Paine’s Creek, Mant’s Landing, and Wing Island
Mean High Water
Paines Creek Landing: 2007
Paines Creek Landing: 2009
March 2010
<table>
<thead>
<tr>
<th>ALTERNATIVE</th>
<th>Overall Effectiveness</th>
<th>Shoreline Stabilization</th>
<th>Structural Lifetime</th>
<th>Permeability</th>
<th>Permitting/Engineering Cost</th>
<th>Construction Cost</th>
<th>Construction Feasibility</th>
<th>Maintenance Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Do Nothing</td>
<td></td>
<td></td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>2. Stone Revetment</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
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</tr>
<tr>
<td>3. Vertical Wall/bulkhead</td>
<td></td>
<td></td>
<td>●</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
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</tr>
<tr>
<td>(timber/steel/composite)</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>4. Rock-filled Gabion Baskets</td>
<td></td>
<td></td>
<td>●</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>●</td>
</tr>
<tr>
<td>5. Coir Logs</td>
<td></td>
<td></td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>○</td>
</tr>
<tr>
<td>6. Cobble Berm</td>
<td></td>
<td></td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>○</td>
</tr>
</tbody>
</table>

* = Relative to other alternatives, varies depending on alternative items and local costs  
● = Good  
○ = Medium  
○ = Poor  
N/A = Not Applicable
Local Planning for Retreat

- Several years of substantial investment in repairs
  - Selectmen meetings, town meeting expenditures
  - Selectmen presentation on alternatives
  - Grant opportunity NRCS Stormwater
    - Can we promise to maintain infrastructure for 75 years?
- Rethink investments, use grant, improve stormwater conditions
  - Removal of pavement = less stormwater
  - Resilient lot able to withstand inundation
  - Culvert replacement
Paine’s Creek
Long term erosion trends

- Short Term: 3.05 ft/year (accretion)
- Long Term: -0.26 ft/year (erosion)

- Short Term: -1.41 ft/year (erosion)
- Long Term: -0.56 ft/year (erosion)

Breakwater and Little Breakwater Landings
Historic Shorelines, Erosion Rates and Variability
Recurring storm damage
Planting beach grass

- Alternative spring break, Brandeis University
Breakwater spring 2012
End scour from revetment to west
Sturdy sand fence in sacrificial dune at Breakwater
Sturdy fence buried under new dune located slightly further from active beach.
Concept: Retreat and rebuild

- Remove existing pavement and restore dunes to edge of proposed lot
- Walking path
- Bioretention with interpretive signage along path
- Bike rack
- Overflow
- Dune fence around bioretention
New replacement lot

- Dune fence around bioretention
- Grass swale
- Remove existing pavement
- 20 9' x 18' spaces, including 3 handicapped spaces
- Site facility
- Standard asphalt
- Permeable pavement parking lot
- Bioretention facility at Sandy Neck parking lot, MA
- 30 9' x 18' spaces
- Dune fence around permeable pavement lot
- 24 0'
Public Outreach

- Televised beach tours and discussions of alternatives
- Town meeting articles for funding (twice)
- Two state CZM grants (design and for construction)
- Postcards to neighborhood
- Multiple televised selectmen meetings
- Articles in newspaper
- Multiple Brewster Coastal Committee meetings
- MEPA site visit
- Historic, Conservation, Planning Board meetings (multiple)
Results?

- Strong support from Selectmen and boards
- Many neighbors liked the retreat, if we didn’t replace the parking that was lost
- Some neighbors supporting, but a group formed to oppose the project (and others)
- Lawsuit, petitions, different designs, confused boards
- Lots more press and editorials
- town meeting articles to oppose this and other projects
- Concurrently, town applied for a CZM Coastal Resiliency Grant to develop community support and understanding of coastal issues.
- Outcome: Selectment sponsored specific yes/no votes at town meeting; and the project was approved and constructed.
Ellis Landing March 2010
Ellis February 2011
Ellis May 2012 stormwater
Ellis March 2014
Mants March 2010
January 2013 Mants

Nor’easter Nemo. Dunes destroyed, parking lot asphalt lifted and damaged.
Articulating concrete mat
Blocks connected with flexible cable
Developing a Coastal Adaptation Strategy for Brewster

- CZM Coastal Community Resiliency Grant 2016
  - $222,000 ($160,000 grant, $62,000 local match)
- Develop a consensus-based Coastal Adaptation Strategy.
  - A measured and detailed public engagement process is the next step in adapting to Brewster's future coastal change and erosion issues.
Climate Adaptation

- Brewster's entire coast is currently in the FEMA VE flood zone and most or all of its tidal marsh and creek system are mapped as AE.
- There are 1,138 land parcels within these zones.
- In the past five years, extensive parts of coastal Brewster have been exposed to storm surge impacts, including dune washover, flooding and significant erosion. In some areas, up to 20 feet of dune/coastal bank have been lost in a single storm event.
Public Beach Access Issues

2014:

- 6,411 resident beach stickers
- 4,355 seasonal and visitor stickers
- Approximately 300 total spaces
- Stickers required 9am to 3pm daily June 15 through labor day.
Brewster BCAG chose the following timeframes and future scenarios for the mapping and analyses of sea level rise and storm surge impacts on Brewster’s coast:

- Time horizons of 20 years and a one foot rise in sea level, 40 years (~ two feet), and 60 years (~ four ft) to provide for both short- and long- term impacts, and
- Storm surge levels of two, four, and eight feet.
Final Report: Coastal Adaptation Strategy