

**REQUEST FOR STATEMENTS OF INTEREST
SOUTH FLORIDA-CARIBBEAN CESU NETWORK
NUMBER W912HZ-16-SOI-0007
PROJECT TO BE INITIATED IN FY 2016**

Project Title: “Evaluating Alligator Status as a System-wide Ecological Indicator of Restoration Progress “

Responses to this Request for Statements of Interest will be used to identify potential investigators for a project to be funded by the U.S Army Corps of Engineers (USACE) Jacksonville District (SAJ). This project is anticipated to last five (5) years.

Approximately \$80,000 is expected to be available to support this project in the base period. Funding is anticipated but uncertain so no award is guaranteed. In the interim, we will pursue a draft cooperative agreement that is ready to fully execute if full funding is available. Additional funding maybe available for follow on work in subsequent fiscal years at funding of \$80,000-\$100,000 for 4 additional option years for a total not to exceed \$480,000.

Background

The Greater Everglades is the only place in the world where both alligators and crocodiles occur. Crocodilians (American alligator [*Alligator mississippiensis*] and the American crocodile [*Crocodylus acutus*]) are good ecosystem indicators of restoration success of a healthy ecosystem, because at all life stages, crocodilians integrate biological impacts of hydrologic conditions (Mazzotti and Brandt 1994, Rice et al. 2005, Mazzotti 1999, Mazzotti and Cherkiss 2003, Mazzotti et al. 2009). Research has linked three key aspects of Everglades’ ecology to crocodilians:

(1) Top predators such as crocodilians are directly dependent on prey density, especially aquatic and semi-aquatic organisms, and thus they provide a surrogate for status of many other species.

(2) Drier (nests) and wetter (trails and holes) conditions created by ecosystem engineers like alligators provide habitat for plants and animals that otherwise would not be able to survive. This increases diversity and productivity of Everglades marshes (Kushlan and Kushlan 1980, Palmer and Mazzotti 2004) and, therefore, alligator monitoring can indicate overall health of the marsh.

(3) The distribution and abundance of crocodilians in estuaries is directly dependent on timing, amount, and location of freshwater flow (Dunson and Mazzotti 1989, Mazzotti and Dunson 1989); crocodiles and alligators exhibit an immediate response to changes in freshwater inputs into the estuaries. Regionally, lack of fresh water due to saltwater

intrusion has been correlated with lower growth and survival of crocodiles (Moler 1992, Mazzotti and Cherkiss 2003, Mazzotti et al. 2007).

Public Benefits: Alligators and Crocodiles are system-wide ecosystem indicators of restoration status and trends and reported in the South Florida Ecosystem Restoration Task Force Biennial system-wide ecological indicator report. Alligators have shown continued declines in density in areas of the Everglades where hydrology is disrupted, with only WCA-1 meeting restoration targets of 1.7 alligators per km. Crocodiles have shown a clear long-term response to improved salinities due to coastal salinity restoration projects in Everglades National Park. Results from this study will be used to evaluate the population recovery of these 2 species in correlation with hydrologic changes being made in the Greater Everglades to restore more natural flow. Increases in sustainable populations will be strong indicators of successful overall ecological health of this massive ecosystem being restored for future generations.

RECOVER Performance Measures

1. Greater Everglades Wetland Trophic Relationships – American Alligator Abundance, Body Condition, Hole Occupancy, and Production Suitability Index (Updated 2014)
2. Southern Coastal Systems - American Crocodile Growth and Survival

Project Objectives

The purpose of this project is to fulfill monitoring objectives in the RECOVER Monitoring and Assessment Plan (MAP) (RECOVER 2004 and 2006):

- Establish pre-CERP reference conditions and variability for alligator performance measure.
- Determine the status and trends of the alligator populations over short (body condition), medium (distribution and relative density) and Long-term (demography) temporal scales.
- Assess unexpected responses of the ecosystem (alligator ecosystem attribute) to changes in stressors resulting from CERP activities
- Support scientific investigations designed to increase ecosystem understanding, cause and effect, and interpret unanticipated results in alligator performance

Base Period Tasks

During the base period the CESU partner will:

1. Survey four routes (WCA3A-N41, WCA3A-Tower, WCA3A-Holiday, WCA3B) for alligators as established in Mazzotti et al. 2010 and updated in Hart et al., 2012.

