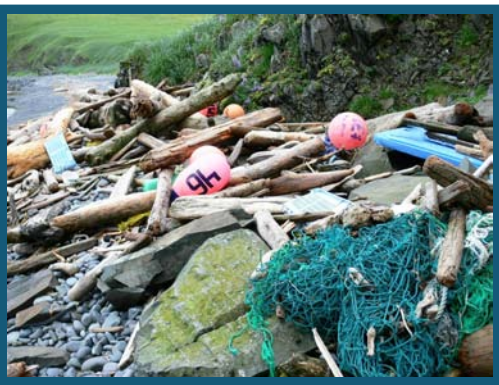
Trashing Your Livelihood

Marine Debris Education for Commercial Fishermen

Marine Conservation Alliance Foundation



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This curriculum is intended for use with the companion PowerPoint presentation, also entitled ***Trashing Your Livelihood***.

Goal Statement:

To demonstrate why it is in the interest of U.S. commercial fishermen to not discard debris at sea.

Time allotted:

15 to 50 minutes: The PowerPoint slides and notes may be used for either a 15- or 50-minute presentation. The longer, 50-minute presentation requires the curriculum outline that follows. Talking points for the shorter, 15-minute presentation are in the slide speaker notes.

Objectives:

1. Know what percentage of marine debris originates from vessels.
2. Define the role played by the North Pacific sub-tropical gyre in collecting marine debris.
3. List six common types of marine debris from fishing vessels and the harm they can cause.
4. Recognize at least six reasons to stop discarding items overboard.
5. Be familiar with at least eight things fishermen can do to reduce marine debris.

Lesson Outline:

I. General ***PowerPoint Slides #1, 2 & 3***

A. Oceans cover about 71% of earth's surface and contain 97% of earth's water (NOAA).

B. 20% to 40% of marine debris originates onboard vessels. (UNEP)
1. In the Central Pacific, there are up to 6 pounds of marine litter to every pound of plankton. (UN & IUCN)
2. Almost all debris on Bering Sea beaches, however, is commercial fishing gear. (MCAF)
3. Much of it is from foreign fleets, but recent accumulations are more domestic in origin due to the phase out of foreign fleets. (MCAF)

C. Much marine debris is suspended in gyres. The North Pacific sub-tropical gyre circulates clockwise in a slow spiral. ***PowerPoint Slide #4***
1. Also known as the "Trash Vortex".
2. Collects debris drifts from Japan via "the Asian Trash Trail" or the "Eastern Garbage Patch" and from the U.S. and Canada via "the North American Trash Trail" or the "Western Garbage Patch".
3. Covers an area in the central North Pacific Ocean.
4. Currents force floating material into the center of the gyre. Winds are light and trash stays there until a storm releases it and it ends up on Alaska beaches.

5. As much as six kilos of plastic may exist for every kilo of naturally occurring plankton in some research tows in this area and along coastal areas such as California. (Algalita Marine Research Foundation) Actual ratio will vary depending on plankton blooms, currents and other oceanic conditions.

D. Debris from fishing vessels ***PowerPoint Slide #5***
1. Lost or discarded nets and lines – entangle wildlife, fishes in perpetuity.
2. Plastics (bottles, gear, bags) – ingested by wildlife; entangles wildlife.
3. Cigarette butts – ingested by wildlife.
4. Gloves and other clothing.
5. Buoys and floats.
6. Strapping bands. (Sheavly)

E. A potentially huge economic impact. ***PowerPoint Slide #6***
1. About 50% of seafood harvested in the U.S. comes from the North Pacific. (ADEC)
2. Almost all debris on Bering Sea beaches is commercial fishing gear.
3. Much of it is from foreign fleets, but U.S. fishermen also significantly contribute to the problem.

II. At least six reasons not to throw trash overboard. ***PowerPoint Slides #7 & 8***

A. **Reason #1:** Prevent curtailment of fishing and your income due to species endangerment. ***PowerPoint Slide #9*** It can shut down your livelihood as it brings the Endangered Species Act into play.

PowerPoint Slide #10

In 1998, the U.S. Marine Mammal Commission reported that plastics harmed 267 marine species worldwide. Some depleted species like sticking their head in plastic loops.

