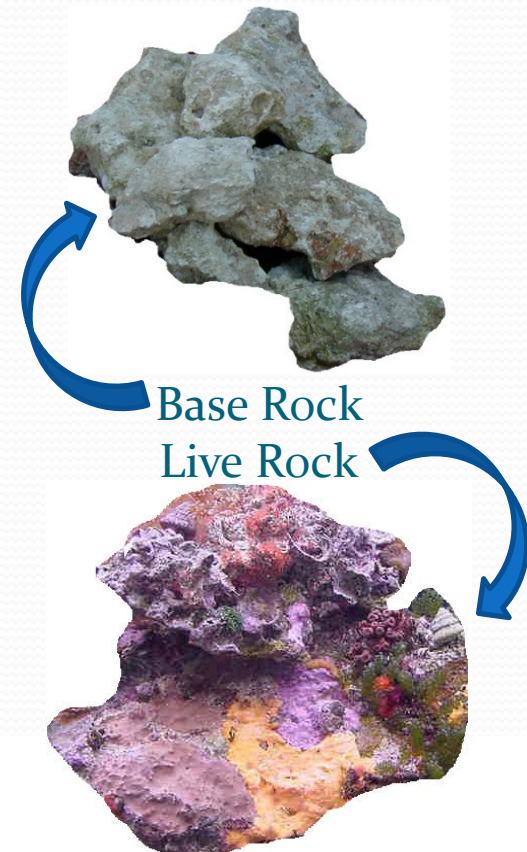
Hard corals can also produced this way, but take longer to grow.





# Live Rock Culture

- Live rock is simply porous rock, often limestone, that is cured in a marine environment.
- “Curing” is the process of base rock being colonized by thousands of marine algae and invertebrates.





# Conclusion

- Florida is the largest ornamental producer in the U.S.
- Ornamental aquaculture is sustainable and conserves marine ecosystems by reducing wild capture.

