Grand Bay NERR Oyster Inventory Survey

Project Objectives

I. Spatially describe and define current intertidal oyster resources in the Grand Bay NERR through "in situ"/desktop mapping and GIS database management.

II. Describe and define abiotic and biotic parameters of the physical environment that produce a productive and stable oyster resource.

III. Maintain the current oyster resource at the Grand Bay NERR by implementing best management practices that ensure protection of the physical environment required for the recruitment and growth of oysters.

IV. To restore, if possible, oyster beds in areas where they historically occurred at Grand Bay NERR.

Phase I – Oyster Mapping

Methodology

The primary objective of Phase I of the Oyster Inventory Survey Project is to map existing intertidal oyster reefs, dead and alive, along the intertidal zones of bays, bayous, and lakes located within the boundary of the Grand Bay National Estuarine Research Reserve. Areas containing oyster shells will be mapped according to a percent cover classification scheme that will ultimately improve the management strategy for oyster reef protection and restoration. Oyster reefs will be observed during low-tide events at all locations to obtain the maximum extent of oyster shell coverage and plotted by hand using six inch high-resolution, true-color orthoimagery obtained from the state of Mississippi. Two test runs at the North Rigolets Bayou and Crooked Bayou proved that the six inch resolution imagery provides accurate detail to map oyster reefs "in situ" by boat and will provide enhanced spatial resolution for areas of critical interest (e.g. restoration reefs). Upon completion of data collection, oyster reefs classifications and extents will be mapped using heads up digitizing in ArcView 9.3. Database attributes will be attached to the shape (polygon/point) to describe information pertaining to the oyster resources. Ancillary data will consist of Trimble GeoXH GPS points and USGS quadrangle topographic maps.

Classification Scheme

Each polygon will contain a segment of a distribution of oyster reef existing within the intertidal shoreline zone. Points will represent isolated clumps of oyster that do not form a consistent distribution over an area of shoreline. Cover classes will be assigned using the following classifications:

- 0 = no shell present
- 1 = 1-30% coverage by oyster shell
- 2 = 31-70% coverage by oyster shell
- 3 = 71-100% coverage by oyster shell
- 4 = isolated oyster shell clump (point)
- 5 = area (polygon) with several small clumps (<20 oysters) that form a patch

Database

Fields in the mapping database will include:

Date, Observer(s), Bayou, Object ID, Unique ID, Coverage Class, Area, Comments
Codes selected for the Unique ID field include:

**WATERBODY**
- BB = Bangs Bayou
- BC = Bayou Cumbest
- BH = Bayou Heron
- BI = Bangs Island
- BL = Bangs Lake
- CB = Crooked Bayou
- CYB = Clay Bayou
- JB = Jose Bay
- JBy = Jose Bayou
- LBB = L’Isle Chaude Bay
- MB = Middle Bay
- MCB = Mattie Clark Bayou
- NB = North Bayou
- NR = North Rigolets
- SR = South Rigolets
- SW = Southwest Bayou

**SHORELINE COMPASS DIRECTION**
- n = north
- s = south
- e = east
- w = west

**SHAPE FEATURES**
- 001 = polyline (percent oyster coverage)
- 002 = point (oyster clump)
  - 1 = small clump
  - 2 = large clump
- 003 = polyline (no oysters present)

*Map Symbology*

Each coverage class is represented by a unique symbol and color in order to differentiate class types on a map. Color and symbols include:

- Blue line with connecting dots: **Class 0**
- Orange single line: **Class 1**
- Yellow double line: **Class 2**
- Red triple line: **Class 3**
- Green circle with dot in middle: **Class 4**
- Light blue/yellow diagonally striped polygon: **Class 5**
Bayou Heron Oyster Resource Data

Class Coverage
- C0 19%
- C1 34%
- C2 19%
- C3 5%
- C4 23%

Class Frequency - Bayou Heron

Mean Length of Oyster Beds per Class - Bayou Heron

Median Length of Oyster Beds per Class - Bayou Heron

Percent of Length Relative to Total Length of Mapped Oyster Beds - Bayou Heron

Class Coverage
- C0 19%
- C1 34%
- C2 19%
- C3 5%
- C4 23%
Bayou Heron

Oyster Resource Classification

- Class 0: <1% or no shell presence
- Class 1: 1-30% shell coverage
- Class 2: 31-70% shell coverage
- Class 3: 71-100% shell coverage
- Class 4: isolated shell clump
- Class 5: patch with several small clumps
Bayou Cumbest Oyster Resource Data

Class Coverage
C0 13%
C1 47%
C2 2%
C3 2%

Class Frequency - Bayou Cumbest

Mean Length of Oyster Beds per Class - Bayou Cumbest

Median Length of Oyster Beds per Class - Bayou Cumbest

Percent of Length Relative to Total Length of Mapped Oyster Beds - Bayou Cumbest
Bayou Cumbest
**Crooked Bayou Oyster Resource Data**

