Job Report

Ronnee L. Schultz
Marine Biologist

Project No. M-6-R-2 Date April 27, 1962

Project Name: Fisheries Investigations in the Aransas-Copano Bay System

Period Covered: January 1, 1960 to December 31, 1960 Job No. C-2

A Survey of the Macro-Vegetation of Mesquite Bay and Cedar Bayou

Abstract: Changes in lower Mesquite Bay's vegetation components were apparent. Forms not previously reported and commonly found in high salinity environments were taken freely in the lower end of the bay. This appearance of high stenohaline plants in the lower end of Mesquite Bay near the mouth of Cedar Bayou suggests the influence of Gulf water entering the bay through the bayou. It appears, however, that although Cedar Bayou allows Gulf water to enter the bay and enables high salinity vegetation to establish itself in the lower end of Mesquite Bay, the greatest single factor affecting the floral components is the fresh water, governed by rainfall, that enters Mesquite Bay from the Guadalupe River via San Antonio Bay.

Objective: The object of this survey is to determine the floral components of Mesquite Bay and Cedar Bayou Pass, their distribution and their seasonal periodicity for comparison with work conducted in 1958 when Cedar Bayou was closed.

Procedure: Plant types were collected by trawl and by hand in conjunction with Jobs No. A-2, B-2 and E-2 at 14 stations (Figure 1). Samples were labeled and returned to the Laboratory for identification.

Findings: A list of species collected during both survey periods is presented. The Thallophytes are presented first (Table 1), followed by the Spermatophytes (Table 2).

Chlorophyeae

Enteromorpha calathra (Roth) J. Agardh. Reported by Hoese (1957-1958.

Enteromorpha flexuosa J. Agardh was the only species of Enteromorpha found during 1960.

Ulva lactuca Linnaeus. This plant was found in late winter and early spring during both studies. The opening of Cedar Bayou does not appear to have affected its growth or location at Stations 4 and 8.

