Outline

1. Background
2. Project Focus & Approach
3. York River Inventory & Characterization
4. Boat Demographics
5. Capacity Analysis
6. Map Review and Feedback
York River

- 13+/- mile tidal River
- Watershed includes areas of York, Kittery, Eliot, and South Berwick
- Mixed use waterway:
  - Commercial and Recreational Fishing
  - Waterborne Transportation
  - Water-based recreation
  - Marine related businesses
  - and other water-dependent uses
- Federally Maintained anchorages and channel in York Harbor
- Significant environmental, cultural, historic, and scenic resources along length
- Economic significance:\n  - $13,700,000 in estimated economic activity
  - 100 jobs dependent on harbor being navigable
  - 160 plus jobs indirectly dependent

• **Town of York Comprehensive Plan Updated in 2018**

  • **Town Goal 7.1:** Manage and maintain existing harbors to provide the greatest possible diversity of use.

  • **Town Goal 7.2:** The Town should encourage public access to its coastal resources.

  • **Town Goal 7.3:** Provide Opportunities for the existing commercial fishing industry to flourish in York.
• York River Study
  • Comprehensive study with multiple focused sub-studies:
    • Archeological/Cultural/Historical Resources
    • Natural Resources
    • Fish Species and Habitat
    • Buildout Scenarios
    • Public and Stakeholder Input
  • Watershed Stewardship Plan published Fall 2018 and adopted by watershed communities
  • Work of York River Study Committee Ongoing
  • Legislation put forth to Designate York River and Tributaries as a *Wild & Scenic River Segments*
• Capacity of York Harbor and River
  • Characterize existing conditions and uses
  • Identify factors that influence capacity
  • Assess current uses and characteristics
  • Identify areas of conflict/concern/opportunity
  • Develop recommendations
Components of Waterway Capacity

- **Spatial Capacity**
  - Watersheet: Navigation Areas, Moorings/Berths, Channels

- **Facility Capacity**
  - At Shore and Upland: Parking, Access, Services

- **Ecological Capacity**
  - Ability of waterway to support uses without detrimental effects on the environment, ecology, fisheries, wildlife

- **Social Capacity**
  - Conflicts between user groups, perceptions of overuse/crowding, impacts to traditional uses or user’s desired experience
Waterway Classes

# Relationship of Waterway Classes to Capacity

<table>
<thead>
<tr>
<th>Spatial</th>
<th>Rural/Developed</th>
<th>Rural/Natural</th>
<th>Semi-Primitive</th>
<th>Primitive</th>
</tr>
</thead>
<tbody>
<tr>
<td>More boats/acre</td>
<td></td>
<td>Fewer boats/acre</td>
<td></td>
<td></td>
</tr>
<tr>
<td>More shoreline development</td>
<td>Less shoreline development</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Facility</td>
<td>More established</td>
<td>More natural</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marinas, docks</td>
<td>Primitive access</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ecological</td>
<td>Less Sensitive</td>
<td>More Sensitive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less frequent or lower value habitats</td>
<td>More frequent or higher value habitats</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social</td>
<td>Greater user presence</td>
<td>Less user presence</td>
<td>More Remote/Peaceful/Tranquil Noise &amp; Visual Impacts</td>
<td></td>
</tr>
</tbody>
</table>
York Harbor Drone Video

Compilation of drone footage captured by GEI Consultants on July 5, 2019.

https://youtu.be/QOggacC8UIo
Harbor Inventory
Overview

Map Areas
- Downstream
- Upstream Series A
- Upstream Series B

Map Series
- Marine Uses & Infrastructure
- Land Use & Regulatory
- Environmental
1. Upstream of Scotland Bridge Road
2. Scotland Bridge Road to Route 1
3. Route 1 to Sewall’s Bridge
4. Sewall’s Bridge to Route 103
5. Route 103 to G-11 Marker “North Basin”
Downstream
Marine Uses & Infrastructure
Downstream
Land Use & Regulatory
Upstream Series B
Environmental
# Watersheet Characteristics

