Program Name: Critical Ecosystem Science Initiative (CESI) and National Park Service Base Funding
Project Name: **Development of comprehensive fish monitoring programs in Everglades National Park**
Project ID: 2603
Lead Agency: NPS

Strategy and Biennial Report Objective Addressed: 2-B.2
Invasive Species Strategic Action Framework Goal: 2

Measurable Output(s): Projects provide data on relative abundance and distribution of non-native fishes and contribute to early detection monitoring in Everglades National Park.

Project Synopsis: Freshwater fish and invertebrates are an integral link in Everglades food webs, providing food for wading birds, larger fish, otters, alligators, and other wildlife (Science Subgroup 1996). However, the construction of canals, imposition of agriculture, and the encroachment of urban development has highly impacted the Everglades ecosystem by loss of habitat and unnatural water quality, quantity, and timing. Altered water timing and flow dynamics and lowering of water levels have likely influenced the dynamics of the freshwater communities in Everglades National Park (EVER; Loftus and Eklund 1994). Understanding the influence of habitat and hydrology on fish assemblages will help provide the knowledge needed to guide restoration programs in the Everglades. Freshwater fisheries monitoring efforts in Everglades National date back to the 1960's. Most of the long-term monitoring efforts have been designed to track the status and trends of the most common species, understand the influence of habitat and hydrology on fish assemblage structure, and to develop performance measures to evaluate hydrological management and restoration actions. However, very few fish monitoring projects have been designed with the objectives to detect, track the abundance of, or evaluate the impacts of non-native fishes.

Hydrologic restoration alone will not solve the non-native species problem in south Florida's National Parks. In addition, some of the water management actions needed to achieve hydroperiod restoration may pose a threat of introducing new non-native species. As of 2007, 34 species of non-native fishes were reproducing in Florida (Shafland et al 2008). Since 1965, 17 non-native freshwater fish species have been observed in Everglades National Park and 16 of the 17 species were first established in canals outside the boundaries of EVER prior to colonizing inside (Loftus 1988, Kline et al. 2014). After water management actions that changed inflows from canals to EVER, Kline et al (2014) observed increases in the number of new non-native species observed in suggesting fish are spreading from canals into EVER marshes (Kline et al. 2014). Although the effects of exotic fishes in the Everglades marshes are largely unstudied and unknown (Schofield and Loftus in review), an increase in the abundance, proportion, or number of species of non-native fish indicates adverse conditions for the restoration of EVER. Approximately 25% of Everglades National Park's internal monitoring efforts have been designed with objectives to assess changes in the relative abundance or distribution of non-native fishes in EVER. One project in particular, EVER's Parkwide Monitoring effort was designed with the objective to contribute to early detection and tracking the distribution of non-native fishes on the freshwater marsh.

Current Status: Monitoring efforts are ongoing that provide a network of reference sites in EVER. Several new non-native species have been detected since 2000. The spread of and distribution of the new non-native fishes have been documented throughout the freshwater marshes.

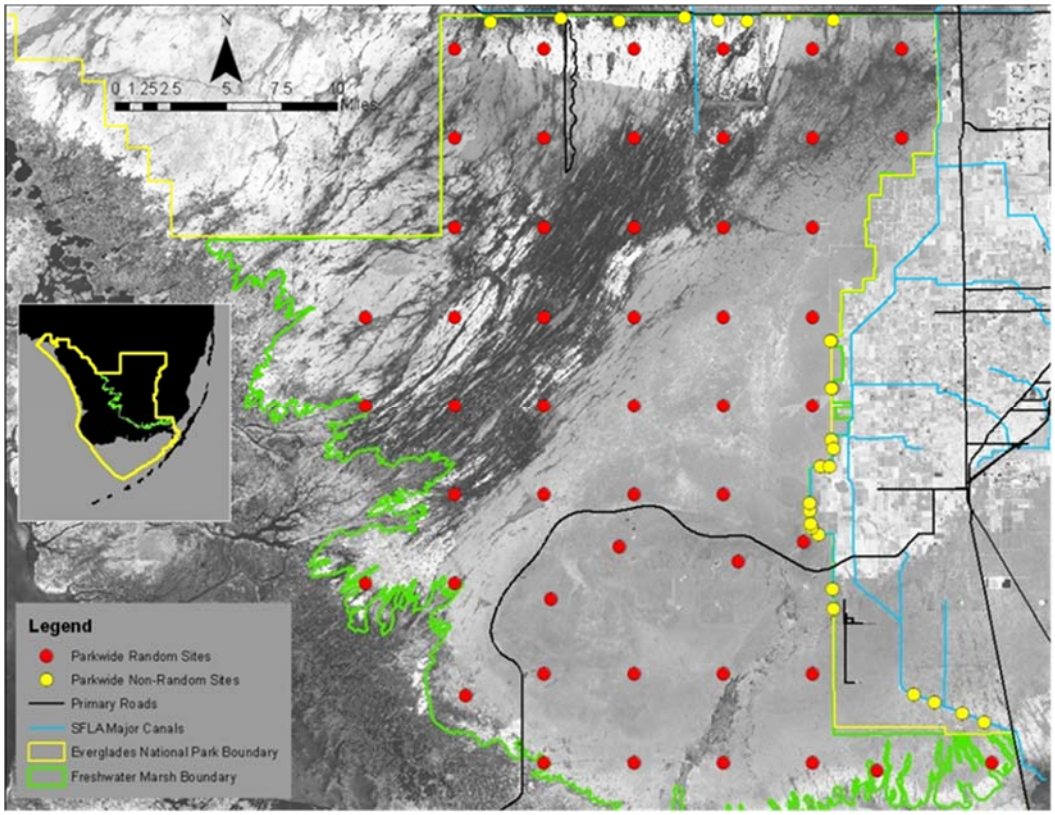
Project Schedule:
Start Date: 1999
Finish Date: Ongoing

