Aqua

U.S. Department of Agriculture **Accomplishments Report AD-421** U.S. Dept. of Agriculture, State Agricultural Experiment Stations and Other Institutions			Date (Month, Day, Year) 03/22/2012
1. Accession 0216194	Agency Identification No. 2. CSREES 3. LA.B	5. Work Unit/Project No. **LAB93936**	6. Status **Annual Report**

7. Title

Understanding and Improving Reproductive Biology of Cultured Aquatic Species

12. Investigator Name(s) (Last Name and Initials)

Green, C.

20. Termination Date 09/30/2013 | 40. Period Covered (mo/da/year): 01/01/2011 TO 12/31/2011

Outputs:

In continuation of our integrated project on baitfish production, findings from research on Gulf killifish reproduction and other topics on marine baitfish culture were presented at four local parish extension offices. These small, 3-hour workshops concluded with a round-table discussion to answer questions; and the attendees filled out post-workshop surveys to determine knowledge retained, interest in marine baitfish culture, and future research and extension goals. We anticipate that an all-day workshop will be held in the spring of 2012 as was conducted previously in 2010. Research on gulf killifish reproduction and osmoregulation resulted in presentations at the annual meeting of the US Aquaculture Society and the Louisiana American Fisheries Society. Dr. Green served as the Program Chair for the US Aquaculture Society meeting and moderated the special session on baitfish. Materials on killifish culture were written, revised throughout the year, and posted on the LSU AgCenter's aquaculture website. Research on invertebrate osmoregulation and salinity tolerance was presented at the special session for crayfish culture at the annual meeting of the US Aquaculture Society and that work was published in the journal, Freshwater Crayfish. The toxicity of a surfactant contained in COREXIT on larval Gulf killifish was presented at the US Aquaculture Society meeting as well as a special session at the annual meeting of the American Fisheries Society. Several journal articles and numerous abstracts were published.

Outcomes/Impacts:

Research on effects of different ion sources, such as potassium, calcium, and magnesium, on growth and survival of Gulf killifish has led to a better understanding of the role of those critical ions. Reproduction studies with Gulf killifish have produced valuable data on spawning cycles with respect to egg production over the spring, summer and fall months. Specifically we have developed enough research in the area of killifish reproduction that we can produce a large number of larvae and fry for our research, within both the spring and fall peaks of their natural production cycle. Indoor egg production in recirculation systems has resulted in a significant amount of production in the late fall months; however, the amount of replication due to limited tank numbers will not allow for a peer-reviewed study on this subject in the 2011 production season. In the fall of 2011, we began work on the physiological effects of stranding adult killifish. This work has resulted in detailing an extraordinary ability for these individuals to survive for over 15 hours out of water, possibly as an adaptation from the tidal marshes they inhabit. Our research on a component of COREXIT has led to knowledge of the acute toxicity of this compound across a salinity gradient and provided us the ability to look at specific genes controlling ion-regulation in the presence of a anionic surfactant. The work on Corexit has provided our lab the ability to acquire other funds to investigate the effects of salinity and weathering to modulate the lethal and sub-lethal properties of oil and oil/surfactant mixtures. This project began in October and results are forthcoming. We have already observed that oil/surfactant mixtures have an increased amount of toxicity in comparison to oil and surfactant mixtures alone and that toxicity is influenced by both duration of weathering and salinity. Our lab has developed protocols for the isolation and purification of glycoproteins that are suspected to cause egg adhesion. Many aquaculture species have sticky eggs that interfere with egg collection and subsequent incubation. With future processed samples, the resulting bands from SDS-PAGE will be excised and purified using C-18 columns. These glycoproteins will then be analyzed for composition using mass spectroscopy. The current and future results of this portion of the project are ongoing and will develop as we continue to extract and characterize these proteins.

Publications:

Green, C. C., K. M. Gautreaux, R. A. Perez Perez, and C. G. Lutz. 2011. Comparative physiological responses to increasing ambient salinity levels in red swamp crawfish Procambarus clarkia and shrimp crayfish Orconectes lancifer. Freshwater

Crayfish 18: 87-92.

Green, C. C., and D. R. Yant. 2011. Use of channel catfish Ictalurus punctatus pituitary as a spawning aid: Influence of seasons and preparations on efficacy. Journal of the World Aquaculture Society. 42:801-811.

Brown, C. A., C. T. Gothreaux, and C. C. Green. 2011. Larval development and yolk utilization of the Gulf killifish Fundulus grandis in response to variations in temperature and salinity. Aquaculture 315:335-339.

Tiersch, T. R. and C. C. Green, editors. 2011. Cryopreservation in Aquatic Species, 2nd Edition. World Aquaculture Society. Baton Rouge, Louisiana, USA.

Green, C. C. and D. R. Yant. 2011. Channel Catfish Pituitary as a Spawning Aid. In: Cryopreservation in Aquatic Species, 2nd Edition. T. R. Tiersch and C. C. Green, editors. World Aquaculture Society, Baton Rouge, Louisiana. Pp. 125-133.

