Don't Throw It Away: Beneficial Use of Storm Debris for Beach and Vegetation Stabilization

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Texas General Land Office
Coastal Resources

- State-owned land
  - Submerged state land
  - Public beaches
    - Wet beach and dry beach (public beach easements)

- Storm response
  - Survey damage
  - Legal responsibility
  - FEMA
Hurricane Harvey Debris

- 91 linear miles of beach
- 11,256.15 cubic yards
- Overwhelmingly vegetative
  - Challenging to access
- Critical habitat (*C. melodus* & *C. canutus*)
240 cubic yards in the last 2 miles (NE beach)

Placed debris into 7 piles but could not collect for disposal

- Dry beach – soft sand
- Wet beach – clay deposits

Significant beach erosion

Nearby beneficial use (Bryan Beach)

Goal: remove hazards, stabilize shoreline, not impede public access

Photo credit: Tara Whittle
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### Table 1: Debris Information

<table>
<thead>
<tr>
<th>No.</th>
<th>Latitude</th>
<th>Longitude</th>
<th>Cubic Yards</th>
<th>Line of Existing Vegetation Profile</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>28.81635248</td>
<td>-95.52480213</td>
<td>20</td>
<td>Gentle slope, 0'-1' elevation</td>
</tr>
<tr>
<td>2</td>
<td>28.81502812</td>
<td>-95.52787688</td>
<td>50</td>
<td>Eroded shore, 2-3' elevation</td>
</tr>
<tr>
<td>3</td>
<td>28.81261953</td>
<td>-95.5817955</td>
<td>30</td>
<td>Gentle slope, 0'-1' elevation</td>
</tr>
<tr>
<td>4</td>
<td>28.80959443</td>
<td>-95.5376461</td>
<td>50</td>
<td>Little slope, 0'-0.5' elevation</td>
</tr>
<tr>
<td>5</td>
<td>28.80771198</td>
<td>-95.54131798</td>
<td>40</td>
<td>Outside of working area</td>
</tr>
<tr>
<td>6</td>
<td>28.80495172</td>
<td>-95.54651043</td>
<td>30</td>
<td>Outside of working area</td>
</tr>
<tr>
<td>7</td>
<td>28.80266392</td>
<td>-95.5504962</td>
<td>20</td>
<td>Outside of working area</td>
</tr>
</tbody>
</table>

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Goal: remove hazards, stabilize shoreline, not impede public access
Vegetation and Shoreline Stabilization

Prep Work

- FEMA, USACE, USFWS, GLO, THC, etc.
- Closely consulted with Moni Belton (USFWS Biologist)
  - Turtle nesting access
- Site visits with Ben Krenzer (SLS)
  - Practicality and equipment limitations
- Permission gained from Sargent Ranch by Clifton Kennedy (DRC)
  - Upland property owner

Photo credit: Carver Wray; GLO
Methodology

Woody Debris Placement

- 100 linear foot placement areas
- 200 linear foot undisturbed areas
- 20 cubic yards of debris per placement area
- 17 placement areas identified and marked
  - Parallel to vegetation line, along vegetation line
  - 2’ – 4’ wide
  - Stacked no higher than largest log within placement area (avg. 3’ diameter)

Photo credit: Tara Whittle
Key
- Debris Placement Area (100 ft.)
- Undisturbed area (200 ft.)
- Allowed working area adjacent to Sargent Ranch (5,100 ft.)

Scale
1 in. : 800 ft.
Methodology

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Additional Information
• Continuation of monitoring and work plan (SWG-2010-00605, Monitoring Work Plan)
• Consistent with natural beach processes

Photo credit: Tara Whittle
Methodology cont.

Active Work

(Feb 15 – Feb 21)

• Only 12 placement areas used
  • 10, 11, 14, 15, 16 left undisturbed
  • Focused on flat areas near debris piles
• Fully monitored by Metric Engineering and myself; all labor done by Ben Krenzer
Key
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Scale
1 in. : 800 ft.
Two post-placement monitoring visits (July 5, 2018 and October 29, 2018)

- Beginning to see sand accumulation
- No major signs of tampering
- Positive response from public

Photo credit: Tara Whittle
Results
Post-placement (February 19 and 21, 2018) vs 4.5 months later (July 5, 2018)

Placement Area 2

Placement Area 4

Placement Area 7

Placement Area 12

Photo credit: Tara Whittle
Results

Placement Area 2: February 19, 2018 vs July 5, 2018 vs October 29, 2018

Photo credit: Tara Whittle
Results

Placement Area 2: February 19, 2018 vs July 5, 2018 vs October 29, 2018

Photo credit: Tara Whittle
Results

Placement Area 2: February 19, 2018 vs July 5, 2018 vs October 29, 2018

2/19

10/29

10” – 18” accumulation

Photo credit: Tara Whittle
What now?

- Will continue to monitor
- Identify future opportunities for beneficial use of debris clean-up projects
- Use information to improve future beneficial use projects
Acknowledgements:

Moni Belton (USFWS)

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TXGLO

Thank You

Questions?

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