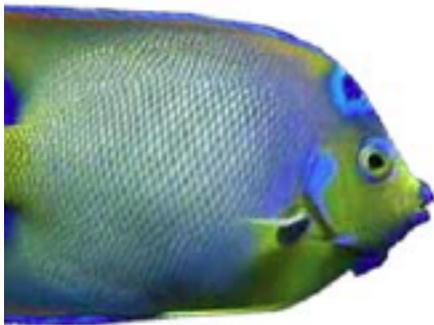




# Introducing Florida Aquaculture

## Training Guide



**SART Training Media**



# Introducing Florida Aquaculture Training Guide

## **Prepared in 2006 by:**

**Kathleen Hartman, DVM, PhD**

Aquaculture Epidemiologist

USDA - APHIS - Veterinary Services

## **Denise Petty, DVM**

Assistant Professor, Large Animal Clinical Sciences

College of Veterinary Medicine

University of Florida, Gainesville

## **Charles M. Brown**

Coordinator for Information/Publication Services

Agriculture and Biological Engineering Department

University of Florida, Gainesville

## **Carol J. Lehtola**

Associate Professor

Agriculture and Biological Engineering Department University

of Florida, Gainesville

## **Updated in 2018 by:**

**Kathleen Hartman, D.V.M., Ph.D.**

Aquaculture Program Leader

USDA-APHIS-Veterinary Services

## **Denise Petty, D.V.M.**

Assistant Professor

University of Florida, College of Veterinary Medicine-LACS

Owner of North Florida Aquatic Veterinary Services

## **Katharine Starzel, D.V.M.**

Field Operations (FiOps), District 1 (D1)

USDA-APHIS- Veterinary Services

## **Acknowledgments:**

**Craig Watson**

Tropical Aquaculture Laboratory

University of Florida, Gainesville

## **Florida Tropical Fish Harms Association**

Copyright by Florida Department of Agriculture and Consumer Services Published March 2005

**SART Training Media** are available for download from the Florida SART Web site

<[www.flstart.org](http://www.flstart.org)>.

---

## **Contents**

<b>About Florida SART</b>	<b>1</b>
<b>Specific Learning Objectives</b>	<b>2</b>
<b>Resources</b>	<b>3</b>
<b>Training Slides</b>	<b>Appendix A</b>

---

## **About Florida SART**

- SART is a multi-agency coordination group.
- SART is made up of over 25 partner agencies (state, federal and non-governmental organizations).
- SART provides preparedness and response resources for Emergency Support Function 17 [(ESF 17) Animal and Agricultural Issues].
- SART statutory authority
  - State Emergency Management Act (Section 252.3569, Florida Statutes)

### **SART Mission**

Empower Floridians through training and resource coordination to enhance all-hazard disaster planning and response for animal and agricultural issues.

### **SART Goals**

- Support the county, regional and state emergency management efforts and incident management teams.
- Identify county resources available for animal and/or agricultural issues.
- Promote the cooperation and exchange of information of interested state, county and civic agencies.

---

## Specific Learning Objectives

At the end of this training module, participants will be able to:

- Describe why aquaculture is a viable industry in Florida
- List and discuss characteristics of Florida aquaculture relating to water use, farm size, commodities and commodity value
- Discuss United States aquaculture imports, exports and market flows
- Name the collaborating agencies involved with the national and state aquatic animal health plans and describe their collaborative roles
- Identify key resources that participants can easily access for more information

---

## Resources

The following are sources of additional information about the subjects mentioned in this introduction.

**Florida Division of Emergency Management**

<http://www.floridadisaster.org>

**United States Department of Agriculture**

<http://www.usda.gov>

**Florida Department of Agriculture and Consumer Services**

<https://www.freshfromflorida.com/>

**Florida Tropical Fish Farms Association**

<http://www.ftffa.com>

**Florida Division of Aquaculture**

<https://www.freshfromflorida.com/Divisions-Offices/Aquaculture>

**eXtension Freshwater Aquaculture Community**

<https://articles.extension.org/pages/58798/freshwater-aquaculture-community-page>

