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Fisheries Specialist
@DrFishSG

I Ain’t Afraid of No Ghost

Ghost nets in Lake Superior

Marine Debris Training for Great Lakes Sea Grant staff
April 8, 2016
Sea Grant in Wisconsin

Superior Field Office
• Communications
• Coastal Engineering

Green Bay Field Office
• Coastal storms
• Water quality

Manitowoc Field Office
• Fisheries
• Ecosystem ecology

Milwaukee Field Office
• Social Science
Ghost nets, a global issue
Ghost net imagery
2015 NOAA Marine Debris Program Report

Impact of "Ghost Fishing"
via Derelict Fishing Gear
## Gill nets

7,000 km of net per year

<table>
<thead>
<tr>
<th>Region</th>
<th>Fishery/gear type</th>
<th>Indicator of gear loss (data source)</th>
<th>Data source</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Sea &amp; NE Atlantic</td>
<td>Bottom-set gill nets</td>
<td>0.02–0.09% nets lost per boat per year</td>
<td>EC contract FAIR-PJ98-4338 (2003)</td>
</tr>
<tr>
<td>English Channel &amp; North Sea (France)</td>
<td>Gillnets</td>
<td>0.2% (sole &amp; plaice) to 2.11% (sea bass) nets lost per boat per year</td>
<td>EC contract FAIR-PJ98-4338 (2003)</td>
</tr>
<tr>
<td>NE Atlantic*</td>
<td>Deepwater monk fish and shark fisheries</td>
<td>&gt;25,000 nets, 1,254 km sheet netting per year</td>
<td>Hairede et al., 2005</td>
</tr>
<tr>
<td>Mediterranean</td>
<td>Gillnets</td>
<td>0.14–0.17% nets per season; est. 15 nets per day</td>
<td>DeepNet 2009</td>
</tr>
<tr>
<td>Baltic Sea*</td>
<td>Gillnets</td>
<td>5,500–10,000 nets lost per year</td>
<td>Baltic Sea 2020 Foundation</td>
</tr>
<tr>
<td>North Pacific*</td>
<td>Gillnets</td>
<td>7,000 km of net per year</td>
<td>Bullimore et al., 2000</td>
</tr>
<tr>
<td>NW Atlantic</td>
<td>Newfoundland cod gillnet fishery</td>
<td>5,000 nets per year</td>
<td>Breen, 1990</td>
</tr>
<tr>
<td>Caribbean</td>
<td>Nets</td>
<td>79% of nets</td>
<td>Matthews and Glazer, 2010</td>
</tr>
</tbody>
</table>

5,500-10,000 nets lost per year

>25,000; 1,254 km sheet netting per year
Traps

20,000 traps lost per year

20-30% traps lost per year

260,000 lost per year in 2002

7,000-31,600 pots per year

Table 2. Summary of trap gear loss/abandonment/discard indicators from around the world

<table>
<thead>
<tr>
<th>Region</th>
<th>Fishery/gear type</th>
<th>Indicator of gear loss (data source)</th>
<th>Data source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gulf of Aden</td>
<td>Traps</td>
<td>c. 20% lost per boat per year</td>
<td>Al-Masroor, 2002</td>
</tr>
<tr>
<td>ROPME Sea Area (UAE)</td>
<td>Traps</td>
<td>260,000 lost per year in 2002</td>
<td>Gary Morgan, personal communication, 2007</td>
</tr>
<tr>
<td>Australia (Queensland)</td>
<td>Blue swimmer crab trap fishery</td>
<td>35 traps lost per boat per year</td>
<td>McKauge, undated</td>
</tr>
<tr>
<td>NE Pacific</td>
<td>Bristol Bay king crab trap fishery</td>
<td>7,000-31,100 traps lost in the fishery per year</td>
<td>Stevens, 1996; Paul et al., 1994; Kruse and Kimke, 1993</td>
</tr>
<tr>
<td>North Pacific*</td>
<td>Traps</td>
<td>7,000-31,600 pots per year</td>
<td>Bullimore et al., 2000</td>
</tr>
<tr>
<td>NW Atlantic</td>
<td>New England lobster fishery</td>
<td>20–30% traps lost per boat per year</td>
<td>Smolowitz, 1978</td>
</tr>
<tr>
<td></td>
<td>Chesapeake Bay</td>
<td>Up to 30% traps lost per year, mainly in the hurricane season</td>
<td>NOAA Chesapeake Bay Office, 2007</td>
</tr>
<tr>
<td>Caribbean</td>
<td>Guadeloupe trap fishery</td>
<td>20,000 traps lost per year, mainly in the hurricane season</td>
<td>Burke and Maidens, 2004</td>
</tr>
</tbody>
</table>

(Adapted from Maciáden et al. 2009)
Fig. 3. Weekly catch rates (WCR) for multifilament and monofilament gillnets and their corresponding exponential models.

