



Project: Emergency Response Tagging and Satellite Tracking for Rehabilitated Pinnipeds

Overview: Since January 2013, elevated levels of malnourished sea lion pups and yearlings have been stranded on California beaches. Over 2,000 young sea lions have washed ashore in 2015 alone, too emaciated and dehydrated to care for themselves. Additionally, highly elevated numbers of Guadalupe fur seals, a species listed as Threatened under the Endangered Species Act, have also been noted; 28 have been observed so far in 2015 (historical annual average is 9). The unprecedented crisis has been declared an Unusual Mortality Event (UME), and rescue and rehabilitation networks are utilizing limited resources to respond. Changes in the availability of sea prey are likely a major contributor to the many strandings. High quality food source spawning grounds, especially sardines, have shifted farther offshore in recent years¹. This may be due to warming ocean temperatures, especially as El Niño, a tropical weather pattern, was declared in early 2015. A lack of high-quality nearby food would force sea lion mothers to travel longer distances, leaving their pups unattended for longer periods of time. Proximal prey, such as market squid and rockfish, may not provide adequate nutrition in the mothers' milk to support pups or to sustain newly-weaned pups foraging on their own.^[1]

There is an urgent need to track rehabilitated sea lion pups and fur seals of all ages after release in order to ensure rescue efforts maximize long-term survival of California sea lions and Guadalupe fur seals. While the direct and indirect causes of current elevated strandings are still under investigation, it is critical for rescue and rehabilitation programs to determine release success and long-term survival rates. Over 50% of rescued sea lion pups and yearlings have survived to be released. It is important to ascertain if the rehabilitated pinnipeds are able to hunt and survive after being returned to potentially prey-limited foraging grounds.

NMSF will fund a study to investigate the food shortage hypothesis using satellite telemetry of released rehabilitated pinnipeds from five rehabilitation facilities to understand where pups are foraging from Santa Barbara to San Diego and provide real-time response to prey and environmental conditions. The study will compare pup satellite data to fish stock assessments being performed by the Southwest Fisheries Science Center in 2015 (PI - Dr. Sam McClatchie). Pup satellite data will be compared to satellite data collected from free-ranging adult female California sea lions by the National Marine Mammal Laboratory in the spring of 2015 (tags were deployed January – April; PI - Dr. Robert Delong) to compare foraging areas utilized by pups and adults.

To get this information, a combination of SPOT and SPLASH tags will be used. SPOT tags can provide basic GPS positioning data while SPLASH tags can provide additional data on GPS location, diving depth, temperature, and other measurements to provide a fuller picture of the animal's behavior and habits. Guadalupe fur seals will be prioritized for tags due to their conservation status. However, we anticipate that there will be fewer than 5 Guadalupe fur seals that are deemed releasable and good candidates for tagging. Depending upon the fur seal's size, the smaller SPOT tag may be chosen. The

remainder of the tags will be distributed among the rehabilitation facilities for use on California sea lion pups. There is significant uncertainty about how many Guadalupe fur seals may be tagged, so we request flexibility in determining how tags are distributed between the two species.

Additional questions related to the rehabilitation process that may be answered by this study, depending upon which pups are deemed to be suitable tagging candidates and which variables can be controlled for, include the examination of factors that might influence post-release survival such as release weight, weight gain in rehabilitation, time spent in rehabilitation, and release location. We also anticipate a comparison of survival of pups in 2015 to those released in 2013.

[\[1\]](http://www.nmfs.noaa.gov/pr/health/mmume/californiasealions2013.htm) National Marine Fisheries Service. April 2015. 2013-2015 California Sea Lion Unusual Mortality Event in California. <http://www.nmfs.noaa.gov/pr/health/mmume/californiasealions2013.htm>.