

**Selected Inventory of Potential Wetland Restoration Sites  
in the Buzzards Bay Watershed  
Phase I: Southern Area**



**March 2004**

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Kerry Healey, Lieutenant Governor**

**Executive Office of Environmental Affairs  
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Phase 1: Southern Area**

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## About This Selected Inventory

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### Study Purpose

This study was undertaken by the Buzzards Bay Project National Estuary Program (BBP) to identify potential wetland restoration opportunities in the southern portion of the Buzzards Bay Watershed. Of particular interest were both freshwater and saltwater wetlands that had been filled due to construction and agricultural related activities on public lands, private conservation areas, and abandoned cranberry bogs. This Selected Inventory is being produced as part of a series of Atlases, the first one being the “*Atlas of Tidally Restricted Salt Marshes in the Buzzards Bay Watershed.*” The salt marsh atlas identified salt marshes impaired by tidal restrictions and its purpose was to aid state and municipal officials in identifying potential remediation projects when road and bridgework is contemplated. It is hoped that this atlas will provide similar help to those government officials and local nongovernmental organizations looking for restoration projects as part of wetland mitigation efforts. Future efforts will be made to produce a “*Selected Inventory of Potential Wetland Restoration Sites in the Buzzards Bay Watershed, Phase II: Northern and Eastern Areas.*”

Although the BBP made considerable efforts to locate all wetland fill sites in the targeted parcels, we recognize that some sites may have been overlooked, and our list should not be considered definitive.

### Information in the Inventory

The study area for this project encompassed the portion of the Buzzards Bay watershed in the southeastern Massachusetts towns of Acushnet, Dartmouth, Fairhaven, Fall River, Freetown, New Bedford, and Westport. Determining potential wetland restoration sites is a fairly complex task. Therefore, in order to establish a realistic set of achievable restoration sites, this project focused only on the following restoration opportunities:

- Public lands owned by the Commonwealth of Massachusetts - predominantly land managed by the Department of Fish and Game (formerly the Division of Fisheries, Wildlife, and Environmental Law Enforcement) and the Division of State Parks and Recreation (formerly the Department of Environmental Management);
- Municipally owned land (both conservation land and non-assigned town land);
- Local land trust properties; and
- Privately owned abandoned cranberry bogs.

The inventory of potential wetland restoration sites in this report contains the following information:

- Maps showing locations of potential wetland restoration sites within the study area;
- An aerial photo of each restoration site with the extent of potential restoration area shown;
- Type of disturbance;
- Approximate amount of fill to be removed for restoration; and
- Property owner.

## **How to Use the Information in the Inventory**

For restoration sites of interest, the landowner should be contacted for a site visit. Since many of the sites have an existing use, coordination with the particular landowner is essential. While the amount of fill to be removed from the filled sites is given in the atlas, this information can only be viewed as a rough estimate. Furthermore, a more detailed look at each site may find more opportunities for restoration.

What has been included in this atlas is the essential information for each site in order to save time for those seeking wetland restoration opportunities. The type of disturbance was included to give some idea concerning the level of environmental improvement as well as the cost of restoration. The depth of fill was included as it directly related to the cost of establishing pre-disturbance elevations to the site. Where possible, information on the type of fill was included as it too related to cost of removal.

## **Distribution of the Inventory**

Distribution of the "Selected Inventory" will include single copies provided to the Conservation Commission and municipal executive (mayor, town manager, or selectmen) of each community. Additional copies will be provided to the Massachusetts Office of Coastal Zone Management, MassHighways, Army Corp of Engineers, NOAA, The Coalition for Buzzards Bay, Buzzards Bay Action Committee, Westport River Watershed Alliance, and area land trusts.

A copy of the inventory has also been posted on the BBP web site, [www.buzzardsbay.org](http://www.buzzardsbay.org).



# Methods

## Initial Site Selection

The area investigated for potential restoration sites included land in the Buzzards Bay watershed that is located within the following towns: Acushnet, Dartmouth, Fairhaven, Fall River, Freetown, New Bedford, and Westport (Figure 1). The BBP's parcel GIS database was used to locate properties owned by the Commonwealth of Massachusetts, municipally owned land, privately owned abandoned cranberry bogs,<sup>1</sup> and local land trust properties.

The owner, or controlling agency, of the properties that were reviewed for potential restoration sites is given below for each town.



