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Toward a standard trash assessment method

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Toward a Standard Trash Assessment Method

Sydney Harris, Washington Environmental Council (formerly ORISE, EPA Region 10)
Salish Sea Ecosystem Conference, Seattle, WA
April 5, 2018
The Escaped Trash Assessment Protocol (ETAP) is currently a draft; EPA intends to incorporate feedback from pilot testers into the protocol and would appreciate your input on any/all aspects, including wording of reference and outreach materials.
Let’s Talk (Aquatic) Trash

• 8 million + tons/year
• 88% plastic
• Plastics do not biodegrade
80% of marine debris comes from land…
...ESPECIALLY from the U.S. ...
"This assumption is not quite accurate, as some MSW is littered or disposed on-site. These amounts are believed to be a small fraction of total discards."

... but we’re not counting it.
Extensive Data is Collected...
... but states aren’t using it.
ETAP: Escaped Trash Assessment Protocol

A universal method

• All environments – density
• Water Quality Standards – threat assessment
• Upstream source ID/reduction – materials management alignment
EPA’s Trash Free Waters Program:

“Reducing the volume of trash entering U.S. waterways.”

- Research
- Prevention, Control & Reduction
- Regulatory Initiatives
- Public-Private Partnerships

www.epa.gov/trash-free-waters
Process & Team Members

- Core working group: Margaret McCauley (EPA R10); Molly Martin (EPA R4); Amanda Hong (EPA R8); Gayle Hubert (EPA R7); Sydney Harris (ORISE, EPA R10)

- Intern support: Sydney Barnes-Grant (UW Capstone); Katie Hunger (UW Capstone)

- Additional input: Romell Nandi (EPA HQs); Andrew Horan (EPA HQs); Liz Ottinger (EPA R3); Emma Maschal (ORISE, EPA HQs); Dylan Laird (ORISE, EPA HQs)

- External peer review: Dr. Jenna Jambeck (University of Georgia); Sarah DaSilva (Environment and Climate Change Canada); Karen Morrison, Allyson Williams, Cynthia Dunn and Nancy Carr (CalRecycle); Heather Trim (Zero Waste Washington)
Sample Existing Protocols

- NOAA – Marine Debris Monitoring and Assessment Project (MDMAP)
- Ocean Conservancy – International Coastal Cleanup
- 5 Gyres – Plastic Beach/Plastic Ocean/Plastic Observe
- COASST (UW) – Marine Debris Survey
- Surfrider – Multiple beach cleanup methods, chapter-based
- Keep America Beautiful – National Visible Litter Survey
- Bay Area Stormwater Management Association (BASMAA) – On-Land Visual Trash Assessment (VTA)
- State of California Surface Water Ambient Monitoring Program (SWAMP) – Rapid Trash Assessment (RTA)
- Alliance for the Great Lakes – Adopt-A-Beach Litter Monitoring
Sample Existing Platforms

• Marine Debris Tracker (NOAA MDP; SEA-MDI)
• Ocean Conservancy – Clean Swell
• Pirika/Takanome
• Litterati
• Global Partnership for Oceans (GPO) – Global Alert
STEP 1: Site Selection

- Use existing site

OR:

- VTA* at randomly-selected sites
- Select highest priority (lowest-scoring) site/s

*VTA = On-land Visual Trash Assessment
STEP 2: Data Collection

- Initial site characterization
- Cleanup trash
- Catalogue trash (using data card)
  - Item Types & Materials
  - Threat Assessment
  - Item Condition
  - Notes
**Total Items by Industry**

<table>
<thead>
<tr>
<th>Industry</th>
<th>Number</th>
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<tbody>
<tr>
<td>Tobacco</td>
<td>4</td>
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<tr>
<td>Retail and Food Service</td>
<td>2</td>
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<tr>
<td>Retail</td>
<td>4</td>
</tr>
<tr>
<td>Personal Care Products</td>
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<td>Other/Unknown</td>
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<td>Other (Furniture/Home)</td>
<td>3</td>
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<tr>
<td>Medical</td>
<td>0</td>
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<tr>
<td>Food &amp; Beverage</td>
<td>0</td>
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<tr>
<td>Fishing/Maritime</td>
<td>0</td>
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<tr>
<td>Construction &amp; Demolition</td>
<td>16</td>
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<tr>
<td>Automotive</td>
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</tbody>
</table>

**Materials**

- Plastic: 150
- Metal: 100
- Glass/Ceramic: 50
- Other: 20
- Paper: 10

**Threat Assessment**

- Open Container: 23%
- Poison Label/s.: 0%
- Sharp: 14%
- Closed Loop/s.: 3%
- Shiny: 15%
- Floppy: 45%

