

A COMPARISON OF
CATTAIL (*Typha* sp.) OCCURRENCE
ON A PHOTO-INTERPRETED MAP
VERSUS A SATELLITE DATA MAP

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SUMMARY

A comparison between a 1985 photo-interpreted vegetation map and a vegetation map made from classified 1987 satellite data of the Loxahatchee National Wildlife Refuge showed that 81% of samples taken in areas occupied by cattail (Typha sp.) on the photo-interpreted map corresponded with cattail on the satellite data map.

INTRODUCTION

Under contract to the National Wetlands Inventory, U.S. Fish and Wildlife Service, Martel Inc. created a vegetation map of the Loxahatchee National Wildlife Refuge by interpreting 1983-1985 1:58000 NHAP color infrared aerial photography. The National Wetlands Inventory planned to digitize this map for inclusion in a computer database for Loxahatchee National Wildlife Refuge, but the complexity of the map made this unfeasible. Instead, the Florida Cooperative Fish and Wildlife Research Unit performed a computer classification of 1987 SPOT satellite data, (scene id 16232978704041559122X and 16232978704041559101P), to generate a map of the wildlife refuge in digital form (Richardson et al. 1990).

Photo-interpretation has been used to test the accuracy of classified satellite data (Dicks et. al. 1990). A visual comparison of the photo-interpreted and satellite data maps indicated that the extent of cattail (Typha sp.) on the satellite data map appeared to be less than that on the photo-interpreted map. Because the occurrence of cattail is central to important ecological and management questions (Richardson et al. 1990), a quantitative comparison of its occurrence on these two maps was desired.

METHODS

The Fort Lauderdale 2NW Quadrangle of the U.S.G.S. 7.5 minute orthophotomap series contains roughly 50% of the cattail in the Loxahatchee National Wildlife Refuge, and was selected as the site for map comparison. Sample points were taken from this selected region within all areas identified on the photo-interpreted map as cattail. 366 samples were taken by randomly placing a 1/4 inch grid over the map, and digitizing the location of all grid points within the cattail areas that were more than .5 mm from boundaries with other vegetation types. The grid cells correspond to 500 feet on the ground.

Using ERDAS image processing software, the sample points were compared with the classified satellite data map. The ERDAS program POLYCAT finds the pixels (picture elements) in the satellite map which correspond to the locations of each sample point. The program then looks at a square block of 9 pixels centered around each sample point pixel, and identifies the vegetation class which occupies the majority of the block. If there is no majority class within the block, the program identifies the vegetation class of the sample point pixel itself. The vegetation class for each sample point is then written to a file.

RESULTS

The digitized sample points were tallied by their satellite map vegetation class to produce Table 1. 81% of the sample points fell into one of the three cattail classes on the satellite map. The remaining sample points were classified as other vegetation types.

Table 1. Cross reference of sample points photo-interpreted as cattail (Typha sp.) on the National Wetlands Inventory map of Loxahatchee National Wildlife Refuge and their vegetation classes on the Florida Cooperative Fish and Wildlife Research Unit's classified satellite data map.

Class Number*	Vegetation Class on Satellite Map	Number of Samples
10	Cattail (close to canal)	157
18	Cattail	107
2	Cattail (invading sawgrass)	31
16	Sawgrass	13
14	Brush/tree island	12
3	Sawgrass	9
4	Brush/sawgrass	9
17	Willow	9
1	Sawgrass	7
15	Sawgrass/brush	6
6	Wet prairie	5
9	Sparse wet prairie	1
5	Tree island	0
7	Tree island	0
8	Brush	0
11	Open water	0
12	Slough	0
13	Willow	0
Column total		366

Cattail correspondence: 81%

* See Richardson et al. 1990 for complete description of classes.

LITERATURE CITED

- Dicks, Steven E., and Thomas H. C. Lo. 1990. Evaluation of thematic map accuracy in a land-use and land-cover mapping program. *Photogrammetric Engineering and Remote Sensing* 56:1247-1252.
- Richardson, John R., Wade L. Bryant, Wiley M. Kitchens, Jennifer E. Mattson, and Kevin R. Pope. 1990. An evaluation of refuge habitats and relationships to water quality, quantity and hydroperiod. A synthesis report. November 1990. 167 pp. Florida Cooperative Fish and Wildlife Research Unit, University of Florida.