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Environmental Monitoring  
Systems Laboratory  
P.O. Box 15027  
Las Vegas NV 89114

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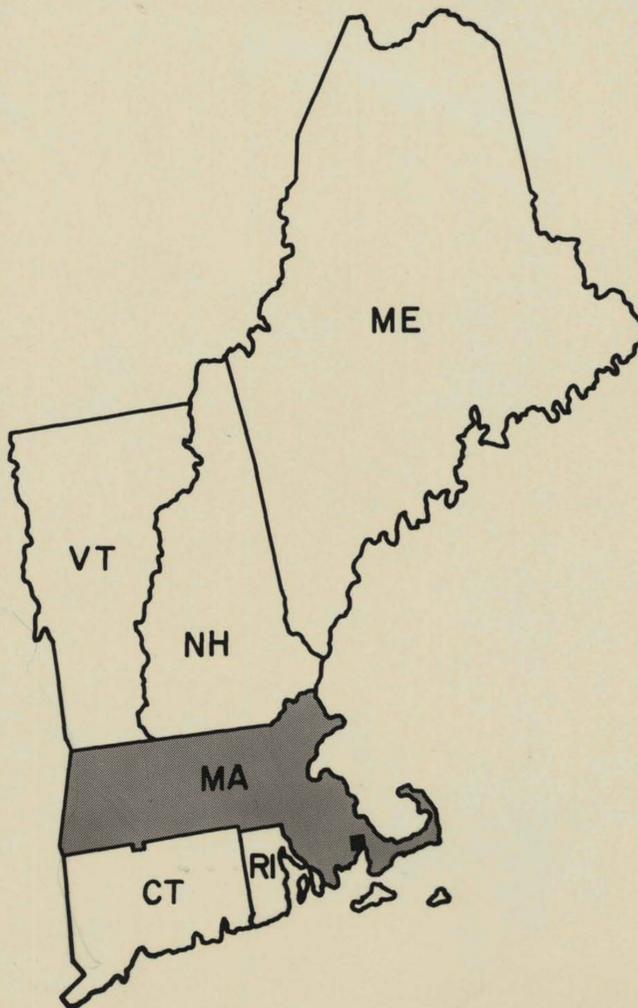
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Research and Development



# Wetlands Identification and Assessment Acushnet River Estuary New Bedford, Massachusetts

EPA Region 1  
and OERR



New Bedford Harbor Shelf 7  
OVS# 17.4

Site:  
Break:  
Other: ME17

Superfund Records Center

SITE: New Bedford

TS-PIC-85072

BREAK: 174

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Wetlands Identification and Assessment  
Acushnet River Estuary  
New Bedford, Massachusetts

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by  
Douglas J. Norton, Imagery Analyst  
The Bionetics Corporation  
Warrenton, Virginia 22186

Contract No. 68-03-3161

Project Officer  
Thomas R. Osberg  
Environmental Photographic Interpretation Center  
Environmental Monitoring Systems Laboratory  
Warrenton, Virginia 22186, FTS 557-3110

ENVIRONMENTAL MONITORING SYSTEMS LABORATORY  
OFFICE OF RESEARCH AND DEVELOPMENT  
U.S. ENVIRONMENTAL PROTECTION AGENCY  
LAS VEGAS, NEVADA 89114

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## ABSTRACT

Bottom sediments of the Acushnet River estuary in New Bedford, Massachusetts have become contaminated with PCBs (polychlorinated biphenyls) and heavy metals. The Environmental Protection Agency (EPA) is evaluating several options for remedial action. One option involves deposition and capping of dredge spoil in an in-harbor container within the tidal wetlands on the eastern shore of the Acushnet River. This study represents the identification of plant communities and preliminary assessment of ecological values of these Acushnet River estuary wetlands.

Identification of tidal wetland vegetation types was accomplished through analysis of medium-scale color aerial photography. These plant communities were individually delineated on the photography and computer-digitized for area measurement. The general ecological significance of each community was evaluated qualitatively, considering rarity, size, shape, productivity, naturalness, and representativeness as the assessment parameters. Land use around the Acushnet River estuary was also mapped.

Within the Acushnet River study area, about 20 hectares (50 acres) of tidal wetlands were identified and verified in the field. The 12 community types delineated in these wetlands were variable in condition. Several instances of human disturbance were noted in about one-third of the total wetlands area, while the remaining two-thirds appeared to be relatively undisturbed, native plant communities typical of tidal wetlands in the Northeast. Contamination of the wetlands was not tested or considered as an evaluation factor in this study.

The Environmental Protection Agency's Environmental Photographic Interpretation Center in Warrenton, Virginia, a field station of the Environmental Monitoring Systems Laboratory in Las Vegas, Nevada, performed this study at the request of EPA Region 1. This analysis was completed in April 1985.

