

# Hole-in-the-Donut Restoration

National Park Service  
U.S. Department of the Interior

South Florida Natural Resources Center  
Everglades National Park



*The Hole-in-the-Donut (HID) is a 6,300-acre wetland restoration project in Everglades National Park (ENP) and is named for the area of farmland surrounded by native landscape that once characterized the region. When farming ceased in 1975, the area was quickly invaded by Brazilian pepper (*Schinus terebinthifolius*), a non-native shrub from South America. Now, under management of ENP, as a wetland mitigation site, the “donut hole” is being restored. Restoration was initiated in 1997 and the efforts to restore and maintain the landscape are still underway.*

Farmed for over 50 years before it was acquired by ENP, the HID, with its well-drained, aerated and fertilized soil, was far more suitable for the growth of non-native Brazilian pepper than the wetland prairie/marsh species that originally were found growing in the nutrient-poor pre-farming environment of the untouched Everglades. Brazilian pepper was first introduced to Florida in 1926 and before long, fruit-eating animals had spread the weedy tree throughout south Florida. Typical of invasive plants, Brazilian pepper thrives in disturbed areas. It was this trait that allowed the plant to invade the HID. Once a few of the shrubs became established, the aggressive weed rapidly dominated the previously farmed land. The dense thicket that eventually formed monopolized the nutrients, water, and sunlight, thereby inhibiting the growth of native plants.

## Restoration

In 1997, ENP initiated a large-scale effort to restore the infested former farmland to its natural state. But getting rid of 6,300 acres of Brazilian pepper is no easy task. Using bulldozers and backhoes, the park set out to conquer the exotic invader. They leveled nearly half of the vast pepper forest and removed the debris. Yet, the battle was far from won. The persistent plant recovered as new shoots cropped

up from underground root systems and from viable seeds remaining in the soil. In a final, ambitious effort, the soil was scraped away down to the bedrock.

A drastic measure, scraping the soil down to bedrock, turned out to be the key to restoring the HID. With the aerated and nutrient-rich agricultural soils removed, the treated areas were successfully restored to wetland. Native wetland plants have reestablished in these areas on their own and wading birds and other animals have become regular visitors. But while basic ecosystem function has been largely restored, the full suite of native organisms has not yet returned. With time, a community of native plants more representative of pre farming conditions is expected to develop.

As of 2017, approximately 5,128 acres have been restored in the HID. The restoration process does raise the question of what to do with the seven million tons of removed soil that remains. Currently stored on-site in large mounds, carrying the soil out of the park would be very disruptive to park visitors and damaging to park roads since such a project would require transporting more than 250,000 dump truck loads of soil out of the park. Nevertheless, park managers are looking for alternative uses for the soil.

Aerial photo looking southeast across the HID showing various stages of wetland restoration implementation in 2013. ENP Staff Photo.



## Restoring a Wetland

Photos by Lauren Serra, ENP, and Rodney Cammauf, ENP Volunteer

Restoring thousands of acres of Brazilian pepper to native marshland is an challenging task. First, the towering weeds are cut down and mulched. Next, the debris is bulldozed into long windrows, scooped up with front end loaders, and then hauled to soil disposal mounds via trucks. Finally, a grader is used to scrape the remaining soil from the bedrock. Scientists actively monitor the progress of the restoration. Wading birds and other wildlife have been quick to return.

## Applied Science and Monitoring

ENP monitors the return of native vegetation and wildlife in restored areas of the HID to determine whether restoration activities have been successful in improving the degraded habitat.

Scientists from universities and research groups outside of ENP have made use of the HID mitigation project to study various aspects of ecological restoration. For example, researchers from the University of Florida have studied the ability to restore pine rockland habitat, known to have occurred in portions of the HID prior to farming. Contact us if you are a funded researcher interested in studying ecological processes in the HID!



Photo by Joy Brunk, ENP

## Wetland Mitigation Program

The HID project was established as an In Lieu Fee (ILF) project in the mid-1990s under Section 404 of the Clean Water Act, and has been authorized through a U.S. Army Corps of Engineers (ACOE) permit (#SAJ-1993-01691) and a Florida Department of Environmental Protection permit (#132416479). The HID was one of the first mitigation projects of its kind in the state of Florida and the scope and scale of the restoration project made it precedent-setting. The project provides mitigation to compensate for unavoidable impacts to freshwater herbaceous wetlands which result from development activities, provided such activities have met all applicable requirements and are authorized by the ACOE. The mitigation funds acquired for the project provide for the long-term management and protection of the restored wetlands in perpetuity.

The HID was chosen as an area to provide compensatory mitigation because it demonstrated successful ecological lift through wetland restoration. The ecological functions restored during the project's ongoing implementation include hydrology, wetland soil formation processes, natural colonization of native wetland plants, the development of freshwater herbaceous wetland plant communities, and improved wildlife utilization.

To learn more about the HID project please scan the QR code below or visit <http://go.nps.gov/HIDRestoration>

