

MARINE MAMMAL & TURTLE DIVISION, SWFSC BIWEEKLY REPORT ON FIELDWORK, PUBLICATIONS, RESEARCH RESULTS, AND EVENTS

25 October 2024

I. Fieldwork:

California Current Cetacean and Ecosystem Assessment Survey: CalCurCEAS 2024 aboard R/V Bold Horizon. 24 July-5 December, California Current – Reporting Period: 1-20 October 2024 – Leg 4 has been great despite persistent weather challenges. The science and vessel teams have been amazing and take great pride in what has been accomplished thus far. Mammal sighting highlights for Leg 4 included blue whales, northern right whale dolphins and numerous schools of short-beaked common dolphins (Figure 1). Seven humpback, six blue, nine fin and six killer whales were documented as photo-identifiable individuals.

In this reporting period: 472.5 nautical miles of survey effort was completed, 221 sightings were recorded (Figure 2) and 12 eDNA samples were collected at predetermined stations and six opportunistic samples at sightings associated with killer whales, sei whales, Baird’s beaked whales, and a mesoplodon species.

Leg 4 concluded in San Francisco on 20 October and Leg 5 will commence on 24 October. The incoming cruise leader will be Scott Benson. As we will say goodbye to the outgoing cruise leader Brittany Hanser and scientists Melody Baran, Suzanne Yin, Cory Hom-Weaver, and Annette Henry, we welcome incoming scientists Juan Carlos Salinas, Andrea Bendlin, Courtney Burger and Josh McInnes.



Figure 1. Top Left: short-beaked common dolphin out the galley porthole (photo by Melody Baran). Top Right: Blue whale (photo by Felipe Triana). Bottom Left: northern right whale dolphin (photo by Cory Hom-Weaver). Bottom Right: Leg 4 team photo (photo by Josie Sinnott).

