

What Happens Next? Tracking Shearwaters After Rescue and Rehabilitation

Dr. André F Raine is the Project Manager of the Kauai Endangered Seabird Recovery Project. He has been working with Hawaii's endemic seabirds for the last eight years. He has worked on conservation and research projects around the world including Bermuda, the Peruvian Amazon, Zambia, Malta and England. Dr. Josh Adams is a research biologist with the U.S. Geological Survey's Western Ecological Research Center. He is the lead biologist in charge of the Seabird Studies program located at WERC's Santa Cruz Field Station. Dr. Adams' work focuses on understanding the distribution and abundance patterns of seabirds at sea, nesting biology, foraging ecology and conservation science. Dr. Adams' current studies are focused in the California Current and Hawaii. Tracy Anderson has been the program co-ordinator of the Save Our Shearwaters program since 2011, where she rehabilitates a wide range of native and endangered birds including shearwaters and waterbirds. She has rehabilitated wildlife in 3 countries – Canada, United States and Belize – and is also an accomplished bird bander.



In the mist-shrouded mountains of Kaua'i, the Newell's Shearwater *Puffinus newelli* still manages to cling to existence. An endangered shearwater endemic to the Hawaiian islands, the species has suffered dramatic historical declines, with populations crashing by 94% in recent decades. The reasons are manifold, including powerline collisions, the ravages of introduced predators such as feral cats and light attraction. Light attraction is a particularly important threat. The shearwater



This year's satellite tags, ready for deployment in Upper Limahuli Preserve. Photo by André F Raine

chicks spend their formative months in the darkness of their mountain burrows, and are not accustomed to human light sources. As the breeding season comes to a close they exercise for a few weeks outside of their burrows and then one night they launch themselves into the dark skies, flying

swiftly over forested ridges and head out to sea. Unfortunately, this maiden voyage often brings them over Kauai's towns, where bright lights disorientate them causing them to circle like moths before crashing to the ground. Once downed, they are easy prey to the island's huge cat and dog population, or they are run over by cars – a sad end for such a beautiful bird.

Luckily, the people of Kauai are well aware of the problem – thanks mainly to the Save Our Shearwaters (SOS) program. Initiated by the State of Hawaii in the late 1970s, it was created as a public conservation effort, educating people about the importance of the bird and providing them with a place for rescued fledglings. Every year, public service announcements remind everyone of the start of the fallout season and aid stations (they look a bit like mail boxes) are set up at fire stations around the island for concerned citizens to put the birds in. SOS staff collect the birds, do a thorough assessment of their health and then either release them or bring them back for rehabilitation. Since its inception, the SOS has processed 31,812 Newell's Shearwaters. That's a huge number of endangered seabirds.

However once the birds are released out to sea it is very hard to understand what happens to them next. They become a diminishing black speck on the blue horizon and then they are gone. Do they survive? To answer this question, the Kauai Endangered Seabird Recovery Project partnered up with SOS and USGS. We decided to use satellite tags to track the birds after they have been released and see if they survived once they were out at sea. Since 2014 we have been tracking fledglings from SOS using Microwave Telemetry's Solar PTT 9.5g tags. Newell's Shearwaters are adept divers, chasing squid and flying fish down to a depth of 50 m, so we had the tags potted to withstand depth dives. We also had them specially modified with four suture tubes so that the tags could be sutured in place. All of the tagging work was done under a federal bird banding permit and through funding from the St. Regis Princeville Resort (via Earthjustice and American Bird Conservancy) and the Kauai Island Utility Cooperative.

Of course, once we had settled on the method, putting the project into practice required a lot more thought. Firstly, birds come in to the SOS program in a range of conditions, from those that can be immediately released to those that need intensive health care and rehabilitation. So, the SOS birds were split into those that were released immediately, those that required one day of evaluation and those that spent two or more days in rehabilitation. Secondly, we needed to compare these birds with birds that were not grounded in the first place. That required helicopter trips into the remote mountain ranges of the north-west of the island, where shearwaters nest on steep valleys under dense fern cover in a wet montane forest. We tagged birds in their burrows in the Upper Limahuli Preserve (managed by the National Tropical Botanical Garden) just before they fledged.

We are now finishing up our study, with the last cohort of birds currently flying away from Kaua'i and out over the deep blue sea. Once they have finished transmitting we will have all of the data we need to see how well the rehabilitated birds fare compared to their wild fledging counterparts, so more to come on this soon! The tracking work has also allowed us to get a better understanding of the first few months of the bird's lives at sea, revealing key areas for newly fledged birds. It turns out that our birds head away from the Hawaiian islands to an area of sea 2500 km away which is (hopefully) rich in squid and flying fish (see map below). The next stage of their life currently remains a mystery, but five years later they will return to our island to find a mate and start digging their own burrows. We will continue to work hard to make sure their island home is safe for their return.



A Newell's Shearwater chick at Upper Limahuli Preserve.

Photo by André F Raine

