Global Reach. Local Benefit.
Flotsam & Jetsam: Leading Environmental Restoration in Cleveland Harbor

October 17, 2013
Brian D. Lynch, VP Planning & Development
The Cuyahoga River has a rich history

Site of Rockefeller’s Standard Oil (1870’s)
It burned a few times (1950’s and 1960’s)
Was a catalyst for the EPA Clean Water Act (1972)
The River is cleaner now

Remains a key industrial artery
Has become a recreational asset
Improved plant, fish and wildlife
Today’s challenge

Floating debris is an environmental stressor
  • Organic materials (90%)
  • Street litter (10%)

Cleveland harbor sees about 200 tons of debris per year

Debris is often introduced via storm drains and CSO discharge during heavy rain events
It comes in all shapes and sizes
The Port’s solution

Develop a vessel(s) that can capture, tow, remove and transfer debris to land

Port conceptualized and designed a system, had it manufactured, then commissioned it

Secured a US EPA Great Lakes Restoration Initiative Grant in 2011 for $425k
Conceptual design for Debris Harvester Vessel System
The boats were commissioned on 17 October 2012
Complex undertaking

- Crewing
- Landside support locations
- Debris disposal
- Admirality law and Jones Act considerations

- Agreements and exchanges
- Safety and training
- Maintenance
- Equipment
- Insurance
The boats were immediately put to the test when Superstorm Sandy hit.
2013 – First full year of service

Debris capture and removal
- 430k lbs. / 462 cubic yards / 170 Bagsters®
- 60 logs (large – 20+ feet long)

Forged better relationships with local partners
- Recreational, environmental, industry, government, USCG, and visitor and convention bureau

Visibility and public awareness > Flotsam & Jetsam on NBC WKYC
### Specifications

<table>
<thead>
<tr>
<th>Vessel Specification</th>
<th>Flotsam</th>
<th>Jetsam</th>
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<tbody>
<tr>
<td><strong>Construction Material</strong></td>
<td>Marine Grade 5/16 Aluminum</td>
<td>Marine Grade 5/16 Aluminum</td>
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<tr>
<td><strong>Length Overall (LOA)</strong></td>
<td>25 feet, 10 inches</td>
<td>25 feet, 10 inches</td>
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<tr>
<td><strong>Beam (Width)</strong></td>
<td>Hull 10 feet; 11 feet including rub-rails</td>
<td>Hull 10 feet, 11 feet including rub-rails</td>
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<tr>
<td><strong>Displacement (loaded)</strong></td>
<td>15,950 lbs.</td>
<td>16,570 lbs.</td>
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<td><strong>Loaded Draft</strong></td>
<td>1 foot, 2 inches</td>
<td>1 foot, 2.56 inches</td>
</tr>
<tr>
<td><strong>Engine</strong></td>
<td>Inboard 160 hp diesel with outdrive</td>
<td>Inboard 160 hp diesel with outdrive</td>
</tr>
<tr>
<td><strong>Maximum Speed</strong></td>
<td>6.5 knots</td>
<td>6.5 knots</td>
</tr>
<tr>
<td><strong>On-board Equipment</strong></td>
<td>Pilot house, Bobcat mini-excavator</td>
<td>Pilot house, deck mounted, hydraulic knuckle boom crane with grapple, debris holding area (for Bagster® or dumpster)</td>
</tr>
<tr>
<td><strong>Crew</strong></td>
<td>Boat chief, excavator operator, deck hand(s)</td>
<td>Boat chief / hydraulic crane operator, deck hand(s)</td>
</tr>
<tr>
<td><strong>Designed by</strong></td>
<td>Murray and Associates, Naval Architects, Ft Lauderdale, FL</td>
<td>Murray and Associates, Naval Architects, Ft Lauderdale, FL</td>
</tr>
<tr>
<td><strong>Built by</strong></td>
<td>Lake Assault Boats, Superior, WI</td>
<td>Lake Assault Boats, Superior, WI</td>
</tr>
<tr>
<td><strong>Manufacture Date</strong></td>
<td>2012</td>
<td>2012</td>
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Each year, more than 400 cubic yards of debris is introduced into Cleveland Harbor. Floating debris in the Cuyahoga River ship channel is an ongoing aesthetic nuisance and a U.S. Environmental Protection Agency designated environmental stressor. It is also an eyesore and a potential hazard.