CalCurCEAS 2024 Leg 4 Oct 1st- 20th

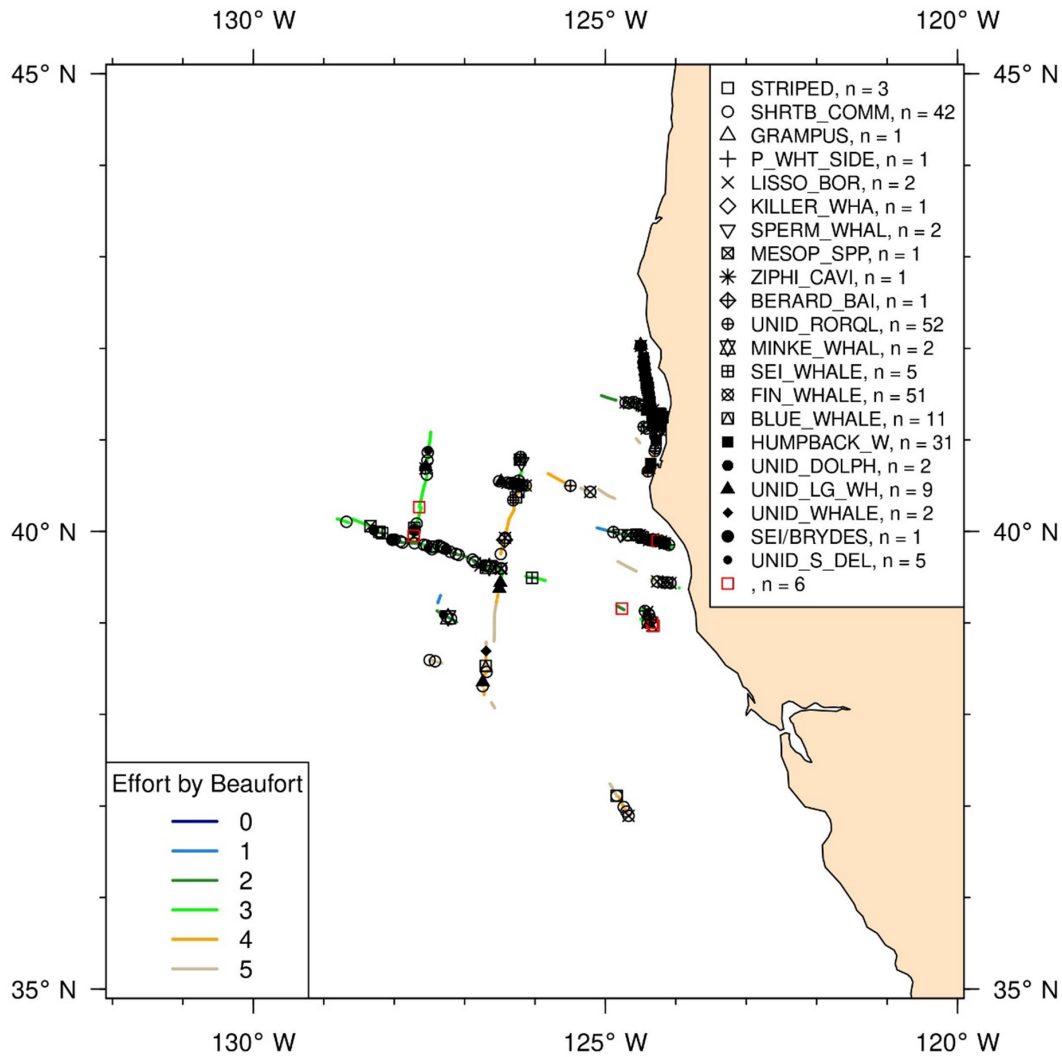


Figure 2. Sightings and effort for Leg 4 of CalCurCEAS 2024

The Leg 4 Scientific Party included: Brittany Hanser, Mary Applegate, Melody Baran, Dawn Breese, Michael Force, Annette Henry, Cory Hom-Weaver, Paula Olson, Felipe Triana, Ernesto Vazquez and Suzanne Yin

CalCurCEAS Acoustics Report 1-20 October: DASBR deployment on Leg 4 of CalCurCEAS proved to be a successful endeavor. We deployed 8 buoys at offshore and wind energy area (WEA) locations and two buoys opportunistically near sei whales. Overall, they drifted a cumulative 408.8 nmi. Some got caught in eddies while others hitched rides on strong currents as depicted in by their drift tracks (Figure 3).

We started off the leg testing two of the newly modified PIFSC buoys in the Eureka Wind Energy Area (WEA). We also deployed a single pole buoy within the WEA. Two of the three deployments drifted from western most to eastern most boundary, collecting valuable recordings in this hard to sample region. The third buoy, which was deployed in the northern part of the

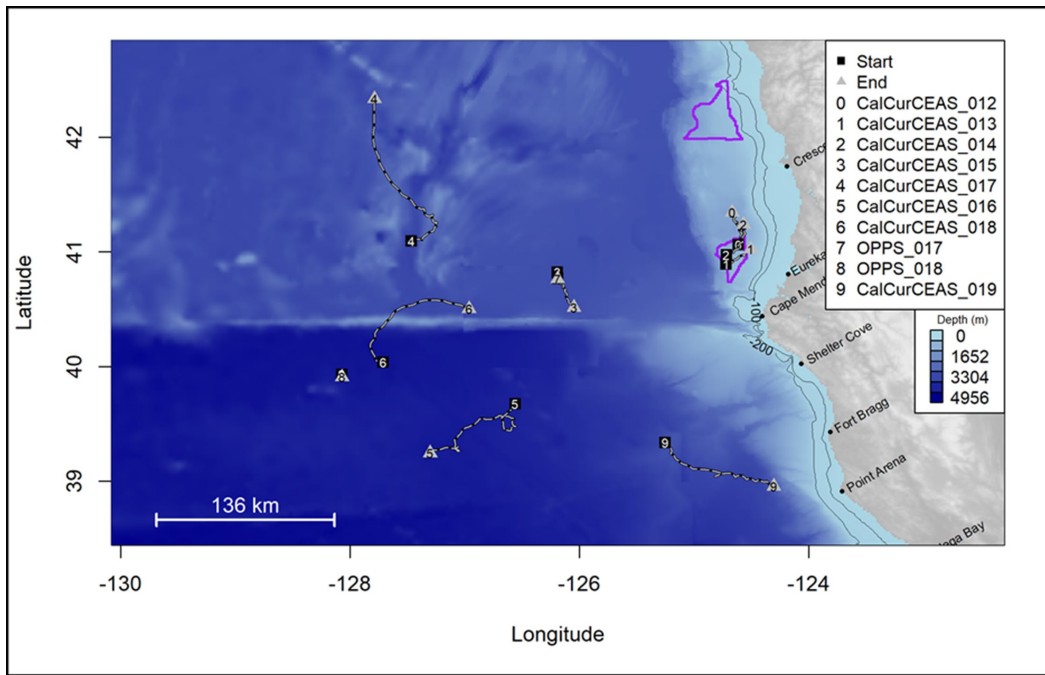


Figure 3. DASBR tracks for Leg 4. Deployment locations are represented by the black squares, and retrieval locations are represented by grey triangles. The purple outlined regions are the wind energy area boundaries

