

## 2010-2012 Summary of Funded Projects

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The Regional Aquaculture Centers are funded through the USDA National Institute of Food and Agriculture with a history over 25 consecutive years. The combined five regional centers represent a national program that covers and reaches all states and territories in the US. The program is unique with the participation of aquaculture industry representatives appointed to an Industry Advisory Council who identify regional research and extension education priorities for project development and monitor progress and outcomes. Other project development and oversight bodies include a Technical Advisory Committee and Board of Directors.

This material updates past project summaries that covered the period 2005-2010. For more information about the listed projects as well as past projects, please visit the home page for each of the five Regional Aquaculture Centers that is referenced below.

### Southern Regional Aquaculture Center Projects

Director: Jimmy Avery, Mississippi State University  
Home page: <http://www.srac.msstate.edu/>

#### **Publications, Videos, and Computer Software**

Funding level:           Approximately \$80,000 per year  
Project start date:       Renewed each year  
Project duration:         Annual  
Participants:             Varies annually

This is an ongoing project now in its 16<sup>th</sup> year. Objectives of the project are to prepare, peer-review, edit, reproduce, and distribute educational publications and videos for southern aquaculture industries. To date, this project has produced 192 Fact Sheets and species' profiles, 5 project summaries, 19 research publications, and 20 videos with contributions from 192 authors from throughout the region. All Fact Sheets completed by this project to date are available on the Internet at <http://www.msstate.edu/dept/srac> and <http://srac.tamu.edu> .

#### **Using National Retail Databases to Determine Market Trends for Southern Aquaculture Products (Supplement)**

Funding level:           \$150,005  
Project start date:       March 2012  
Project duration:         2 years  
Participants:             Mississippi State University (Lead Institution), University of Arkansas at Pine Bluff, Texas Tech University, Auburn University, University of Florida

Dramatic shifts in the price of U.S. farm-raised catfish, beginning in the fall of 2010, caused processors to ask project participants what effect these price increases would have on competitiveness of U.S. farm-raised catfish in the marketplace through 2011. Acquiring two more years of data will allow the project to examine how supermarket trends vary with and without Wal-Mart sales in the dataset.

### **Improving Catfish Broodstock Management by Manipulating Diet, Stocking Densities, and Sex Ratios**

Funding level: \$388,385  
Project start date: January 2012  
Project duration: 3 years  
Participants: University of Arkansas at Pine Bluff (Lead Institution), Texas A&M University, and USDA-ARS

The basic techniques used to spawn channel catfish and hatch eggs were developed prior to 1920. Although these practices are simple, spawning success is unpredictable and inconsistent over time and across locations. The first objective of this project is to identify diet formulations to improve reproductive performance (egg biochemical composition, fecundity, egg, and fry quality) of catfish and determine associated effects on production costs. This will be accomplished by comparing diets differing in protein concentration, lipid source, and nucleotide content on reproductive performance and diet effects on production costs. The second objective is to determine effects of stocking densities and sex ratios on catfish reproductive success and determine associated costs. This will be accomplished by comparing effects of sex ratios, stocking densities, and post-spawning consolidation of broodfish on spawning success and associated costs.

### **Performance Evaluation of Intensive, Pond-Based Culture Systems for Catfish Production**

Funding level: \$300,000  
Project start date: September 2012  
Project duration: 3 years  
Participants: USDA-ARS (Lead Institution), Auburn University, Mississippi State University, and University of Arkansas at Pine Bluff

Catfish farmers are examining two approaches to intensify production. The first approach is to stock catfish at high densities in smaller commercial ponds and installing more aeration per acre. Another approach is to modify a catfish pond to confine fish in a small portion of the total pond area and intensively aerate/manage that area. However, most research on these new systems has been conducted at research institutions in smaller production units. Little data is available on the economics of these systems on commercial farms. This study will evaluate the efficiencies of these new production systems on commercial catfish farms. Based on these findings, a complete economic analysis will be performed and will provide the necessary guidance to make

recommendations to farmers. In addition, detailed physical descriptions of each culture system will be thoroughly investigated and the most-efficient and practical designs will be recommended to farmers.

### **Effects of Mosquito Abatement Pesticides on Various Life Stages of Commercially Important Shellfish Aquaculture Species in the South**

Funding level: \$40,000  
Project start date: June 2011  
Project Duration: 1 year  
Participants: College of Charleston, Sanibel-Captiva Conservation Foundation Marine Laboratory

Shellfish aquaculture occurs in coastal areas where land-use conflicts are common. One potential conflict involves mosquito abatement programs, which are increasingly used in the tidewater areas due to increased coastal development and corresponding human population growth. Objectives of this project are to review the various mosquito abatement pesticides utilized in the southern region near the major shellfish hatchery and nursery facilities; select pesticides of most concern based on application data and available toxicity data for further bioassay testing; and use standard toxicity-testing protocols to assess potential impacts of the selected pesticides on larval and post-set clams and oysters.

