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Caloosahatchee Oxbow Research Proposal

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Introduction

In 1996, a study of the Caloosahatchee oxbows was initiated by CRCA Technical Committee Co-Chairs, Dr. John Capece and Rae Ann Wessel. The oxbows are the semi circle shaped water bodies on either side of the river channel which are the remnant bends of the original river. The purpose of the survey was to generate information about the 35 Caloosahatchee oxbows located along the north and south shores of the river between the Franklin Lock in Lee County and the City of La Belle in Hendry County. In addition to the effort to study the rivers health the survey was designed to introduce the public to, and encourage their involvement in, a scientific study of the river.

The objective of that initial survey was to compile a baseline of the configuration, depth, habitat, land uses and development present along each of the oxbows. The preliminary results were used to create educational presentation material which has been used in public presentations and before the Board of the South Florida Water Management District. This information was critical in our presentations before the WMD Board requesting more research attention and funding for the Caloosahatchee and West Coast. In the end our efforts were pivotal in acquiring additional water quality funding and technical scientific support for the Caloosahatchee.

A by-product of the study was the initiation of a series of public, educational Oxbow & Riverlore Cruises that provided the public with an introduction to the rivers history, ecology and water quality and resulted in additional public interest as well as additional donations to CRCA. This education/outreach effort was the key that attracted attention to the survey effort and secured funding from the Center for Environmental Studies, a division of Florida Atlantic University.

Having completed the first phase of the study in 1997, CRCA was awarded funding from the Center for Environmental Studies to begin a second phase of the study in 1999. Data collection had just begun when a reorganization of the South Florida Water Management District resulted in staff and budget changes that closed the Tarpon Bay Environmental Lab and eliminated the funding for the study.

Project Scope

The oxbows support the only remaining natural riverine habitat in this altered river system. Unlike the Kissimmee River, the Caloosahatchee can never be restored to its historic flow patterns because of its designation as the *Cross Florida Ship Channel*. The best that we can accomplish is to protect and restore the remnants of the original riverbed, the oxbows. In fact, these areas, provide the only refuge areas for nursery species and have potentially high ecological value.

Previous studies of the Caloosahatchee oxbows include: a geomorphic and biological survey conducted by Milleson et al. (1979), water quality studies by Camp Dresser & McKee, Inc. (1994) and The University of Florida Institute of Food and Agricultural Science (IFAS) in 1996. The water quality and sedimentation information gathered in these studies indicates that the river and its remnant oxbows have been degraded over the last 21 years.

The pattern of water quality degradation and the lack of biological data to compare to the 1978 study by Milleson et al. has pointed up the need for further scientific data collection. In a degrading system it is critical to continue to monitor conditions so that assessments can be made about the type and possible cause of degradation and decisions can be made to provide for remediation of the system.

Project Goal

The long term goal of this study is to rehabilitate as many oxbows in the Caloosahatchee to the greatest extent possible in order to enhance water quality, habitat function and biological diversity. In addition to these environmental objectives restoring and preserving the oxbows will help to preserve the cultural heritage and historic value of the river. This objective becomes more critical with the initiation of the Comprehensive Review Study, the SFWMD Minimum Flows and Levels review, SW Florida Feasibility Study and increasing land conversion and development pressure along the oxbows and river.

The objective of this study is to utilize the data collected to design, permit and construct a Demonstration project which will restore the functions of the natural habitat system. This may include removal of fill across oxbows which impede flow, restoration of functional depths and habitat management to name a few. Among these objectives we hope to reduce and eliminate the increasing destruction of these critical habitat areas.

The benefits of this goal will be improved water quality for both the river and estuary, increased habitat diversity and productivity of natural shelter, feeding and nursery areas and enhanced property values.

Study Concept

In order to accomplish the project scope and work toward the long term project goals, the proposed study is divided into five phases. To insure the success and broad support of this project it is conceived that CRCA will look for willing, cooperative partners to accomplish the phases of this study.

Partnerships are conceived to include the Florida Dept. of Environmental Protection (DEP), Army Corps of Engineers (COE), School Science clubs, private businesses and property owners.

Phase I - Field Assessment and Sampling

The 1996 survey identified three levels of oxbow function; high value, moderate and poor. Each oxbow could be categorized as fitting in one of these categories. Ideally, all 35 oxbows measured and surveyed in 1996-7 would be resurveyed to establish new baselines from which comparisons could be made. However, if time and money constraints dictate, we can sample a sub-set of 10 oxbows which represent a selection of oxbows which represent the range of functioning for analysis of geomorphic, sediment and macroinvertebrate and vegetative habitat assessment studies.

Field Sampling

Cross sections on each oxbow will be field staked and GPS located at a minimum of three locations within each oxbow. Each cross section will be measured for width and depth at 10 ft. intervals. Measurements will be taken of temperature, pH, conductivity, DO and light attenuation (secchi disk). Flow will be measured at the deepest point of each transect. Equipment needed for these measurements will need to be loaned, donated, rented or purchased or worked out on a cooperative basis in a partnership. Field work will be conducted with volunteers under the supervision of Rae Ann Wessel, the project manager to provide QA/QC.

Plant beds will be sampled in each oxbow using a floating 1 meter square pvc frame. Two quadrats will be randomly sampled within each plant bed. In each quadrat plants will be identified and stem density will be counted and recorded. Plant bed habitat will be characterized and GPS located. Equipment for this sampling will be constructed from pvc purchased at minimal cost. Field work will be conducted by volunteers trained and supervised by Rae Ann Wessel.

Macroinvertebrate samples will be taken from each oxbow in conjunction with the plant bed sample sites, for analysis of the diversity of the macroinvertebrate community within different vegetative habitats. Sample sites will be selected based on the habitat and sediment variations found in each oxbow. Professional identification services needed for processing these samples will need to be purchased or worked out on a cooperative basis in a partnership. Field sampling will be conducted by Rae Ann Wessel with volunteers.

Phase II - Data Evaluation and Assessment Report Preparation

Field data from the sampling of the 10 selected oxbows will be compiled into a tabular format and evaluated in a report which summarizes the results and categorizes the subject oxbows by a set of selected standards. The report will be written by Rae Ann

Wessel with help from interested volunteers and students. The reports conclusions will be presented to the CRCA Board with recommendations for selection and permitting of a demonstration project.

Phase III - Demonstration Project Selection & Permitting

Once selected the project team will work with the permitting agencies, Corps of Engineers, Water Management District, Dept. of Environmental Regulation and County/City agencies to permit a demonstration project. The concept is to work as partners with the permitting agencies to increase participation, reduce permitting costs and share expenses.

Phase IV - Demonstration Project Construction

Once permitted, such a demonstration project can apply for money and matching funds to construct and monitor the project.

Phase V - Demonstration Project Monitoring

Post construction monitoring will be conducted on a regular schedule dictated by the design and restoration specific to the demonstration project oxbow. Monitoring will sample transect depths, flow, water quality, macroinvertebrate and benthic composition monitoring and vegetative habitat restoration diversity and success. Wildlife usage will also be documented using a standard survey techniques.