

Study reveals successful strategies for removing invasive caimans from Florida Everglades

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An adult spectacled caiman captured in Biscayne Bay Coastal Wetlands. Credit: Nick Scobel

The [spectacled caiman](#), a species native to Central and South America, has been established in Florida since the 1970s. The pet trade and crocodilian farming industries, escapes and deliberate releases made it possible for caimans to invade the Florida Everglades.

They pose a threat to [native wildlife](#) occupying the same habitat as our native alligators and crocodiles, competing for food and other resources. Meanwhile, they also prey upon birds, small mammals, fish and other reptiles.

In a new University of Florida study, published in the journal *Management of Biological Invasions*, [wildlife biologists](#) at the Institute of Food and Agricultural Sciences (IFAS) reveal how a series of efforts and strategies led to successful control and removal of caimans in specific areas of the Everglades.

"This study demonstrates the effects that the combination of early detection, rapid response, and persistent removal efforts can have on an invasive species," said Sidney Godfrey, a [wildlife](#) biologist at the UF/IFAS Fort Lauderdale Research Education Center (UF/IFAS FLREC) and lead author of the study.

Scientists consider their removal efforts and the results of the study a [significant milestone](#) for invasion science, as its applications can be leveraged and expanded to other invasive species found statewide and globally.

"Managing invasive wildlife will not be an in-and-out process, where we go in and remove wildlife and then think we are done," said Frank Mazzotti, a UF/IFAS professor of wildlife ecology at FLREC and principal investigator for the caiman removal project. "Even with early detection and rapid response, long-term removal efforts and multi-agency cooperation—bolstered by continued monitoring—will be key to

success."

Scientists at state and [federal agencies](#) see promise in the results and continued use of these strategies because they believe the caiman invasion has also impacted the restoration goals of the Comprehensive Everglades Restoration Plan (CERP). At a cost of more than \$24.5 billion, CERP is the largest ecosystem restoration project undertaken in the United States to restore, preserve and protect the South Florida ecosystem, while providing for other needs of the region, including water supply and flood protection.

"This project was a huge success because it shows that sustained control efforts make a difference. It also shows that eradication of spectacled caimans may be a real possibility. Controlling invasive species is a dynamic and ever-changing endeavor, and this team got in there and experimented with different strategies and found some that are very promising," said Larry Williams, State Supervisor for the U.S. Fish and Wildlife Service Florida Ecological Services Field Office. "Kudos to everyone who helped with the project. It would be great if we can continue to support the work."

Caimans eat native wildlife and may compete with Florida's native alligators and crocodiles, which conflicts with CERP's goal of improving native species populations. The UF/IFAS team aimed to remove caimans in and around specific CERP projects to minimize these impacts.

A critical outcome of the team's efforts was successfully reducing caimans in the Biscayne Bay Coastal Wetlands and C-111 Canal Project areas, important arteries in South Florida's water management infrastructure. They serve as vital components of CERP because they're designed to improve freshwater flow to Everglades National Park, Florida Bay and Biscayne Bay.



Sidney Godfrey, a wildlife biologist at UF/IFAS, holds juvenile spectacled caiman. Credit: Justin Dalaba

"True Everglades restoration cannot be accomplished without invasive species management, so the results of these efforts are encouraging. We made a significant investment into invasive species management on two of our Everglades restoration projects, and that investment paid off. Everyone involved in providing support for this project should be truly proud of what was accomplished—creating a science-based paradigm for successful invasive species management in the Everglades," said Col. James Booth, Commander of the U.S. Army Corps of Engineers Jacksonville District.

"This is great news for South Florida's ecosystem. Invasive species are a major threat to the ecological integrity of our ecosystem and the South Florida Water Management District continues to work to protect the biodiversity and habitat of the Everglades," said Drew Bartlett, Executive Director of the South Florida Water Management District. "Thank you to the University of Florida and our partner agencies for working on strategies to remove invasive species including the spectacled caiman from the Everglades."

For the study, the team compiled data for 10 years, from 2012 through 2021 of the project's removal efforts. Strategies included conducting weekly surveys, rapid responses for removal of reported caiman sightings and performing necropsies of captured caimans. The UF/IFAS team started surveying and removing caimans from the Biscayne Bay Coastal Wetlands in December 2012, and their efforts increased with state and federal agency support in 2017.

The team leveraged the support to expand their efforts into the C-111 Project in 2018 as part of an early detection and rapid response plan for a second, more recently discovered caiman population. The team also conducted targeted, on-foot surveys of possible caiman habitats that may have been overlooked around their search routes to remove as many caimans as possible.

"We are thankful for our strong partnership with UF/IFAS as we continue to tackle [invasive species](#) issues in the state," said Roger Young, Executive Director of Florida Fish and Wildlife Conservation Commission. "Collaborative, consistent efforts such as what has been done to address invasive caimans are critical to conservation of Florida's native wildlife and incredible ecosystems."

Team members analyzed data they collected along 11 search routes within and adjacent to South Florida CERP projects, including the

Biscayne Bay Coastal Wetlands, C-111 Canal Project and natural protected areas. They removed 251 caimans during the 10-year period. The rate of caiman removals per year increased from five in 2012 to a peak of 47 in 2020. They learned more about caiman nesting and hatching dates from necropsies, which increased their removals by providing information on when and where to target the removal of reproducing and hatchling caimans.

"Previous attempts to remove these invaders in South Florida have failed, but they may have ended too early to get the caiman under control," said Godfrey.

The only previous peer-reviewed study on South Florida caiman removal efforts was conducted over 40 years ago. That [study's removal efforts](#) lasted about one year in a relatively small area of South Florida. It is unclear whether the previous attempts used information collected during removals to fine tune their efforts, he added.

"Our study is a much-needed update on the status of spectacled caiman in South Florida," said Godfrey. "Based on our results, we are cautiously optimistic that our removal efforts may be impacting the overall caiman population in the Everglades restoration areas."

The next steps for the team's removal project include developing and using new tools, such as using thermal imaging cameras to find caiman nests. They also plan to publish dietary and genetic information about the caiman to increase public awareness of their impact on native wildlife and their origins.

"We need to continue our efforts to minimize the impact of caiman on South Florida's native wildlife," said Godfrey. "The fact that we are seeing a relatively rapid reduction, over 60 years after they were introduced, gives us hope that our continued efforts may be successful."

More information: Sidney T. Godfrey, What is the potential for extirpating spectacled caiman from Comprehensive Everglades Restoration Plan projects in South Florida? *Management of Biological Invasions* (2023). [DOI: 10.3391/mbi.2023.14.3.02](https://doi.org/10.3391/mbi.2023.14.3.02)

Provided by University of Florida

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