**USDA APHIS**

<https://www.aphis.usda.gov/aphis/home/>

**Safety for Fish Farm Workers, a video in English and Spanish, available from the National Ag Safety Database (NASD)**

<http://nasdonline.org/search.php?query=safety+for+fish+farm+workers>

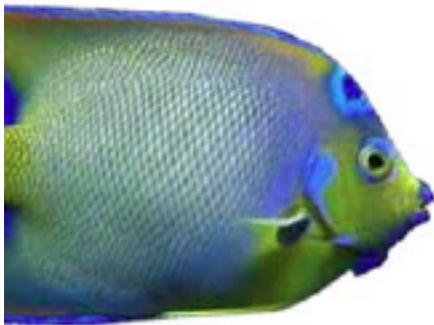
**Spawn, Spat, and Sprains book by the Alaska Sea Grant College Program available in entirety for a fee via the following link**

<https://seagrant.uaf.edu/bookstore/pubs/AN-17.html>



# Introducing Florida Aquaculture

## Appendix A: Training Slides



**SART Training Media**



---

---

---

---

---

---

---

---

## Introducing Florida Aquaculture



State Agricultural Response Team

2

---

---

---

---

---

---

---

---

## Introducing Florida Aquaculture

Prepared by:

**Kathleen Hartman, D.V.M., Ph.D.**  
Aquaculture Epidemiologist, USDA-APHIS-VS

**Denise Petty, DVM**

Assistant Professor  
Large Animal Clinical Sciences  
College of Veterinary Medicine  
University of Florida, Gainesville

**Charles M. Brown**

Coordinator for Information/Publication Services  
Agriculture and Biological Engineering Department  
University of Florida, Gainesville

**Carol J. Lehtola**

Associate Professor  
Agriculture and Biological Engineering Department  
University of Florida, Gainesville

Updated December 2018 by:

**Kathleen Hartman, D.V.M., Ph.D.**  
Aquaculture Program Leader  
USDA-APHIS-Veterinary Services

**Denise Petty, D.V.M.**

Assistant Professor  
University of Florida, College of Veterinary Medicine-  
LACS  
Owner of North Florida Aquatic Veterinary Services

**Katharine Starzel, D.V.M.**

Field Operations (FIOps), District 1 (D1)  
USDA-APHIS- Veterinary Services



State Agricultural Response Team

3

---

---

---

---

---

---

---

---

## Acknowledgements

- **Craig Watson**  
Tropical Aquaculture Laboratory,  
University of Florida
- **Florida Tropical Fish Farms Association**



---

---

---

---

---

---

---

---

## Learning Objectives

- Describe why aquaculture is a viable industry in Florida
- List and discuss characteristics of Florida aquaculture relating to water use, farm size, commodities and commodity value
- Discuss United States aquaculture imports, exports and market flows
- Name the collaborating agencies involved with the national and state aquatic animal health plans and describe their collaborative roles
- Identify key resources that participants can easily access for more information



---

---

---

---

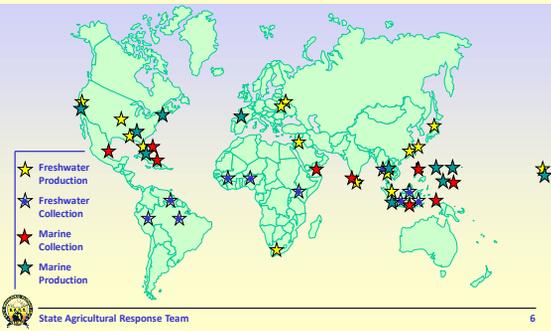
---

---

---

---

## Production and Collection



---

---

---

---

---

---

---

---

## Why Florida?

### Resources are here!

- Infrastructure
- Climate
- Water



---

---

---

---

---

---

---

---

## Tropical Fish Farms in Florida



---

---

---

---

---

---

---

---

## Aquaculture Land Use



- 127 farms with sales
- 7-8 ponds per acre of land
- 131.1 acres of water
- Average 1.2 acres of water per farm



---

---

---

---

---

---

---

---

## Water Use

### Ponds

- Small (100,000-300,000 liters/pond)
- Mostly self-filling, water table pond



---

---

---

---

---

---

---

---

## Water Use



### Recirculating Systems

- Reuse system
- Require filtration



---

---

---

---

---

---

---

---

## Florida Freshwater Ornamental Production



- Produced in tanks and ponds
- Over 400 varieties in production
- Livebearer and egg-layer categories
- Many compete with wild-caught equivalents



---

---

---

---

---

---

---

---

## Florida Saltwater Ornamental Production



Limited to ~ 4 dozen species, all with strong parental care, and small spawn size



