**TECHNICAL SUMMARY**

LOOP Environmental Monitoring Program
2000-2001 Vegetation and Wildlife

Summary of Report Number 367

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## INTRODUCTION

The Louisiana Offshore Oil Port (LOOP) facilities in coastal Louisiana provide the United States with the country's only Superport for off-loading deep draft tankers. The facilities are located south of New Orleans in Lafourche Parish in southeast Louisiana and in adjacent offshore waters west of the Mississippi River Delta. LOOP is operated by LOOP LLC., a private corporation jointly owned by Shell Oil Company, Texaco Inc., Ashland Inc., Murphy Oil Company, and Marathon Pipeline Company.

The LOOP pipeline, which connects the facilities to onshore storage and distribution systems, traverses the major wetland habitats in the Louisiana coastal area. The 159 km pipeline crosses the near-offshore Gulf of Mexico near Fourchon through beach/barrier headland, estuary, and bottom land hardwood and bald cypress/water-tupelo swamp forests within the estuary. Four salinity zones–saline, brackish, intermediate, and fresh–are traversed, each providing a unique habitat supporting a variety of species. The coastal marshes of Louisiana are among the most productive ecosystems in the world, supporting a wide variety of estuarine-dependent organisms.

## OBJECTIVES

The goal of the vegetation and wildlife portion of the LOOP Environmental Monitoring Program was to measure the immediate and long-term impacts of LOOP-related pipeline construction and operation on surrounding wetland plant communities and associated waterfowl, wading-bird, furbearing mammal, and alligator populations.

## RESEARCH APPROACH

To meet the objectives of the LOOP Environmental Monitoring Program, two primary indices were used to determine environmental change. First, species composition and density were used to signify changes in the physical and chemical environment. Changes in species presence, diversity, and abundance typically indicate a change in the quality of an ecosystem. Second, net primary production was used to determine the quantity of production of the ecosystem.

Principles of sampling design, data collection, and analysis were used to determine which variables were the most important causal agents. Surveys were conducted regarding spatial and temporal variability as related to identifiable changes caused by the pipeline. Statistical methods were used to evaluate main effects, interactional effects between and among variables, and one-way effects between variables; test the hypothesis; and determine spatial and temporal trends.

The different parts comprising the 2000-2001 monitoring program are discussed by component in the report. They are beach elevation, beach vegetation, general biological overflight, muskrats, wading bird/seabird rookeries, vegetation biomass, Clovelly radial transects, wading birds, and pelicans.

## CONCLUSIONS

In an effort to meet the requirements of the LOOP Environmental Monitoring Program, the surveys summarized above were performed in 2000-2001. Overall, the LOOP pipeline corridor appeared to be in good environmental condition as a result of the construction and operation of the LOOP pipeline. Construction impacts to vegetation, wildlife, and hydrology did occur in 1978 through 1981;

however, LOOP did attempt to minimize these impacts by backfilling the canal, plugging waterbody crossings, planting vegetation on the beach, etc. A portion of the LOOP pipeline has become a shallow waterbody, but wading birds and waterfowl find this an attractive habitat. No survey conducted could attribute direct impacts on the environment to the continued operation of the LOOP pipeline. The most significant action item for LOOP is to provide repair and/or maintenance to some plugs in the project area. Erosional processes were observed from the complex channelization of the marsh. This appears to be a result of natural coastal processes with many causes, and the LOOP pipeline does not appear to have hastened this process.

**RECOMMENDATIONS**

In an effort to meet the requirements of the LOOP Environmental Monitoring Program, the surveys detailed in the final report were performed in 2000-2001. During the course of the work, the following recommendations were developed to better improve the scientific merit and the cost effectiveness of the surveys.

The LOOP EMP should be redesigned to 1) incorporate current research regarding coastal processes and rate of land loss and 2) utilize current aerial mapping and remote sensing technologies as an initial monitoring tool that can be used to guide specific field investigations. Such technologies have been proven to satisfy the requirements of monitoring programs with goals and objectives similar to the EMP while minimizing the intrusion associated with field surveys in wetland environments. The recommendations are:

1. Current research since the initiation of the EMP should be implemented since this significant body of research strongly suggests that habitat type and quality directly reflect wildlife sustainability. Thus, the monitoring of specific wildlife habitat surveys would estimate net productivity and species composition.

2. Aerial mapping/remote sensing technologies Data generated by current, digital aerial mapping technology and commercially available spatial/spectral software should be used to accurately measure shoreline erosion at the beach crossing,thereby eliminating the need for a separate beach elevation survey. These technologies could also be used to identify erosional processes that need immediate maintenance or that occur as a result of storm events. Assessments of primary production and vegetative diversity, two stated goals of the EMP, should also be evaluated using this technology, thus reducing the need for extensive field surveys associated with the vegetation biomass survey and the general biological overflight.

3. In addition to the recommendations above, it is suggested that the beach vegetation survey, which was conducted in January 2001, be done at a different time of the year, either in April/May at the beginning of the growing season or in August/September at the end of the growing season. It should not be done in January when plants are brown and dormant.

It is important to note that the requisite annual and biannual vegetation and wildlife surveys will be completed during the 2002-2003 survey. Upon completion of all surveys, a more definitive set of recommendations may be possible.