PowerPoint Slide #11

Discarded gear fishes in perpetuity. Entrapping depleted species can threaten to close fisheries…and fishermen get blamed.

1. Marine Birds
   a. Short-tailed albatross – close to shutting down longline fishery in Alaska.
   b. 40% of albatross chicks die on Midway Atoll due to plastics alone. (Weiss)
   c. More than a million seabirds die every year from plastic entanglement or ingestion. (Marine Conservation Society, U.K./NOAA website) Much of this entanglement is caused by discarded fishing gear.
2. Marine mammals – Seals and sea lions: Many are depleted species. ***PowerPoint Slide #12***
   a. Estimated that over 100,000 of these marine mammals die each year due to ingestion and entanglement of marine debris. (NOAA debris website)
   b. Between 1982 and 2000, over 200 endangered Hawaiian Monk Seals were entangled in discarded fishing gear. (Keeney) Only 1200-1500 exist.
   c. As many as 30,000 Northern fur seals (NOAA- Sinclair & EPA) are caught in abandoned fishing gear each year.

d. ***PowerPoint Slide #13 Accidental*** capture and entanglement in fishing gear and marine debris is the biggest threat to whales, dolphins and porpoises worldwide, killing more than 300,000 animals per year. (NOAA)
e. The population of Eastern North Pacific Right Whales is so small that in the 20th century there was only one confirmed sighting of a calf. (www.nmfs.noaa.gov/pr/species/mammals/cetaceans/rightwhale_northern.htm) Imagine what would happen to your fishery if your fishing debris killed a Pacific Right Whale, of which only 200 are estimated to live.

3. Plastic trash imitates food ***PowerPoint Slide #14***
   a. Birds ingest plastic lighters and bottle caps as well as various small, broken pieces of plastic trash.
   b. ***PowerPoint Slide #15*** Sea Turtles- mistake plastic bags for jellyfish – their favorite food.
   61% (Bjorndal) to 80% (Tomas) of turtles have plastic in their digestive track and thousands of sea turtles die every year from ingesting plastic. (Ocean Conservancy - U.K.)
   c. Plastic bags from Alaska can end up in Hawaii. (NOAA) Your plastic bag can affect fishermen's lives in another part of the ocean.
   d. Whales mistake plastic bags for squid.
4. Debris destroys fish habitat ***PowerPoint Slide #16***
   a. Living coral - fishing gear can sink and wrap around living coral.
   b. Derelict fishing gear has been identified in Hawaii as the most serious threat to the coral reefs of northwest Hawaii and can potentially threaten fragile Alaska corals.

B. **Reason #2:** Safeguard against diminished markets and sales due to negative consumer perceptions. ***PowerPoint Slide #17***
A poisoned resource can kill your markets. ***PowerPoint Slide #18***
Fish accumulate toxins from smaller feed fish, and these toxins show up in consumer tests. Long-lived, predator fish have most toxins – halibut, rockfish, cod etc.
Plastic comprises 60-80% of all ocean debris. (Derraik) ***PowerPoint Slide #19***

1. Sunlight as well as wind and wave action break down plastic into microscopic size. Small marine organisms ingest it. It then blocks intestinal tracks when larger prey eats the small creatures.
2. On British beaches, over a third of material that did not look organic, was found to be synthetic polymers used in plastic. (National Geographic) Plastic doesn't just pollute the beach; it ***is*** the beach.
3. Plastic in oceans increased 300% between 1960 and 1990.
4. United Nations estimates there are 46,000 pieces of plastic litter floating on every square mile of ocean.
5. Plastics, like diamonds, are forever! ***PowerPoint Slide #20***
   a. Despite some manufacturer claims, plastics do not biodegrade; they photo-degrade. Sunlight breaks down plastic into smaller and smaller pieces until there is only plastic dust. But plastic always remains a polymer.
   b. Lifespan of plastic (before reduced to microscopic polymer particles)
      (i) Monofilament fishing line – 600 years.