Requires controlled, indoor facilities except for live rock



Competes head-on with wild caught specimens



---

---

---

---

---

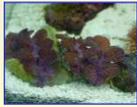
---

---

---

## Ornamental Invertebrate Culture

- Live Rock still dominates
- "Value Added" Live Rock
- Tank-raised corals ("soft" and "hard")



---

---

---

---

---

---

---

---

## Live Rock and Open Water Sites



- Expanded initially after ban on wild harvest, but more indoor facilities have since been added.
- Gulf of Mexico and Florida Keys
- State and federal leases



---

---

---

---

---

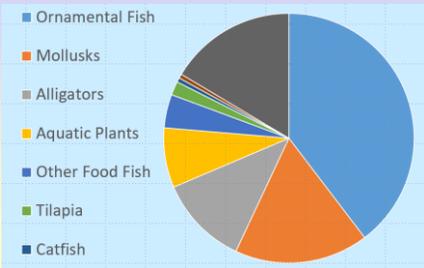
---

---

---



## Industry Statistics: Percent 2013 Florida Farm Gate Value




---

---

---

---

---

---

---

---

---

---

## U.S. Ornamental Fish Imports & Exports




---

---

---

---

---

---

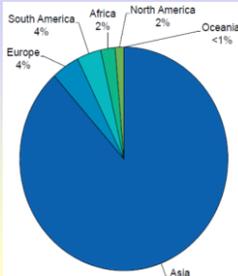
---

---

---

---

## Aquaculture Production by Continent, 2012




---

---

---

---

---

---

---

---

---

---

## Industry/Commodity Group

### • Crop Groups

- Freshwater and saltwater aquatic ornamental animals
- Bait fish
- Freshwater and saltwater food aquatic animals
  - Shrimp and clams
- Sport fish

### • Commodity

- Producers/farmers
- Wholesalers
- Retailers
- Hobbyist



---

---

---

---

---

---

---

---

## Worldwide Markets



---

---

---

---

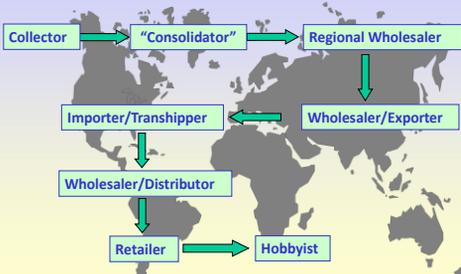
---

---

---

---

## Market Flow Chart for Wild-Caught Ornamentals



---

---

---

---

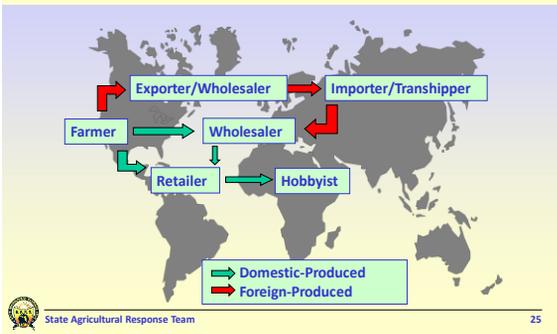
---

---

---

---

## Market Flow Chart for Farm-Raised Ornamentals




---

---

---

---

---

---

---

---

---

---

---

---

## Interagency Collaboration

- Roles of different agencies
  - Private stakeholders
  - University/college
  - State
  - Federal

---

---

---

---

---

---

---

---

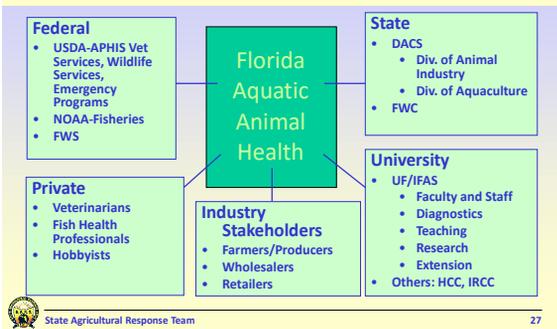
---

---

---

---

## Interagency Collaboration




---

---

---

---

---

---

---

---

---

---

---

---

## Private and Stakeholder Role

- **Who?**
  - Farmers/Producers
  - Wholesalers
  - Retailers
- **Advisory committees**



