



NATIONAL PARK SERVICE

RESCUING THE ‘RIVER OF GRASS’

The nation’s largest hydrologic restoration project aims to make the Florida Everglades everlasting

By Matt Alderton

RIVERS ARE NATURE’S JACKS-IN-THE-BOX. Most of the time, they idle quietly within the confines of their banks. Sometimes, however, they break free, charging from their riverbeds with sudden, surging gusto.

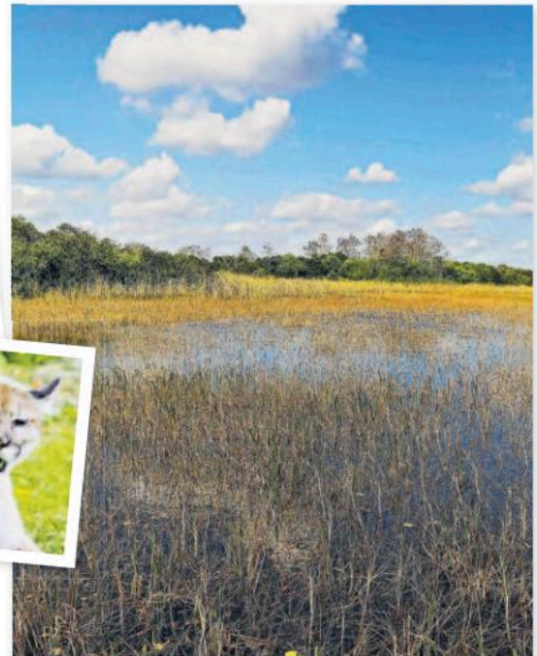
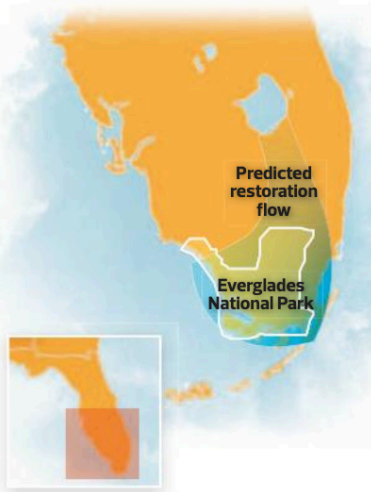
Florida’s Kissimmee River used to spring from its box on a regular basis. Connecting Lake Kissimmee in Central Florida with Lake Okeechobee to the south, the river would fill to capacity during heavy rainfall, then disgorge excess water into its 2-mile floodplain. Wildlife — including herons and alligators — loved it. Humans did not. In 1948, Congress authorized the U.S. Army Corps of Engineers (USACE) to tame the Kissimmee River. The Corps channelized the river in the 1960s, turning its sauntering

curves into straight lines as flood control for Florida’s burgeoning population. Water that once journeyed 103 circuitous miles to Lake Okeechobee was instead funneled 56 miles through a concrete ditch known as the C-38 canal, ensuring fast and efficient evacuation of rainwater from the central Florida basin.

To the delight of adjacent landowners, flooding became a thing of the past. Unfortunately, so did many native flora and fauna, whose populations declined rapidly, according to scientists who analyzed the river ecosystem during and after construction. Based on their findings and resulting public outcry, a movement to “put the river back” commenced before the canal’s completion in 1972. Scientists subsequently studied restoration options

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FLORIDA EVERGLADES



As a result of human activity, there are fewer egrets, cougars and other wildlife flourishing in the delicate Everglades ecosystem.

MAP: MIRANDA PELLICANO; PHOTOS: NATIONAL PARK SERVICE (2); RHONA WISE

EVERGLADES
BY THE NUMBERS

8.2
MILLION

PEOPLE DEPEND
ON DRINKING
WATER FROM
THE EVERGLADES

72

SPECIES

LIVING THERE ARE
THREATENED OR
ENDANGERED

66%

OF THE LAND

HAS BEEN LOST DUE
TO ENVIRONMENTAL
CHANGES

in the 1970s and '80s, which ultimately led Congress to authorize restoration of the middle third of the channelized Kissimmee River in 1992, 20 years after the construction of the C-38 canal. Although work won't conclude until 2020, results already are evident. Native plants, animals and fish have returned, and so has the river's natural, meandering course.

"Everything from the aquatic wading bird population to native vegetation to the volume of fish in reported fisheries is being restored," said Howard Gonzales, chief of the ecosystem branch in the Corps' Jacksonville District. "Mother Nature has reclaimed that floodplain."

The Kissimmee River's changing fortunes bode well for a related, yet far larger scope of work currently underway in the Florida Everglades. Known as the Comprehensive Everglades Restoration Plan (CERP), it eventually will resuscitate Florida's largest and most endangered ecosystem. First, though, the Corps-led program — the largest environmental restoration program in U.S. history — must overcome a bevy of challenges that threaten its swift progress and successful conclusion.

'ECOLOGICAL DESTRUCTION'

What happened to the Kissimmee River also happened to the Everglades, which supplies drinking water for 8.2 million Floridians and habitat for 72 threatened or endangered species, according to Eric Eikenberg, CEO of the Everglades

Foundation, whose mission is restoring the Everglades, only a third of which remains. (Others estimate that half of the original 3 million acres is gone.)