WEA quickly drifted north outside of the region but still provided us with useful data. While the first three deployments were only 2-4 days long, they allowed us to make sure we eliminated the water intrusion issue we were having with the PIFSC buoy during Leg 2.

Modifications to the PIFSC buoy involved using a marine sealant to adhere closed cell foam to the inside of the yellow floating collar to build up the inner diameter, making it snug around the PVC spar (Figure 4). Previously, this piece slid up and down the spar and we believe it was the culprit that was causing the head piece to become loose. We also attached a larger diameter hose around the existing hose clamp at the bottom of the yellow float, and a secondary hose and hose clamp above the float. These were used as a failsafe if the yellow float did, for whatever reason become loose again. We zip tied a sponge to the base of the GPS mount inside the head piece to help absorb water if any did get in (Figure 4). And finally, we added an extra 10lbs of lead weight to the bottom of the spar to help keep the buoy upright while in the ocean (Figure 4). Upon retrieval of the two PIFSC buoys, we noticed no water intrusion and are now happy with our design.

Once the WEA buoys were collected, we immediately headed offshore to deploy more DASBRs. We managed to deploy buoys at four locations (Figure 4). All deployments were made in calm seas and prevailing winds. Once deployed we continued to survey and if the visual team encountered a sei whale then we would assess the conditions and deploy an opportunistic buoy in hopes of collecting single species recordings. Little is known about sei whale vocalizations in this region of the Pacific and therefore any opportunity to try and collect recordings is valuable. We deployed a total of two opportunistic buoys but unfortunately the animals we deployed a DASBR next to were not vocalizing.

Offshore DASBRs were deployed for 6-7 days. No significant issues were encountered during their time in the water. All GPS units, both the SolarOne and Spots worked well. During the

retrieval of DASBR 15, the visual team observed a pod of offshore killer whales near the buoy. Numerous large baleen whales were also present in the area (the closer animals were identified as fin whales). Upon reviewing the acoustic recordings from that encounter, we detected high-frequency modulated calls.

This call type has been documented in the presence of various orca ecotypes globally, but its specific function remains unclear. This was an exciting encounter and we cannot wait to go through the recordings more thoroughly.

All data were processed using QAQC protocols to check for dropped samples, and no issues were identified. The recordings will be backed up at the lab and on external hard drives to ensure data security. Overall, the deployment and retrieval operations were successful, providing valuable acoustic data that will contribute to future analyses.

