

Our Ocean Backyard — *Santa Cruz Sentinel* columns by Gary Griggs, Director, Institute of Marine Sciences, UC Santa Cruz.

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Global migrations—sooty shearwaters



Sooty shearwaters, which breed and hatch their young out in New Zealand and then travel thousands of miles to the North Pacific to feed where they can be seen in flocks of thousands in Monterey Bay in the summer months.

“The Birds” of Alfred Hitchcock’s, the sooty shearwaters that were poisoned by the toxins from the anchovies they had gorged on, appear in the summer months along our shoreline in huge numbers. Many of you have probably noticed the huge black clouds of these birds out over the bay, which can number in the thousands, flying just above the ocean surface and diving for small fish. Because many marine birds and mammals, whales and elephant seals, for example, are only temporary seasonal residents along our coast, biologists who study these animals have long wondered where do they go when they aren’t here? The larger animals, like the grey whales, are pretty hard to miss as they swim just offshore. Their seasonal migration between summer feeding grounds in the Bering Sea and their winter calving area in the lagoons of Baja California have been known for decades.

The small sooty shearwaters posed greater tracking problems, however, until our researchers here at Long Marine Lab, working with colleagues in New Zealand, France and Hawaii, figured out a way to track their migrations and personal lives.

Working with engineers, these scientists have developed increasingly smaller and more advanced electronic tags for all sorts of marine animals. The tags developed for the shearwaters are attached as leg bands in New Zealand where the birds nest in burrows. These tiny instruments are able to keep track of light levels and temperature over time, which provide a record of the latitude where the birds are on any particular day, and also pressure, which indicates diving depths. All of this migration information is recorded by the tags and can be recovered when these little birds return to their nesting areas in the southern hemisphere.

What came as a big surprise several years ago when the data were first downloaded from these miniature recorders, was that these little birds underwent the longest recorded migrations of any animal ever tracked! From their New Zealand nesting grounds, these birds leave in April and follow global wind patterns, heading first eastward, and then following the trade winds to the north Pacific where they feed throughout the summer months. The sooty shearwaters head to one of three different but highly productive feeding grounds, the western Pacific off Japan, the Gulf of Alaska, and the waters of the California Current. They dine on fish, squid and krill for several months and then turn around and complete a figure 8 path, flying all the way back to the southern hemisphere in a southwesterly direction, continuing their pursuit of an “endless summer” of seafood.

The most amazing part of this story is that these birds, weighing less than two pounds, complete a total migration of 40,000 miles over a period of about six months, equivalent to flying completely around the world at the equator one and a half times! On their best days they fly over 600 miles, taking advantage of the trade winds on both their northerly and their southerly migrations. Equally impressive are the dive records for the shearwaters. Not only do they fly 40,000 miles to feed, but the pressure recorders in their electronic tags indicate that they can dive to depths of over 200 feet below the surface searching for food. Sooty shearwater populations today are declining, with researchers concluding that because they operate on a truly global scale, that they may be serving as an important indicator of climate change and ocean health.