*No Poison Labels Found*

**Item Condition**

- Intact/Unfouled: 17%
- Degraded/Heavily Fouled: 39%
- Partially Intact/Partially Fouled: 44%
Adaptive Management

• Test land use changes
• Design targeted interventions
• Measure policy effectiveness
• Analyze major events
• List impaired waterways?
Pilot Testing in WA

• EPA provides ETAP & reference materials

• Zero Waste Washington leads pilot testing

• Site Leaders lead individual events; sign off on data & provide feedback
Site Criteria

- Continuous area
- Consistent land use type/s

‡ Ideally: connect to GIS platform for community-scale mapping of VTA scores
Site Characterization

- Latitude and Longitude (4 corners OR central point + total area)
- Land Use/s
- Proximity to water, storm drain or critical habitat
- Preventative Measures
- General Observations
- VTA Score
Site Characterization

- Receptacles Present
- Public Transit Hub
- Residential
- Water-Adjacent
Cleanup & Catalogue

- Two Parts OR Two Teams:
  - Part/Team 1: Cleanup
  - Part/Team 2: Catalogue

‡ Note: Cleanup and cataloguing can be conducted simultaneously or in two phases (if trash can be stored).
Part/Team 1: Cleanup

- Fan out; collect all trash within site borders
- No information collected except items that are not moved (heavy/hazardous)
- Double-check to ensure all trash collected
Part/Team 2: Catalogue

• As bags arrive from Team Cleanup OR at a later time
• Catalogue each item in pairs; record on data card
• REPEAT one bag with new pair – field duplicate
• Sort catalogued items into piles by material type
• Weigh & photograph completed piles
Data Cards
Testing two options
Data Card

Option 1:
Identify product, then material

<table>
<thead>
<tr>
<th>Item List</th>
<th>Product/Brand</th>
<th>Material</th>
<th>Intact/Un-Fouled</th>
<th>Partially Intact/Partially Fouled</th>
<th>Degraded/Heavily Fouled</th>
<th>Shiny</th>
<th>Floppy</th>
<th>Closed Loop/S</th>
<th>Sharp</th>
<th>Pc/Sql</th>
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</thead>
<tbody>
<tr>
<td>1. Beverage Bottle - disposable</td>
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<td>2. Beverage Cup - disposable</td>
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<td>3. Beverage Other Container - disposable</td>
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<td>4. Beverage Container - durable</td>
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<td>5. Beverage container cap - disposable</td>
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<td>6. Beverage container cap or lid - durable</td>
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<td>7. Beverage packaging other - disposable</td>
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<td>8. Straw or Stirrer - disposable</td>
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<td>9. Cozy/Beverage Sleeve - disposable</td>
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<td>10. Straw or Stirrer - durable</td>
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<td>11. Napkin/Tissue - disposable OR durable</td>
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<td>12. Utensil, Plate/ServiceWare - disposable</td>
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<td>13. Utensil, Plate/ServiceWare - durable</td>
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<td>14. Cooler - disposable</td>
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<td>15. Cooler - durable</td>
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<td>16. Bag - disposable</td>
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<td>18. Product Packaging (non-food/bev)</td>
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<td>21. Cigars/Cigarettes/Cannabis and Packaging</td>
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<td>26. Construction Debris</td>
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## Data Card

**Option 2:**

Identify material, then product

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<thead>
<tr>
<th>Item List</th>
<th>Intact/ Un-fouled</th>
<th>Partially Intact/ Fouled</th>
<th>Degraded/ Heavily Fouled</th>
<th>Shiny</th>
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<th>Closed Loop/s</th>
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<td>Newspaper, Junk Mail and Office Paper</td>
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<td>Beverage Bottles and Containers</td>
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<td>Beverage Cans and Containers</td>
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<td>Foam Fast Food Service Items</td>
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Threat Assessment
Item Condition – Intact/Un-fouled
Item Condition – Partially Intact/Partially Fouled
Item Condition – Degraded/Heavily Fouled
Item Sorting & Weighing

- Material
- Item Type
- Disposal Method (Recycle, Compost, Landfill)
- Other??
STEP 3: Data Analysis

• Enter data from paper forms into Excel/Google Form

• Auto-analysis features:
  ñIndustry type
  ñPackaging/product
  ñPlastic/non-plastic
  ñTotal items tallied
  ñTotal threats flagged
  ñTrash & threat density calculation

‡ Ideally: Data stored in universal, GIS-enabled database that is free-to-access by the public
QA/QC Measures

• Volunteer training
• Cleanup: Double-check site to ensure all items collected
• Catalogue:
  ñCategorize items in pairs
  ñPreserve one randomly selected bag before sorting – field duplicate
• Photos of sorted piles
• Site leader – sign off on data before submitting