

Project: **Detecting and Quantifying Cryptic Seabird Bycatch in West Coast At-Sea Hake Fisheries**

Background

The incidental catch of seabirds is a global fisheries issue, and is particularly concerning for albatrosses since 15 of 22 albatross species face extinction. The first documented take of an ESA-listed short-tailed albatross (Fig.1, *Phoebastria albatrus*) off the Pacific coast in April 2011 focused attention on bycatch mitigation in West Coast groundfish fisheries and motivated collaborative research and outreach to reduce seabird interactions in West Coast longline fisheries (Gladics et al. 2017). In addition, large numbers of Near Threatened (IUCN 2017) black-footed albatross (*Phoebastria nigripes*) interact with West Coast groundfish fisheries, further motivating efforts by managers and the industry to seek collaborative solutions to minimize impacts to seabirds.

Overlap between albatrosses and West Coast at-sea hake catcher-processors has raised concerns about the potential for undocumented seabird mortalities (Guy et al. 2013), despite the presence of fisheries observers on 100% of their trips. Seabird mortality in trawl fisheries can be cryptic and easily go undocumented. Seabirds flying or floating behind trawl vessels can strike the trawl (warps) or communication (third wire) cables attached to the net (Zador and Fitzgerald 2008). Seabird mortalities from cable strikes have been recorded in trawl fisheries that process fish at sea, but they are difficult to detect (Sullivan et al. 2006a,b; Melvin et al. 2011; Maree et al. 2014). Observer duties generally prevent them from witnessing seabird-cable interactions and any resulting mortality or injuries, and dead seabirds rarely end up in the net or attached to the cables. Data collected during a special project of the At-Sea Hake Observer Program (A-SHOP) indicated a potential mismatch between bycatch estimated through standard observer activities (primarily conducted in the ship's factory) versus bycatch estimated using dedicated observation periods and documenting bird cable strikes.

In response, NWFSC, AFSC, and ARO convened a Seabird Cable Strike Mitigation Workshop in Seattle, WA in November 2017. This workshop brought together industry, bycatch reduction engineers, biologists and fisheries managers to develop practical gear modifications to reduce seabird-cable strikes in West Coast and Alaska trawl fisheries. Workshop participants identified the need for additional data collection to provide greater confidence in bycatch estimates based on extrapolation. They also identified potentially operationally feasible mitigation techniques, and determined that the West Coast at-sea hake catcher-processor fleet was best situated to test mitigation approaches using black-footed albatross-cable interactions as a key metric. Most critically, there was support within the at-sea hake catcher-processor fleet to host this research during their standard fishing operations (D. Waldeck, pers. comm.). The active participation from Pacific hake and Alaska pollock industry members in the workshop signaled the industry's intention to proactively address this issue. Subsequently, PWCC member companies have been full collaborators on the design and implementation of this research.

FY2018 Project Results

Project funding started October 1, 2018 and, almost immediately, Amanda Gladics conducted a 15-day pilot trip on the F/V Seattle Enterprise to refine research protocols, conduct a feasibility analysis of electronic monitoring video recording equipment, and trial potential seabird bycatch mitigation options. In winter 2018-2019, Gladics summarized results from the pilot trip, developed a formal research protocol and training materials, and recruited project participants to serve as dedicated at-sea seabird observers. We conducted extensive coordination with Pacific Whiting Conservation Cooperative and At-

sea Processors Association staff, and member company representatives ahead of the Spring 2019 hake season. Gladics also provided a formal oral presentation to Pacific Whiting Conservation Cooperative members, summarizing results from pilot trip at their annual meeting on 1/23/2019.

During the Spring 2019 hake season, we deployed three dedicated seabird monitors on PWCC member hake catcher-processor vessels between May 13 – June 18, for a total of 76 days at sea. Our observers collected nearly 500 hours of observations during all phases of fishing operations including setting, towing and hauling gear. The observers collected environmental data, documented the frequency of seabird interactions with trawl fishing gear, and made assessments of interaction outcomes (bird mortality, injury, or not harmed). Gladics will be summarizing data and beginning preliminary analysis during the summer months, and we expect to deploy four at-sea observers on four different vessels during the Fall 2019 hake season.

Additionally, we deployed an electronic monitoring system with the observer on the F/V Northern Jaeger and we collected video during all daylight hours, resulting in over 5 TB of video data. These data will be archived for future analysis, pending additional resources.