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## INTRODUCTION

The city of New Bedford, Massachusetts is a heavily industrialized, coastal metropolitan area, centered on the Acushnet River estuary. Industrial water pollution problems in this area have resulted in its identification by the U.S. Environmental Protection Agency (EPA) as one of the largest Superfund sites in the nation.

Bottom sediments of the Acushnet River estuary have become contaminated with PCBs (polychlorinated biphenyls) and heavy metals, and remedial clean-up is planned. Several methods of sediment removal and disposal are under evaluation by EPA Region 1. One option involves deposition and capping of dredge spoil within the tidal wetlands of the Acushnet River estuary.

This study is a general assessment of plant communities and ecological values of tidal wetlands located within the study area delineated on the U.S. Geological Survey (USGS) New Bedford North 1:25,000 scale topographic map (Figure 1). Wetland vegetation types were identified through analysis of medium-scale color aerial photography. These plant communities were named according to the dominant plant species. The general ecological significance of each plant community was evaluated qualitatively and discussed briefly. A land use interpretation (also Figure 1) was performed on the area surrounding the wetlands.

Aerial photography of the New Bedford area provided the primary data source for this study.<sup>1</sup> Small-scale black and white photography for the year 1977 was analyzed to obtain information on abundance and type of tidal wetlands in the greater New Bedford area. Medium-scale color aerial

<sup>1</sup>A complete listing of all maps and photography used for this report can be found in the References section.

photography was flown for EPA on July 23, 1983. This imagery was used as a current source for identifying specific wetland plant communities in the study area. Study area and plant community boundaries presented in this report were determined from observations made from the aerial photography alone and do not denote legal property lines or ownership.

The EPA's Environmental Photographic Interpretation Center in Warrenton, Virginia, a field station of the Environmental Monitoring Systems Laboratory in Las Vegas, Nevada, performed this study at the request of EPA Region 1. This analysis was completed in April 1985.

## SUMMARY

The characteristics of tidal wetlands in the greater New Bedford area, and in the Acushnet River estuary in particular, were assessed and described. Several tidal wetlands (Table 1) with a total area of 157.0 hectares (387.9 acres) were found to occur in the greater New Bedford area, within a 6-km (3.7-mile) radius of the Acushnet River estuary (Figure 2). The two wetlands occurring in the Acushnet River study area (designated as Wetlands A and B) measured 20.3 hectares (50 acres).

A brief comparison of Wetlands A and B with other wetlands in the region was made. Almost the entire wetlands acreage within the 6-km (3.7-mile) radius, as well as Wetlands A and B, consisted of ditched high salt marsh, mostly dominated by marsh grasses. Several of the neighboring wetlands appeared larger, more complex and diverse in physical form than did Acushnet Wetlands A and B. Large size and diversity are factors often related to higher ecological significance. In contrast, however, Wetlands A and B may have greater value as shelter during harsh environmental conditions than the wetlands closer to the open bay.

Land use patterns around the study area were also examined. Industrial and residential development surrounds the Acushnet River estuary and Wetlands A and B. Undeveloped land (beside Wetlands A and B) is almost nonexistent within 1 kilometer (0.6 mile) of the river shoreline. The land use adjacent to other tidal wetlands in the New Bedford area is markedly less urbanized than the area bordering the Acushnet River, which probably also implies greater habitat value in the other wetlands outside the study area.

In summary, a preliminary assessment of the Acushnet River estuary wetlands indicates that these wetlands have some ecological values. Wetlands A and B do not appear to be the most valuable tidal wetlands in the New Bedford area, however, because other nearby wetlands are larger, more complex

TABLE 1  
TIDAL WETLANDS, NEW BEDFORD AREA

Figure 2 Symbol	Acres	Hectares
A*	7.4	3.0
B*	42.6	17.3
C	8.1	3.3
D	2.7	1.1
E	69.1	28.0
F	10.2	4.1
G	5.3	2.1
H	231.3	93.6
I	11.2	4.5
Total	387.9 Acres	157.0 Hectares

\* - Occurs in the Acushnet River estuary study area

and diverse, and surrounded by less urbanized terrain. The study area wetlands are nonetheless one component of a series of local wetlands, probably utilized for food and shelter by local and migratory wildlife that move among the marshes.

The individual wetland communities within the Acushnet River study area were also assessed for ecological significance. Twenty-five communities in Wetlands A and B (Table 2) representing twelve community types were identified in Figure 3, described, measured by computer, and evaluated.

The overall condition of these community types was variable. Generally vigorous native plant communities, and generally degraded or non-native communities, both exist onsite.

The most abundant native plant community was found to be high salt marsh dominated by saltmeadow grass (Spartina patens) and spikegrass (Distichlis spicata). This community's 9.5 hectares (23.5 acres) represented 46.9% of the total wetlands area. Other common high salt marsh native communities, including those dominated by marsh elder (Iva frutescens), and panic grass (Panicum) comprised an additional 3.2 hectares (7.9 acres).

