



Global Re-introduction Perspectives: 2011

More case studies from around the globe
Edited by Pritpal S. Soorae



IUCN/SSC Re-introduction Specialist Group (RSG)





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Supplementation of juvenile American alligators in Louisiana, USA

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Introduction

The American alligator (*Alligator mississippiensis*) is widely distributed in high numbers in the southeastern United States. The species is classified as CITES Appendix II and the 2009 IUCN Red List category is LR1c (lower risk/least concern). Most southeastern states have management and harvest programs for alligators, as their high population numbers now support such programs. In Louisiana, an extensive “ranching” program allows for collection of eggs from the wild, in addition to an annual harvest of adult alligators. Egg quotas and harvest limits are established on suitable wetlands by biologists of the Louisiana Department of Wildlife and Fisheries, and are based on population estimates from annual nesting surveys. Because large numbers of eggs are permitted for collection (to avoid natural mortality from flooding, predation, and desiccation), 12% of the eggs hatched are required to be returned as juveniles to the wetlands where the eggs were collected, which is the quantity believed that might have survived to the juvenile age if the eggs had not been collected. These released juveniles therefore supplement the already healthy population, and essentially allow for the collection and utilization of the eggs, while avoiding the high natural mortality of the eggs and new hatchlings.

Goals

- Goal 1: Maintain a stable or rising alligator population statewide while allowing utilization of the egg resource and adult population.
- Goal 2: Ensure enough alligators are released for supplementation to replace that segment of the population collected as eggs.
- Goal 3: Ensure that released alligators have reasonable growth and survival by



Close-up of a female alligator at a nest site

© Ruth Elsey

releasing in adequate juvenile habitat with good prey base, cover, and permanent water.

- **Goal 4:** Ensure that alligators released for supplementation after being raised in captivity are later capable of breeding and contribute to future population recruitment.

Success Indicators

- **Indicator 1:** Stable or rising population indices based on annual nesting surveys.
- **Indicator 2:** Reasonable growth of alligators released for supplementation (monitored by later recapture of marked release alligators by live capture and release work by biologists, or by recovery if harvested as adults many years later).
- **Indicator 3:** Reasonable survival of alligators released for supplementation (monitored by later recapture of marked release alligators by live capture and release work by biologists, or by recovery if harvested as adults many years later).
- **Indicator 4:** Documentation of nesting by alligators released for supplementation (observation of marked alligators at nests) or by examination of reproductive tracts of later harvested adult alligators previously released for supplementation as juveniles.

Project Summary

Feasibility: Supplementation of juvenile alligators in Louisiana was felt to be feasible due to the vast acreage of wetlands (2 to 3 million acres of wetlands) as suitable habitat. A long history of harvest of adult alligators by local trappers has led to a strong sense of stewardship of the wetlands by the trappers and landowners. Alligators had previously been captured as juveniles in Louisiana and released to other southeastern states with more limited populations with success to bolster the populations in those states. A strong economic incentive exists by allowing landowners to sell eggs (which otherwise would be lost to natural mortality) to alligator farmers/ranchers, and this encourages landowners to maintain healthy wetlands. The egg ranching program began in 1986 with the initial wild egg collection permits being established, and the first releases to the wild of supplementation alligators being made in 1988. Wild alligator population assessments are made by annual aerial coastal nest counts conducted by helicopter; the nest counts provide an index to follow population trends. These data are used to establish harvest quotas for eggs on participating wetland properties; nest counts have been stable or rising for many years.

Implementation: The re-introduction of juvenile alligators to the wild requires a seven-person team of biologists and wildlife technicians employed by the LDWF. Alligator farms are located all over the state in remote distant locations. Each alligator to be re-introduced is measured and then permanently marked by cutting out two of the alligator's tail scutes, and two web tags with a six-digit identification number are placed between the toes of the rear feet of the alligator. The sex of each alligator is recorded and the alligators are placed in heavy burlap bags and then moved to a livestock trailer or a shady spot prior to release. Complex

calculations are done to determine how many alligators of a given size are required to fulfill the release obligations for each landowner (more alligators if they are less than 121.9 cm, and fewer if they are over 121.9 cm in total length). The alligators are then transported by vehicle and boat to be released in suitable juvenile habitat (small ponds with ample cover and available prey base). In some cases blood samples and other specimens are taken for health surveillance

monitoring; in some cases random full necropsies are done by qualified veterinarians to monitor the health of the alligators for supplementation.



