Office of Coast Survey
Nautical Charting of Artificial Reefs

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Coast Survey Mission

For 95 thousand miles of shoreline and 3.4 million square nautical miles of waters, we are a congressionally-mandated service that:

• Promotes navigational safety and commerce for the Nation’s Marine Highways.

• Contributes to the National economy and environmental protection

• Maintains 2,000+ nautical charts and 9 Coast Pilots
Scope of coverage

Exclusive Economic Zone – 200 Miles Out
3.4 Million Square Nautical Miles

Office of Coast Survey
- SOLAS: Tens of thousands
- Non-SOLAS Commercial: Hundreds of thousands
- Large recreational: A million
- Small recreational: Tens of millions

Office of Coast Survey
Evolution of Container Ships

- **Pre-1970**
  - 1,700 TEU
  - <10 Containers Wide

- **1970 – 1980**
  - 2,300 TEU
  - 10 - 11 Containers Wide

- **1985**
  - 3,220 TEU
  - 11 - 13 Containers Wide

- **1986 – 2000**
  - 4,848 TEU
  - 13 - 17 Containers Wide

- **2000 – 2005**
  - 8,600+ TEU
  - 17 - 22 Containers Wide

- **2005 – 2012**
  - 9,600+ TEU
  - 17 - 22 Containers Wide

- **2012 – 2020**
  - 14,000+ TEU
  - 22 - 23 Containers Wide

Office of Coast Survey
Fish Haven / Artificial Reef Charting Policy

- Permits issued by the USACE are the sole source for classifying obstructions as artificial reefs / fish havens

- Delete soundings, within the Fish Haven, deeper than the authorized minimum depth

- Delete all charted details within fish haven except features of less or unknown depths, submerged cables, pipelines and wells

- Fish havens less than or equal to 66 feet charted with dotted limiting line, blue tint and an authorized minimum clearance
Artificial Reef Symbology

- Obstn Fish Haven (auth min 30 ft)
- Obstn Fish Haven (auth min 20 ft)

Fish Haven (auth min 15 fms)
<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>OBJECTID</td>
<td>0</td>
</tr>
<tr>
<td>SHAPE</td>
<td>Polygon</td>
</tr>
<tr>
<td>LNAM</td>
<td>US026283681004327</td>
</tr>
<tr>
<td>RCID</td>
<td>132</td>
</tr>
<tr>
<td>PRIM</td>
<td>3</td>
</tr>
<tr>
<td>GRUP</td>
<td>2</td>
</tr>
<tr>
<td>OBJL</td>
<td>86</td>
</tr>
<tr>
<td>RVER</td>
<td>1</td>
</tr>
<tr>
<td>CATOBS</td>
<td>fish haven</td>
</tr>
<tr>
<td>EXPSOUE</td>
<td>shoaler than the range of depth of the surrounding depth area</td>
</tr>
<tr>
<td>OBJNAM</td>
<td>West Delta-117 &quot;C-Aux&quot;</td>
</tr>
<tr>
<td>QUASOUE</td>
<td>least depth unknown, safe clearance at value shown</td>
</tr>
<tr>
<td>VALSEU</td>
<td>27.4</td>
</tr>
<tr>
<td>WATLEV</td>
<td>always under water/submerged</td>
</tr>
<tr>
<td>SCAMIN</td>
<td>3499999</td>
</tr>
<tr>
<td>SORDAT</td>
<td>20090719</td>
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<tr>
<td>SORIND</td>
<td>US,US,reprt,L-1093/09 (NWID: 17770)</td>
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<tr>
<td>INFORM</td>
<td>&lt;null&gt;</td>
</tr>
</tbody>
</table>
Essential Information Required for NOS to Chart Fish Haven/Artificial Reefs

