OCTOBER 2020
FS: 20-10-C

FACT SHEET

CHOKED:
THE DEADLY IMPACTS OF PLASTIC POLLUTION ON MARINE LIFE

In recent years, scientists have documented vast amounts of plastic throughout the world's oceans, an influx of harmful pollution that threatens the health of marine ecosystems. Plastic pollution persists for many years in the marine environment because it never completely biodegrades but rather breaks up into small particles.[1] These particles are consumed by seabirds, mammals, and even fish, with often fatal results and the potential to significantly impact ocean health.[2,3]

A seal with a discarded plastic flying disc stuck tightly round its neck resting on a beach in Norfolk, England.

For more information on plastic's impact on ocean life, as well as some solutions to the issue, please see our complementary fact sheet, *Plastic Peril*, on the NRDC website.

For more information, please contact:
Kari Birdseye
kbirdseye@nrdc.org

www.nrdc.org
www.facebook.com/NRDC.org
www.twitter.com/NRDC

To date, scientists have documented the harmful impacts of marine plastic pollution on 800 different marine species, including all known species of sea turtles, half of all species of marine mammals, and one-fifth of all species of seabirds.[4] These impacts include life threatening incidents such as entanglement or ingestion of plastic particles.

Plastics often resemble food for marine life. They can be confused for small fish, krill, and plankton, and plastic bags in particular can be mistaken for jellyfish, especially by sea turtles.[5] Because plastic cannot be digested and does not pass readily through the digestive tract, eating it causes a wide range of complications for marine species, including starvation, malnutrition, intestinal blockage, and intake of toxins, all of which can lead to death.[6] Additionally, scientists are concerned about the larger, long-term impacts of toxic pollutants absorbed, transported, and consumed by fish and other marine life, including the potential to affect human health.

© USFWS

The decomposing body of an albatross chick, its stomach filled with plastic, found at the Midway Atoll National Wildlife Refuge.

IMPACTS TO WILDLIFE: THE SOBERING FACTS ABOUT PLASTIC POLLUTION

Below are some of the instances and facts surrounding plastic pollution and its negative impact on wildlife and marine species.

- Seabirds collect plastics on foraging trips during the nesting season and then feed them to their young. In the North Atlantic, more than 80 percent of Cory's shearwater fledglings contain plastics in their stomachs.[7] In the North Pacific, 90 percent of Laysan albatross chicks (and 83 percent of adult Laysans) have some sort of plastic debris in their gastrointestinal tracts.[8]
- More than 92 percent of Northern fulmars have ingested plastic.[9]
- It is predicted that plastic ingestion will continue to increase in seabirds and that it will reach 99 percent of all species by 2050.[10]
- Corals that come into contact with plastics have a greater risk of contracting diseases than those that do not.[11]
- It is estimated that 52 percent of all sea turtles in the world have ingested some form of plastic or marine debris.[12]
- As of 2016, 46 different marine mammal species have been documented ingesting plastic.[13]
- In 2018, a dead sperm whale washed up on the coast of Spain; necropsy results revealed that the whale's stomach contained 64 pounds of plastic trash.[14]
- Abandoned fishing gear (also called "ghost gear") finds its way into the ocean in numerous ways. Ghost nets are a problem not only because they pollute marine environments, but because this gear can trap and ensnare sea life for years after it has been discarded. This can lead to a slow and painful death for many marine animals.
- Studies demonstrate that planktonic organisms, the foundation of marine food webs, are ingesting plastic particles and fibers.[15] Preliminary research shows that this ingestion disrupts functions of the endocrine system, impacts metabolism, increases mortality in zooplankton, and impedes the growth and efficiency of photosynthesis in microalgae.[16]
- Approximately 35 percent of fish that eat plankton in the Great Pacific Garbage Patch contain fragments and micro-fragments of plastics in their guts.[17]
- Plastic particles accumulate toxic chemicals, including DDT and PCBs, and concentrate these chemicals to a level as much as one million times the levels found in surrounding seawater.[18] When animals then consume these toxic plastics, it can be fatal.

ENDNOTES

1 Richard C. Thompson et al., "Lost at Sea: Where Is All the Plastic?" *Science* 304, no. 5672 (May 2004): 838, https://doi.org/10.1126/science.1094559.

2 Anthony L. Andrady, "Microplastics in the Marine Environment," *Marine Pollution Bulletin* 62, no. 8 (August 2011): 1596-1605, https://doi.org/10.1016/j.marpolbul.2011.05.030.

3 David K. A. Barnes et al., "Accumulation and Fragmentation of Plastic Debris in Global Environments," *Philosophical Transactions of the Royal Society B: Biological Sciences* 364, no. 1526 (July 2009), http://doi.org/10.1098/rstb.2008.0205. Christine A. Ribic, Seba B. Sheavly, and John Klavitter, "Baseline for Beached Marine Debris on Sand Island, Midway Atoll," *Marine Pollution Bulletin* 64, no. 8 (August 2012): 1726-29, https://doi.org/10.1016/j.marpolbul.2012.04.001. Barry Yeoman, "A Plague of Plastics," National Wildlife Federation, July 2019, https://www.nwf.org/Home/Magazines/National-Wildlife/2019/June-July/Conservation/Ocean-Plastic.

4 Secretariat of the Convention on Biological Diversity and the Scientific and Technical Advisory Panel—GEF, *Impacts of Marine Debris on Biodiversity: Current Status and Potential Solution*s, CBD Technical Series No. 67, 2012, https://www.cbd.int/doc/publications/cbd-ts-67-en.pdf. Secretariat of the Convention on Biological Diversity, *Marine Debris: Understanding, Preventing and Mitigating the Significant Impacts on Marine and Coastal Biodiversity,* CBD Technical Series No. 83, 2016, https://www.cbd.int/doc/publications/cbd-ts-83-en.pdf.