Class Coverage
C0 18%
C1 40%
C2 24%
C3 4%
C4 12%
C5 2%

**Class Frequency - Crooked Bayou**

<table>
<thead>
<tr>
<th>Class</th>
<th>Number of Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class 0</td>
<td>10</td>
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<tr>
<td>Class 1</td>
<td>23</td>
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<td>Class 2</td>
<td>14</td>
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<tr>
<td>Class 3</td>
<td>2</td>
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<tr>
<td>Class 4</td>
<td>7</td>
</tr>
<tr>
<td>Class 5</td>
<td>1</td>
</tr>
</tbody>
</table>

**Mean Length of Oyster Beds per Class - Crooked Bayou**

<table>
<thead>
<tr>
<th>Class</th>
<th>Mean Length (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class 0</td>
<td>225</td>
</tr>
<tr>
<td>Class 1</td>
<td>1113</td>
</tr>
<tr>
<td>Class 2</td>
<td>554</td>
</tr>
<tr>
<td>Class 3</td>
<td>1425</td>
</tr>
<tr>
<td>Class 4</td>
<td>0</td>
</tr>
<tr>
<td>Class 5</td>
<td>759</td>
</tr>
</tbody>
</table>

**Median Length of Oyster Beds per Class - Crooked Bayou**

<table>
<thead>
<tr>
<th>Class</th>
<th>Median Length (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class 0</td>
<td>517</td>
</tr>
<tr>
<td>Class 1</td>
<td>2440</td>
</tr>
<tr>
<td>Class 2</td>
<td>827</td>
</tr>
<tr>
<td>Class 3</td>
<td>1425</td>
</tr>
<tr>
<td>Class 4</td>
<td>0</td>
</tr>
<tr>
<td>Class 5</td>
<td>769</td>
</tr>
</tbody>
</table>

**Percent of Length Relative to Total Length of Mapped Oyster Beds - Crooked Bayou**

<table>
<thead>
<tr>
<th>Class</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class 0</td>
<td>2%</td>
</tr>
<tr>
<td>Class 1</td>
<td>17%</td>
</tr>
<tr>
<td>Class 2</td>
<td>24%</td>
</tr>
<tr>
<td>Class 3</td>
<td>15%</td>
</tr>
<tr>
<td>Class 4</td>
<td>34%</td>
</tr>
<tr>
<td>Class 5</td>
<td>2%</td>
</tr>
</tbody>
</table>
Oyster Resource Classification

- Class 0: <1% or no shell presence
- Class 1: 1-30% shell coverage
- Class 2: 31-70% shell coverage
- Class 3: 71-100% shell coverage
- Class 4: isolated shell clump
- Class 5: patch with several small clumps

Crooked Bayou
North Rigolets Oyster Resource Data

Class Coverage
C0 12%
C1 24%
C2 18%
C3 10%
C4 27%
C5 10%

Class Frequency - North Rigolets

Number of Features

Class 0  14
Class 1  5
Class 2  6
Class 3  9
Class 4  5
Class 5  0

Mean Length of Oyster Beds per Class - North Rigolets

Mean Length (ft)

Class 0  289
Class 1  442
Class 2  545
Class 3  795
Class 4  267
Class 5  0

Median Length of Oyster Beds per Class - North Rigolets

Median Length (ft)

Class 0  285
Class 1  500
Class 2  658
Class 3  930
Class 4  463
Class 5  0

Percent of Length Relative to Total Length of Mapped Oyster Beds - North Rigolets

Percent

Class 0  3%
Class 1  4%
Class 2  19%
Class 3  7%
Class 4  66%
Class 5  0%

Class Coverage
C0 12%
C1 24%
C2 18%
C3 10%
C4 27%
C5 10%
Oyster Resource Classification

Class 0  <1% or no shell presence
Class 1  1-30% shell coverage
Class 2  31-70% shell coverage
Class 3  71-100% shell coverage
Class 4  isolated shell clump
Class 5  patch with several small clumps

North Rigolets
Bangs Bayou Oyster Resource Data

Class Coverage
C0 19%
C1 29%
C2 23%
C3 29%

Class Frequency - Bangs Bayou

Mean Length of Oyster Beds per Class - Bangs Bayou

Median Length of Oyster Beds per Class - Bangs Bayou

Percent of Length Relative to Total Length of Mapped Oyster Beds - Bangs Bayou
Oyster Resource Classification

Class 0  <1% or no shell presence
Class 1  1-30% shell coverage
Class 2  31-70% shell coverage
Class 3  71-100% shell coverage
Class 4  isolated shell clump
Class 5  patch with several small clumps

Bangs Bayou
Bangs Lake Oyster Resource Data

Class Coverage
C0 35%
C1 49%
C2 11%
C3 3%

Class Frequency - Bangs Lake

Mean Length of Oyster Beds per Class - Bangs Lake

Median Length of Oyster Beds per Class - Bangs Lake

Percent of Length Relative to Total Length of Mapped Oyster Beds - Bangs Lake

Class Coverage
C0 35%
C1 49%
C2 11%
C3 3%
Oyster Resource Classification

- Class 0: <1% or no shell presence
- Class 1: 1-30% shell coverage
- Class 2: 31-70% shell coverage
- Class 3: 71-100% shell coverage
- Class 4: isolated shell clump
- Class 5: patch with several small clumps