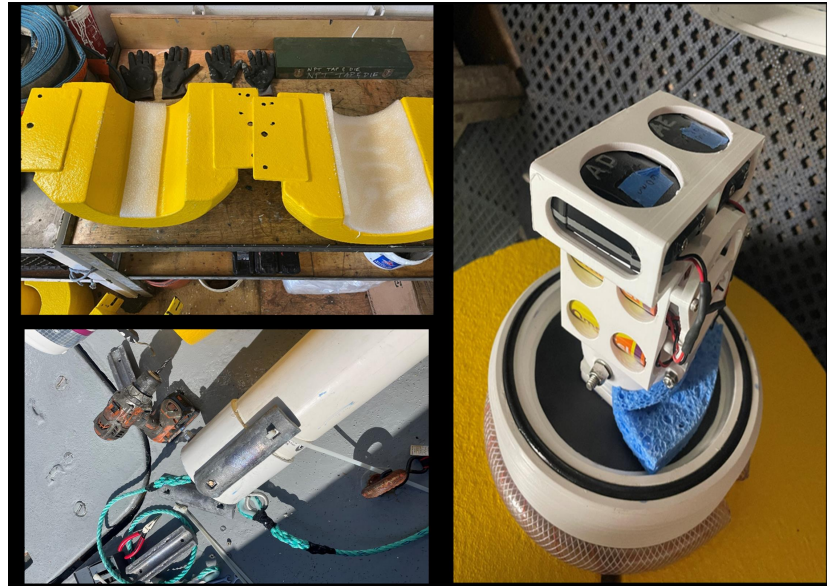


Figure 4. Upper left: Closed cell marine grade foam epoxied to the inside of the yellow floating collars. Right: A kitchen sponge zip tied to the base of the GPS mount inside the head piece. Bottom Left: Lead weight bolted and zip tied to the bottom of the PVC spar body of the PIFSC buoy to help keep it up right while deployed. Photos by Cory

Seabird Summary 1-20 October:

The Seabird Team wrapped up Leg 4 with a total of 43 species and 4452 individuals. We saw eight new species this leg, which brings our total for the survey to 77. Our most common seabirds for the leg were Red Phalaropes, which accounted for about a fourth of the total birds seen. They were virtually all seen off the continental shelf almost every day and, along with Black-footed Albatross and Leach's Storm Petrel, are typical of the pelagic environment. About 80% of the birds this leg were seen in our first four days while hugging the coast waiting for



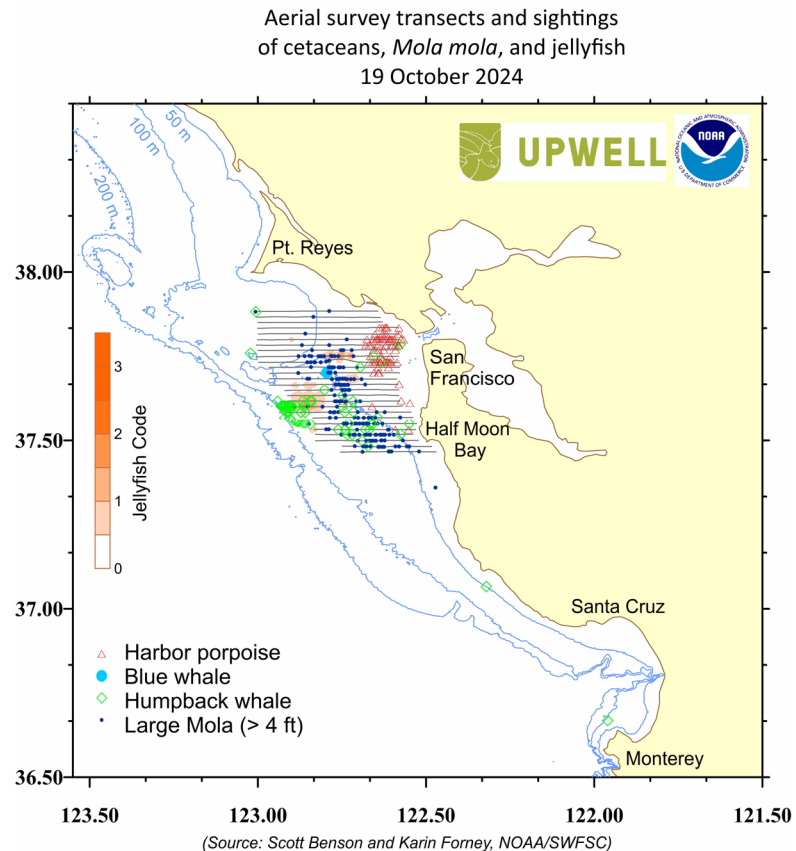
Figure 5. Cook's Petrel 172 NM WSW of Point Arena (Photo by Michael Force).

better weather. Thirty five percent of them were migrating shearwaters, with Pink-footed (684), Buller's (324), Sooty (217) and Short-tailed (14) seen. Fall migration has mostly passed, other than the occasional distant flock of unidentified ducks and geese, and we are now moving into a

winter avifauna when more gulls, typical winter residents, are seen. Four species of gulls made up 11% of our total this leg, compared to 4, 3 and 10% on Legs 1-3 respectively (not including the migratory Sabine’s Gull). Other notable sightings included Murphy’s, Hawaiian and Cook’s Petrels (Figure 5) in the tempestuous pelagic waters far west of Cape Mendocino.