A lesser amount of acreage was seen as degraded or populated by non-native vegetation. Common reed (Phragmites communis), a non-native tall grass that invades disturbed native high marshes, dominated 1.4 hectares (3.4 acres) or about 6.8% of the total wetland area. A small panne or marsh pool, measuring 0.3 hectares (0.7 acres), was visible adjacent to a junkyard; vegetation stress related to junkyard runoff seemed possible. Sediment (unvegetated) and trash deposition was noted in numerous other areas that total 5.1 hectares (12.6 acres), or about 25.1% of the study area wetlands.

Wildlife habitat values in the assessment were based on general habitat values associated with each plant community type, and on field observation. Though onsite investigation was brief, wildlife usage of the area was

TABLE 2  
ACUSHNET RIVER WETLANDS COMMUNITY AREA MEASUREMENTS

Figure 3 Community Number	Acres	Hectares
1	2.94	1.19
2	0.98	0.40
3	0.29	0.12
4	3.22	1.30
5	0.45	0.18
6	1.85	0.75
7	0.29	0.12
8	0.43	0.17
9	2.92	1.18
10	0.25	0.10
11	0.15	0.06
12	1.08	0.44
13	3.76	1.52
14	0.19	0.08
15	0.66	0.27
16	2.86	1.16
17	5.90	2.39
18	2.96	1.20
19	0.05	0.02
20	1.98	0.80
21	6.46	2.61
22	0.58	0.23
23	6.64	2.69
24	2.94	1.19
25	0.24	0.10
Total	50.07 acres	20.27 hectares

verified in the case of the fiddler crab (Uca pugnax) and the ribbed mussel (Mytilus). Canada geese (Branta canadensis), mute swans (Cygnus olor) and redheaded ducks (Aythya americana) were observed rafting just offshore in the estuary. Other probable wildlife values may be verified by in-depth onsite study.

The possibility does exist that even the wetland communities that appear healthy may have undergone contamination related to the other pollution problems in the Acushnet River estuary. However, the scope of this preliminary assessment did not include contamination of the wetlands as an evaluation parameter, nor did it involve in-depth field investigation of all flora and fauna present at the site. The study is therefore intended to be used as a baseline to guide more detailed field investigation that will examine other factors related to wetland values. The findings of more detailed onsite studies may modify the evaluation of the Acushnet River study area wetlands as discussed here.

## METHODOLOGY

Assessment of the Acushnet River estuary wetlands consisted of two main tasks: identification of wetland plant communities, and preliminary ecological evaluation of the wetlands. Aerial photography was the primary data source for this study, supplemented by field information and collateral scientific literature.

### Identification

A search of government and commercial aerial photographic sources was undertaken to obtain the best quality photography available of the Acushnet River study area. Midsummer 1983 color aerial photography was obtained for use as a recent, high-resolution source for plant community identification. Small-scale, black and white 1977 coverage was also acquired to enable the identification of similar tidal wetlands within a 6-kilometer (3.7-mile) radius of the Acushnet River estuary. A listing of all maps and photography used for this report can be found in the References section.

The analysis was performed by stereoscopically viewing pairs of film transparencies, backlit on a standard Richards light table. By observing the study area three-dimensionally, and at various magnifications, the analyst could search for and identify tidal wetlands. Specific objects, features, or "signatures" associated with different plant communities and environmental conditions were noted in identifying and evaluating the wetland types present onsite. The term "signature" refers to a combination of characteristics (such as color, tone, shadow, texture, and size) which indicate the presence of a specific feature or condition, even though the feature itself is not directly identifiable from the photography.

Prints were made from the two available years of aerial coverage (1977 and 1983). Wetland community types and other important features were

annotated on overlays to these prints and described in the text. The large print format was selected to enable the delineation and description of plant communities as small as 0.02 hectare (0.05 acre).

It should be noted that the study area boundary, wetland boundaries, and plant community boundaries were determined from observations made from the aerial photography and do not denote legal property lines or ownership. The wetland plant communities within the study area were field checked before issuing this final report.

In this report, a distinction is made between probable and possible identifications. Probable is used when a limited number of discernible signatures allows the analyst to be reasonably sure of a particular identification. Possible is used when few signatures are discernible, and the analyst can only infer an identification.

#### Preliminary Assessment

Ecological values of the Acushnet River estuary wetlands were assessed, following the identification of wetland plant community types within the study area. Individual wetland plant communities were evaluated singularly, and the entire wetlands complex within the study area was evaluated as a whole unit as well.