Novelo, N., D. Kuenz, C. C. Green and T. R. Tiersch. 2011. Ultrasonographic Monitoring of Channel Catfish Ovarian Development. In: Cryopreservation in Aquatic Species, 2nd Edition. T. R. Tiersch and C. C. Green, editors. World Aquaculture Society, Baton Rouge, Louisiana. Pp. 134-144.

Green, C., T. Allgood, A. Rivera., C. Bodinier, and F. Glavez. 2011. Acute toxicity of the anionic surfactant dioctyl sulfosuccinate sodium to embryos and larval gulf killifish. Abstract for oral presentation at Annual meeting of the American Fisheries Society. Seattle, WA.

Gautreaux, K., T. Allgood, and C. Green 2011. Acute toxicity of the anionic surfactant dioctyl sodium sulfosuccinate to embryos, larvae, and juvenile Gulf killifish at varying salinities. Abstract for oral presentation at Aquaculture America Conference (February 28-March 3) New Orleans, LA.

Green, C. C., K. M. Gautreaux, R. A. Perez Perez, and C. G. Lutz. 2011. Comparative physiological responses to increasing ambient salinity levels in red swamp crawfish Procambarus clarkia and shrimp crayfish Orconectes lancifer. Abstract for oral presentation at Aquaculture America Conference (February 28-March 3) New Orleans, LA.

Yant, R., and C. Green 2011. Current status on the approval process for channel catfish Ictalurus puctatus pituitary as a spawning aid for finfish. Abstract for oral presentation at Aquaculture America Conference (February 28-March 3) New Orleans, LA.

Anderson, J., S. Brogan, C. Gothreaux, G. Thomas, and C. Green. 2011. The gulf killifish Fundulus grandis project: integrating research and extension for the common goal. Abstract for oral presentation at Aquaculture America Conference (February 28-March 3) New Orleans, LA.

Patterson, J. T., and C. Green. 2011. Growth and osmoregulatory physiology of juvenile Gulf killifish Fundulus grandis across a salinity gradient. Abstract for oral presentation at Aquaculture America Conference (February 28-March 3) New Orleans, LA.

Brown, C., F. Galvez, and C. Green. 2011. Metabolic and embriogenic responses to terrestrial incubation of Gulf killifish Fundulus grandis eggs across a temperature gradient. Abstract for oral presentation at Aquaculture America Conference (February 28-March 3) New Orleans, LA.

Anderson, J., S. Brogan, C. Gothreaux, G. Thomas, and C. Green. 2011. The gulf killifish Fundulus grandis project: integrating research and extension for aquacultural development. Abstract for oral presentation at American Fisheries Society, Louisiana Chapter, Lafayette, LA.

Allgood, T., and C. Green. 2011. Effects of female size on reproductive output of the Gulf killifish Fundulus grandis. Abstract for oral presentation at American Fisheries Society, Louisiana Chapter Lafayette, LA.

Gothreaux, C., and C. Green 2011. Gulf killifish Fundulus grandis egg production ratios, cycles, and mats, oh my. Abstract for oral presentation at American Fisheries Society, Louisiana Chapter Lafayette, LA.

Patterson, J. T., and C. Green. 2011. Growth and osmoregulatory physiology of juvenile Gulf killifish Fundulus grandis across a salinity gradient. Abstract for oral presentation at American Fisheries Society, Louisiana Chapter Lafayette, LA.

Brown, C., F. Galvez, and C. Green. 2011. Metabolic and embriogenic responses to terrestrial incubation of Gulf killifish Fundulus grandis eggs across a temperature gradient. Abstract for oral presentation at American Fisheries Society, Louisiana Chapter Lafayette, LA.

Anderson, J., S. Brogan, C. Gothreaux, G. Thomas, and C. Green. 2011. Integrating research and extension for gulf killifish Fundulus grandis production. Abstract for poster presentation at National Aquaculture Extension Conference (June 5-7), Memphis, TN.

Anderson, J., S. Brogan, C. Gothreaux, G. Thomas, and C. Green. 2011. The Gulf killifish (Fundulus grandis) project: integrating research and extension for aquaculture development. Abstract for oral presentation at World Aquaculture Natal, Brazil.

Anderson, J., S. Brogan, C. Gothreaux, G. Thomas, and C. Green. 2011. The Gulf killifish (Fundulus grandis) project: integrating research and extension for aquaculture development. Oral presentation for Aquaculture of Marine Baitfish, University of Florida (June 21), Fort Pierce, FL.

Participants:

C. Green (PI), J. Anerson, S. Brogan, G. Lutz, C. Gothreaux, C. Fisher, C. Brown, and J. Patterson, LSU AgCenter.

Target Audiences:

Fish farmers, students, fish physiology researchers, hatchery managers, marina owners, and natural resource agency biologists.

Project Modifications:

Nothing significant to report during this reporting period.

Approved (Signature)	Title	Date
Robert A Ehn		3-23-12