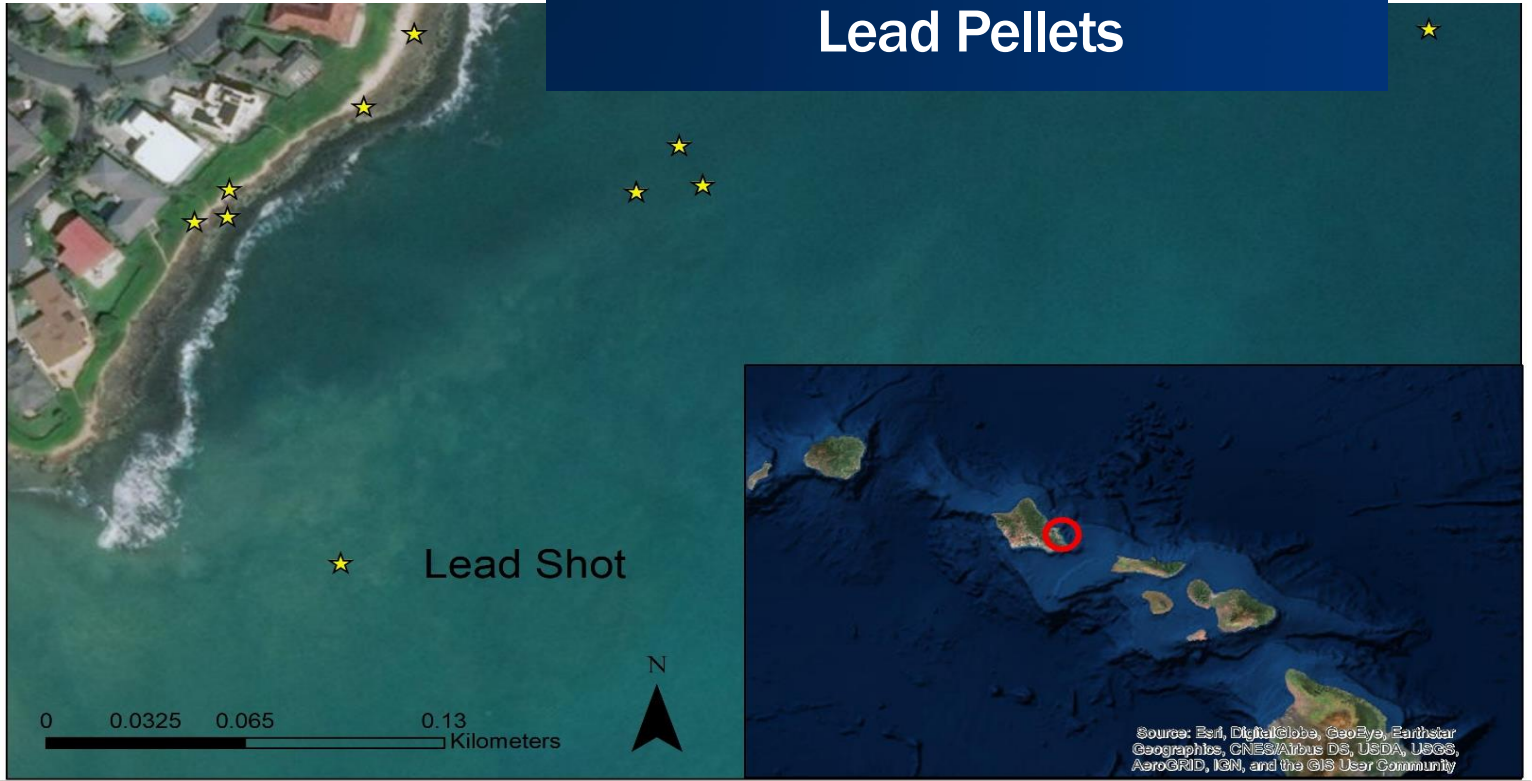


Green Sea Turtles Exposed to Lead Pellets



Overview

The Honolulu Skeet Club on Kailua Bay, Oahu, is an active Superfund site managed by the Department of Health's HEER Office. Institutional controls in the form of signs warn people not to touch or eat the small lead pellets, which are visible in piles throughout the site and in nearshore sediments in Kailua Bay. Unfortunately, the signs do not keep wildlife from ingesting the pellets.

Katherine Shaw, a doctoral candidate at Texas Tech University, and her colleagues at the Pacific Islands Fisheries Science Center, The Nature Conservancy of Hawaii, and the National Institute of Standards and Technology are studying the effects on the green sea turtle (*Chelonia mydas*) exposed to lead pellets in the sediment of Kailua Bay.

Signs warn people not to ingest the lead pellets scattered in the sand at the former Honolulu Skeet Club in the Kaimalino neighborhood on Kailua Bay, Oahu. But the lead pellets might be ingested by the green sea turtles that live in the area. Concentrations of lead in the blood of these turtles indicate that they have been exposed to lead.

During a three-year study (2011-2013) of green sea turtles along the shoreline of Kaimalino neighborhood at the mouth of the Kawainui Marsh, about 75 percent of the marked turtles were recaptured, indicating that they are highly resident in the area near the Honolulu Skeet Range. Turtles that remain in one area for such a long time may accumulate contaminants from the sediment and food in that area. In a preliminary study, concentrations of lead in the blood of green turtles from Kailua Bay were as high as 140 parts per billion, which is three times higher than blood levels considered safe for children. Lead is not an essential nutrient for turtles. Lead in the blood of turtles indicates exposure to lead in food or water.

Ecological Risk Assessment

The globally-threatened green sea turtle is exposed to inorganic and organic chemicals in its diet. As hatchlings, green sea turtles live offshore and eat both plants and animal prey. As they mature, they move to nearshore habitats and become completely herbivorous, eating only seagrasses and algae. Contaminants may enter the turtle's body in contaminated vegetation and through incidentally ingested sediment and anthropogenic debris.

Sea turtles foraging in the sediment for seagrasses and algae may ingest lead pellets and other harmful debris [1]. Shaw and her team are analyzing samples of sediment, water, algae, and turtle tissue to investigate how the lead, arsenic, antimony, and tin may be moving from the pellets to the food web in Kailua Bay.

Click here for more on this study:

<https://www.arcgis.com/apps/Cascade/index.html?appid=4cbbae08e89f4030b6b755e71638960a>

Lead pellets are not the only source of contaminants in the green turtle's diet. Metals such as copper are introduced to the water from antifouling paint on boats and docks, then taken up by seagrasses and algae [2]. The green sea turtle was reported to have the highest concentration of copper of all sea turtles studied [3]. Livers of green turtles also bioaccumulate cadmium, lead, barium, vanadium, mercury, and other metals [4,5] as well as flame retardants [5].

Green turtles are affected by a disease called fibropapillomatosis, in which rampant tumor growth debilitates the turtle and leads to early death. Contaminants have been blamed for increasing this disease [6]; however, other studies have ruled out PCBs [7] and metals [4] as causative agents. Plastics have been found in the stomachs of green sea turtles at sea, but researchers posit that most PCBs, pesticides, and other organic chemicals are introduced to the turtle through its diet [8].

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