### **Development of Baitfish, Goldfish, and Ornamental Fish Hatchery Methods**

Funding level: \$59,957  
Project start date: March 2011  
Project duration: 1 year  
Participants: University of Arkansas at Pine Bluff (Lead Institution), Louisiana State University, University of Florida

Concerns over the potential spread of fish diseases and aquatic nuisance species through the harvesting and distribution of wild baitfish have increased the demand for farm-raised bait and ornamental fish. Research on optimal hatchery methods for commercially important species is needed to meet production goals and reduce costs, while techniques for promising new bait and ornamental species must be developed. Bait and ornamental fish farmers have requested species-specific research on hatchery methods related to egg collection and handling for fathead minnows, goldfish, and ballyhoo. Objectives of this project include developing hatchery methods to de-stick adhered goldfish and ballyhoo eggs; and maximize egg collection of fathead minnows.

### **Reproduction and Larval Rearing of Freshwater Ornamental and Marine Bait Fish**

Funding level: \$500,000

Project start date: January 2011  
Project duration: 3 years  
Participants: University of Florida (Lead Institution), Louisiana State University,  
Mississippi State University

Freshwater ornamental fish and marine baitfish production are important and underserved sectors of domestic aquaculture. Key bottlenecks usually involve the control of captive maturation, spawning, and rearing of early life stages. This project will develop new hatchery technologies for improved production of freshwater ornamental species and marine baitfish with high commercial potential. Specific objectives are to: 1) develop improved technologies for spawning and larval rearing of pinfish, goggle eye, and Bala shark; 2) evaluate spawning substrate preference for captive ballyhoo; 3) develop improved technologies for egg hatching and larval rearing of *Fundulus grandis* and *F.seminolis*; and 4) publish and disseminate project results. This project will provide essential knowledge for successful commercial production of freshwater ornamental and marine baitfish species in the southern region, with immediate positive economic impacts for the United States.

### **Potential Marketing Structures for the Catfish Industry**

Funding level: \$250,000  
Project start date: January 2011  
Project duration: 2 years  
Participants: University of Arkansas at Pine Bluff (Lead Institution), Auburn  
University, Kentucky State University, University of California at Davis,  
University of Missouri

Southern aquaculture industries have declined as a result of competition from low-priced imports, substantial increases in the price of feed, and a weak economy. Other segments of U.S. agriculture have integrated horizontally using various organizational forms and structures, including market exchanges, marketing cooperatives, marketing orders, market agreements, marketing commissions, market councils, marketing boards, bargaining associations, and others. Horizontally integrated structures provide for control over large volumes of supply, allowing greater influence over the price received by farmers and responsiveness to changing market conditions. This project will identify market structures that have resulted in higher farm-level prices for similar commodities and examine the consequences of adopting these alternative market structures and organizations for the U.S. farm-raised catfish industry.

### **Evaluation of Impacts of Potential “Cap and Trade” Carbon Emission Policies on Catfish, Baitfish, and Crawfish Farming**

Funding level: \$120,000  
Project start date: January 2011  
Project duration: 2 years

Participants: Auburn University (Lead Institution), University of Arkansas at Pine Bluff, Louisiana State University

Reducing carbon emissions for the purpose of curbing global warming and climate change is a national environmental goal, and aquaculture will likely be involved in future carbon cap-and-trade regulations. This project will estimate net carbon balance in ponds and determine practices that may increase net carbon capture. Based on estimations of net carbon balance under different management scenarios, economic effects will be analyzed for possible policy options. Carbon emission issues will be explained to producers through fact sheets for catfish, crawfish, and baitfish and a special session on the topic will be organized at a major United States aquaculture meeting.

### **Development and Evaluation of Cool-Water Crawfish Baits**

Funding level: \$125,000  
Project start date: January 2011  
Project duration: 3 years  
Participants: Louisiana State University (Lead Institution), Texas A&M University, Auburn University

Crawfish aquaculture is unique among other aquaculture industries because harvesting is a passive process based on trapping using baits. Traps are typically baited with either manufactured, formulated baits or fresh-frozen fish. Formulated baits are used during the warm season but become less effective in cool water. However, using fish for cool-water crawfish bait has become expensive and sources are unreliable. This project will develop biologically and economically effective cold-water formulated crawfish baits. Specific objectives are to identify attractants, bait formulations, or processes that increase the efficacy of formulated crawfish bait in cool waters and compare the efficacy of experimental formulated baits or processes with fish baits for increasing crawfish catch and profits in cool-water conditions.

### **Identifying Determinants for Development of Live-Market Grading Standards for Crawfish**

Funding level: \$50,000  
Project start date: January 2011  
Project duration: 1 year  
Participants: Louisiana State University (Lead Institution), University of Arkansas at Pine Bluff

Large variation in sizes and appearance of crawfish during the harvest season are marketing problems for live crawfish. Lack of industry-adopted grading standards hampers market expansion and leads to constant tension among sellers and buyers of crawfish. Objectives of this project include surveying major components of the crawfish supply chain to determine the value of grade standards for crawfish; determining size distribution of crawfish at harvest; and using that data to identify grading methods that will segregate crawfish into various size categories;

and presenting the findings and recommendations from the project to the crawfish aquaculture industry via workshops, educational programs and newsletters.