Figure 1. Selected Inventory Study Area

### Acushnet

- Acushnet Park Commission
- Acushnet Water Department
- Acushnet Conservation Commission
- Fairhaven-Acushnet Land Preservation Trust
- New Bedford Harbor Trustee Council
- New Bedford Water Department

### Dartmouth

- Dartmouth, Town of
- Dartmouth Conservation Commission
- Dartmouth Natural Resources Trust
- Dartmouth Park Department
- Dartmouth Water Department
- Division of State Parks and Recreation
- Department of Fish and Game
- Fall River, City of
- New Bedford, City of
- The Trustees of Reservations
- University of Massachusetts

<sup>1</sup> The abandoned cranberry bog data was supplied by MassGIS and is available on their website, [www.ma.state.us/mgis/massgis.htm](http://www.ma.state.us/mgis/massgis.htm).

#### Fairhaven

- Division of State Parks and Recreation
- Department of Fish and Game
- Fairhaven, Town of
- Fairhaven-Acushnet Land Preservation Trust
- Fairhaven Conservation Commission

#### Fall River

- Division of State Parks and Recreation
- Department of Fish and Game
- Fall River Conservation Commission
- Fall River Water Department
- Greater Fall River Land Conservation Trust
- Massachusetts Land Conservation Trust
- The Trustees of Reservations

#### Freetown

- Division of State Parks and Recreation
- Department of Fish and Game

#### New Bedford

- Bristol County Conservation District
- Division of State Parks and Recreation
- Department of Fish and Game
- New Bedford, City of
- New Bedford Conservation Commission
- New Bedford Parks Department

#### Westport

- Division of State Parks and Recreation
- Fall River Water Department
- Westport, Town of
- Westport Conservation Commission
- Westport Land Conservation Trust

The property boundaries for the parcels owned by the above entities were overlain on two MassGIS ortho aerial photograph surveys with 0.5m pixel resolution. One of these photographic surveys was a black and white photography survey from March 1996 and the other was a color photography survey from April 2001. Restoration sites were identified on these properties by locating either areas of filled wetlands, changes in wetland boundaries, or anomalies in the photographs, such as apparent changes in features that might be inconsistent with wetland coverages. The wetland boundary information used for this analysis was based on three sets of information: historic and most recent United States Geographical Survey (USGS) topographic quadrangle maps, and the 1992 DEP Wetland Conservancy Program Maps.

The historic USGS topographic maps dating from the late 1930s to the early 1940s were downloaded from <http://docs.unh.edu/nhtopos/MassachusettsList.htm>. These maps were



Figure 2: Portion of 1948 New Bedford North Quadrangle.



Figure 3: Portion of 1973 New Bedford North Quadrangle.

georeferenced and then where needed, a wetlands boundary was created from the georeferenced topographic maps. Wetland boundary changes were then evaluated by comparing the most recent USGS topographic wetlands (available from MassGIS) to the historical USGS topographic wetlands (Figures 2 & 3).

The wetlands shown on the historic topographical maps and features evident on recent aerial photographs were also compared to the “core” wetlands identified in the 1992 Department of Environmental Protection Wetland Conservancy Program (DEP-WCP) wetland survey (Figure 4).<sup>2</sup> The wetland boundaries identified by the Conservancy Program were based on evaluating infrared aerial photographs taken during early spring (leaf-off) conditions and are generally considered to delineate the minimum extent of wetlands, and not the regulatory wetland boundary pursuant to the Wetlands Protection Act.

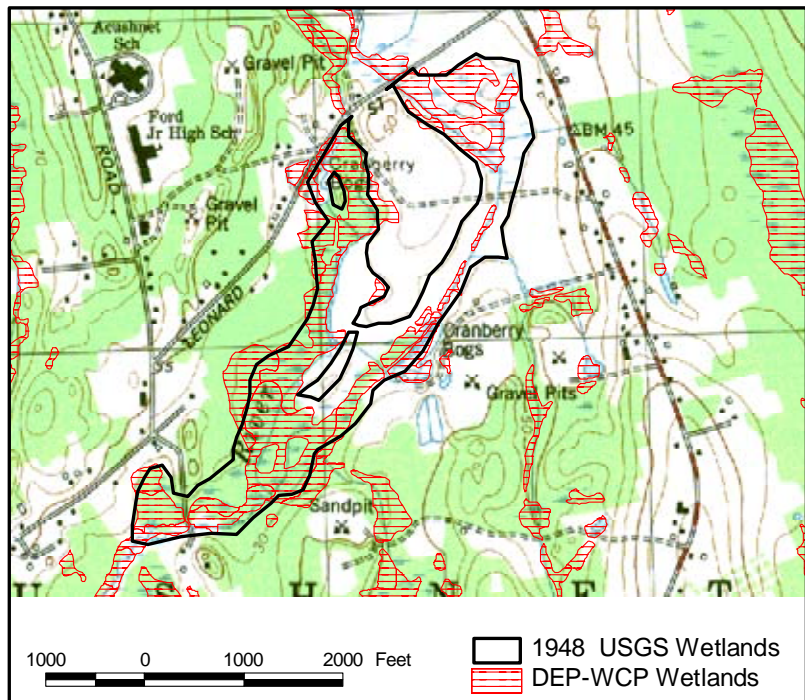


Figure 4: Layering of Data (area depicted in illustrations 2 & 3, with the 1948 USGS wetlands and the DEP-WRP wetlands).