<table>
<thead>
<tr>
<th>Area</th>
<th>No.</th>
<th>Description</th>
<th>High Water Area(^1) (acre)</th>
<th>Low Water Area(^2) (acre)</th>
<th>% Intertidal</th>
<th>Length Along Thread(^3) (mi)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Upstream</strong></td>
<td>1</td>
<td>Limit of Study to Scotland Bridge Road</td>
<td>245</td>
<td>38.2</td>
<td>84%</td>
<td>4.0</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Scotland Bridge Road to Route 1</td>
<td>289</td>
<td>44.2</td>
<td>85%</td>
<td>1.7</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Route 1 to Sewall's Bridge</td>
<td>174</td>
<td>82.7</td>
<td>52%</td>
<td>2.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>707</td>
<td>165</td>
<td>77%</td>
<td>7.8</td>
</tr>
<tr>
<td><strong>Downstream</strong></td>
<td>4</td>
<td>Sewall's Bridge to Route 103</td>
<td>120</td>
<td>25.4</td>
<td>79%</td>
<td>0.65</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>North Basin: Route 103 to &quot;G-11&quot;</td>
<td>24.1</td>
<td>16.0</td>
<td>34%</td>
<td>0.27</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>South Basin: &quot;G-11&quot; to &quot;R-9&quot;</td>
<td>87.5</td>
<td>29.3</td>
<td>67%</td>
<td>0.37</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>231</td>
<td>71</td>
<td>69%</td>
<td>1.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>938</td>
<td>236</td>
<td>75%</td>
<td>9.1</td>
</tr>
</tbody>
</table>

Notes:
1. Based on Highest Annual Tide line as published by MEGIS
2. Low water line digitized from low-tide aerial imagery
3. Measured along approximate centerline of low-water channel of York River. Tributaries are not included.
## Waterfront Facilities

<table>
<thead>
<tr>
<th>Area</th>
<th>No.</th>
<th>Description</th>
<th>Boat Launches (trailered or hand-carry)</th>
<th>Working Waterfront Sites</th>
<th>Docks &amp; Piers&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Dock Density&lt;sup&gt;2&lt;/sup&gt; (docks / mile)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Upstream</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Limit of Study to Scotland Bridge Road</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>1.3</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Scotland Bridge Road to Route 1</td>
<td>1</td>
<td>0</td>
<td>13</td>
<td>7.6</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Route 1 to Sewall's Bridge</td>
<td>1</td>
<td>0</td>
<td>35</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Downstream</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Sewall's Bridge to Route 103</td>
<td>1</td>
<td>5</td>
<td>13</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>North Basin: Route 103 to &quot;G-11&quot;</td>
<td>1</td>
<td>1</td>
<td>6</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>South Basin: &quot;G-11&quot; to &quot;R-9&quot;</td>
<td>2</td>
<td>1</td>
<td>11</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
1. Dock locations digitized from aerial imagery
2. Calculated as number of docks / thread length of segment
## Local Boat Usage

<table>
<thead>
<tr>
<th>Area</th>
<th>No.</th>
<th>Description</th>
<th>Boats on Docks/Slips/Dry Storage¹</th>
<th>Boats on Moorings²</th>
<th>Total Local Boats³</th>
<th>Local Boat Density⁴ (boats / acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Upstream</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>Limit of Study to Scotland Bridge Road</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td>0.08</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>Scotland Bridge Road to Route 1</td>
<td>5</td>
<td>0</td>
<td>5</td>
<td>0.11</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>Route 1 to Sewall’s Bridge</td>
<td>12</td>
<td>20</td>
<td>32</td>
<td>0.39</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Total</strong></td>
<td><strong>20</strong></td>
<td><strong>20</strong></td>
<td><strong>40</strong></td>
<td><strong>0.24</strong></td>
</tr>
<tr>
<td><strong>Downstream</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>Sewall’s Bridge to Route 103</td>
<td>18</td>
<td>69</td>
<td>87</td>
<td>3.4</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>North Basin: Route 103 to &quot;G-11&quot;</td>
<td>4</td>
<td>98</td>
<td>102</td>
<td>6.4</td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>South Basin: &quot;G-11&quot; to &quot;R-9&quot;</td>
<td>116</td>
<td>128</td>
<td>244</td>
<td>8.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Total</strong></td>
<td><strong>138</strong></td>
<td><strong>295</strong></td>
<td><strong>433</strong></td>
<td><strong>6.1</strong></td>
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<tr>
<td></td>
<td></td>
<td><strong>Total</strong></td>
<td><strong>158</strong></td>
<td><strong>315</strong></td>
<td><strong>473</strong></td>
<td><strong>2.0</strong></td>
</tr>
</tbody>
</table>