5 Archie Carr, "Impact of Nondegradable Marine Debris on the Ecology and Survival Outlook of Sea Turtles," *Marine Pollution Bulletin* 18, no. 6, suppl. B (1987): 352-56, https://doi.org/10.1016/s0025-326x(87)80025-5. Qamar Schuyler et al., "Correction: To Eat or Not to Eat? Debris Selectivity by Marine Turtles," *PLoS ONE* 7, no. 10 (2012), https://doi.org/10.1371/annotation/0215f07d-0265-485c-966f-aee192a18313.

6 Jörg Oehlmann et al., "A Critical Analysis of the Biological Impacts of Plasticizers on Wildlife," *Philosophical Transactions of the Royal Society B: Biological Sciences* 364, no. 1526 (July 2009): 2047-62, https://doi.org/10.1098/rstb.2008.0242. Peter Davison and Rebecca G. Asch, "Plastic Ingestion by Mesopelagic Fishes in the North Pacific Subtropical Gyre," *Marine Ecology Progress Series* 432 (2011): 173-80, https://doi.org/10.3354/meps09142.

7 Airam Rodríguez, Beneharo Rodríguez, and María Nazaret Carrasco, "High Prevalence of Parental Delivery of Plastic Debris in Cory's Shearwaters (*Calonectris diomedea*)," *Marine Pollution Bulletin* 64, no. 10 (2012): 2219-23, https://doi.org/10.1016/j.marpolbul.2012.06.011.

8 D. Michael Fry, Stewart I. Fefer, and Louis Sileo, "Ingestion of Plastic Debris by Laysan Albatrosses and Wedge-Tailed Shearwaters in the Hawaiian Islands," *Marine Pollution Bulletin* 18, no. 6, suppl. B (1987): 339-43, https://doi.org/10.1016/s0025-326x(87)80022-x. Holly Gray, Gwendolyn L. Lattin, and Charles J. Moore, "Incidence, Mass and Variety of Plastics Ingested by Laysan (*Phoebastria immutabilis*) and Black-Footed Albatrosses (*P. nigripes*) Recovered as By-catch in the North Pacific Ocean," *Marine Pollution Bulletin* 64, no. 10 (2012): 2190-92, https://doi.org/10.1016/j.marpolbul.2012.07.053.

9 Stephanie Avery-Gomm et al., "Northern Fulmars as Biological Monitors of Trends of Plastic Pollution in the Eastern North Pacific," *Marine Pollution Bulletin* 64, no. 9 (2012): 1776-81, https://doi.org/10.1016/j.marpolbul.2012.04.017.

10 Chris Wilcox, Erik Van Sebille, and Britta Denise Hardesty, "Threat of Plastic Pollution to Seabirds Is Global, Pervasive, and Increasing," *PNAS* 112, no. 38 (2015): 11899-904, https://doi.org/10.1073/pnas.1502108112.

11 Joleah B. Lamb et al., "Plastic Waste Associated With Disease on Coral Reefs," *Science* 359, no. 6374 (2018): 460-62, https://doi.org/10.1126/science.aar3320.

12 Chris Wilcox et al., "A Quantitative Analysis Linking Sea Turtle Mortality and Plastic Debris Ingestion," *Scientific Reports* 8, article 12536 (2018), https://doi.org/10.1038/s41598-018-30038-z.

13 Secretariat of the Convention on Biological Diversity, *Marine Debris*.

14 Andrea Diaz, "A Sperm Whale That Washed Up on a Beach in Spain Had 64 Pounds of Plastic and Waste in Its Stomach," CNN, April 11, 2018, https://www.cnn.com/2018/04/11/health/sperm-whale-plastic-waste-trnd/index.html.

15 Jean-Pierre W. Desforges, Moira Galbraith, and Peter S. Ross, "Ingestion of Microplastics by Zooplankton in the Northeast Pacific Ocean," *Archives of Environmental Contamination and Toxicology* 69, no. 3 (2015): 320-30, https://doi.org/10.1007/s00244-015-0172-5.

16 Center for International Environmental Law et al., *Plastic & Climate: The Hidden Costs of a Plastic Planet*, May 2019, www.ciel.org/plasticandclimate. Sascha B. Sjollema et al., "Do Plastic Particles Affect Microalgal Photosynthesis and Growth?" *Aquatic Toxicology* 170 (2016): 259-61, https://doi.org/10.1016/j.aquatox.2015.12.002.

17 Christiana M. Boerger et al., "Plastic Ingestion by Planktivorous Fishes in the North Pacific Central Gyre," *Marine Pollution Bulletin* 60, no. 12 (2010): 2275-78, https://doi.org/10.1016/j.marpolbul.2010.08.007.

18 Fernanda Imperatrice Colabuono, Satie Taniguchi, and Rosalinda Carmela Montone, "Polychlorinated Biphenyls and Organochlorine Pesticides in Plastics Ingested by Seabirds," *Marine Pollution Bulletin* 60, no. 4 (2010): 630-34, https://doi.org/10.1016/j.marpolbul.2010.01.018. Yukie Mato et al., "Plastic Resin Pellets as a Transport Medium for Toxic Chemicals in the Marine Environment," *Environmental Science & Technology* 35, no. 2 (2001): 318-24, https://doi.org/10.1021/es0010498.