<sup>2</sup> Available from the MassGIS website.

## Site Selection Refinement

A list of hundreds of potential wetland restoration sites was developed by overlaying property parcel coverages of targeted properties and wetland boundaries on the aerial photographs as described above. Due to the large number of sites all could not be field investigated, and because it was recognized that many of the filled or altered wetland areas on this list would not be viable restoration sites, a pilot study of 20 of the 51 sites identified in the Town of Dartmouth were field investigated to refine the remote selection process. Based on the site visits in this pilot study, the following types of sites were eliminated from consideration for the reasons given.

### 1. Footpaths

Many sites on land trust and other passive recreation properties were existing footpaths. The BBP determined that these were not available for restoration, as the restoration activities would conflict with the existing use (Figure 5).



Figure 5: Site DART-20

### 2. Vegetative Anomalies

Some anomalies that were viewed in the orthophotographs did not represent actual wetland alterations. The 0.5m resolution orthophotographs available from MassGIS are detailed enough to show a fallen tree as something different from the surrounding area. Site visits revealed that many anomalies found in the orthophotographs were not wetland alterations (Figure 6).

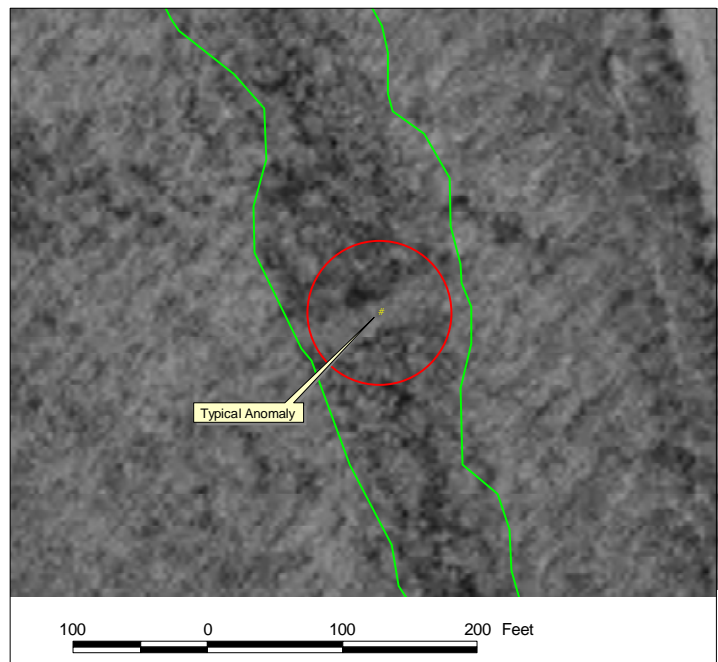


Figure 6: Anomalies in the Orthophotographs

### 3. Existing Public Facilities

Several sites turned out to be existing public facilities. The BBP determined that many public facilities were not available for restoration, as the restoration activities would conflict with the existing use (Figure 7).

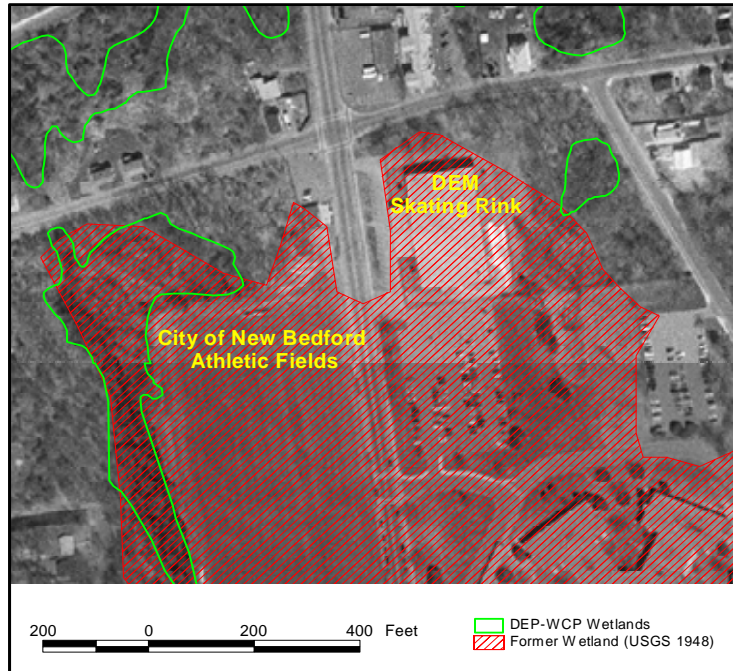


Figure 7: Public facilities located in a former wetland.