Ayaz et al. 2006
Removals

2004-2012 12,000+ nets

2000-2006 10,285 tons

2000-2006 5,600 traps

2008-2013 161 nets; 28,934 crab pots; 4,202 other pots
<table>
<thead>
<tr>
<th>Costs</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Environmental</strong></td>
<td><strong>Reduced unintended fish mortality of commercial/target species</strong></td>
</tr>
<tr>
<td>• Some negative impacts of removing lost</td>
<td>• Reduced unintended mortality of non-target species (marine mammals,</td>
</tr>
<tr>
<td>gear form the sea on scavenger species that</td>
<td>birds, reptiles, etc.)</td>
</tr>
<tr>
<td>may depend on 'ghost' nets and pots</td>
<td>• Reduced abration, 'plucking' of organisms, and translocation of</td>
</tr>
<tr>
<td>• Potential costs in terms of resource</td>
<td>sea-bed features</td>
</tr>
<tr>
<td>productivity of removing lost gear from</td>
<td>• Reduced littering of beaches</td>
</tr>
<tr>
<td>the sea, if fouled ghost nets are</td>
<td>• Reduced synthetic particulate matter in the marine environment</td>
</tr>
<tr>
<td>acting as reefs rather than actively</td>
<td>from nets that eventually decompose</td>
</tr>
<tr>
<td>catching fish</td>
<td>• Management measures may help to provide better information on the</td>
</tr>
<tr>
<td>• Some ghost nets may be better left</td>
<td>extent of ghost fishing and related environmental impacts</td>
</tr>
<tr>
<td>alone rather than retrieved, if already</td>
<td><strong>Social</strong></td>
</tr>
<tr>
<td>completely bio-fouled and embedded in</td>
<td>• Enhanced employment in fishing communities resulting from</td>
</tr>
<tr>
<td>the seabed</td>
<td>increasing catch levels associated with reduced unintended fish</td>
</tr>
<tr>
<td>• Potential habitat damage from retrieval</td>
<td>mortality</td>
</tr>
<tr>
<td>gear</td>
<td><strong>Economic</strong></td>
</tr>
<tr>
<td></td>
<td>• Improved recreational, tourism and diving benefits with reduced</td>
</tr>
<tr>
<td></td>
<td>levels of lost gear on beaches and at sea</td>
</tr>
<tr>
<td></td>
<td>• Public reassurance that efforts are made to mitigate the</td>
</tr>
<tr>
<td></td>
<td>environmental impact of fishing</td>
</tr>
<tr>
<td><strong>Social</strong></td>
<td><strong>Economic</strong></td>
</tr>
<tr>
<td></td>
<td>• Could potentially impact (positively or negatively) on some gear</td>
</tr>
<tr>
<td></td>
<td>manufacturers and employees if fishers switch gear</td>
</tr>
<tr>
<td><strong>Economic</strong></td>
<td>• Potential costs to fishers from modified gear in the form of:</td>
</tr>
<tr>
<td></td>
<td>○ Increased costs of nets</td>
</tr>
<tr>
<td></td>
<td>○ Possible reduced target/intended catch rates</td>
</tr>
<tr>
<td></td>
<td>○ Reduced handling efficiencies</td>
</tr>
<tr>
<td></td>
<td>• Cost (to fishers or administrations) of retrieval programmes/activities</td>
</tr>
<tr>
<td></td>
<td>to remove lost/discarded gear, or other management measures e.g.</td>
</tr>
<tr>
<td></td>
<td>costs of time required for better communication, costs of better</td>
</tr>
<tr>
<td></td>
<td>marked gear, etc.</td>
</tr>
<tr>
<td></td>
<td>• Management costs of monitoring the extent of ghost fishing and the</td>
</tr>
<tr>
<td></td>
<td>impacts of any management measures</td>
</tr>
<tr>
<td></td>
<td>• Costs of further research required</td>
</tr>
<tr>
<td></td>
<td>• Management costs of enforcement of any new regulations associated</td>
</tr>
<tr>
<td></td>
<td>with management options</td>
</tr>
</tbody>
</table>

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*Marine litter (some of it from lost gear) may result in lost revenue for fisheries, due to fouled propellers and blocked intake pipes, and can also endanger human life, if the vessel cannot return to port, or cannot steer to avoid collision.*
Ghost nets, a Great Lakes issue
Great Lakes Ghost Net?
How often are they lost?

How many are out there?