Central California Aerial Survey, 19 October 2024 – Karin Forney (CMAP) and Scott Benson (MTEAP), in collaboration with NGO partner Upwell (based in Monterey, CA) conducted an aerial survey within the Gulf of the Farallones. The primary objective was to assess leatherback habitat and abundance (if present). A secondary objective was to obtain information on the distribution and minimum number of whales within this region, to inform management of the Dungeness crab fishery, which will open sometime on or after November 15. Weather conditions were excellent (sunny, 5-8 kts wind) and the team completed fine-scale east-west transects from about Half Moon Bay to Duxbury Reef (see Figure), covering the primary leatherback foraging habitat off central California. No leatherbacks were seen, but aggregations of leatherback prey (brown sea nettles, egg yolk jellies) were recorded where they were sufficiently close to the water surface to be seen from the air. Numerous sightings of ocean sunfish (*Mola mola*), another jelly predator, were recorded, indicating that there is still suitable foraging habitat for leatherback turtles. Humpback whales were very abundant, with 108 individuals recorded during the single-day survey. The whales appeared to be foraging on anchovies, based on the presence of anchovy schools and the abundance of

other piscivorous species (California sea lions, seabirds) near sighted whales. One blue whale was observed traveling southbound within the Gulf of the Farallones, and the survey team also documented large numbers of harbor porpoises. Details about the whales, leatherback habitat, and ecosystem indicator species were provided to the California Department of Fish and Wildlife (CDFW) for their first [seasonal risk assessment](#) for the Dungeness Crab Fishery, and to Cascadia Research Collective field researchers, who are conducting humpback whale studies in collaboration with MMTD. For more information, please contact [Karin Forney](#) or [Scott Benson](#).



Green turtle ecological research in Southern California, Fall 2024 – The SWFSC marine turtle research team launched its Fall 2024 green turtle capture season on 26 September and will finish on 29 October. The season includes bi-weekly efforts, and while most efforts are focused in San Diego Bay (8 outings), research also will have occurred in Seal Beach National Wildlife Refuge and upper San Gabriel River (the latter for the first time ever; see photo). To date, the team has captured 20 green turtles, with all but 3 occurring in San Diego Bay. Among San Diego Bay turtles, 12 individuals were first-time captures and five were recaptures, with one large male first captured in 1999 (photo below). This brings the number of ‘20+ year recaptures’ to 6 individuals over the last two years (see Table 1), underscoring that for at least some green turtles, San Diego Bay provides an important habitat over multi-decades. In addition to the health screening and body measurements, the team deployed a turtle-borne video camera on 3 turtles to determine habitat use and behavior (bringing the project total to 16 camera deployments), and attached Argos-linked GPS satellite tags on 2 turtles so far and hopefully up to 7 by the end of the season.

Capture efforts at San Gabriel River and in San Diego Bay coincided with Uncrewed Aerial System (UAS) surveys led by Tomo Eguchi, Trevor Joyce, and the Cetacean Health and Life History Program’s entire UAS team. For the season, temporary yellow non-toxic paint stripes were applied to turtles to facilitate capture-mark-recapture abundance estimation based on the UAS surveys. For turtle research questions, contact [Jeff Seminoff](#); for UAS related questions please contact [Tomo Eguchi](#).



Top: NOAA researchers (SWFSC and West Coast Regional Office) with partners from Aquarium of the Pacific (Long Beach, CA) in the Upper San Gabriel River basin with two of the three green turtles captured that day. Note the yellow markings on both turtles (see text for description). Bottom left: Photo 2. NOAA research team with dip nets for turtle capture in Upper San Gabriel River. Bottom right: Photo 3. NOAA researchers landing a large female green turtle in San Diego Bay. Turtles at this study site are captured using specialized turtle ‘tangle nets’.





Adult male green turtle captured in San Diego Bay on 16 October. This turtle measured 101.5 cm curved carapace length and weighed 133 kg. It was first captured in 1999 (see Table 1 below).