(ii) Plastic bottles – 450 years.
(iii)Plastic bags – 10-20 years. **(**U.S. National Park Service, Mote Marine Lab, Sarasota, FL)

c. No naturally occurring organisms break these polymers down.
d. Plastic has been manufactured only for about 50 years, and will last 10 to 1,000 years or longer in the environment. (National Geographic)

6. Plastic attracts other toxins. ***PowerPoint Slide #21***
   a. Plastics often include toxic chemicals including biocides, fire retardants, colorings and plasticizers (to increase flex).
   b. 2001 study found plastics tend to attract hydrophobic toxins from other sources at up to one million times background levels. These include PCBs and DDE pesticides. (Mato) When plastics and associated toxins are ingested by filter feeders at the base of the food chain, this has implications for human health if ingested and these toxins are released.
   c. When animals ingest plastic, it is possible that hazardous chemicals in the plastics may leach out and be absorbed into the animals' bodies. (US EPA 1992b) This could potentially cause toxic effects to the animal. A study on great shearwaters (Derraik) revealed that PCBs in the tissue of these seabirds were derived from ingested plastic debris.
   d. Additional research has hinted that toxins are released from plastics when digested by animals that are in turn consumed by humans. (Hideshige, Mosko)
   e. Plastics also carry foreign and invasive species. (Derriak)
7. Cigarette butts pose a health hazard to animals that eat them. ***PowerPoint Slide #22***
   a. Nearly all cigarette filters are made of cellulose acetate, a form of plastic.
   b. Contain tar, nicotine and toxic gases.
   c. Ingestion of more than three cigarette butts can cause serious illness in a toddler. (National Capital Poison Center)
   d. Butts have been found in the stomachs of fish, birds, whales and other marine creatures that mistake them for food.
   e. They were the most common item found in one British Columbia beach clean up, followed second by plastic. 913,771 cigarette butts were collected.
   f. Ocean Conservancy's 2006 International Coastal Cleanup collected 1.9 million cigarette butts.
   g. Smoking-related items made up 35% of debris in the International Coastal Cleanup of 2005.
   h. Cigarette butts take 1 to 5 years to degrade. (California Waste Management Bulletin)
8. Other toxins enter environment from trash.
   a. Mercury from batteries.
   b. Other chemicals from various sources.

C. **Reason #3:** Protect the safety and health of <u>your</u> family, friends & customers. ***PowerPoint Slide #23***

1. Toxins end up in the fish to take home to your family.
   a. Fishermen eat more fish than the general population. It gets in YOUR food chain.

b. Mercury has negative health effects on pregnant women and young children including neurological disorders and learning/developmental disorders. (National Resources Defense Council)

2. Subsistence seabird hunters ingest toxins from marine debris found in birds.

D. **Reason #4:** Stop expensive repairs and lost fishing time. ***PowerPoint Slide #24***

1. Debris can clog cooling system intakes and cause breakdowns.
2. Debris can foul propellers or gear. In a survey of fisherman in Oregon, 58% had experienced vessel problems due to plastic marine debris. Average repair was $2,725. (California Coastal Commission)
3. The Japanese fishing industry spent $4.1 billion USD on boat repairs in just one year (1992) due to marine debris. (International Year of the Ocean 1998, Discussion Papers)
4. In 2005, collisions with floating and submerged objects caused 269 boating accidents, resulting in 15 fatalities, 116 injuries and $2.9 million in property damage. (www.MarineDebris.Web@noaa.gov)

5. ***PowerPoint Slide #25***: Lines and nets fouling a prop; plastic sucked into an intake – if these things happen at an inopportune time, you can find yourself in danger in a hurry.

E. **Reason #5:** Discarding debris at sea is often against the law and can result in fines and penalties and legal hassles. ***PowerPoint Slide #26***

No one wants to be looking behind himself constantly in an effort to prevent being caught.

1. It is illegal to dump: ***PowerPoint Slide #27***
    a. In lakes, rivers, bays, sounds, and within three miles from shore: plastic, paper, rags, glass, food, metal, crockery, or dunnage (lining and packing materials).
    b. Three to 12 miles from shore: Plastic, dunnage, and paper, rags, glass, food, metal, crockery if not ground to less than one inch.
    c. 12 to 25 miles: plastic, dunnage.
    d. Outside 25 miles: plastic.
    e. It is illegal to dump any plastic in any waters.
2. Fines up to $50,000 and up to 6 years in jail. (MARPOL 73/78)
3. Civil penalties up to $25,000 for each day of violation.
4. Boats over 26 feet must display a MARPOL placard.
5. It's costly to you as a US tax payer. The Marine Debris Research, Prevention, and Reduction Act (S.362), passed by U.S. Congress in 2006, authorizes up to $120 million, plus matching funds, through FY2010 for marine debris cleanup.

