Isle Royale National Park Protection & Response Strategies: Overcoming Contingency Planning Challenges via the Regional Response Team

Michelle Jaster, U.S. EPA Region V
Freshwater Spills Symposium
April 6-8, 2004
Isle Royale National Park

- Isolated within Lake Superior (world’s largest freshwater lake)
- 850 square miles
- 99% Wilderness
- Series of islands (400+) and submerged lands
- Park property extends 4.5 miles into Lake Superior waters
Isle Royale National Park

- Limited human influences
- < 20,000 visitors annually
- Open only 6.5 months per year
- Full transportation services only 3 months per year
- Limited development – no roads
- Accessible by boat or float plane only
Initiated Through the Area Committee

• Pre-planning initiative requested by Park Service
• Joint USCG/EPA Sub-Area Committee (Western Lake Superior PAC)
• Previously established relationships between NPS, USCG and EPA
Driven Through RRT

- Requested by National Park Service
- Recognized as ecological “jewel”
- Extremely focused/site-specific intensive planning efforts
- Sub-group of RRT members volunteered
- On-going learning process for all involved
RRT Sub-group
Why Isle Royale?

• Extremely sensitive natural resource
• International boundaries
• Limited local response resources
• Park is only staffed part-time
• Historical groundings/wrecks
Why Isle Royale?

Thunder Bay

Isle Royale NP

Houghton
Isle Royale Sensitivity

• International Biosphere
• Brook Trout (highly sensitive coastal run & lake trout populations)
• Nesting Loons
• Moose, otter, mink, gray wolf (longest running predator-prey study)
• Multiple State endangered plant species
Isle Royale Sensitivity

• Arctic Plant Species – narrow strip in splash zone
• Mussel population – one of the largest native remaining refuges in the Great Lakes
• Eagle and Grey Wolf – Federal listed species
• Historic and/or cultural – fishing camps, docks, marinas, beaches, light houses
Isle Royale Sensitivity
Threats to Isle Royale

- International shipping lane within 1 mile of Isle Royale
- Approximately 600 ships per year – 1200 trips past
- 3% liquid cargo
- Vessel fuel load (~200,000 gal)
- Heaviest traffic during late fall/early winter
- Oil storage on Isle Royale itself
The Planning Begins…. 

- RRT Members are approached for volunteers
- Discussions begin with regularly scheduled conference calls
- The Park Service invites the RRT Sub-group to Isle Royale
June 2003 Site Visit

Participants from multiple RRT Members/Response Groups:

- NPS, USEPA, USCG MSO
- NOAA, USCG AST
- MDEQ, Houghton Co. EMA
- MPC, GLC
June 2003 Site Visit

- Overview of entire Park via sea-plane
- Site-specific visits to 10 areas of greatest concern via boat
- Develop potential protection strategies for each of the areas
- Identify limitations/resource needs
Use of Inland Sensitivity Atlases

Inland Sensitivity Atlas, Upper Peninsula of Michigan
Snug Harbor/Tobin Harbor area
Specific Sites Visited – June 2003

(Passage Island also)
June 2003 Site Visit
Develop Strategies/Maps

- Develop strategies for each sensitive area identified
- Develop detailed maps with sensitive areas and strategies
- Link maps to protocols for response
Spill Response vs. Natural Resources

- Identified response strategies, capabilities, limitations
- BUT...........
- What about all these sensitive natural resources??
- Recognized need to bring ecological experts into the loop
Net Environmental Benefit Analysis

• Risk Assessment Tool
• Delineates Advantages and Disadvantages of specific response strategies
• Evaluates response strategies against site-specific flora, fauna, and habitats
NEBA

• Facilitated Process
• Potential Impacts based on Spill Scenario
• Consequences of Spill
• Potential Response Strategies
• Site-Specific Process = Realism
NEBA Workshop

• January 6-8, 2004 in Duluth
• Joint “Experts”: Responders and Resource Managers
• Spill Scenario:
  – Grounded freighter
  – 30,000 gallons fuel released
  – Impacts NE tip of Isle Royale
  – Late April/Early May
NEBA Workshop