Green turtle captured	Date of first capture	Date of last capture	Years at Large	Initial body size	Final body size	Notes
Turtle 1 (Adult Female)	10-Dec-02	27-Apr-23	21	95.1cm SCL	100.8cm SCL, 136kg	Turtle was already a very large adult 21 years ago
Turtle 2 (Adult Male)	17-Dec-97	27-Apr-23	26	103.2cm CCL	102.7cm CCL, 136kg	Turtle was already a very large adult 26 years ago; CCL data correct
Turtle 3 (Adult Male)	31-Mar-90	9-May-23	33	56.7cm SCL, 29kg	96.5cm SCL, 163.5kg	Heaviest of all turtles captured so far
Turtle 4 (Adult Male)	13-Dec-00	23-May-23	23	89.4 cm SCL, 105kg	96.3cm SCL, 136kg	Turtle was already a large adult 23 years ago
Turtle 5 (Adult Male)	6-Dec-00	26-Oct-23	23	65.2 cm SCL, no weight	93.5cm SCL, 122 kg	This is Trey! An adult male tracked to Revillagigedo
Turtle 6 (Adult Male)	12-Mar-99	15-Oct-24	25	98.6cm SCL, 151kg in 2005	99.0cm SCL, 131kg	adult male, with CATS #15. relatively fresh escort male scars on front flippers

Table 1. Summary of extreme long-term (20+years) recaptured green turtles in San Diego Bay, 2023-2024

II. Manuscripts accepted for publication:

Parsons, K.M., Krützen, M., Gerber, L., Jourdain, E., Konrad Clarke, C.M, **Martien, K.K.**, & Foote, A.D. (*In press*). *The role of kinship in shaping cetacean societies*. In D. Croft, S. King, E. Garland, & A.D. Foote (Eds.), *The Evolution of Cetacean Societies*. University of Chicago Press.

Abstract – Social relationships among kin can influence individual fitness, thereby shaping sociality through the action of selection. Since the publication of *Cetacean Societies*, the number of long-term field studies has increased and matured, providing greater comparative and longitudinal perspectives on the role of kinship in structuring cetacean societies. In this chapter, we consider the role of philopatry, kinship and kin-based interactions within social groups, and how these roles vary across different ecological contexts and timescales. We focus on four well-studied odontocete taxa for which there are both long-term social and genetic data: bottlenose dolphins (*Tursiops* sp.), killer whales (*Orcinus orca*), sperm whales (*Physeter macrocephalus*), and false killer whales (*Pseudorca crassidens*). By considering both fitness benefits (in terms of passing genes to the next generation), and fitness costs of reproductive conflict between kin, we provide a synthesis of studies comparing social and genetic data and how these costs and benefits have shaped cetacean sociality.

III. Papers published:

Becker, M.A., Murphy, K.R., **Archer, F.I.**, **Jefferson, T.A.**, Keith-Diagne, L.W., Potter, C.W., Urrutia-Osorio, M.F., Ndong, I., & McGowen, M.R. (2024). Common dolphin (*Delphinus delphis*) mitochondrial genomes from Senegal reveal geographic structure across the North Atlantic but provide no support for global long-beaked clade. *Marine Mammal Science*, 40(4), e13144. <https://doi.org/10.1111/mms.13144>

Abstract – The common dolphin (*Delphinus delphis*) is a widely distributed species exhibiting extensive morphological diversity, with previous taxonomies recognizing multiple *Delphinus* species primarily based on relative beak length. We sequenced mitochondrial genomes of *D. delphis* morphotypes from multiple regions, calculated mitogenome nucleotide diversity ($\pi = 0.00504$), dated *Delphinus* mitogenome diversification to 1.27 mya, and conducted phylogenetic and population-level analyses focusing on morphotype and geographic origin. We present the first *Delphinus* sequencing data from Senegal, at the edge of where long- and short-beaked dolphins co-occur in the Atlantic, but only recovering stranded dolphins with long or indeterminate beak lengths. While we detected little genetic structure across most of the North Atlantic, fixation indices demonstrate that Senegalese dolphins are distinct. Geography did not reliably predict phylogeny, with few monophyletic localities, but we do infer a monophyletic group of long-beaked dolphins from California, Peru, and possibly China. However, neither Senegalese long-beaked dolphins nor long-beaked *D. d. tropicalis* are closely related to Pacific long-beaked dolphins, providing no support for a worldwide long-beaked clade (formerly *D. capensis*). Our findings reveal a distinctive Senegal *Delphinus* population and provide a foundation for global genomic analyses to further investigate the evolution of *Delphinus* morphotypes.