The assessment process performed in this study was brief, and was limited in scope by several factors. Primarily, the study area wetlands were evaluated for ecological significance only; hydrological and geological significance, land use potential, and other types of values (or lack thereof) were not addressed. Wetland suitability as a contaminated sediment disposal site was not considered in this evaluation. The wetlands assessments were qualitative, and were not used to priority-rank the wetland communities. Two

sources for assessment were used: observations from aerial photography, and information about ecological significance of tidal wetlands obtained from the pertinent scientific literature.<sup>1</sup>

Wetlands assessment was based on several parameters, collectively indicative of general ecological significance. The evaluation parameters, and their meanings as applied to this study, are listed below:

Rarity - the uniqueness of the plant community as determined by frequency of occurrence in the Acushnet River study area, the New Bedford area, and the Northeast in general;

Size - the area measurement in hectares or acres, determined through computer digitizing;

Shape - the configuration of the plant community, if relevant to its ecological value;

Productivity - the vigor of the plant community as an indicator of its ability to support wildlife;

Naturalness - the presence or absence of man-made disturbance in and near the plant community, and also, whether the plant community is comprised of native or introduced species;

Representativeness - whether a plant community is a high quality example of its community type;

Other Considerations - as they arise.

<sup>1</sup>A complete listing of scientific literature used in developing and applying these wetlands evaluation concepts is contained in the References section of this report.

## LAND USE

Figure 1 depicts the land use patterns within a 3-kilometer (1.9-mile) radius of the Acushnet River study area. The predominant land use, covering almost all the land area, is residential housing. A series of industrial buildings is visible on the western shore of the estuary. Non-urban land use classes are much less common, and include the wetlands and upland woods in the study area and the undeveloped land north and east of the city.

The land use classification system used in this report was adapted from a United States Department of Interior publication<sup>1</sup> on land use identification using remote sensor data. Minor modifications to this system were required to provide an accurate representation of land usage in the area.

The analysis was performed using photography dated April 1, 1977. The following land use categories were identified:

### LAND USE CATEGORIES

11	- Residential	185	- Educational Facilities
121	- Commercial	193	- Open Urban
122	- Vehicle-Related Activities	211	- Cropland
123	- Junk/Salvage Yards	211C	- Cranberry Bog
133	- Heavy Industry	431	- Mixed Forest
141	- Highways	513	- Tidal Estuary
143	- Railroads	521	- Freshwater Ponds
144	- Airports	531	- Reservoirs
145	- Communications	532	- Mined Area Reservoirs
153	- Power Substations	613	- Mixed Forested Wetlands
154	- Power Lines	624T	- Emergent Marsh (Tidal)
161	- Mixed Commercial/Residential	629	- Mixed Non-Forested Wetlands
162	- Mixed Commercial/Light Industrial	752	- Stone Quarry
171	- Cemeteries	769	- Transitional Land
173	- Vacant		

<sup>1</sup>Anderson, James R. et al., 1976, A Land Use and Land Cover Classification System for Use with Remote Sensor Data, U.S. Department of Interior, Geological Survey Professional Paper 964.

NEW BEDFORD AREA WETLANDS IDENTIFICATION  
APRIL 1, 1977 (Figure 2)

The Acushnet River estuary is one component part of a much larger estuarine system, encompassing several river estuaries and bays on the southern coast of Massachusetts. Tidal wetlands are found in the Acushnet River estuary, and in several other locations in this general vicinity.

Evaluation of the Acushnet River estuarine wetlands is dependent in part on the size, abundance and distribution of wetlands near the river as well as within the Acushnet River study area. Figure 2 identifies all major tidal wetlands found within an approximate 6-kilometer (3.7-mile) radius of the Acushnet River estuary, encompassing New Bedford Harbor, the Acushnet River estuary, and parts of Nasketucket Bay, Clarks Cove, and the considerably larger Buzzards Bay. Within this radius nine major wetlands (identified as Wetlands A-I) were annotated, two of which (Wetlands A and B) lie within the Acushnet River study area. A brief description of each wetland is given below.

A. High salt marsh, upper Acushnet River estuary. This 3.0-hectare (7.4-acre) tidal marsh occupies a small portion of the Acushnet River shoreline, and is composed of herbaceous, emergent marsh vegetation. Tidal inundation of the area is intermittent (hereafter defined as being flooded only during monthly high tides on the average).

B. High salt marsh, Acushnet River estuary. This 17.3-hectare (42.6-acre) tidal marsh is the largest wetland in the Acushnet River estuary and New Bedford Harbor. Its vegetation is herbaceous, probably with a shrub zone near its inland boundary. Tidal inundation is intermittent.

C. High salt marsh, Acushnet River estuary. This small tidal wetland occupies 3.3 hectares (8.1 acres) near a disturbed area of the Acushnet

River's eastern shoreline. Shrubs appear to dominate the wetland, which has probably undergone disturbance from construction nearby. Tidal activity is intermittent.