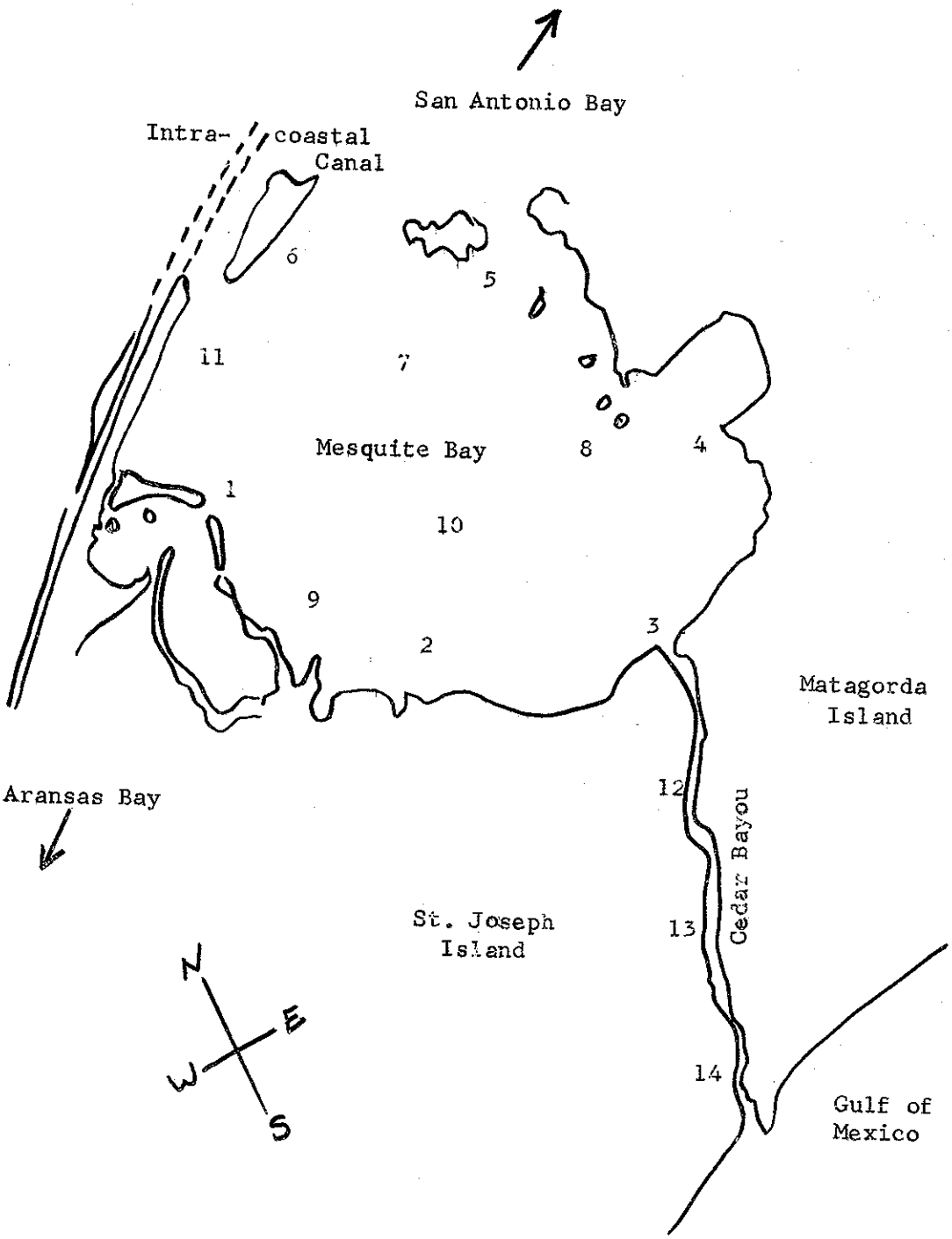
Ulva fasciata Delile. Hoese reported this plant as abundant near Station 4. During 1960 it was in wider distribution (Table 1) in April and May and was especially abundant on pilings.

Cladophora fasciularis (Mertenz) Kutzeing. This was the only species of Cladophora found in either study.

Rhizoclonium riparium (Roth) Harvey. A heavy bloom of *R. riparium* took place in June and July near most of the shore areas in Mesquite Bay and Cedar Bayou. Hoese did not report it.

Figure 1

Vegetation Sample Stations
in Mesquite Bay



414

Table 1
Thallophytes

	Stations 1	2	3	4	5	6	7	8	9	10	11	12	13	14	Salinity Range
Chlorophyceae															
Enteromorpha calathra	Bloom in March and April, 1958														
		S	S	S			S								
Enteromorpha flexuosa		S	S	S			S								27-33
Ulva latuca				H											36.0-38.3
				S				S							17.0-24.0
Ulva fasciata			H	H	H										3.0-17.0
		S		S						S					17.0-26.0
Cladophora fasciularis	Found on posts and pilings														5.0-40.0
	S	S	S								S				16.0-27.0
Rhizoclonium riparium	S	S		S	S	S					S				26-32
Phaeophyceae															
Dictyota dichotoma	H			H					H						
		S	S	S								S	S	S	32-35
Padina vickersiae			S											S	33-35
Sargassum fluitans												H			
			S									S	S	S	33-35
Sargassum natans			S									S	S	S	32-35
Rhodophyceae															
Gelidium corneum			H	H							H				1.8-3.0
Gelidium crinale			H	H							H				1.8-3.0
	S				S	S					S				1.9-12.6
Agardhiella tenera	February and March in high salinities														
			S												36
Hypnea musciformis	H	H													37.7-40.1
			S									S		S	28.0-35.0
Hypnea cornuta			S												32-36

H = found by Hoese
S = found by Schultz
Salinity in parts per thousand

415

Table 1 Continued.