**Dimensions:**
- Polygon or Point with Radius

**ONE Authorized Minimum Clearance**

**Accurate Geographic Coordinates (NAD83)**

**USACE Permit**

**No Conflict with Charted Features**

**Deployment Notification**

**Obstn Fish Haven (auth min 30 ft)**
USACE or Permittee sends Notice to Nautical Data Branch (NDB)

Notice details entered into NDB Permit/Public Notice Database

Notice evaluated for charting conflicts, accuracy, completeness

NDB communicates with USACE and/or Permittee relaying possible issues

NDB receives Permit from USACE

Construction Begins: NDB receives Deployment Notification from Permittee

Fish Haven charted according to the dimensions set forth in the USACE Permit

Published in the Local Notice to Mariners

NDB evaluates subsequent deployment data.
What does the Marine Chart Division require in the USACE Permit?

- Accurate Geographic Coordinates (Latitude – Longitude)
  - Polygon - triangular, rectangular, or irregular in shape
  - Circle - center point with radius
  - Statement of coordinate system and datum (NAD83)

- One authorized minimum depth / clearance per each distinct reef boundary defined by a set of coordinates
  - Statement of tidal datum, e.g., MLW or MLLW
One authorized minimum clearance per each distinct reef boundary.

Distinct Reef Boundary

Obstru
Fish Haven (auth min 60 ft)

Distinct Reef Boundary

Distinct Reef Boundary

Distinct Reef Boundary
Clearance provided in this Permit is too ambiguous.
After communication with the USACE and the Permittee, the bounding coordinates and the corrected description of the Authorized Minimum Clearance in the permit modification were revised accordingly; one clear and concise clearance was provided.

<table>
<thead>
<tr>
<th>Palm Beach Deep Site H</th>
<th>Latitude</th>
<th>Longitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>NW Corner</td>
<td>26.803333°</td>
<td>-80.020000°</td>
</tr>
<tr>
<td>SW Corner</td>
<td>26.783333°</td>
<td>-80.020000°</td>
</tr>
<tr>
<td>NE Corner</td>
<td>26.803333°</td>
<td>-79.983333°</td>
</tr>
<tr>
<td>SE Corner</td>
<td>26.783333°</td>
<td>-79.983333°</td>
</tr>
</tbody>
</table>

A minimum clearance of 50-feet from the top of the deployed material relative to MLW shall be maintained for Palm Beach Deep Site H.
12-60 FT DEPTH REQUIRES 50% OF WATER DEPTH MLW CLEARANCE

>60 FT REQUIRES 50 FT MLW CLEARANCE
Split Fish Haven

Instead, for larger areas, it is recommended to split the Fish Haven to accommodate a broad disparity of depths within the water column.

*Note: If needed, the Fish Haven may be split into more than just two parts.
Potential Conflicts for Proposed Reefs

- Safety Fairways
- Restricted Areas
- Anchorages
- Entrance Channels
- Pipelines/Cables
- Missile Test Areas
- Unexploded Ordnance
Port Everglades
11466
Initial Reef Proposal
Port Everglades
11466
Charted
Banded-Depth
Fish Havens
Impacts of Inaccurate/Incomplete Information

Charting of reefs conflicts with previously depicted information e.g., Anchorage, Restricted Area

Deep-draft vessels denied access to Ports and federally-maintained channels.

Additional time and money spent by all stakeholders in resolving conflicts.
Fish Haven Removal from Charts

• The United States Army Corps of Engineers permit has either expired or has been rescinded.

• The permittee has provided a document stating when material was last deployed and that no further material will be deployed.

• And…
Continued... Fish Haven Removal from Charts

• Charted hydrography has been added to the former fish haven from a survey conducted after the date the permit expired or was rescinded, after the date of the last deployment of material, and that NOAA Hydrographic Surveys Division has determined that the survey meets the IHO standard for M_QUAL attribute CATZOC A1.

• When only part of the fish haven meets all of the requirements for feature removal, the remaining portion of the fish haven must be retained on the chart with a revised limiting line separating the remaining fish haven from the deleted portion.
QUESTIONS?

http://www.nauticalcharts.noaa.gov/index.html