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## **Report Shows Dramatic Drop in Growth of Cattails in Florida Everglades**

WEST PALM BEACH, Fla. — August 26, 2003 — The South Florida Water Management District has released a study that shows a 67% decrease in the growth of cattails in the Florida Everglades.

The study's findings are a significant indicator of the improving health of the Everglades and can be attributed to on-farm phosphorus cleanup by sugar farmers begun in the mid 1990s and to the 2000 completion of a 6,400-acre storm water filter marsh on the northwest border of the cattail study area. The water management district praised the findings as more proof that farmers' efforts are working to cut phosphorus leaving their fields and that the filter marshes are effective at further cleaning the water from farms, urban areas and Lake Okeechobee. "It's a positive indication good things are occurring out there," said Chip Merriam, District deputy executive director for water resources.

"This is outstanding news for the efforts to restore the Everglades," said Judy Sanchez, spokesperson for U.S. Sugar Corporation. "Day after day, report after report shows that the combined efforts of the farmers, the state and the water management district have produced dramatic results. The restoration partnership is working and everyone concerned about the health of the Everglades should be very happy."

"We are particularly encouraged by the fact that one concentrated area of cattails in WCA-2A actually has been replaced by saw grass and other healthy habitat. Impacts experienced over 50 years were reversed in eight years. That is the best news of all," said Sanchez.

Since farmers first fully implemented Best Management Practices or BMPs in 1996, the new soil and water management techniques have been successful in reducing phosphorus in water leaving the farms by over 50%. Areas of "dominant" cattails have not been expanded since 1995. Some areas have actually decreased.

The District study found that the cattail growth had slowed to an average of 785.2 acres per year from 1995 to 2003, compared to 2,374 acres per year from 1991 to 1995. The study discredits environmental critics claims, made as recently as this summer, that the spread rate of cattails was approximately 9 acres per day (3,300 acres per year). More than 50 % of the cattail areas mapped in the study are categorized as "sparse" in density. The study area covered 104,000 acres of the state-owned Everglades, west of Broward and southern Palm Beach counties.

The water management district has built a series of filter marshes to further reduce the phosphorus before it goes south to the Everglades. Nearly 50% of the planned storm water treatment areas will not be fully operational for another year, forecasting additional reductions as they come on line.

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October/November 2003

## Cattail Expansion Rate Slows

*Encouraging sign for Everglades recovery*



*Just as doctors look at multiple indicators to determine your overall health and well-being, scientists also look at multiple indicators to determine the condition of the Everglades.*

One factor is cattail growth. Based on the latest South Florida Water Management District report, the prognosis indicates that the Everglades is responding favorably to phosphorus-

reduction treatments. Between 1995 and 2003, the rate of cattail expansion in Water Conservation Area 2A (WCA-2A) declined from 2,375 acres per year to 785 acres per year.

A small portion in the northern tip of WCA-2A shows a marked decrease in cattail coverage due to a combination of upstream phosphorus reduction activities, the redistribution of inflow patterns, and natural fires.

"While the overall goal is restoration, reversing cattail expansion throughout the Everglades is extremely important," said Chip Merriam, deputy executive director for water resources. "The downward trend is promising news that our clean up efforts are working."

Due to historical nutrient buildup in the soils, water managers did not expect to see such dramatic changes this soon in the cattail expansion rate. However, phosphorus levels have been reduced significantly and much of the treated inflows have been distributed in an attempt to more closely mimic historic

sheetflow into the Everglades. Scientists also point out that a number of natural conditions (such as fire, wind, and fluctuating water levels due to floods and droughts) play a role in cattail growth and could influence future status reports. For example, the spread of sparse cattail into the marsh interior may be attributed to a combination of factors including nutrient loadings and reflux of phosphorus from the soils, which are exacerbated by higher water levels.

### WHY ARE CATTAILS BAD FOR THE EVERGLADES?

Cattails are a natural aquatic plant, typically found in wetland systems around the world, including the Everglades. In fact, it is an approved species for shoreline restoration projects in the state of Florida. Under historic conditions, the Everglades' low-nutrient levels kept the smattering of cattail plants in check.

