

INVASION OF THE CATTAILS

LSU researcher seeking to save Everglades from native plant invader

For the past year, Irv Mendelssohn has been riding an airboat out into the Florida Everglades. His studies endeavor to save this ecosystem from an invader that few would suspect: cattails.

Images of these saw grass-filled wetlands are known to many, but those images have been changing swiftly over the past 40 years. The ecosystem of the freshwater Everglades is built around saw grass, its primary form of vegetation. However, about 30 years ago, the number of cattails, once seen only in small localized populations, began to increase dramatically and now threatens to take over the environment. Though the impact of this change may not seem large to those outside of the study, it could be traumatic for plant and animal life in the area, completely changing the ecosystem.

With \$9 billion in federal and Florida state funds devoted to restoring the Everglades, scientists are searching for the cause of this invasion and potential solutions to the problem. One hypothesis of researchers is that the fragmentation of the Everglades by the plowing of numerous canals throughout the area has changed the natural hydrology and, in many areas, increased the water level. Cattails flourish in greater amounts of water. The other hypothesis, on which Mendelssohn, a professor in LSU's Wetland Biogeochemistry Institute, is focusing, deals with the permeating of sulfate and phosphorus from agricultural areas into the Everglades. Cattail growth can be fueled by higher levels of phosphorus in the water and land. In addition, sulfate may generate toxic hydrogen sulfide that can negatively impact saw grass, and promote cattail dominance.

Extending one foot below the soil's surface and four feet above it, plastic rings spanning five feet in diameter have been set up by Mendelssohn's research collaborators at the U.S. Geological Survey to enclose test areas of cattails and saw grass. Because they are focusing on the effects of sulfate, they dose the test areas with a sulfate solution and measure the amount of hydrogen sulfide produced in the soil. When hydrogen sulfide is present, saw grass suffers because a specific adaptation that cattails possess, an air space tissue that transports oxygen from the atmosphere into the soil, is much less developed in saw grass. The tissue protects the cattail from the poisonous hydrogen sulfide, which is more toxic than cyanide.



Irv Mendelssohn, a professor in LSU's Wetland Biogeochemistry Institute, examines the leaves of cattail plants in a greenhouse of the institute. Cattail population growth in the Everglades is threatening to throw the ecosystem out of balance.

In addition to testing the pH, soil nutrients, and hydrogen sulfide levels, Mendelssohn and his post doctoral researcher Hongjun Chen measure plant growth and the rate at which the plants process carbon dioxide. Depending on their findings and those of his colleagues from USGS, better practices may be employed by farmers to reduce amounts of phosphorous and sulfate that are transported from agricultural fields into the environment.

Mendelssohn emphasizes that overpopulation of cattails is unhealthy for the ecosystem. The animal species that depend on saw grass for food and habitat could be forced to leave the Everglades for other food sources. The effect could cascade down the food chain from one species to the next, magnifying the damaging effects a growing cattail population will have on the Everglades.

If something is not done about the continuing spread of cattails, the Everglades will become an entirely different environment. Now, it is up to Irv Mendelssohn and a host of other scientists and research teams trekking through the marsh to save a legion of plants and animals.

ON THE WEB:

LSU Wetland Biogeochemistry Institute

www.wetlandbiogeochemistry.lsu.edu

U.S Geological Survey

www.usgs.gov