**Notes:**
1. Based on 2019 Harbor Use Fee inventory
2. Based on 2019 Mooring Holders inventory
3. Includes only those boats registered with the Harbormaster in the Town’s Harbors or using Town facilities more than 14 days per annum. Day launches, canoes/kayaks, and other non-local vessels are not included.
4. Boat density calculated as total boats / low water area
River Regions & Classes

<table>
<thead>
<tr>
<th>Study Area</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Upstream of Scotland Bridge Road</td>
<td>Semi-Primitive</td>
</tr>
<tr>
<td>2 Scotland Bridge Road to Route 1</td>
<td>Rural Natural</td>
</tr>
<tr>
<td>3 Route 1 to Sewall’s Bridge</td>
<td>Rural Developed</td>
</tr>
<tr>
<td>4 Sewall’s Bridge to Route 103</td>
<td>Rural Developed</td>
</tr>
<tr>
<td>5 North Basin</td>
<td>Suburban</td>
</tr>
<tr>
<td>6 South Basin</td>
<td>Suburban</td>
</tr>
</tbody>
</table>
# Boat Demographics

<table>
<thead>
<tr>
<th>Category</th>
<th>Total Quantity</th>
<th>Boat Length Category</th>
<th>Average Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mooring Holders</td>
<td>282</td>
<td>&lt; 18 ft: 51</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td></td>
<td>18 - 25 ft: 150</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 25 ft: 81</td>
<td></td>
</tr>
<tr>
<td>Tender/Skiff</td>
<td>161</td>
<td>&lt; 18 ft: 161</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>18 - 25 ft: 0</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 25 ft: 0</td>
<td></td>
</tr>
<tr>
<td>Wait List for Moorings</td>
<td>270</td>
<td>&lt; 18 ft: 61</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>18 - 25 ft: 106</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 25 ft: 103</td>
<td></td>
</tr>
<tr>
<td>Docks/Slips/Dry Storage/Trailered</td>
<td>196</td>
<td>&lt; 18 ft: 69</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td></td>
<td>18 - 25 ft: 88</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 25 ft: 39</td>
<td></td>
</tr>
<tr>
<td>Transients (Yearly Average for last 5 years)</td>
<td>205</td>
<td>&lt; 18 ft: 0</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td></td>
<td>18 - 25 ft: 6</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 25 ft: 199</td>
<td></td>
</tr>
<tr>
<td>Paddlecraft (Peak Season Weekend Day Range 2018)</td>
<td>43-120</td>
<td>&lt; 18 ft: ---</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>18 - 25 ft: ---</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 25 ft: ---</td>
<td></td>
</tr>
</tbody>
</table>
**Boat Demographics**

**York Harbor Boat Demographics**

**Typical Vessel Characteristics:**
Small Power and Sail Boats
Average Length = 24 ft
Average Beam (est.) = 8-10 ft

![Powerboat and Sailboat Illustrations]
Boat Demographics

York Harbor Transient Boat Demographics
Transient Boat Size Distribution

Typical Vessel Characteristics:
Average Length = 36 ft
Average Beam (est.) = 12-14 ft
Largest Boat = 55 ft
Mix of power and sail

Powerboat
Sailboat
More than 70% of total annual use is during the months of July and August.
Components of Waterway Capacity

• Spatial Capacity

• Facility Capacity

• Ecological Capacity

• Social Capacity
Spatial Capacity

• Primary issues considered:
  - Area Use: Anchorage vs. Navigation
  - Channel widths
    • Existing conditions at selected locations
    • Recommended Widths
    • Army Corps Navigation Channels
  - Boat density
    • Existing boat density
    • Recommended density at moorings/berths
    • Recommended density in use
Based on ASCE 50

- **Minimum Clear Channel Width (feet)**
  - \[ \text{Minimum Clear Channel Width} = 5 \times \text{average beam} + 0.10 \times \text{number of boats served} \]
  - Increased channel width recommended at changes of direction, in exposed locations, and high current locations.

