**Alligators and Crocodiles as Indicators of Ecological Responses to Everglades Restoration**

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At all life stages, alligators and crocodiles integrate biological impacts of hydrologic conditions. Florida’s two native species of crocodilians—the American alligator (*Alligator mississippiensis*) and the American crocodile (*Crocodylus acutus*)—are important indicators of ecosystem health in the Everglades. Research has linked three key aspects of Everglades’ ecology to these crocodilians: (1) as top predators they are directly dependent on prey density, especially aquatic and semi-aquatic organisms and thus provide a surrogate for status of many other species, (2) drier (nests) and wetter (trails and holes) conditions created by these ecosystem engineers provide habitat for plants and animals that otherwise would not be able to survive, (3) distribution and abundance of crocodilians in estuaries is directly dependent on timing, amount, and location of freshwater flow and crocodiles and alligators exhibit an immediate response to changes in freshwater inputs into the estuaries. Restoration success or failure can be evaluated by comparing recent and future trends and status of alligators and crocodile populations with historical population data and model predictions. Restoration hypotheses for alligators and crocodiles are as follows:

Alligators

* Restoration of hydropatterns (depth, duration, distribution, and flow) will improve relative density and body condition of alligators in southern marl prairie/rocky glades and ridge and slough landscapes.
* Restoration of estuarine salinity regimes will expand distribution and abundance of reproducing alligators into oligohaline portions of estuaries.

Crocodiles

* Restoration of freshwater flows and salinity regimes to estuaries will increase relative density, body condition, growth, and survival of crocodiles.

The main objectives of this monitoring effort have been to: 1) monitor changes in alligator populations resulting from restoration over short-term (body condition), medium-term (distribution, relative density, hole occupancy) and long-term (demography) temporal scales, and 2) monitor changes in growth, survival, body condition, relative density, and nesting of crocodiles in response to restoration projects. Interim results of the monitoring program provide quantitative support for the restoration hypotheses. Positive ecological responses of alligators and crocodile awaits clear evidence for ecosystem restoration.