What species get caught?
Commercial and subsistence fishing
Harvest by Lake

Most from Canadian Lake Erie

Lake Michigan
Lake Michigan Commercial Landings
Great Lakes Commercial Fishery Catch & Value - 2013

Data: NOAA, OCFA

- Pounds (LB)
- Dollars ($)

44 million pounds
51 million dollars
Fishing gear types
Gill net
Smoked chubs.
Trap net
Trawl net

- Steel cable to trawler
- Floats
- Square mesh panel
- Bridle
- Trawl net
- Cod end
- Smaller fish able to escape
Tackling the ghost net issue
Ghost nets can be hazards to boaters and anglers.
Clean up is time consuming.
Angler safety
Safety video, informative poster
Reporting ghost nets
you can catch your propeller in it.
If you do get caught in a net,

https://youtu.be/8OKxHK0JfxY
1. Identify

2. Free yourself

3. Mark location
Ghost Net Reporting

* Required

State *

Nearest City

Locations [GPS Coordinates]
ex: 46.43726, -80.81562)

Time and Date of Occurrence
(ex: 2:50 pm on 12/31/13)

Is the net visible from the surface of the water?
- Yes
- No

Additional Comments

Name

Phone

Email

Do you wish to remain confidential?
- Yes
- No

Submit

Never submit passwords through Google Forms.
BEWARE OF GHOST NETS

Ghost nets are dangerous to boaters. Free your boat, record with GPS, mark with a float and report the location.

glifwc.org/ghostnet

Learn more at greatlakesghostnets.org

Sea Grant

Learn more at greatlakesghostnets.org

Sea Grant
Sport shows

Duluth, MN
Milwaukee, WI
Best practices
Best practices video
Workshops
Ghost nets - Don’t get trapped!

What’s a Ghost Net?
Commercial and subsistence fishing is an important part of the heritage of Great Lakes communities. Fishers use nets to efficiently capture fish to feed families and people across the country. Storms, wind, shifting ice, and waves can cause fishers to lose their nets, a type of durable net commonly used in the Lake Superior fishery. Once the nets are broken, the nets can drift beneath the water’s surface for years, creating a potential hazard for anglers.

Boaters and recreational anglers and boaters can be at risk from having their propellers or fishing gear fouled by ghost nets, which can be a safety hazard or cause costly damage to vessels.

Reducing net loss through education and outreach
In order to address ongoing issues, the University of Wisconsin Sea Grant, the Apostle Islands Sport Fisherman’s Association, the Great Lakes Indian Fish and Wildlife Commission, and the NOAA Marine Debris Program formed a partnership to develop an education and outreach plan to prevent net loss and reduce this threat to the Lake Superior fishery.

This project will educate the group that is most likely to encounter commercial and ghost nets – recreational anglers. Wisconsin’s sea is producing video that highlights potential hazards to anglers from commercial ghost nets and provide tips on how to avoid them or free tangled equipment. Educational signage at docks will help anglers identify and avoid fishing gear.

The project team is holding workshops for commercial and tribal fishers, as well as the public, to encourage changes in behavior that prevent marine debris from entering the marine environment. Participants will receive best practices and other tools for preventing fishing net loss, which will help reduce the number of ghost nets in the lake and the amount of harmful bycatch from the nets.

Learn more:
- NOAA Marine Debris Program
- Report suspected ghost nets:
  - Great Lakes Indian Fish and Wildlife Commission
  - Wisconsin Department of Natural Resources (800-36-DEBRIS: 800-36-3327)
Communications

- Social Media
- Fishing Tournaments
- Press Releases
- Presentations
Marine Debris in the Great Lakes

Marine debris spoils the unique beauty of the Great Lakes region, a complex system of habitats, wetlands, rivers, and tributaries. Debris in the Great Lakes ranges from small items, including microplastics and other litter, to large abandoned and discarded vessels. No matter the size or type, debris harms the environment, wildlife and natural resources, creates safety and liability hazards, and threatens the Great Lakes' vibrant recreational fishing and boating economy. Since 2006, the NOAA Marine Debris Program has worked with partners in the region to prevent marine debris from entering the Great Lakes through education, outreach, and removal projects.

Current Projects
- Tracking Shipwreck from Lake Superior
- Great Lakes Action Plan
- Great Lakes Debris Removal Project

Reports and Materials
- Turning the Tide on Trash
- Dredging of the Great Lakes: Land-Based Marine Debris Workshop
- The Great Lakes vessel-based marine debris action plan
- What We Know About: Marine Debris

Hot Topics
- Great Lakes Action Plan: Microplastics
- May 2015 Check out for the Great Lakes Action Plan: broadcast webinar!

Image Gallery

Video

Funded Partners in the Region
- Alliance for the Great Lakes
- Great Lakes Water Quality Agreement
- Great Lakes Restoration Initiative
- Great Lakes St. Lawrence Marine Debris Program
“Jay Glase, the mapping project manager for the National Park Service, credits an educational video released this spring by the Wisconsin Sea Grant with raising awareness about the issue.

“It was just by pure coincidence that this happened so soon after the Wisconsin Sea Grant video came out,” said Glase.”
The Future?

• NOAA Marine Debris removal grant proposal
  - More efficient marking & removal.

• Continued outreach and education

• Work with tribes on other issues
Aquaculture and Fisheries Technologies for Food and Health Educators, Seafood Professionals, and Communicators

Aquaculture and Fish Tech 101

May 9-12, 2016
University of Wisconsin-Milwaukee School of Continuing Education
Conference Center, 161 West Wisconsin Avenue, Milwaukee, WI
Thank you

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