F. **Reason #6:** Protect against having an ugly, degraded environment in which to work. ***PowerPoint Slide #28***

1. Appearance of debris has economic consequences.
2. Public perception that your fishing is negatively impacting the environment.
3. Public perception that you are harvesting food from an unclean environment.
4. It's just ugly and dangerous to animals and people.

III. What can <u>you</u> do? ***PowerPoint Slide #29*** The solutions start with you!

A. Create less trash. Before you leave the dock:

1. Buy products that use less packaging. Try to buy in bulk to reduce the amount of packaging you need to discard. ***PowerPoint Slide #30***
2. Remove unneeded packaging from products before you take them onto your boat.
3. Choose products sold in recycled and recyclable containers.
4. Use reusable containers and items whenever possible. ***PowerPoint Slide #31***
5. Reuse items numerous times – bags, plastic containers, boxes, etc. – instead of discarding them after one use, and then recycle them again. ***PowerPoint Slide #32***

B. Onboard, adopt a zero tolerance policy: ***PowerPoint Slide #33***

1. Don't throw *any* trash overboard. It's easier than figuring out MARPOL regulations.
2. Secure fishing gear and other possessions BEFORE the seas get rough so nothing is accidentally lost over the side. ***PowerPoint Slide #34***

If gear is lost over the side, attempt to recover (if safe) or mark it as a hazard to navigation, and report it.

   a. Minimize the chance of trash accidentally flying overboard by keeping it off the open deck.
   b. If trash accidentally falls overboard, go back and get it (if it is safe to do so). Turn it into a man overboard drill.
   c. Cut rather than remove whole strapping bands or plastic loops- if they do get away they will not become nooses for wildlife.

3. Never discard fishing line, Styrofoam or other plastics, cigarette butts or any other trash into the water. ***PowerPoint Slide #35***

C. Back in harbor:

1. Take all discards/trash to shore**.** ***PowerPoint Slide #36***
2. Keep plenty of litterbags aboard; discard full ones at the marina dumpster or with your home rubbish.
3. Recycle whatever you can: paper, plastic, glass, aluminum, cans, plastics, fishing gear, fishing line.
4. Encourage marinas and communities to offer recycling facilities.
   a. If living in a port without recycling, help start a program.
   b. Don't just make an ocean-trashing problem a landfill problem.

D. Help reduce the problem that already exists.

1. Participate in beach clean ups and help pick trash from beaches. ***PowerPoint Slide #37***
   a. With 35,000 miles of coastline, mostly without road access, this is difficult and expensive. You help is valuable.
   b. Ocean Conservancy's International Coastal Cleanup started in 1986.
      i. Involves over 100 nations every three years on third Saturday in September.
      ii. In 2006, more than 350,000 volunteers around the world scoured 35,000 miles of shoreline and removed 7 million pounds of trash.

c. Marine Conservation Alliance Foundation also supports local efforts in Alaska with NOAA grants and private donations at other times of the year with emphasis on derelict fishing gear.

i. St. Paul & St. George Islands – In 2007, 10 tons removed from just 2 miles of beach on St. Paul.
ii. Gore Point – 40 tons removed.
iii. Prince William Sound – 40 tons removed.
iv. Yakutat – 8 tons removed.
v. Unalaska – 8 tons removed.
vi. Norton Sound CDQ Region- 30 tons removed near Unalakleet and 22 tons from Shaktoolik.
vii. Other Alaska efforts.

2. Report littered beaches and trash at sea to Marine Conservation Alliance Foundation at marinedebris@ak.net or on the website www.mcafoundation.org/report.html. Report:

a. Location and GPS coordinates.
b. Description of debris.
c. Estimated amount.
d. Hazardous materials should be reported to the Coast Guard at 1-800-424-8802.

IV. Conclusion ***PowerPoint Slide #39***

A. Stow it – don't throw it . . . ***PowerPoint Slide #40***

B. . . . and leave only a wake on the sea. ***PowerPoint Slide #41***

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