Researchers catching a female alligator at a nest for DNA work © Vida Landry

Initial indications suggested the experimental program worked successfully, and the program has expanded markedly since inception. Now, a normal re-introduction season from mid-March until late August can involve statewide travel to measure, mark, tag, measure and sack 40,000 to 50,000 alligators, for the trip to the marsh to be released to their wetlands of origin. This compensates for the 350,000 - 400,000 alligator eggs collected from Louisiana's extensive wetlands (some 2,557,000 acres) in most years. The success of these programs was highlighted in the summer of 2005, when over 507,000 eggs were collected. That fall coastal Louisiana was adversely impacted by devastation from Hurricanes Katrina and Rita; had the eggs not been collected the mortality of the new hatchlings from that year's crop would have been very high. Similar losses were avoided by high egg collections in 2008, when Hurricanes Gustav and Ike again impacted virtually all the wetlands in coastal Louisiana.

Post-release monitoring: The fate of the released alligators for supplementation is extremely important, as it is a major financial factor for the alligator farmer/rancher, as well as very time consuming for the LDWF to administer, so every effort is made to ensure it is conducted as carefully as possible to ensure maximum survival of the alligators. Most monitoring is done by having biological staff work at "check stations" during the annual harvest of adult alligators, to record data on any marked farm-released alligators. This provides data on growth, survival, and possible reproduction, if a large female shows evidence of having nested. Our annual nesting survey also provides indices of population trends, and thus far (after over 20 years of egg collections and supplementation) the population trends are stable to increasing. We have monitored food habits of

Reptiles

alligators released, and found similar stomach contents in released alligators as in native wild alligators caught in the same area; in some cases the released alligators consumed larger prey at a smaller size. Growth rates have shown the released supplement alligators grow as well as or better than native wild counterparts. We have also documented successful nesting by released alligators. A small series of blood samples showed plasma corticosterone (stress hormone) levels were comparable in released alligators captured months after release as compared to wild juveniles.

Major difficulties faced

- Difficulties in statistical analyses of survival based on mark-recapture (survival models often based on much shorter-lived species such as waterfowl), models often show poor “goodness of fit” since alligators often not recovered/ harvested until many years after release when they become adults.
- Difficulties ensuring alligators are released in appropriate juvenile habitat in suitable quantities (just a few alligators in each pond) due to the program being so voluminous and inability to have staff members present at each release site in the wetlands.
- Inexact data exist on survival of wild alligators, making it problematic to determine how many farm-release alligators are required for release to supplement for those eggs collected.

Major lessons learned

- Selection of appropriate juvenile habitat for release; to enhance survival rates and minimize cannibalism.
- Recommend releasing alligators over large areas of wetlands to avoid crowding.
- Releasing reasonable quantities of alligators within one given day.
- Encourage re-introductions when weather/environmental conditions are optimum (ample water levels and low salinities in small ponds) and recommend avoiding extreme exposure to heat (use of refrigerated trucks and limit the brief storage times in shaded locations).
- Recommend using year-specific tail notches to mark re-introduced crocodylians, to help provide data as to at least the year of re-introduction (if not which specific animal) should the foot web tag be lost with later growth.

Success of project

Highly Successful	Successful	Partially Successful	Failure
√			

Reason(s) for success/failure:

- Implementation of the program has allowed for collections of hundreds of thousands of eggs annually, which would otherwise be lost to natural mortality, and the economic incentive for egg sales encourages landowners to maintain wetlands.
- Annual nesting surveys show stable or rising populations.

- Large numbers of recaptures of alligators previously released from farms for supplementation are harvested each year as large adults, many 3.35 m alligators and even some in the 3.65 m size class have been recovered and survived 12 – 13 years or longer before harvest.
- We have documented successful reproduction by the released alligators for supplementation; thus they now contribute to future population recruitment.
- The significant economic value of the alligator egg harvest helps ensure participating landowners have a strong incentive to preserve wetlands, and this habitat conservation and the releases to the wild help ensure stable alligator populations.

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