Surveys along these routes will be performed by airboat. Alligator locations will be recorded using GPS equipment. Surveys will be conducted in marshes, in the dry (spring) and wet season (fall). Spotlight surveys for relative density in each area will be conducted twice each season at least 14 days apart to achieve independent counts (Woodward and Moore 1990, Mazzotti et al. 2010). Capture surveys will be conducted in the same general locations. Relative condition of alligators will be determined by conducting a condition factor analysis (Zweig 2003, Mazzotti et al. 2009).

2. Analyze and report on trends in both relative density and condition of alligators on an annual basis for inclusion in the RECOVER Annual Assessment Report. Protocols will follow those developed for the MAP. More detailed descriptions of survey routes, methodologies, and analyses can be found in Alligator and Crocodile MAP Annual Assessment Reports (e.g., Mazzotti et al. 2010; Hart et al. 2012).

Project Tasks for Option Years

Future tasks will build on the base period tasks by producing tools and case study analyses that demonstrate the potential of ecosystem service analysis in decision making. Specific approaches may include:

1. Additional routes for alligator monitoring
2. Performance Measure Updates
3. Crocodile monitoring in Southern Coastal Systems
4. Updated monitoring protocols
5. Modeling of CERP project performance

Meetings and Reports

A minimum of five meetings will be scheduled for major participants in this study:

1. Kickoff – overview of monitoring objectives, method, timing of monitoring and report deliverables;
2. Annual RECOVER Science Meeting;
3. GE Regional Meeting;
4. Monitoring Progress Meetings (Draft to discuss results, RECOVER review to discuss comment resolution, and Final Report to discuss changes to report and any updates to conclusions.

Reports - An annual update on the current project results will be provided each year of the study. A draft summary report will be made available at the end of the project for peer review by the stakeholder group. A final report would be provided following review and edits from the group.

Vendor Requirements

Vendor must be a non-federal partner of the South Florida Caribbean CESU Unit willing to accept the negotiated CESU indirect cost rate of 17.5%. Successful applicants should have expert knowledge with related work experience in measuring ecosystem indicators, relating ecosystem indicators to ecological conditions, and synthesizing information for decision making. Candidates should have demonstrated expertise in monitoring crocodylians, managing complex datasets, and maintaining long-term studies. Applicants should have a working knowledge of Corps planning approaches and be familiar with other federal agency approaches to measuring ecosystem indicators. Candidates will be required to submit annual reports and a final report prior to the end of the funded period.

Government Participation

The USACE, Jacksonville District Representatives will participate in study planning and providing case study data and information to the selected Vendor. The USACE, Jacksonville District Representatives will participate in study site selection, field site visits as appropriate, and the review and selection of proposed methods and products. The USACE, Jacksonville District Representatives will provide technical review of data and reports for presentations and publications that disseminate the results of accomplished work.

Materials Requested for Statement of Interest/Qualifications:

Please provide the following via e-mail to:

Deberay.R.Carmichael@usace.army.mil (maximum length 2 pages, single spaced 12 pt. font)

- 1) Name, Organization and Contact Information
- 2) Brief Statement of Qualifications including:
 - a. Biographical Sketch
 - b. Relevant past projects and clients with brief description of project
 - c. Staff, faculty and students available including area of expertise
 - d. Brief description of capabilities to successfully complete this project

Note: a proposed budget is NOT requested at this time.

Additionally, the evaluation method and selection criteria for research and development awards must be:

- 1) The technical merits of the proposed research and development; and
- 2) Potential relationship of the proposed research and development to the Department of Defense missions.

Please send responses or direct questions to:
Deberay R. Carmichael
U.S. Army Engineer Research and Development Center (ERDC)
ERDC Contracting Office (ECO)
3909 Halls Ferry Rd.
Vicksburg, MS 39180
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Timeline for Review of Statements of Interest: Review of Statements of Interest will begin after the SOI has been posted on the CESU website for 10 working days.

Literature Cited

Dunson, W.A., and F.J. Mazzotti. 1989. Salinity as a limiting factor in the distribution of reptiles in Florida Bay: a theory for the estuarine origin of marine snakes and turtles. *Bulletin of Marine Science* 44: 229-244.