---

---

---

---

---

---

---

---

## University-College Role

- **University of Florida**
  - Extension Programs and Diagnostics
    - Facilities
      - Tropical Aquaculture Laboratory
      - Fisheries and Aquatic Sciences
    - Non-regulatory
    - Education-oriented
  - Research
- **HCC, IRCC**



---

---

---

---

---

---

---

---

## State Role

- **Department of Agriculture and Consumer Services**
  - Division of Animal Industry
  - Division of Aquaculture



---

---

---

---

---

---

---

---

## Division of Animal Industry

- **Mission:** To protect Florida's agriculture, including aquaculture, industries
- Enforce animal health regulations
- Protect the state from animal pests and diseases
- **Players:**
  - State veterinarian
  - Bureau of Diagnostic Laboratories
    - Test development
    - Perform diagnostic tests
  - Bureau of Animal Disease Control
    - Provide assistance to farmers to control diseases of concern



---

---

---

---

---

---

---

---

## Division of Aquaculture

- **Mission includes:**
  - Enhance the growth of aquaculture while protecting Florida's environment
  - Coordinate and assist the development of aquaculture
  - Provide a means of communication between the aquaculture industry and the regulatory agencies through the Aquaculture Review Council and the Aquaculture Interagency Coordinating Council
- Issue aquaculture certificates that identify aquaculture producers and aquaculture products (i.e., BMPs)
- State aquaculture plan



---

---

---

---

---

---

---

---

## State Role

Florida Fish and Wildlife Conservation Commission

- Recreational fisheries
- Commercial fisheries
- Stock enhancement
- Habitat issues
- Wild stock assessment
- Wild fish kill investigations
- Research and education
- Prohibited and restricted species list
- And much more...



---

---

---

---

---

---

---

---

## Federal Role

USDA-APHIS, Wildlife Services



- APHIS - Animal and Plant Health Inspection Service
- WS - Predator control on aquaculture farms



---

---

---

---

---

---

---

---

## Federal Role

USDA-APHIS, Veterinary Services

- Lead agency for aquaculture health in the United States
- International exportation of animals and animal products
- Laboratory approval
- National Aquatic Animal Health Plan



---

---

---

---

---

---

---

---

## The National Aquatic Animal Health Plan's Mission Statement

Develop and implement a national aquatic animal health plan (NAAHP) for aquaculture in partnership and cooperation with industry, regional organizations, state, local, and tribal governments, and other stakeholders



---

---

---

---

---

---

---

---

## NAAHP Objectives

- Improve the health and productivity of cultured aquatic animals
- Facilitate safe interstate and international commerce
- Ensure availability of diagnostic, inspection, and certification services
- Protect cultured and wild aquatic animals from foreign diseases
- Define the roles and responsibilities of private industry and government in health management



---

---

---

---

---

---

---

---

## Key Resources

- Florida Department of Community Affairs, Division of Emergency Management's Emergency Response Team  
<http://www.floridadisaster.org>
- United States Department of Agriculture  
<http://www.usda.gov>
- Florida Department of Agriculture and Consumer Services  
<https://www.freshfromflorida.com/>



---

---

---

---

---

---

---

---

## Key Resources

- Florida Tropical Fish Farms Association  
<http://www.ftffa.com>
- Florida Division of Aquaculture  
<https://www.freshfromflorida.com/Divisions-Offices/Aquaculture>
- eXtension Freshwater Aquaculture Community  
<https://articles.extension.org/pages/58798/freshwater-aquaculture-community-page>
- USDA APHIS  
<https://www.aphis.usda.gov/aphis/home/>



---

---

---

---

---

---

---

---

## Key Resources

- **Safety for Fish Farm Workers**, a video in English and Spanish, available from the National Ag Safety Database (NASD)  
<http://nasdonline.org/search.php?query=safety+for+fish+farm+workers>
- **Spawn, Spat, and Sprains** book by the Alaska Sea Grant College Program available in entirety for a fee via the following link  
<https://seagrant.uaf.edu/bookstore/pubs/AN-17.html>



---

---

---

---

---

---

---

---

## Summary

- **Aquaculture is viable in Florida because of water, infrastructure and climate**
- **Water use, farm size, commodities and commodity value characteristics of Florida aquaculture**
- **Comparisons between United States aquaculture imports and exports and the products' destinations**
- **Roles various agencies have in the aquatic animal health**
- **Resources for further information**



---

---

---

---

---

---

---

---