Wetland Plant Communities, Galveston Bay System

Galveston Bay
National Estuary Program

GBNEP-16
March 1992

Wetland Plant Communities, Galveston Bay System

printed on recycled paper

Wetland Plant Communities, Galveston Bay System

prepared by
William A. White and Jeffrey G. Paine
Bureau of Economic Geology
The University of Texas at Austin

assisted by
Damon Waitt

E.G. Wermund
Principal Investigator

The Galveston Bay National Estuary Program

Publication GBNEP-16
March, 1992

This project has been funded in part by the United States Environmental Protection Agency under assistance agreement # CE-06550-01 to the Texas Water Commission. The contents of this document do not necessarily represent the views of the United States Environmental Protection Agency or the Texas Water Commission, nor do the contents of this document necessarily constitute the views or policy of the Galveston Bay National Estuary Program Management Conference. The information presented is intended to provide background information for Management Conference deliberations in drafting of official policy in the Comprehensive Conservation and Management Plan (CCMP). The mention of trade names or commercial products does not in any way constitute an endorsement or recommendation for use.

Policy Committee

The Honorable Rodney Ellis, Chair
Texas Senate

Mr. Buck J. Wynne, III, Vice-Chair
Regional Administrator, EPA Region 6

Mr. John Hall
Chair,
Texas Water Commission

Mr. John Wilson Kelsey
Vice-Chair,
Texas Parks and Wildlife Commission

Ms. Linda Shead
Executive Director
Galveston Bay Foundation

Mr. Charles W. Jenness
Chair,
Texas Water Development Board

Ms. Eileen Crowley
Former President
Greater Houston Partnership
Chamber of Commerce Division

The Honorable Jon Lindsay
County Judge, Harris County

Local Governments Advisory Committee

The Honorable Ray Holbrook, Chair

Management Committee

Mr. Myron O. Knudson, Chair

Ms. Barbara Britton, Vice-Chair

Scientific/Technical Advisory Committee

Dr. Frank M. Fisher, Jr., Chair

Dr. Robert McFarlane, Vice-Chair

Citizen's Advisory Steering Committee

Ms. Sharron Stewart, Chair

Ms. Glenda Callaway, Vice-Chair

Galveston Bay Public Forum

Dr. Martin Arisco, Chair

Dr. Don Bass, Vice-Chair

Program Director

Dr. Frank S. Shipley

TABLE OF CONTENTS

EXECUTIVE SUMMARY 1

INTRODUCTION 2

- General Objectives of Field Investigations 2
- General Project Objective and Wetland Definition 2
- Field Surveys 3
- Methods 3

WETLAND COMMUNITIES IN THE GALVESTON BAY AREA 5

- General Setting of the Galveston Bay System 5
- Classification of Wetland Communities: Background and Previous Studies 5
- Species Composition of Wetland Plant Communities, Galveston Bay System 13
  - Wetland Indicator Status of Prevalent Plants at Survey Sites 23
  - Wetland Plant Communities 23
    - Salt-Marsh Community 27
    - Brackish-Marsh Community 27
    - Fresh-Marsh Community 38
    - Forested Wetland Communities (Swamps) 42
    - Submerged Vegetation Community 42
- Soils and Wetland Community Relationships 42
- Examples of Wetland Profiles Developed from Topographic Survey Transects 49
  - Smith Point Transect 49
  - Brazoria National Wildlife Refuge Transect 51

ACKNOWLEDGMENTS 52

REFERENCES 53

APPENDICES

A. Field Site Surveys 57

B. List of Plant Species by Site Number 63

C. Elevation Transects 85

Figures

1. Index map of the Galveston Bay area....4
2. Natural systems in the Galveston Bay area....6
3. Location map of field survey sites....15
4. Index map of quadrangles covering the Galveston Bay area....19
5. Low salt-marsh community of *Spartina alterniflora* and open water on the inland margins of Jones Bay (east end of West Bay)....28
6. Salt-marsh community on Follets Island....28
7. Low salt-marsh community inland from West Bay....29
8. Salt-marsh community on the bayward margin of Bolivar Peninsula....29
9. Salt-marsh community at Houston Point....30
10. Salt marsh/sand flat community on Follets Island....30
11. Profile of salt marsh at Smith Point showing relative elevations of plant communities....31
12. Profile of brackish marsh in the Brazoria National Wildlife Refuge showing relative elevations of plant communities....32
13. Brackish-marsh community in the Brazoria National Wildlife Refuge southwest of Hoskins Mound....34
14. Brackish-marsh community in the Brazoria National Wildlife Refuge east of Hoskins Mound....34
15. High and low brackish-marsh communities in the Anahuac National Wildlife Refuge....35
16. Brackish-marsh community dominated by *Spartina patens*, west of High Island....35
17. Brackish-marsh community in a swale on Galveston Island....36
18. Brackish- to fresh-marsh community in a depression on Follets Island, gulfward of highway....36
19. Brackish-marsh community on the Trinity River delta....37
20. Brackish-marsh community on the Trinity River delta near the delta/bay margin....37
21. Fresh-marsh community in the Trinity River valley north of Interstate Highway 10....39
22. Fresh- to brackish-marsh community on the Trinity River delta near Old River Lake....39
23. Fresh-marsh and forested-wetland communities in the San Jacinto River valley....40
24. Fresh-marsh community of *Scirpus californicus* in an ox-bow lake in the Brazoria National Wildlife Refuge....41
25. Fresh-marsh community dominated by *Eleocharis quadrangulata* (squarestem spikesedge)....41

26. Swamp community dominated by *Taxodium distichum* along the Trinity River inland from Interstate Highway 10 43

27. Generalized map showing the locations of submerged vegetation along the margins of the Trinity River delta 44

28. Generalized map showing the locations of submerged vegetation in 1956 and 1987 in the Galveston Bay system 45

29. Disturbed-area community on a small spoil mound along the Intracoastal Waterway on the landward margin of Follets Island 50

Tables

1. Generalized characteristics of active coastal processes and conditions in the Galveston Bay area 7

2. Dominant and common plants in brackish and fresh marshes in Chambers County 9

3. Common species in salt and fresh marshes in the Brazoria National Wildlife Refuge, Brazoria County 10

4. Typical plants found in grassflats, marshes, and transitional areas in the Galveston Bay area 11

5. Typical plants identified at saline sites at Armand Bayou and vicinity 12

6. Water regime descriptions for wetlands used in the Cowardin and others (1979) classification system 14

7. List of USGS 7.5-minute topographic maps that encompass the Galveston Bay project area 20

8. List of common plant species for various marshes based on field surveys 21

9. Species most frequently observed at survey sites in the study area 22

10. Wetland indicator status and common names of plants identified in field surveys 24

11. Characteristics of typical soils at field survey sites 46