But cattail is an aggressive, opportunistic plant. Fueled by high

*Continued page 2*

# WATER Matters

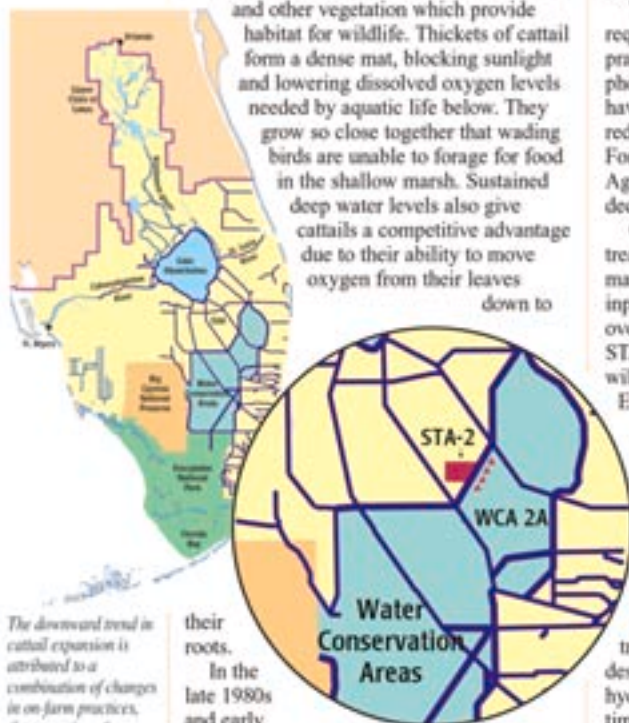
## Cattail Expansion Rate Slows

### Encouraging sign for Everglades recovery

Continuation

phosphorus inflows from agricultural and urban areas, cattail began to bully its way into the Everglades landscape, out-muscling more desirable plants such as sawgrass and other vegetation which provide habitat for wildlife. Thickets of cattail form a dense mat, blocking sunlight and lowering dissolved oxygen levels needed by aquatic life below. They grow so close together that wading birds are unable to forage for food in the shallow marsh. Sustained deep water levels also give cattails a competitive advantage due to their ability to move oxygen from their leaves

down to



The downward trend in cattail expansion is attributed to a combination of changes in on-farm practices, the operation of stormwater treatment areas, the redistribution of treated water inflows (red arrows) and natural fires.

their roots.

In the late 1980s and early 1990s, aerial vegetation mapping and field visits in a 104,000-acre portion of the Everglades known as Water Conservation Area 2A verified intense growth stands along major inflow points. This cattail explosion was visual documentation of changes in the Everglades habitat due to excess nutrients and became a rallying cry for water quality improvements.

#### IMPROVING WATER QUALITY

Settlement of a federal lawsuit in 1991 and subsequent passage of the Everglades Forever Act in 1994 set into motion a series of construction, research and regulatory programs designed to significantly reduce phosphorus inflows into the Everglades. A major component is the construction of several large wetlands, known as Stormwater Treatment Areas (STAs), to capture and

biologically remove excess nutrients from farm water. Four STAs have been built and two more are scheduled to come on-line this year.

The agricultural industry was also required to implement changes in on-farm practices to reduce the amount of phosphorus leaving farm fields. Growers have consistently surpassed the 25% reduction mandated by the Everglades Forever Act. This year, the Everglades Agricultural Area (EAA) documented a 35% decrease in phosphorus levels.

Combined, the existing stormwater treatment areas and farming best management practices have cut phosphorus inputs to the Everglades by 1,400 metric tons over the past decade. "When the additional STAs become operational, even more water will be cleaned before release into the Everglades," said Merriam.

The District has developed a Long-Term Plan – embodied in the amended Everglades Forever Act passed this year – for further reducing phosphorus inflows and to accelerate recovery of impacted areas. Examples of potential methods include harvesting/physical removal of cattail, adjustments in water levels, prescribed burning, chemical treatments and the re-planting of more desirable species. Improvements in hydropatterns (water depth, flow and timing/distribution) are also planned.

#### HIGH-TECH MAPPING

Ken Rutchey, a senior supervising environmental scientist, oversees the WCA-2A cattail mapping project.

"We monitor the extent and density of cattail to determine if water management practices are having an effect on plant communities," he said. "The resulting data trends provide us with an indication of the condition and dynamics of the ecosystem."

Scientists and technicians start with color infrared aerial photographs taken 12,000 feet above the earth. A fine resolution grid system – divided into 170,500 individual cells – is then superimposed over the aerial images. Each grid cell is analyzed for vegetation and cattail coverage. To ground-truth the data, 742 GPS-identified locations were visited by airboat or helicopter. The

2003 aerial photos were then compared with ones taken in 1991 and 1995 (prior to implementation of the phosphorus-reduction measures) to determine the changes, if any, in cattail coverage.

#### RESULTS ARE ENCOURAGING

Results show that while the spread of cattail continues in the Everglades water conservation area, the rate of expansion is slowing down. It is important to note that cattail growth may continue even as the long-term water quality improvements are implemented due to phosphorus releases from the soil and until full hydrologic restoration is achieved.

"We view this recent cattail survey as confirmation that our phosphorus-reduction investment is paying off," said Henry Dean, SFWMD Executive Director. "We are encouraged by the initial results and will continue to reduce nutrient inflows, create alternative water storage and distribution options, and work toward a healthier Everglades."