In the 19th century, he said, portions of the Everglades were drained to create dry land on which to live and farm. Because hurricane tides frequently overtopped their embankments causing flooding, the Corps fortified them in the 1930s by building Herbert Hoover Dike around Lake Okeechobee. When the Corps dredged the Kissimmee River, its contents drained into the lake, around which the Corps simultaneously built a massive network of canals, levees and water storage areas to divert sheet flow east and west instead of south, thereby containing the lake.

The sugarcane fields and suburbs that punctuate the land between Lake Okeechobee and Florida Bay are proof that it worked. However, nature was, again, an unintended casualty.

"The work (USACE) did in the 1960s caused ecological destruction to the lake itself and to the communities around it," Eikenberg said. "When the Corps, the federal government and the state government realized the sins of the previous generation, they began restoring the ecosystem back to its natural beauty."

CERP is the program through which they're doing it. A 50-50 partnership between Florida and the federal government — whose agents are the South Florida Water Management District and the Corps, respectively — was

established by Congress in the Water Resources Development Act of 2000, which laid out a program with 68 components, expected to cost \$10.5 billion and take more than 30 years to complete. Seventeen years later, six are underway and just one has been completed. Finishing the program's work, the Corps estimates, will take an extra \$5.9 billion and an additional 23 years.

SLOW FLOW

In some respects, the damage is already done.

"We're not going to take areas that were developed either for agricultural use or residential use and turn them back into Everglades," said Gonzales, USACE's Everglades program manager. "It's just not feasible."

What is feasible is restoring the natural, southerly flow of water from the Kissimmee River into Florida Bay via Lake Okeechobee, which will infuse what's left of the Everglades with the water it needs.

We want to "provide a landscape where threatened and endangered species can continue to rebound and grow," Gonzales explained.

Progress toward that goal has been too slow for some, including the National Academy of Sciences (NAS), which assesses CERP's advancements every two years on behalf of the federal government. Its most recent report, published in

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Marjory Stoneman Douglas' 1947 book, *The Everglades: River of Grass*, provided the nickname for the popular tourist attraction.

GETTY IMAGES

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— Howard Gonzales, chief of the ecosystem branch, USACE Jacksonville District

December, expressed serious concerns about the program, beginning with its funding. Or rather, its lack thereof.

"The original assumption was that ... there would be a significant investment from the federal government and the state of Florida to the tune of \$200 million each per year. If you look at our federal and state appropriations, we haven't quite hit those numbers," reported Gonzales, who said combined state and federal appropriations for fiscal year 2017 is \$216 million — 54 percent of CERP's promised funding. Some years, it's been even less.

NAS also is concerned about CERP's underlying science, according to David Ashley, professor of engineering practice at the University of Southern California and chair of the Committee on Independent Scientific Review of Everglades Restoration Progress, which conducts NAS' biennial review.

In the 17 years since CERP's inception, he said, scientists have learned that the Everglades ecosystem was historically much wetter than originally thought. They also have gained new insights about the potential impacts of sea level rise and climate change on the Everglades, neither of which was considered at CERP's outset. This, plus the realization that some previously planned water-storage projects are no longer feasible — which creates a gap between the infrastructure the Everglades needs and the infrastructure CERP ultimately will deliver — means the Corps must re-evaluate its future plans and update the CERP scope of work, Ashley said.

"Everything that has been funded and started should continue, but now they should take a look at incorporating new issues into future planning," he said. "We believe the system needs to be designed in a way that those issues do not take away from the long-term effectiveness of the restored ecosystem."

The Corps already does a good job of incorporating new science on individual CERP projects, NAS acknowledged in its report. What's needed now — and what the Corps intends to deliver — is a programmatic update.

"We're definitely taking the recommendations from the NAS very seriously," Gonzales said. "We're starting to take those steps, and we'll incorporate that assessment into the 2017 update of our integrated delivery schedule."

TURNING THE CORNER

Although he wishes CERP were advancing further and faster, Eikenberg said he's encouraged by the pace of recent progress, including federal authorization last year of the Central Everglades Planning Project, which will remove a critical mass of dams and levees in order to restore natural sheet flow to the heart of the Everglades. According to the Corps, it's one of nine CERP projects currently authorized by Congress to receive funding.

"I'm optimistic," Eikenberg said. "We're going to see significant progress by the year 2025 and certainly by 2030."

Significant progress already is evident on at least two CERP projects

currently underway. The Picayune Strand Restoration Project was the first CERP project to begin construction in 2008. Scheduled for completion in 2020, it will restore more than 55,000 acres in southwest Florida with the aid of three pump stations that will re-hydrate dried-out wetlands. Once destined for residential development, the land instead will become prime habitat for the endangered Florida panther.

The second project — the Indian River Lagoon-South Project, also scheduled for completion in 2020 — encompasses a 3,400-acre aboveground reservoir, a pump station and 6,300 acres of stormwater treatment areas that will work to restore wetlands east of Lake Okeechobee.

"In the Picayune Strand area, in particular, there's already been visible positive impact," Ashley said. "They've filled in canals and changed the profile to more closely match its original state. As a result, they're seeing the kind of sheet flow they predicted would occur and the return of natural vegetation. It's very important evidence that the overall planning goals are feasible."

Clearly, there's a way to restore the Everglades. All that's needed now is the will — and the wherewithal — to do so, according to Eikenberg.

"These are massive water infrastructure projects," he concluded. "We've got to put our foot to the pedal now so we can see progress happen sooner rather than later."

Because later, he said, might be too late.