We trialed three different mitigation approaches to dissuade birds from approaching the fishing gear. The F/V Seattle Enterprise used a water jet to visually and physically deter seabirds from the offal plume. The F/V Northern Jaeger used perpendicular booms extending from the port and starboard stern of the vessel with vertical streamers to deflect birds from the trawl warps. The F/V Alaska Ocean crew attempted to use a snatch block to bring the net sonar wire closer to the stern of the vessel. Unfortunately, the first attempt to use the snatch block resulted in a major malfunction that damaged the net sonar cable. This kind of operational challenge is not unusual when trialing a new mitigation approach, and should not preclude further testing. Snatch blocks are commonly used in the Alaskan pollock fishery. However, they are rarely used in the hake fishery, which operates at much deeper depths, and may require some adaptation to the fishing conditions on the U.S. West Coast. We plan to test all three mitigation ideas again during the Fall 2019 season, and will continue to troubleshoot operational challenges with vessel crews.

While this research is still in progress, this collaboration has jump-started operational testing of seabird bycatch mitigation devices and strategies in the at-sea hake catcher processor fleet. We have also increased the observational effort above what the At-Sea Hake Observer Program had been able to do previously by an order of magnitude. The enhanced observational effort during this special project should result in increased certainty in seabird bycatch rate estimates, demonstrate NMFS dedication to basing management decisions on sound science, and support the collaborating PWCC member companies to continue to take ownership in understanding the issue and seeking workable solutions.

Figures.



Figure 1. A juvenile short-tailed albatross, the age class most commonly observed off the U.S. West Coast. Photo by Rob Suryan.



Figure 2. The view looking astern of a hake catcher-processor vessel, showing seabirds flying in the vicinity of the third and fourth wires. These cables transmit data from a net sonar device and a live video feed near the codend of the net. Photo courtesy of A-SHOP program.



Figure 3. The water jet mitigation approach trialed on the F/V Seattle Enterprise. Photo by Amanda Gladics.



Figure 4. An electronic video monitoring system during operational feasibility testing on the F/V Seattle Enterprise during the Fall 2018 hake season. Photo by Amanda Gladics

References

Gladics A.J., E. F. Melvin, R. M. Suryan, T. P. Good, J. E. Jannot, and T. J. Guy. 2017. Fishery-specific solutions to seabird bycatch in the U.S. West Coast sablefish fishery. *Fisheries Research* 196: 85-95.

- Guy, T. J., S. L. Jennings, R. M. Suryan, E. F. Melvin, M. A. Bellman, L. T. Ballance, B. A. Blackie, D. A. Croll, T. Deguchi, T. O. Geernaert, R. W. Henry, M. Hester, K. D. Hyrenbach, J. Jahncke, M. A. Kappes, K. Ozaki, J. Roletto, F. Sato, W. S. Sydeman, and J. E. Zamon. 2013. Overlap of North Pacific albatrosses with the U.S. west coast groundfish and shrimp fisheries. *Fisheries Research* 147: 222-234.
- IUCN 2017. The IUCN Red List of Threatened Species. Version 2017-3. <<http://www.iucnredlist.org>>. Downloaded on 02 January 2018.
- Maree, B. A., R. M. Wanless, T. P. Fairweather, B. J. Sullivan, and O. Yates. 2014. Significant reductions in mortality of threatened seabirds in a South African trawl fishery. *Animal Conservation* 17: 520-529.
- Melvin, E. F., K. S. Dietrich, S. M. Fitzgerald, S., and T. Cardoso. 2011. Reducing seabird strikes with trawl cables in the pollock catcher-processor fleet in the eastern Bering Sea. *Polar Biology* 34: 215-226.
- Sullivan, B. J., P. Brickle, T. A. Reid, D. G. Bone, and D. A. J. Middleton. 2006a. Mitigation of seabird mortality on factory trawlers: trials of three devices to reduce warp cable strikes. *Polar Biology* 29: 745-753.
- Sullivan, B. J., T. A. Reid, and L. Bugoni. 2006b. Seabird mortality on factory trawlers in the Falkland Islands and beyond. *Biological Conservation* 131: 495-504.
- Zador, S. G., and S. M. Fitzgerald. 2008. Seabird attraction to trawler discards. AFSC Processed Rep. 2008-06, 26 p. Alaska Fish. Sci. Cent., NOAA, Natl. Mar. Fish. Serv., 7600 Sand Point Way NE, Seattle WA 98115.