	Stations 1	2	3	4	5	6	7	8	9	10	11	12	13	14	Salinity Range
Hypnea												H		H	27-36
cervicornis			S										S	S	22.0-32.0
Gracilaria	Found in February and March, high salinities														
blodgettii	S				S			S			S				16-24
Gracilaria	Found in March in low salinities														
verrucosa															
Gracilaria	Found in March in low salinities														
folifera	S				S	S		S							12-29
Gracilaria	Found in September in medium salinities														
ferox															
Laurencia				H											36.0
poitei				S		S									35.0
Centroceras															
clavatum				S										S	36
Ceramium															
strictum				S										S	32
Digenia															
simplex				S								S	S	S	26-36
Polysiphonia	Abundant in 1957-58														
ferulacea	S	S	S			S					S				12-29
Polysiphonia	H														40
denudata															

Table 2
Spermatophytes

	Stations 1	2	3	4	5	6	7	8	9	10	11	12	13	14	Salinity Range
Diplanthera												H	H		17-25
wrightii		S			S	S						S	S		24.0-31.0
Ruppia	Replacing Diplanthera in Feb.											H	H		4-18.3
maritima		S			S	S		S			S	S	S		9.2-36.0
Halophila	Recorded in 1957 and 1958														
engelmanni		S													30.7
Spartina															
alterniflora	S	S	S	S	S	S	S	S	S			S			1.9-36

416

Phaeophyceae

Dictyota dichotoma (Hudson) Lamouroux. D. dichotoma was found only occasionally during this study near the bay mouth of Cedar Bayou. It was found growing in high salinity waters.

Padina vickersiae Hoyt. Padina occurred occasionally during the summer months of 1960 and was usually found attached to shell or other debris.

Sargassum fluitans (Bergesen)

Sargassum natans (Linnaeus) J. Mayen

These two plants are commonly found along the Gulf beach after being washed ashore. They are not found attached in the bays and cannot be considered part of the natural flora.

Rhodophyceae

Gelidium corneum (Hudson) Lamouroux

Gelidium crinale (Turner) Lamouroux

Both of these species were collected by Hoese during his survey, while the latter was encountered only once in 1960.

Agardhiella tenera (J. Agardh) Schmitz. This species was found twice during 1960 survey period, once at Station 3 and again at Station 12 in March and June. It is believed not to be native to Mesquite Bay and probably occurred when washed in from the Gulf.

Hypnea musciformis (Wulfen) Lamouroux

Hypnea cornuta (Lamouroux) J. Agardh

Hypnea cervicornis J. Agardh

These plants were all taken in and around Cedar Bayou during early spring and summer. During the latter part of the summer, H. cervicornis was dominant. Only three specimens of H. cornuta were taken. These plants were found in high salinities over 27 parts per thousand.

Gracilaria blodgettii Harvey. This was the most common algae found in Mesquite Bay except at its lower end. The probable reason for this distribution is its salinity tolerance.

Gracilaria verrucosa (Hudson) Papenfus. This plant was reported by Hoese only.

Gracilaria foliifera (Forskal) Bergesen. G. foliifera was another fairly common algae in the upper end of Mesquite Bay during both studies.

Gracilaria ferox J. Agardh. Hoese found this plant in the winter months, but it was not collected during this survey.

Laurencia poitei (Lamouroux) Howe. This plant was collected by the writer at Stations 4 and 8 but was not abundant. It occurred throughout the summer until fall, when a heavy mortality occurred.

Centroceras clavatum (C. Agardh) Montagne. Centroceras is a plant which appears to prefer high salinities as it occurred in abundance on the Port Aransas jetties.

Ceramium strictum (Kutzing) Harvey. Another high salinity plant found at Port Aransas is C. strictum. It too was probably washed into the bay through the pass.

Digenia simplex (Wulfen) C. Agardh. This plant was found occasionally during this study. It has been found in areas which are usually influenced in some way by an inlet or pass into the bay. If Cedar Bayou remains open, it may establish itself in the lower bay.