Hart, K.M., F.J. Mazzotti, and L.A. Brandt. 2012. American Alligator Distribution, Size, and Hole Occupancy and American Crocodile Juvenile Growth and Survival. Annual Assessment Update for US Army Corps of Engineers. University of Florida Fort Lauderdale Research and Education Center. Fort Lauderdale, FL. 79pp.
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Mazzotti F.J., K.M. Hart, B.M. Jeffery, M.S. Cherkiss, L.A. Brandt, I. Fujisaki, K.G. Rice. 2010. American alligator distribution, size, and hole occupancy and American crocodile juvenile growth and survival. Volume I. MAP RECOVER 2004-2009 Final Summary Report, Fort Lauderdale Research and Education Center, University of Florida, Fort Lauderdale

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RECOVER. 2004. CERP Monitoring and Assessment Plan: Part 1 Monitoring and Supporting Research. Restoration Coordination and Verification Program c/o US Army Corps of Engineers, Jacksonville District, Jacksonville, FL, and South Florida Water Management District, West Palm Beach, FL.

RECOVER. 2006. Monitoring and Assessment Plan (MAP), Part 2 2006 Assessment Strategy for the Monitoring and Assessment Plan. Restoration Coordination and Verification Program c/o US Army Corps of Engineers, Jacksonville District, Jacksonville, FL, and South Florida Water Management District, West Palm Beach, FL.

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http://141.232.10.32/pm/ssr_2014/Docs/ge_alligator_2014.pdf

Rice, K.G., F.J. Mazzotti, and L.A. Brandt. 2005. Status of the American Alligator (*Alligator mississippiensis*) in Southern Florida and its Role in Measuring Restoration Success in the Everglades. in *Status and Conservation of Florida Amphibians and Reptiles*. Meshaka, Jr., W.E. and K.J. Babbitt eds. Melbourne, FL: Krieger Publishers.

Woodward, A.R., and C.T. Moore. 1990. Statewide alligator surveys. Final Report. Bureau of Wildlife Research, Florida Game and Fresh Water Fish Commission, Tallahassee, Florida.

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Figures of Alligator Survey Routes