D. Salt marsh, Acushnet River estuary. This 1.1-hectare (2.7-acre) tidal marsh is a small, low-lying pocket of herbaceous vegetation. Tidal flooding probably is regular (hereafter defined as usually occurring twice daily with the high tides) for most of the wetland, and intermittent for the area farthest inland.

E. High salt marsh, Buzzards Bay. This large tidal wetland measures 28 hectares (69.1 acres). Tidal inundation is intermittent, and unrestricted by dikes, causeways or bridges as in Wetlands A through D. Natural tidal channels and some man-made ditching are visible throughout the wetland, the edges of which are flooded regularly by the tides. Most of the wetland consists of herbaceous, high marsh vegetation. A dike cuts off the interior part of the marsh, and a fill area protrudes seaward from the dike, transforming some of the marsh to man-made upland.

F. Diked high salt marsh, near Buzzards Bay. This 4.1-hectare (10.2-acre) marsh area was isolated from Wetland E by construction of a dike, which may restrict or totally prevent tidal inundation. If culverted, very limited intermittent flooding may occur. The vegetation of this wetland is a mixture of herbaceous and shrub growth, and is probably degraded by human disturbances.

G. Diked high salt marsh, near Buzzards Bay. Like Wetland F, this 2.1-hectare (5.3-acre) marsh area is a former component of Wetland E but is now isolated by a dike. A fill area also separates Wetland G from Wetland F. Culverted drainage may allow very restricted, intermittent flooding by tides. The mixed herb-shrub vegetation is likely to be degraded seriously from human disturbances.

H. High salt marsh, Nasketucket Bay. This 93.6-hectare (231.3-acre) wetland is the largest tidal marsh within the 6-kilometer (3.7-mile) radius of the study area. Its large size, extensive and convoluted shoreline, unrestricted flooding, and less-developed adjacent uplands suggest that this wetland is potentially the most ecologically valuable tidal marsh in the greater New Bedford area. Man-made ditching and natural tidal channels occur throughout the marsh; edges of these channels and the shoreline are probably flooded regularly by tides. The greater portion of the marsh receives intermittent flooding. Plant communities throughout the wetland are herbaceous.

I. Marsh islands, Nasketucket Bay. These four wetland islands are scattered offshore of Wetland H, and have a combined area of 4.5 hectares (11.2 acres). Vegetation is probably a combination of herbaceous high salt marsh, low salt marsh, and tidal flat species, and concurrently, tidal inundation also varies from regular to intermittent.

ACUSHNET ESTUARY WETLANDS IDENTIFICATION  
JULY 23, 1983 (Figure 3)

The specific area of interest as a possible disposal site for contaminated dredge spoil was restricted to the tidal wetlands on the eastern shore of the Acushnet River, north (upstream) of the Interstate 195 bridge. Two tidal marshes, identified as Wetlands A and B on Figure 2, occur in this area of interest.

Figure 3 is a photographic enlargement of Wetlands A and B, upon which the major plant communities have been delineated and numbered. Units 1 through 25 are described below in terms of dominant plant species and nature of tidal inundation. Dominant species identifications were estimated from onsite observations; dominance consisted of at least 30% areal cover by the named plant species. Scientific names for each plant are given only at their first occurrence in the text.

The actual assessment of the Acushnet wetlands plant communities will be presented in a separate section of this report.

1. Common reed (Phragmites communis) high salt marsh. Tidal inundation intermittent. A dense, monospecific plant community.

2. Saltmeadow grass/spikegrass (Spartina patens/Distichlis spicata) high salt marsh. Tidal action intermittent. Saltmarsh cordgrass (Spartina alterniflora, low marsh form) occurs along shoreline, which receives regular tidal flooding.

3. Tidal pool and tidal flat with channel to river. No dominant vegetation. Regular inundation.

4. Saltmeadow grass/spikegrass high salt marsh. Tidal flooding intermittent. Marsh elder shrubs (Iva frutescens) present along inland boundary and ditches. Small natural channels present. Saltmarsh cordgrass present along shoreline, ditches, and channels.

5. Common reed high salt marsh. Tidal flooding intermittent to seasonal (hereafter defined as undergoing tidal flooding only during twice-yearly high tides or heavy storm conditions).

6. Saltmeadow grass/spikegrass high salt marsh. Mostly a thin band along shoreline. One tidal channel present; flooding intermittent.

7. Bare shoreline. No dominant vegetation. Tidal flooding regular.

8. Marsh elder/panic grass high salt marsh. Tidal inundation intermittent to seasonal; high spots in this community may be upland. Herbaceous ground cover among marsh elder shrubs is panic grass (Panicum). Winged sumac (Rhus copallina) present on high spots. Trail along the axis of this unit may imply some filling at one time.

9. Saltmeadow grass/spikegrass high salt marsh. Tidal stream (unit 10) runs through center of this community. Ditches, small natural channels present; these are lined with saltmarsh cordgrass (low marsh form). Tidal flooding intermittent.