Carretta, J.V., Greenman, J., Wilkinson, K., Saez, L., Lawson, D., & Viezbigke, J. (2024). Sources of human-related injury and mortality for U.S. Pacific West Coast marine mammal stock

assessments, 2018-2022. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-SWFSC-705. <https://doi.org/10.25923/tj6f-y570>

IV. Research findings:

V. Press:

VI. Local events - meetings or events hosted in-person or virtually:

VII. Travel - meetings attended in-person or virtually:

Earth Biogenome Project (EBP), Arizona State University, 14-16 October 2024 – Phil Morin was an invited participant in this workshop which served as a review and planning session for an NSF mid-scale Infrastructure Design proposal (\$20M) to develop a US national EBP genome sequencing infrastructure for generating reference-quality genomes of eukaryotic species. The proposed program would include sample resourcing from national biobanks and communities, community sequencing programs, genome sequencing and assembly core facilities, and broad education and outreach to expand community involvement and benefits from genome sequencing.

Evaluation of proposed bycatch identification approach for 2025 Report to Congress, 18 October 2024 – Several NOAA sea turtle scientists including Jeff Seminoff from SWFSC met with colleagues from NOAA's Office of International Affairs, Trade and Commerce to help refine the strategy and approach for identifying countries with reportable bycatch under the Moratorium Protection Act.

Brazil National Network of Forensic Isotopes Meeting, 25 October 2024 – Jeff Seminoff will participate remotely in this meeting, giving a 1-hour keynote seminar entitled "From molecules to management: how stable isotope analysis can inform conservation planning for sea turtles". This National Forensics meeting will host a collection of scientists from Brazil and worldwide that will present on, and discuss in group format, how stable isotope analysis can inform enforcement agencies for how to better combat wildlife trafficking.

Population Genomic Inference from Low-Coverage Whole-Genome Sequencing Data, Physalia Courses, 21-24 October 2024 – Peter Dutton, Amy Frey, and Suzanne Roden participated in this online course to explore best-practice guidelines and workflows to survey variation across entire genomes at a population scale with the use of low-coverage sequencing data.

Meeting of the West Coast Take Reduction Team, Long Beach, 28-29 October 2024 - Jim Carretta, Alex Curtis, Karin Forney, Jeff Moore and Dave Weller will participate in the Internal Kick-Off Meeting for the West Coast Take Reduction Team (WCTRT). NOAA Fisheries has preliminarily decided that the WCTRT will address incidental mortality and serious injury of three strategic marine mammal stocks (i.e. Central America/Southern Mexico humpback whales, Mainland Mexico humpback whales, and Eastern North Pacific blue whales) and five commercial fisheries (Federal sablefish pot, CA Dungeness crab pot, OR Dungeness crab pot, WA Dungeness crab pot and CA spot prawn pot). Additional fisheries and/or stocks may be included when the WCTRT is formally established in 2025.

VIII. Awards, grants, and recognition:

IX. Other of note:

The Southwest Acoustic Ecology Lab (SAEL) has published a new blog post by guest blogger Selene Fregosi. In this post, Selene shares insights on what it means to be a glider pilot and how she and her team are using Seaglidors to collect passive acoustic data. This fall, Oregon State University and the Southwest Fisheries Science Center have partnered to deploy gliders within the CalCurCEAS study area. These data will offer a unique opportunity to compare passive acoustic recordings gathered by both Seaglidors and our Drifting Acoustic Spar Buoy Recorders (DASBRs). [View the blog here.](#)

Stranding summary for the weeks of October 9 – 22, 2024

Cetaceans: 1

- 10 October 2024: Kerri Danil, Raija Hammond (volunteer), Jesse Pierce, and Keiko Sherman responded and/or participated in the necropsy of a 117.3 cm male long-beaked common dolphin calf that stranded at Torrey Pines State Beach, La Jolla, CA. Gross observations included superficial jagged skin lacerations (presumed to be shark inflicted), fractured ribs, mild cardiac contusion, left pulmonary contusion, right pulmonary laceration, and 700 ml of free blood in the abdomen. Cause of death was attributed to blunt force trauma that resulted in exsanguination due to a deep pulmonary laceration. Possible causes include: shark attack, vessel collision, or interspecific aggression.

Pinnipeds: 4 (no response)

Turtles: 0

X. Where-about of Division Director:

In La Jolla