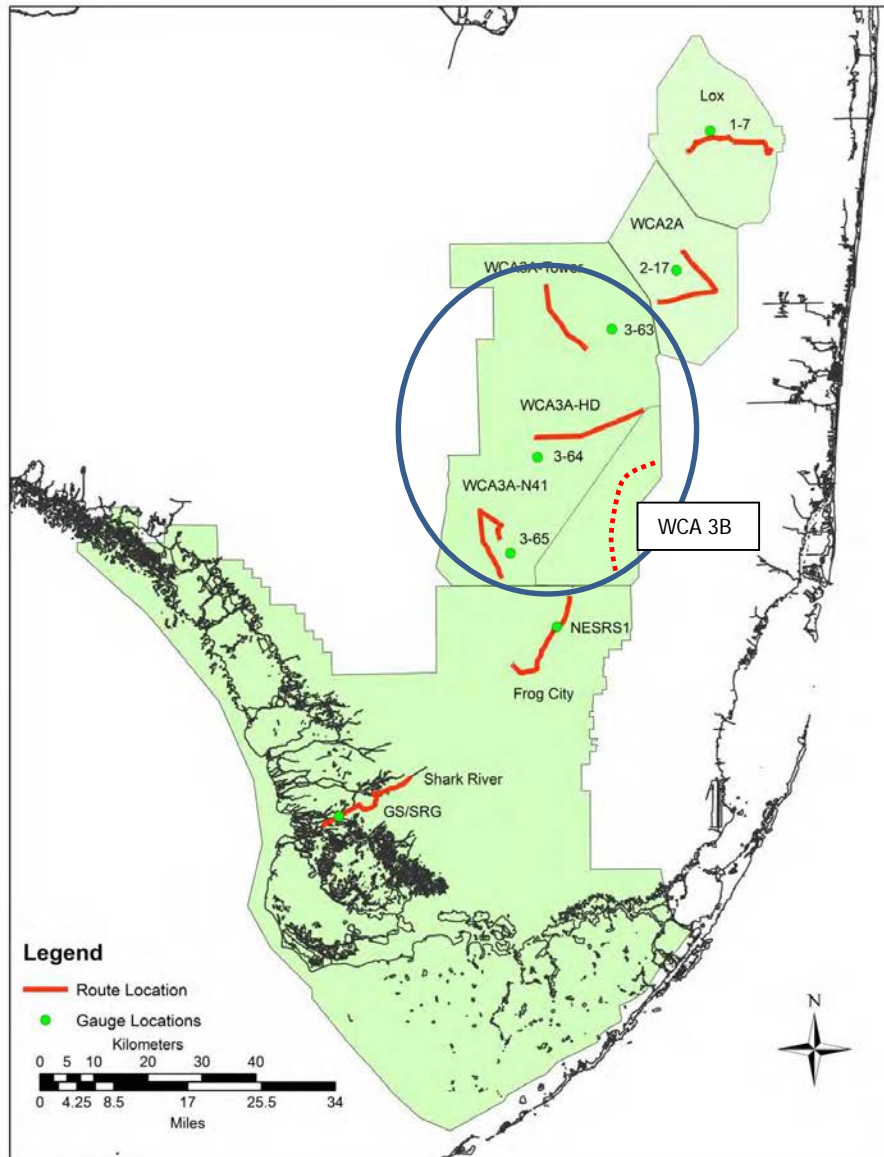


Figure 6-64. Location of alligator survey routes and gauges used for WY 2003–WY 2012 analysis of trends in alligator relative density. Results for the Shark River route are presented in the Southern Coastal Systems chapter.

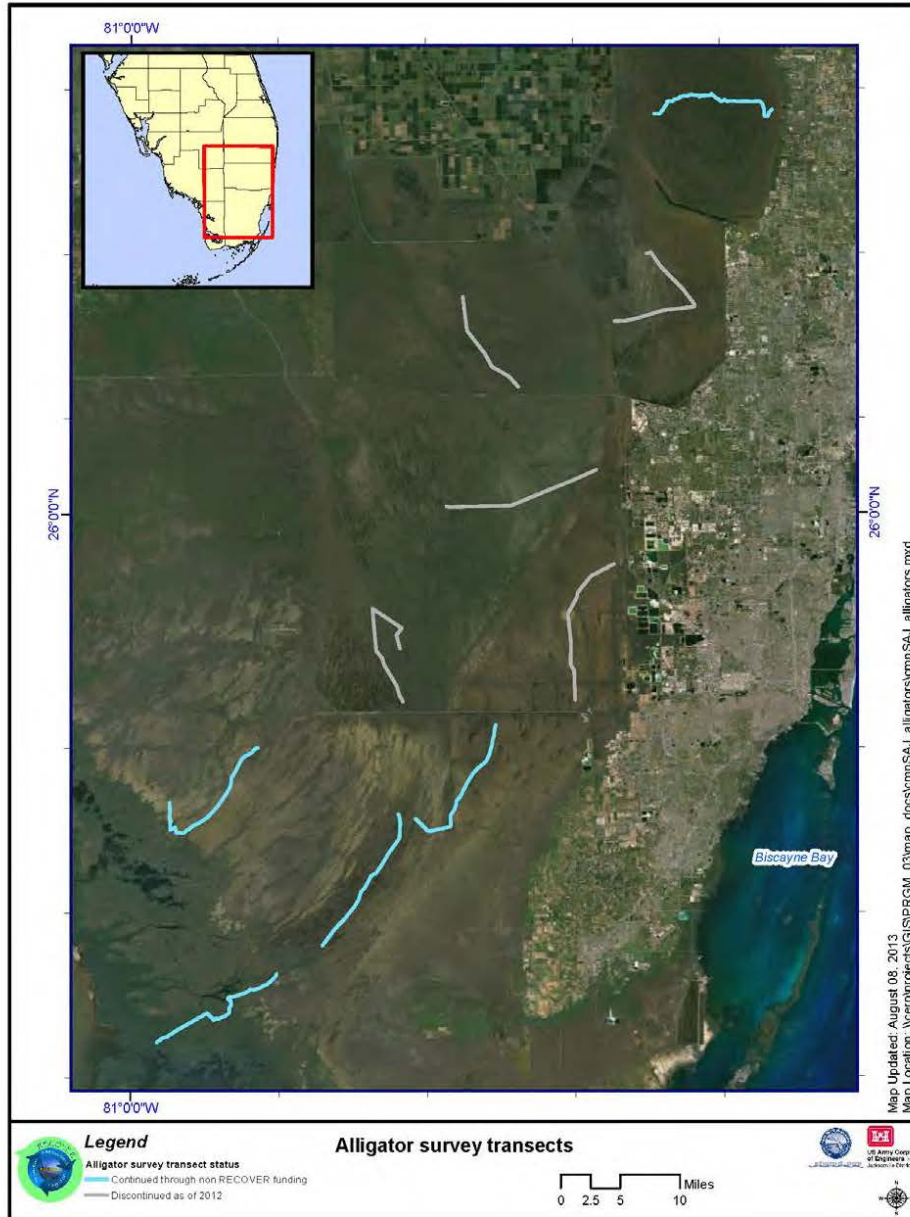


Figure A3-2-22. One of three maps for Alligator and Crocodile Monitoring.