10. Tidal stream. No dominant vegetation. Route of tidal flow into unit 9.

11. High salt marsh/upland transition zone. Mixed shrub dominance includes beach plum (Prunus maritima), winged sumac, and marsh elder. Tidal inundation seasonal.

12. Sparsely vegetated sediment deposit, high salt marsh. An extremely patchy, heterogeneous mixture of bare sediment, herbaceous and shrub growth. Tidal inundation intermittent. Scattered saltmarsh cordgrass and saltwort (Salicornia) growing near the shoreline. Saltmeadow grass, marsh elder in patches near inland edge. Two high spots are covered by beach plum and beach grass (Ammophila breviligulata).

13. Marsh elder high salt marsh. Tidal flooding intermittent. Dense, low shrub community. Scattered saltmeadow grass and bare areas of sediment also present.

14. Saltmeadow grass/spikegrass high salt marsh. Tidal flooding intermittent.

15. High salt marsh panne. Unvegetated, standing water and mud present. Tidal flooding intermittent.

16. High salt marsh/upland transition zone. This mixed plant community is a marsh elder/saltmeadow grass/panic grass high salt marsh. Possibly transitional between wetland and upland; slightly higher than most of this wetland's high marsh areas. Tidal flooding intermittent or possibly seasonal.

17. Saltmeadow grass/spikegrass high salt marsh. Tidal inundation intermittent. Ditches lined with saltmarsh cordgrass (low marsh form).

18. Saltmarsh cordgrass and unvegetated marsh sediment. Shoreline is bare mud flat. Inland edge grades into marsh elder and saltmeadow grass. Fiddler crab (Uca pugnax) burrows and ribbed mussel (Mytilus) abundant near shoreline. Tidal flooding regular to intermittent.

19. High salt marsh panne. Unvegetated, standing water present. Permanently flooded.

20. Saltmarsh cordgrass and unvegetated marsh sediment. Tidal inundation regular. Patchy occurrence of saltmarsh cordgrass among mud flats at the shore and unvegetated sediment deposits.

21. Saltmeadow grass/spikegrass high salt marsh. Tidal inundation intermittent. Ditches lined with saltmarsh cordgrass (low marsh form). Blackgrass (Juncus gerardi) among other species at inland edge.

22. Saltmeadow grass/spikegrass high salt marsh. Tidal inundation intermittent, possibly more frequent. Though dominant species match those in covertype 21, this unit appears distinctly different on the photography. Darker green signature possibly comes from more saturated conditions and more lush growth than neighboring high marsh.

23. High salt marsh/upland transition zone. This mixed herbaceous and shrub community is a marsh elder/saltmeadow grass/panic grass high salt marsh. Transitional between wetland and upland. Tidal flooding seasonal. Linear feature visible on photography is a low rock wall.

24. Saltmeadow grass/spikegrass high salt marsh. Patchy occurrence of marsh elder and common reed. Ditched, tidal flooding intermittent.

25. Saltmarsh cordgrass (low marsh form) low salt marsh. Tidal flooding regular.

## ACUSHNET WETLANDS PRELIMINARY ASSESSMENT

The plant communities present in the the Acushnet River estuary wetlands vary widely in size, shape, vigor, disturbance, and other parameters of ecological significance. A large proportion of the wetlands is composed of apparently vigorous, native plant communities. In general, the high marsh vegetation showed dense cover, and field investigation revealed that a normal amount of seed was being produced by the spikegrass and saltmeadow grass. Several other areas, however, show signs of significant human disturbance, non-native plant species, or impoverished vegetation cover.

The general ecological significance of each occurrence of every plant community (units 1 through 25, Figure 3) was qualitatively evaluated according to a common set of evaluation parameters including rarity, size, shape, naturalness, representativeness, and productivity.<sup>1</sup> These concepts were defined, as used in this report, in the Methodology section. Evaluations of plant communities 1 through 25 are presented below; their area measurements appear in Table 2 (page 6). Where an assessment parameter is insignificant to the evaluation of that community, it is not discussed. An overall assessment of the Acushnet River estuary wetlands appears in the Summary section of this report.

1. Common reed high salt marsh - This small community is not native, and generally occurs where native tidal marsh is severely disturbed. Reed marsh probably provides some wildlife food and cover, but its wildlife habitat value is generally less than that of the native community it replaced. This thick stand of common reed may also act as a seed source for this species' invasion of healthy native plant communities downriver. Reed marsh is abundant in the Northeast. (See also unit 5.)

<sup>1</sup>A complete listing of scientific literature used in developing and applying these wetlands evaluation concepts is contained in the References section of this report.