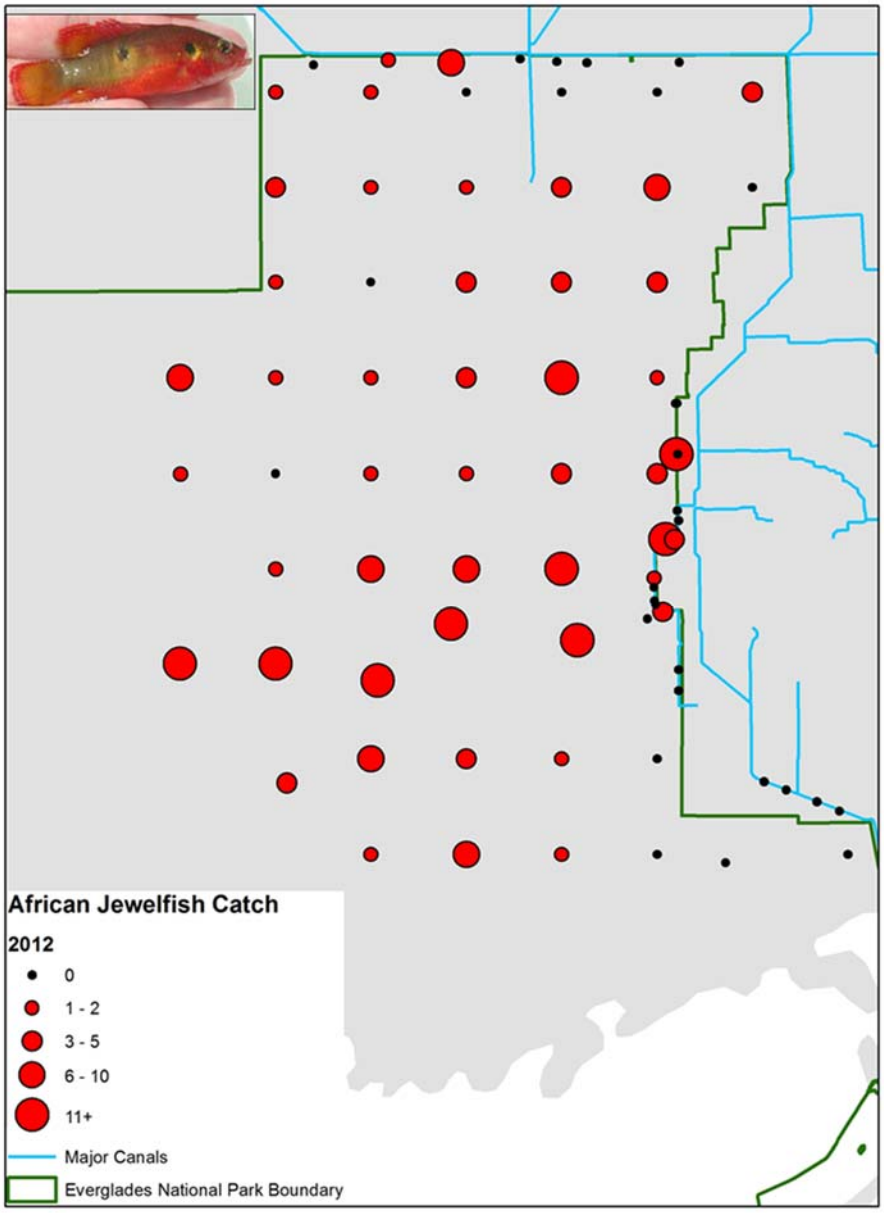
Detailed Project Budget Information

	2014	2015	2016	2017	2018	Balance to Complete	Total
Federal	$55,690	$57,000	$58,150	$59,300	$60,450	ongoing	$234,900
SFWMD**	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Local	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Total	$55,690	$57,000	$58,150	$59,300	$60,450	ongoing	$234,900

Contact: Jeff Kline

Map of area: Map of ENP's Parkwide monitoring effort




African Jewelfish Catch
2012
0
1 - 2
3 - 5
6 - 10
11+
Major Canals
Everglades National Park Boundary