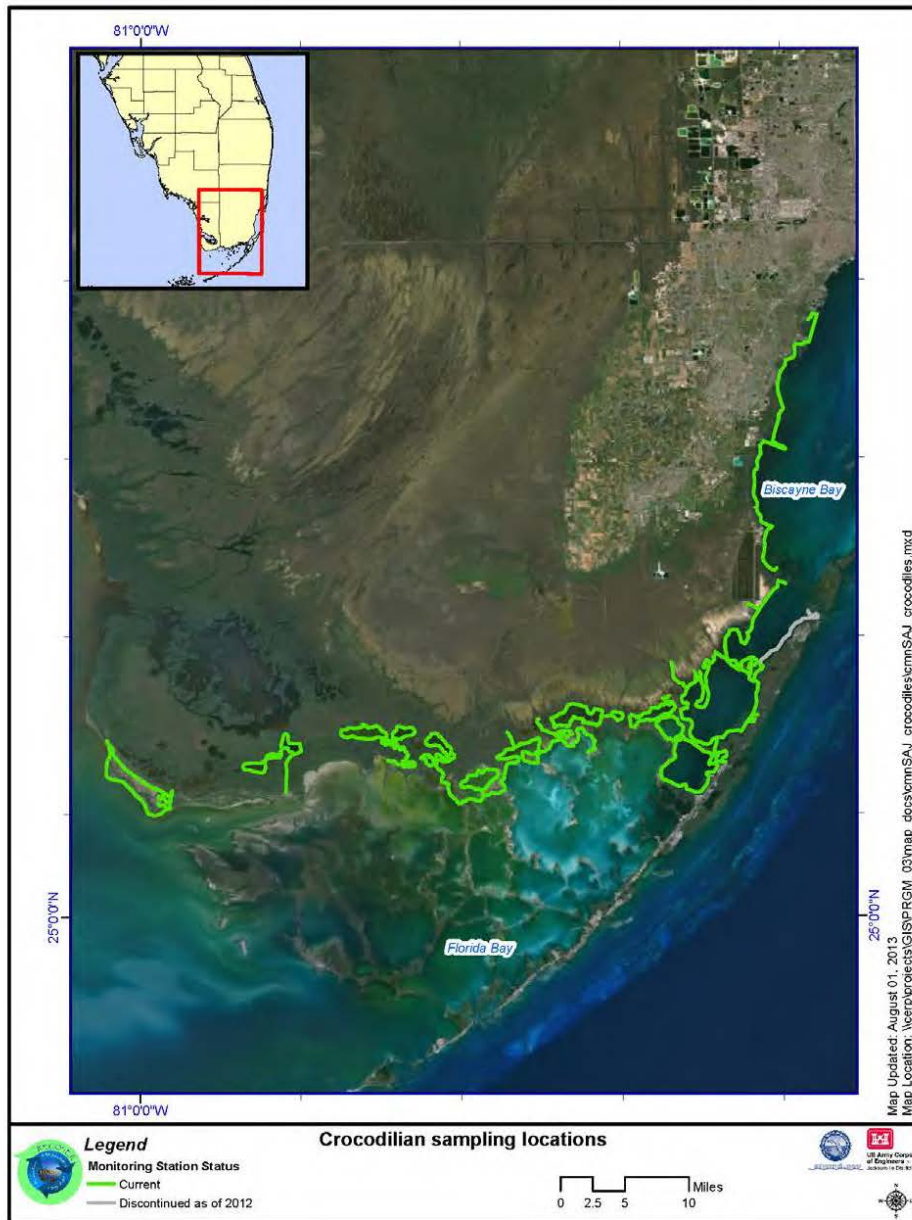


Figure A3-2-23. Two of three maps for Alligator and Crocodile Monitoring.