2. Saltmeadow grass/spikegrass high salt marsh - This community is one of the most abundant vegetation types in the coastal Northeast. The dominant plant species are native and usually indicative of a relatively natural and undisturbed setting. Most of the other wetlands in the greater New Bedford area (Figure 2) also appear to be this community type. Mosquito control ditching, which appeared in most high salt marshes during the 1930's, is a minor disturbance to this marsh area. Probable habitat values for this community include shelter, feeding and breeding habitat for shorebirds and waterfowl. Plant growth is not particularly vigorous.

3. Tidal pool and flat - This is a natural formation common in the Northeast but not locally in the Acushnet River estuary. This pool is small, and may be limited in ecological value by its size and by the possible presence of contaminated sediments in the river. Possible values for mollusk and fish habitat might include feeding, breeding and shelter. Shorebirds and waterfowl may also utilize the area. (See also unit 10.)

4. Saltmeadow grass/spikegrass high salt marsh - This is one of the larger and more vigorous occurrences of this high marsh community type in the Acushnet River estuary. It is a good representative example of native high salt marsh vegetation. The unit contains small natural tidal channels and a significant length of shoreline; furthermore, it encompasses a tidal pool (unit 3). Some mosquito control ditching is present. The diverse combinations of water, shoreline, and high marsh present in this community probably render it one of the more valuable wildlife habitats in this wetland. (See also units 6, 9, 14, 17, 21, 22 and 24.)

5. Common reed high salt marsh - This community became established on severely disturbed ground where utility poles and lines pass through the inland edge of this wetland. It is a small occurrence of a non-native plant

species, probably of limited wildlife habitat value. A negative aspect of this community is its closeness to healthy, native plant communities which it may in time invade and colonize. (See also unit 1.)

6. Saltmeadow grass/spikegrass high salt marsh - This unit contains the common, native, high salt marsh vegetation found in over half the total area of the wetlands under study. Though the acreage in unit 6 is small, its main significance is that it consists of a zone along the shore. The community is disturbed slightly by a small number of mosquito control ditches, and the shoreline and ditches are unvegetated in places. Nonetheless, the vegetative growth in the community is generally vigorous. (See also units 4, 9, 14, 17, 21, 22 and 24.)

7. Bare shoreline - This small unit has no apparent plant cover. It is flooded daily and probably very unstable. The site may have value to aquatic organisms during flood stage and to feeding shorebirds when exposed.

8. Marsh elder/panic grass high salt marsh - This is a small occurrence of native plant species. Shrubs and high spots provide some variation in wildlife shelter on the predominantly open, unsheltered high salt marsh. If human disturbance once occurred, it has now been overgrown.

9. Saltmeadow grass/spikegrass high salt marsh - This is one of several, generally vigorous patches of this native plant community found in the Acushnet River wetlands. The high salt marsh vegetation in this area surrounds a tidal stream (unit 10), and is punctuated by small natural channels and a few ditches. This community has potential habitat value to shorebirds, and the stream and channels may be significant to aquatic life. (See also units 4, 6, 14, 17, 21, 22 and 24.)

10. Tidal stream - This area does not appear to have a dominant vegetation community. The sheltered location of the stream and its native

salt marsh surroundings present a potentially productive but small area of aquatic wildlife habitat. Waterfowl and shorebirds probably use this site for feeding and shelter. (See also unit 3.)

11. High salt marsh/upland transition zone - This small shrub community probably occupies a small high spot in the marsh. It is a native plant community that, in combination with the locally more abundant plant species, adds to the diversity of wildlife habitat available in the area. (See also units 16 and 23.)

12. Sparsely vegetated sediment deposit, high salt marsh - Evaluation of this area is contingent upon as yet unavailable information on contamination. Sediment deposition on marshes is a natural process, and the resulting deposits can provide wildlife feeding areas and habitat for many invertebrates. Chemical contamination of sediments, however, would tend to alter these values. (See also unit 20.)

13. Marsh elder high salt marsh - This native plant community may be suitable for some shorebird feeding habitat. Sediment deposits or bare areas are scattered throughout the community, adding to its diversity but possibly acting as sources of contamination. The area appears to contain a mixture of habitats and plant species. (See also unit 18.)

14. Saltmeadow grass/spikegrass high salt marsh - This is a small patch of the most common native high marsh plant community present in these wetlands. Its ecological value is probably limited by its nearness to a possibly contaminated area (unit 15) and a junkyard.

15. High salt marsh panne - This shallow pool of water perched on high marsh would potentially be a feeding site for shorebirds and waterfowl. Tidal marshes with numerous pannes generally contain greater habitat value than those without pannes. This panne, however, is situated downhill from a

junkyard and may be contaminated with substances toxic to wildlife and plants. The panne may be devoid of vegetation now because of plant mortality.

