

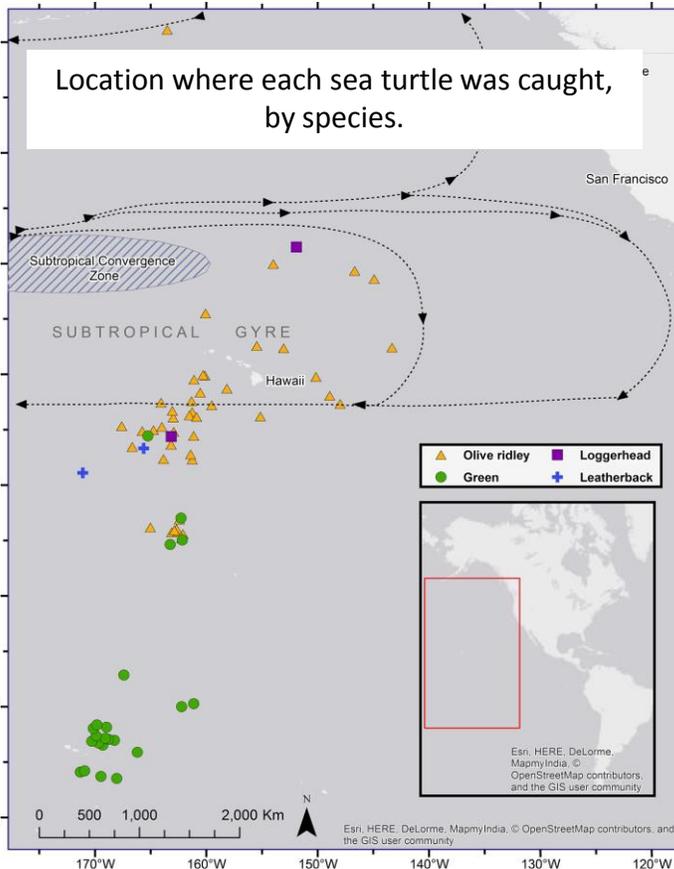
High frequency of occurrence of anthropogenic debris ingestion by sea turtles in the North Pacific Ocean



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Hair comb, toothbrush, plastic bottle necks, caps & bags found in sea turtles' stomachs.



Anthropogenic (human-generated) debris is a growing problem in our marine ecosystems, negatively impacting nearly 700 species worldwide.

To investigate the frequency in which sea turtles are ingesting human-generated debris, we evaluated the stomach contents of 71 sea turtles that were accidentally caught, and deceased, in longline fisheries in the North Pacific ocean. US fisheries have legal limits of this accidental catch that we call bycatch. Fisheries work with government officials so when an animal is caught and found deceased, we are able to learn from them.

What we found: Of the 71 sea turtles we sampled, 83% had ingested human-generated debris. The majority (95%) of this debris by weight was plastic. **We highlight the need to better understand the factors affecting human-generated debris ingestion and its sublethal effects.**

- We report some of the highest documented values for frequency of occurrence of human-generated debris ingestion by sea turtles worldwide with 91% of greens and 82% of olive ridleys ingesting human-generated debris.
- Plastic was the most prominent human-generated debris ingested. It accounted for 94% of the dry weight of human-generated debris ingested by green turtles and 93% for olive ridleys, 99% for one loggerhead, and 93% for the other loggerhead.
- Sea turtles had ingested items such as: a black hair comb, a red tooth brush, plastic bottle caps, plastic bottle necks, plastic bags, fishing line, polystyrene, rope, and small unidentified plastic pieces.
- This is the first published report of human-generated debris ingestion by olive ridley sea turtles outside of the Atlantic Ocean.

What we did: We dissected, identified, categorized and quantified the stomach and gastrointestinal tract contents from 71 sea turtles. All sea turtles were collected as deceased legal bycatch. No sea turtles were harmed for this study. This included 45 olive ridley, 22 green, 2 loggerhead and 2 leatherback sea turtles, which were collected between 1993-2011. Percent frequency of occurrence was calculated as follows: [# of sea turtles ingesting human-generated debris/ # of sea turtles analyzed] *100



Left: Human-generated debris ingested by **one** loggerhead, which made up 78% of its diet. Debris includes: **A red toothbrush, 16 plastic bottle caps, and 2 plastic bottle necks.** For scale, this picture shows four sheets of A4 letter paper.

Below: Human-generated debris ingested by **one** green turtle, which made up 75% of its diet. This picture shows **eight sheets of A4 printer paper covered in plastic bags and small plastic pieces.**



Why is this important?

- The sublethal effects of human-generated debris ingestion by marine animals is not well known, but can have adverse effects such as: perforation or obstruction of gastrointestinal tract, nutrient dilution, and toxin absorption which may lower the animal's overall fitness. This is especially of concern for threatened and endangered species, like all animals in this study.
- Human-generated debris ingestion, especially that of plastic, by marine animals can likely transfer bioaccumulated pollutants throughout the marine food web, and potentially onto our plates.