For York Harbor, Downstream:

- A channel serving approximately 500 boats
- Average beam = 8 ft - 10 ft
- Min clear channel width = 90 ft – 100 ft
- Increased width is warranted due to currents, shallows, complex navigation patterns
Spatial Capacity

Channel Conditions

- 150’ federal channel
- 75 ft +/- clear
- 80 ft +/- clear
- Channel not clearly defined
- 80 ft based on USACE plan
- 180 ft +/- clear
Spatial Capacity
Boat Density – Berths & Moorings

- Maximum density varies greatly by type of use and berth/mooring conditions
- Based on typical vessels in York Harbor:
  - Single Point Moorings: \( \sim 10-15 \text{ boats / acre} \)
  - Slips \( \sim 30+ \text{ boats/ acre} \)
- Assumes an efficient, well designed, orderly layout
- Currently 4-6 boats per acre in water in most densely used areas
Spatial Capacity

Boat Density

4-6+/ - boats/acre
Spatial Capacity

Boat Density – In Use

- Maximum density varies by Character and Type of Vessels
- Case-by-case evaluation required that is specific to the waterway
- Examples of recommended ranges:

  - **Florida DEP**
    - Limited power (10 HP or less) boating: 5 to 10 acres per boat
    - Unlimited power boating: 10 to 20 acres per boat
    - Sailing: 20 to 50 acres per boat
    - No power, still water: 5 to 10 acres per boat

  - **New York State Office of Parks & Recreation**
    - Sailboat: 6 to 8 acres per boat
    - Powerboats: 6 to 8 acres per boat
    - Fishing anchored: 0.3 to 0.5 acre per boat
    - Rowboats: 1 acre per boat
    - Fishing trolling: 1 acre per boat
    - Canoes and kayaks: 1 acre per boat
• Where are facilities located?
• Are existing facilities sufficient?
• What improvements should/can be made at existing facilities?
• Are additional/new facilities needed?
Facility Capacity
Facility Capacity

Route 1 Boat Ramp
Facility Capacity

Kayaks & Dinghies at Strawberry Island
• Water based activities both depend on, and have the potential to impact, the marine ecosystem
• What amount and type of use increases risk to River environment?
• Capacity will vary by area:
  • Shallow/narrow areas more sensitive
  • High Value Habitat more sensitive
  • Areas with other natural or cultural resources are more sensitive
• Potential issues
  • Reduction in water quality
  • Pollution
    • Spills
    • Discharge of oil, bilge water
    • Wastewater from holding tanks
    • Litter, debris
  • Impacts to fisheries
    • Closures
    • Impacts to or depletion of fish stocks
  • Impacts to marsh and submerged aquatic vegetation
  • Impacts to birds and other wildlife
  • Shoreline erosion
Social Capacity

• Management of mixed uses
  • Recreational and Commercial
  • Sailboats, Power Boats, Paddle Craft
  • Swimming and other recreation
• Changing demographics – increased recreational uses and impacts to traditional uses
• Perceptions of overuse
Social Capacity

- Observance of rules and regulations
  - Headway Speed
  - Paddlecraft Safety
  - “Rules of the Road”
  - Local regulations on facility use, swimming areas, etc.
- Attitude toward stewardship
Waterway capacity is a complex equation that must consider Physical Characteristics, Environmental Qualities, Types of Uses, User Behaviors, and many other complex and interrelated factors – as well as the Values and Goals of those responsible for managing the waterway.

Effective management requires a combination of:

- Management resources
- Stakeholder input
- Education
- Regulation
- Enforcement

This is an ongoing process that requires adjustment and accommodation as conditions change.
Next Steps

• Gather feedback
• Continue harbor analysis
• Detailed analysis of specific issues/problem areas
• Additional field observations and stakeholder meetings
• Formalize recommended capacity criteria
• Develop recommendations
• Next Presentation in September or October TBD
Map Review & Feedback

- Printed maps
  - Use color coded dots to point out areas on maps:
    - Red – negative
    - Green – positive
  - Comments are encouraged
  - Use sticky notes or write on maps for comments
THANK YOU!

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