# Water Conservation Area 2A Cattail Trend Analysis 1991-2003

Time series trend analysis of cattail (*Typha* spp.) within Water Conservation Area 2A (WCA-2A) was performed utilizing 1:24,000 scale color infrared aerial photography captured in 1991, 1995 and 2003. Each cattail map was generated utilizing stereo photointerpretation techniques. The 1991 and 1995 cattail maps were delineated using a vector system with a minimum mapping unit of one acre. (Further discussion of 1991 and 1995 maps can be found in the February 1999 journal of *Photogrammetric Engineering & Remote Sensing*.) The 2003 cattail map was compiled utilizing a quarter hectare (50 x 50 meter) grid method constituting a minimum mapping unit of 0.6 acres. The quarter hectare grid was generated and superimposed over the 2003 aerial photography, resulting in 170,500 individual grid cells covering all of WCA-2A. Vegetation within each individual grid cell was observed utilizing a Leica SD2000 stereo-plotter. Cattail cover was estimated for each grid cell assigned one of four possible categories. The categories of this classification are: "cattail monotypic" (greater than or equal to 90% cattail), "cattail dominant mix" (50%-89% cattail), "cattail sparse mix" (10%-49% cattail), or "other" (less than 10% cattail). For ground-truthing, seven hundred and forty two locations within WCA-2A were visited using differential GPS navigation by airboat or helicopter. These points were determined to be areas in question or "unknown" during the photointerpretation process.

Advantages of the grid system mapping include greater time and cost efficiency and the unique ability to classify vegetation within the same quarter hectare grid cells from this analysis during future mapping efforts. This allows for the past, present and future analysis of each individual quarter hectare of the entire area under study. In addition, the grid system more accurately depicts the overall heterogeneity of Everglades vegetation.

Results show that cattail continues to spread throughout WCA-2A, with monotypic cattail patches expanding throughout the eastern portion of the impoundment and along the southwestern boundary. In addition, sparse cattail continues to spread along distinct cattail-sawgrass boundaries and throughout the southern regions of WCA-2A. The rate of spread appears to be slowing down, however, when compared to the 1991-1995 period. This decrease in rate may be due to the reduction in annual total phosphorus loads to WCA-2A during the 1995 to 2003 period. Excess nutrients, hydrologic alterations, invasive habitat availability, and fire have been shown to influence successful establishment of cattail in the Everglades. The relative importance of these factors influencing cattail coverage in WCA-2A from 1995 to 2003 still needs to be determined. A small area in the northern tip of WCA-2A shows a decrease in cattail coverage. It is hypothesized that the loss of cattail in this area is due to a combination of events including fire, a reduction in phosphorus loading, and water levels with the closing of structure S10E in 1996. Structure S10E regulates water flow from the Hillsboro Canal into northern WCA-2A.

	Cattail	Cattail Dominant Mix	Cattail Sparse Mix	Other	Total Cattail
1991	1041.8	5651.9	6822.2	90262.2	13515.9
1995	4068.0	9745.6	9196.3	80768.3	23010.0
2003	4898.8	9093.3	15299.2	74536.5	29291.2

\*Numbers are in acres

# Sun-Sentinel

AUGUST 26, 2003

## Cattail Growth Declines Study Finds

They are the most visible symbol of the Everglades' demise, crowding out saw grass and the native wetland wildlife that goes with it.

But while cattails continue to increase in number in Florida's signature marsh, fueled by phosphorus runoff from farms and yards, their rate of spread is slowing significantly, water managers said Monday.

The South Florida Water Management District hailed the findings as more proof that farmers' steps are working to cut phosphorus leaving their fields and filter marshes that further clean their drainage water.

The district's analysis found that cattails are expanding -- in varying densities -- at an average rate of 785.2 acres this year compared to 2,374 acres in 1995. That's a 67 percent decrease in a 104,000-acre swath of the Everglades west of Broward and southern Palm Beach counties. The calculations are for the segment of Everglades most overrun with cattails.

"It's a positive indication good things are occurring out there," said Chip Merriam, district deputy executive director for water resources.

But Audubon of Florida pointed out the district figures still show cattails fanning out at an average of 2 acres a day, evidence that phosphorus pollution continues to grow inside the River of Grass. Total cattail coverage has more than doubled in the area since 1991, from 13,516 acres to 29,291 acres.

"Two acres a day is too much for the Everglades to keep losing," said Audubon Senior Vice President Charles Lee.

Cattails have been dubbed the Everglades' grave marker, because by the time they flourish, it's too late: The damage has been done. Water chemistry and algae are altered from their natural state, with ripples up the food chain.

As cattails sprout and thicken, they push out native saw grass, wading birds and fish, fill in open water areas, and lower dissolved oxygen levels.

Solid stands of cattail increased by 831 acres from 1995 to 2003. From 1991 to 1995, they gained three times as much ground: 3,026 acres, the district reported.

The district attributes the slower rate of cattail growth to on-farm phosphorus cleanup work begun in the mid-1990s and to the 2000 completion of a 6,400-acre filter marsh on the northwest border of the cattail study area. Farmers in the Everglades Agricultural Area south of Lake Okeechobee this year cut the amount of phosphorus flowing from their fields by 35 percent. The district-built filter marsh catches some of the pollutant passed on by farms.

Yet cattails don't tell the whole story, environmentalists note. The water district is studying phosphorus levels in Everglades soil to improve its understanding of the pollution problem, Merriam said.

Still, U.S. Sugar, a major grower in the Everglades Agricultural Area, said the cattail calculations show steady progress.

"I think this is more outstanding news for the Everglades," said U.S. Sugar spokeswoman Judy Sanchez.