Polysiphonia ferulacea Suhr. P. ferulacea was found during the winter months in both studies and dominated the floral picture in February and March, disappearing with warmer weather.

Polysiphonia denudata (Dillwyn) Kutzing. This plant was reported only by Hoese.

Spermatophytes

Diplanthera wrightii (Ascherson) Ascherson. As a marine perennial, Diplanthera was found scattered in small patches in the lower bay in shallow waters one to three feet deep. In the fall it disappeared as the water became cooler and salinity decreased.

Ruppia maritima Linnaeus. Widgeon grass is a submerged perennial found in salt waters of up to 35 parts per thousand. The higher ranges of salinity are tolerated for only a short time. It was found in spring and summer months near most shore stations and achieved its best growth in the spring.

Halophila engelmanni Ascherson. Halophila, another perennial, was recorded only at Station 2, where it was found floating on the surface of the water. It is abundant in Redfish Bay in about three feet of water.

Spartina alterniflora Lois. Hoese's not mentioning this plant was probably an oversight, as it is a common shore plant in all of our bays, especially in protected areas. It is fairly important to bay ecology because of the detritus it adds and the attachment it affords to many species of plants and animals.

Other plants, mentioned because of their presence and not for their importance, are listed below.

Monanthochloe littoralis Engelman
Distichlis spicata (Linnaeus)
Salicornia sp.
Suaeda sp.

These plants all occur on or near the shore of the bay and pass and only during high tides are they actually in the water.

Discussion: Mesquite Bay, with its interesting association of plants, does not seem to have undergone any major changes as far as distribution is concerned. The species composition of the bay was essentially the same in both surveys, with only a few plants found during one survey and not the other.

The opening of Cedar Bayou seems to affect only the lower portion of Mesquite Bay, and most of the new species of plants found were in that zone.

If a similar study were to be made in Mesquite Bay when the Bayou was open in dry years, greater changes might be seen.

Ruppia maritima was scarce in Hoese's study but was abundant near the shore in 1960. In the winter it was not apparent, but its roots were found.

Summary: 1. Some change has taken place in the floral components of Mesquite Bay as a result of the opening of Cedar Bayou.

2. Fresh-water from San Antonio Bay entering Mesquite Bay has a great influence on Mesquite Bay's flora.

3. The lower portion of Mesquite Bay had higher salinity plants than the upper portion of the bay.

Prepared by: Ronnee L. Schultz
Marine Biologist

Ernest G. Simmons
Regional Supervisor

Approved by Terance R. Leary
Coordinator

418

Bibliography

Dawson, E. Y. 1956. How to Know the Seaweeds. Wm. Brown Co., Dubuque, Iowa.

Fritsch, F.E. 1948. The Structure and Reproduction of the Algae. Cambridge University Press.

Hoese, H.D. 1957-1958. Hydrographic and Ecological Studies in Mesquite Bay and Cedar Bayou, Texas. Thesis, A Report of the Mesquite Bay Project to the Marine Fisheries Division of the Texas Game and Fish Commission.

Smith, G.M. 1938. Cryptogramic Botany, Vol. I, McGraw Hill Book Co., Inc., New York, New York.

_____ 1951. Manual of Phycology. Botanica Co., Waltham, Mass.

Taylor, W. R. 1957. Marine Algae of the Northeastern Cost of North America. University of Michigan, Science Series, Vol. XIII, Ann Arbor, Michigan.

_____ 1928. The Marine Algae of Florida with Special Reference to the Dry Tortugas. Papers Tortugas Lab., Vol. XXV, pp. 1-219. Published 347 Carnegie Inst., Washington, D. C.

_____ 1960. Marine Algae of the Eastern Tropical and Sub-Tropical Coasts of the Americas. University of Michigan Press, Ann Arbor, Michigan.

_____ 1941. Notes on the Marine Algae of Texas. Papers of the Michigan Academy of Sciences, Arts, and Letters, Vol. XXVI.