

# Marine Debris:

## Cigarette Lighters and the Plastic Problem on Midway Atoll

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### Introduction

Debris carried on ocean currents washes up on shorelines all over the world. Not only is this human-generated problem unsightly, it is a major hazard to the marine environment and harmful to the animals who live and depend on the sea.

Here on Midway Atoll, marine debris is a problem that is visible on otherwise pristine white beaches; nets and other kinds of discarded materials wash up on shore in quantities of over 100 pounds per week. All of this debris is a major danger for sea animals such as endangered Hawaiian monk seals. However, creatures of the water are not the only animals affected by sea-borne trash; marine debris poses a threat to the health of the thousands of albatross chicks that hatch on Midway every year.



(Laysan Albatross chick and adult; picture by B. Mayer)

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## A Plastic Diet

Over eons of evolution, Laysan Albatrosses learned that they could eat just about anything that floated on the ocean. Adult albatrosses thrive on squid, fish and flying fish eggs, digesting everything except tough squid beaks and eye lenses, fish otoliths (ear bones), as well as other floating organic matter. When a mass of this tough material has accumulated in a bird's stomach, it is passed up the throat and back out into the environment in an oval package called a "bolus." This is much like the process in which an owl regurgitates indigestible mice bones in an owl pellet. Squid and fish are so nutritious that during the time when albatrosses are raising their chicks, an oily slurry of partially digested squid and fish can be fed directly to their young from the adults' open mouths.



(Laysan Albatross feeding chick; picture by B. Mayer)

In recent times, humans have added plastics to the albatrosses' menu. When foraging over the open ocean, adult albatrosses unknowingly consume floating plastic and return to feed it to their young. It is possible that albatrosses ingest so much plastic because of their habit of preying on the eggs of flying fish. Flying fish lay long strings of garnet-colored eggs and attach them to objects floating at sea. Up until the invention of plastic, the fish used floating bits of wood and pumice, but now floating plastic pieces outnumber these natural items. As a result, adult albatrosses often take in plastic while gathering fish eggs. Laysan Albatrosses eat greater volumes and more varieties of plastics than any other seabirds. Plastics can comprise up to 50% of the indigestible material in an albatross' intestinal tract, leading to problems such as:

- Satiation, or appetite suppression. Food is displaced by large volumes of plastics, causing dehydration and malnutrition that can eventually lead to death.
- Complication or inhibition of the process of bolus formation and regurgitation.
- Mechanical blockage of the esophagus, stomach or gizzard by large pieces of plastics. Sharp fragments may tear or puncture internal organs.
- PCB's accumulating on the surface of ocean-borne plastics, partially burned plastics, and synthetic additives may serve as sources of harmful contaminants.

### Plastic Cigarette Lighters

Anyone visiting Midway would notice the abundance of plastic lighters scattered amid the landscape. In a two-and-a-half month period, volunteers collected well over 1000 lighters while working on the atoll.



(cigarette lighters collected by volunteers; picture by D. Tsukayama)

Lighter Color	Quantity	Percentage
orange	249	19
green	228	17
white	220	17
red	139	11
pink	135	10
blue	120	9
purple	104	8
yellow	88	7
black	27	1
<b>TOTAL</b>	<b>1310</b>	<b>100</b>

The overwhelming majority of these lighters were collected in the interior of Sand Island, far from the shoreline. Therefore, it is logical to assume that these lighters were fed by albatross adults to their chicks while on nesting grounds. Lighters and other plastic are a common component of

albatross boluses; some are found as dramatic evidence causing albatross death.



(cigarette lighters in the stomach of a dead albatross chick; picture by B. Mayer)

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### **How can the Plastic Problem be solved?**

We all live on planet Earth, our home in the cosmos. Ocean currents do not distinguish from which wharf or ship marine plastic originates. Cigarette lighters and other plastic wastes that are not properly disposed of have greater consequences than we might initially perceive. A cigarette lighter tossed overboard anywhere in the North Pacific can wind up in an albatross' stomach on Midway Atoll. Here are some ideas on how to solve the problem:

- Dispose of plastic materials properly.
- Reduce, reuse, recycle! Find out about recycling plastics in your area.
- Be a wise consumer---pay attention to your use and need of disposable products and their fate.
- Show your support, financial and otherwise, for organizations and companies that address pollution issues.
- Educate your friends and family about plastic pollution.

- Write your congressmen about proper plastic disposal, enforcement of illegal ocean dumping, and the need to recycle.
- Recognize our individual kuleana (responsibility), as human beings and as conscientious global citizens, to our Earth, ourselves, our fellow animals, and our future generations.



(These three piles of marine debris--glass, fish nets & rope, and plastic--were collected in one morning on Eastern Island, Midway Atoll; picture by B. Mayer.)

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### **Other Links:**

[Midway Atoll National Wildlife Refuge](http://www.fws.gov/midway/)

<http://www.fws.gov/midway/>

[Friends of Midway](http://www.friendsofmidway.org/)

<http://www.friendsofmidway.org/>

[NOAA's marine debris website](http://marinedebris.noaa.gov/marinedebris101/welcome.html)

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***"Leave only footprints....."***

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