16. High salt marsh/upland transitional zone - This mixed community of wetland grasses and shrubs is distant from the shore and may only rarely be flooded. Its border is degraded by high tide and storm-level tide debris and trash. The dominant plant species are native, and the area may be used by upland wildlife species and some wetland species. (See also units 8 and 23.)

17. Saltmeadow grass/spikegrass high salt marsh - This is one of the two largest contiguous parcels of this native plant community. The only visible significant disturbance in this location is the mosquito control ditching. Potential values include shorebird breeding, feeding and shelter. Vegetation in this community is vigorous. (See also units 4, 6, 9, 14, 21, 22 and 24.)

18. Saltmarsh cordgrass and unvegetated marsh sediment - This is a relatively large patch of a native high marsh species. The area is probably lower-lying than most of the Acushnet River wetlands. Shorebirds may use the area for feeding. Fiddler crab burrows and ribbed mussels are abundant near shore. (See also units 13 and 22.)

19. High salt marsh panne - This is a very small, shallow pool perched on the marsh. Such areas are valuable as wildlife feeding habitat. This is the only undegraded panne in the study area.

20. Saltmarsh cordgrass and unvegetated marsh sediment - Evaluation of this area is contingent upon as yet unavailable information on contamination. Sediment deposition on marshes can be natural and can be utilized by wildlife, but if these sediments are contaminated, the value of the area is altered. The site encompasses a significant part of the wetlands shoreline, and may be eroded from frequent flooding. (See also unit 12.)

21. Saltmeadow grass/spikegrass high salt marsh - This is the largest and probably most significant occurrence of this native high salt marsh community in these wetlands. It is only disturbed by mosquito control ditching. The site is the best local example of this community in the study area, and appears vigorous. Its larger size, significant length of shoreline, and proximity to a variety of other wetland communities imply that it is one of the more valuable local habitats. (See also units 4, 6, 9, 14, 17, 22 and 24.)

22. Salt meadow grass/spikegrass high salt marsh - This is a native plant community that appears to have undergone the most vigorous growth onsite. It probably represents a small but useful habitat for shorebirds. (See also units 4, 6, 9, 14, 17, 21 and 24).

23. High salt marsh/upland transition zone - This is a large patch of marginal wetlands, rarely flooded and populated by native plants that present a variety of wildlife habitats. The area is somewhat degraded by a debris-filled high water line. (See also units 8 and 16.)

24. Saltmeadow grass/spikegrass high salt marsh - This particular community contains patches of marsh elder and blackgrass among the dominant plants. It represents a typical example of one type of native salt marsh community. Its sheltered location may add to its wildlife habitat value, as does the proximity of open water and wooded uplands. (See also units 4, 6, 9, 14, 17, 21 and 22.)

25. Saltmarsh cordgrass low salt marsh - This appears to be the only occurrence of this community type in the study area. Its daily flooding and different vegetation forms present the only such type of wetland wildlife and aquatic life habitat in the area. Though this type is common in the Northeast in general, it is not widespread in the New Bedford area.

## REFERENCES

### AERIAL PHOTOGRAPHY

<u>Date</u>	<u>Agency</u>	<u>Mission Code</u>	<u>Frame #</u>	<u>Orig. Scale</u>	<u>EPIC Frame #</u>
April 1, 1977	USGS <sup>1</sup>	VECR	1:69-70	1:80,000	8921-8922
July 23, 1983	EPIC <sup>2</sup>	83/098	376-378	1:24,000	376-378

### MAPS

<u>Source</u>	<u>Name</u>	<u>Scale</u>	<u>Date</u>
USGS	New Bedford North	1:25,000	1979

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<sup>1</sup>U.S. Geological Survey, U.S. Department of Interior

<sup>2</sup>Environmental Photographic Interpretation Center, U.S. Environmental Protection Agency

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# **Wetlands Identification and Assessment Acushnet River Estuary New Bedford, Massachusetts**

by

Douglas J. Norton, Imagery Analyst  
The Bionetics Corporation  
Warrenton, VA 22186

Contract No. 68-03-3161

Project Officer  
Thomas R. Osberg  
Environmental Photographic Interpretation Center  
Environmental Monitoring Systems Laboratory  
Warrenton, VA 22186, FTS 557-3110

**ENVIRONMENTAL MONITORING SYSTEMS LABORATORY  
OFFICE OF RESEARCH AND DEVELOPMENT  
U.S. ENVIRONMENTAL PROTECTION AGENCY  
LAS VEGAS, NEVADA 89114**



FIGURE 1  
ACUSHNET WETLANDS

LOCATION MAP/LANDUSE  
NEW BEDFORD NORTH, MASS. - APRIL 1, 1977

SCALE 1:25,000



FIGURE 2  
ACUSHNET WETLANDS

APRIL 1, 1977

APPROX. SCALE 1:29,500



FIGURE 3  
ACUSHNET WETLANDS

JULY 23, 1983

APPROX. SCALE 1:5,500