### 4. Existing Utility Structures and Easements

In areas where there were gas, electric, water, and sewer utility lines, wetlands had been altered to satisfy the needs of the particular utility. The BBP determined that the utility line easements were not available for restoration, as the restoration activities would conflict with the existing use (Figure 8).



Figure 8. Electric Easement

## 5. Access Roads

Many of the fill sites visited turned out to be access roads. The BBP determined that the access roads were not available for restoration, as the restoration activities would conflict with the existing use (Figure 9).



Figure 9: Access Road through Marsh.

## 6. Apparent Wet Fields

Wet spots in fields may or may not be altered wetlands. Whether the wet spots shown below in figures 10 and 11 or on other orthophotographs were wetlands could only be determined through a site visit.



Figure 10: Dry Field



Figure 11: Wet Field

## 7. Old Gravel Pits

Old gravel pits are good wetland creation sites. Many of the municipal gravel pits were excavated to the water table, with some areas having an established wetland. However, these could not be considered restoration sites, as they were historically uplands.

The elimination of the seven categories of wetland alterations above reduced the number of sites needing field investigation from 225 to 120. The number of identified sites, before and after being sorted by the “pre-selection criteria,” is summarized by municipality in Table 1.

**Table 1: Number of Sites Before and After Preliminary Selection Criteria**

<b>Town</b>	<b>Abandoned Cranberry Bogs</b>	<b>Potential Sites Prior to Pre-selection Criteria</b>	<b>Potential Sites After Pre-selection Criteria</b>
Acushnet	4	51	32
Dartmouth	0	66	30
Fairhaven	1	28	18
Fall River	0	14	4
Freetown	1	4	1
New Bedford	1	26	17
Westport	0	36	18

### Site Visit Procedure

BBP staff visited the 120 sites that passed the Pre-selection Criteria. Based on these field investigations, the site was placed in one of the following three categories:

- Rejected, Not Altered Wetland
- Rejected, Restoration Criteria Not Met
- Potential Restoration Site

Although the sorting process using the various information sources available was able to dramatically reduce the number of sites visited, several locations visited were found to be unaltered wetlands. This was considered normal as there was a different criterion for wetland identification for each data source, and the differences in coverage between the data sources were used to determine which sites to visit. These sites were identified as "Rejected, Not Altered Wetland."

Many times conflicting uses were not apparent until a site visit was made. When the site contained an access road, park, ball field, utility lines, or some other use that was incompatible with a restoration project, the site was labeled as "Rejected, Restoration Criteria Not Met."

Sites that were identified as altered wetlands and had opportunities for restoration were labeled as a "Potential Restoration Site." At "Potential Restoration Sites," the BBP personnel would inspect the site and note the type of disturbance, the extent of the disturbed area, and the depth of fill, if fill was the disturbance type. The extent of the fill was denoted on a color or black and white orthophotograph. Any additional information that could be of use was denoted on the orthophotograph margins. Areas that had more than one disturbance type were broken down into multiple sites with each disturbance listed as a discreet restoration site.

## Results

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The types of disturbances discovered during the site visits were cropping, fill, abandoned cranberry bogs, and ditching.

Cropping refers to the practice of cutting back vegetation to inhibit natural vegetation succession. Types of cropping found were: hay fields, mowed lawn, mowed rough of a golf course, and pasture.

Since the type of fill may affect the cost of removal and disposal, the type of fill was noted when it could be determined. Types of fill encountered were gravel, road silt, asphalt, sand, trash, large stones, rocks (smaller stones), and municipal compost.

There were 75 potential restoration sites in the study area, with the total area of all sites comprising 124 acres. Table 2 breaks down the number of restoration sites and acreage by town.

**Table 2: Number of Potential Restoration Sites and Acreage Sorted by Town**

<b>Town</b>	<b>Number of Restoration Sites</b>	<b>Total Acreage</b>
Acushnet	21	16
Dartmouth	16	18
Fairhaven	16	23
Fall River	4	1
Freetown	0	0
New Bedford	10	59
Westport	8	7

Maps and data on each potential restoration site are included in the appendices. No maps for Freetown are included in this Atlas as there were no potential restoration sites identified in Freetown.

## Acknowledgements

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# Locus Map of Potential Restoration Sites