• Impacted high priority species:
  – Grey Wolf
  – Common Loon
  – Bald Eagle
  – Coaster Brook Trout
  – Arctic Shoreline Plants
  – Boreal Chorus Frog
  – Freshwater Mussel Beds
NEBA Workshop

- Impacted Habitat Zones
  - Terrestrial
  - Coastal Wetlands
  - Shoreline
  - Near Shore
  - Reefs
  - Open Water
NEBA Workshop

• Discussed/ranked specific response strategies:
  – Natural Recovery (No Action)
  – Mechanical/Manual Recovery
  – Shoreline Cleaners
  – In Situ burning (shoreline only)
Isle Royale Risk Ranking Matrix:

Duluth, Minnesota
January 6-8, 2004

<table>
<thead>
<tr>
<th>Degree of Resource Impact</th>
<th>Probable Population Collapse</th>
<th>Long-term (4-7 years)</th>
<th>Intermediate-term (2-3 years)</th>
<th>Short-term (1 year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catastrophic</td>
<td>1A</td>
<td>2A</td>
<td>3A</td>
<td>4A</td>
</tr>
<tr>
<td>Critical</td>
<td>1B</td>
<td>2B</td>
<td>3B</td>
<td>4B</td>
</tr>
<tr>
<td>Marginal</td>
<td></td>
<td>2C</td>
<td>3C</td>
<td>4C</td>
</tr>
<tr>
<td>Negligible</td>
<td></td>
<td></td>
<td>2D</td>
<td>3D</td>
</tr>
</tbody>
</table>

Legend: Cells that are red represent a high level of concern, cells that are shaded yellow represent a moderate level of concern, and cells shaded green represent a limited level of concern.
## RELATIVE RISK MATRIX SUMMARY

<table>
<thead>
<tr>
<th>Ecosystems</th>
<th>Shoreline</th>
<th>Nearshore</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resources</td>
<td>Vegetation</td>
<td>Mammals</td>
</tr>
<tr>
<td><strong>Response Options:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural Recovery</td>
<td>1A</td>
<td>1B</td>
</tr>
<tr>
<td>Mechanical Removal</td>
<td>2A</td>
<td>2B</td>
</tr>
<tr>
<td>Shoreline Cleaners</td>
<td>2A</td>
<td>2B</td>
</tr>
<tr>
<td>In-situ Burning</td>
<td>2B</td>
<td>3B</td>
</tr>
</tbody>
</table>
NEBA Benefits

• Rank response strategies, taking into account ecological risks associated with specific actions

• Biggest Benefit:
  – Brought together Responders and Resource Managers
NPS Short Term Plans

- Continue drills w/Park equipment and personnel
- Trail crews to pull debris from beaches
- Evaluate critical areas for pre-staging Park boom
- Plan for protecting water intakes during spill event
Longer Term Overall Plans

- Draft and Finalize NEBA Workshop findings
- Refinement of Response Strategies
  - Mechanical Recovery
  - In Situ Burning
  - Logistical Issues
- Develop Overall Isle Royale/NPS Protection Plan
- Amend Western Lake Superior ACP
- Evaluate transportation options
Mechanical Recovery

• Available resources
  – Park, USCG, CCG, Contractor
  – Compatibility of resources

• Additional equipment needs
  – Boom, anchors, skimmers, boats, storage capacity

• Pre-staging equipment
In Situ Burning

- Pre-approval to be sought from Michigan and RRT
- Agreement being developed with U.S. Forest Service Fire Center and EPA
- Training
- Protocol for expedited response
Logistical Issues

- Communications
- Transportation
- Number of Responders
- Education of Responders
- Limited Staging/Developed Areas
More to Come........
Portable Process

- Apostle Islands
- Indiana Dunes
- Pictured Rocks
- Sleeping Bear Dunes
Summary

• RRT provided framework for implementing cooperative, collaborative pre-planning effort
• Biggest benefits:
  – Increased communication among RRT members/stakeholders
  – Strengthened existing relationships
  – Generated interest in Isle Royale and Lake Superior
  – Learning experience for all involved
Any Questions?
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