

Technical Review Comments on the Draft Report on Seabird Searcher Efficiency Trials for the Kaua'i Seabird Habitat Conservation Plan (Prepared by Stephen Rossiter for the Hawai'i Division of Forestry and Wildlife, January 2022)

March 10, 2022

On behalf of the participants in the Kaua'i Seabird Habitat Conservation Plan, the applicants' technical subject matter experts reviewed the Draft Report on Seabird Searcher Efficiency Trials undertaken by the Hawai'i Division of Forestry and Wildlife at certain KSHCP covered properties and facilities on Kaua'i in fall of 2021. These comments are in addition to individual meetings that the KSHCP participants have had with representatives of DOFAW and USFWS to receive any "recommend[ed] measures that could be undertaken to raise the discovery rate to the approved level (i.e., updated search protocols, staff training, predator control action)" as required by Section 6.2.2.1 of the KSHCP.

This review identifies the following 4 areas about which we have significant concerns: (1) the study appears to not be supported by existing data; (2) the study depends on interpretation of the ecology and behavior of the species; (3) the study design tests performance of a monitoring program that deviates from the approved guidance contained in the KSHCP; and (4) the study presents overly simplistic paradigms in the formulation of underlying assumptions. These issues may have biases that could have affected the study design and interpretation of findings.

The two species of seabirds that are the focus of the report are the threatened Newell's Shearwater (*Puffinus newelli*) and the endangered Hawaiian Petrel (*Pterodroma sandwichensis*). Both are roughly the same size and possess similar feather coloration, though patterning differs. The Newell's Shearwater is more common in the annual light attraction fallout on Kaua'i than the Hawaiian Petrel. We use the term *seabirds* to refer to both species collectively in the context of the report.

The areas where study design or assumptions may have introduced bias in the findings are listed below along with comments and discussion that address each in the context of this technical review.

1. The study design was based on the following assumptions: that live seabirds always seek cover in thick vegetation or a dark nook or cranny and become almost impossible to find once light, that expert observation of these species indicates that downed birds will seek dense cover before daybreak, and that birds move to find cover and are attracted to covered areas away from open areas.

We agree that this behavior does occur, but based on field observations, we believe that it is not consistent and may vary depending on the habitat conditions at respective facilities. Many facilities where outdoor lighting is focused and seabirds would be expected to fallout contain open view fields, variable amounts of landscape vegetation, and other types of infrastructure such as fences, roadways, and pedestrian walkways. Some live birds are also injured, dazed or perhaps too fatigued to fly or move off. Past field monitoring and observations have found live birds during daylight hours in a range of different locations and landscape conditions. Over representing decoy placement in dense cover or dark nooks based on this leading assumption

may introduce bias in the study design and result in a lower than actual discovery rate estimate for the site.

2. Related to the placement of decoys in the trials, the report states that random points were generated for each decoy placement at each facility and then it was determined whether that decoy would be placed on the random point's exact location or whether the decoy would be placed in the nearest available cover that a live bird could walk to, such as concealing vegetation or a dark nook or cranny.

This study design potentially introduces an element of hiding more decoys than would occur in a natural situation and therefore biases the discovery results downward. It is not clear what basis was used to select the number, distance and type of cover to choose from a given random point. The emphasis on hiding cover is important to understand. If there are new interpretations about the behavior of downed fledgling seabirds that should be introduced and evaluated alongside existing data then it would help for this to happen, in an adaptive, participant-agency coordination capacity.

3. Decoys placed in cover were included as successfully discovered only if they were reported by monitoring personnel by sunrise. Decoys placed out in the open were included as successfully discovered only if they were reported prior to 30 minutes before sunrise (daybreak). This means some decoys could actually be found *during* a fully compliant morning search (which is *required* to be conducted within one hour before sunrise and therefore may not be fully completed by 30 minutes before sunrise) and not be counted as discovered.

This study design tested the "monitoring period" compliance issue (was monitoring conducted during the ideal monitoring hours of three hours after sunset and 30-90 minutes before sunrise), rather than the discovery rate of the facility monitoring program. For instance, some decoys were actually found and reported by monitor after the ideal monitoring period, before they were picked up by the study proctor, and due to the constraints of the study design, these decoys were not included in the analysis of estimated discovery rate. In these cases, if the decoy specimens had been actual seabirds, they could have been alive and unharmed, injured, or dead, and not able to move to or seek cover, and should be considered found even after sunrise. Under these circumstances, the present study design is biased to underestimate the discovery rate of the respective facilities.

4. Decoys were not placed with intent, nor allowed to remain at large, for observation and possible discovery between daybreak and sunset of the following day (24+ hours).

As in Item 3, the study design did not test the actual discovery rate of the facility because it did not allow additional observations that would occur by monitors or other support staff after daylight and during the remainder of the day when monitoring would continue. This would include personnel active at respective facilities, some of whom perform downed seabird searches and surveillance monitoring activities throughout the day and would possess training

and demonstrated capacity to detect and report downed seabirds. As described in Item 3, an actual seabird could have been dead or injured and not able to move to cover, or it could be a live seabird resting in relative view or in partial cover and able to be discovered by continuing monitoring efforts throughout the day, support staff, landscape maintenance personnel or property employees, after sunrise.

Regardless of the specific circumstances, the study design is biased to underestimate the discovery rate of the facility by not considering additional detections that would probably otherwise occur during daylight hours. Additionally, birds may be found dead, sometimes more than 24 hours after the fallout event. For example, one KSHCP participant conducted a discovery rate trial in 2019 in which a Wedge-tailed Shearwater trial carcass was found and reported 48 hours after it was placed out. Although considered a mortality, such discoveries should be included in discovery rate validation estimates because KSHCP Participants are required to account for lethal and non-lethal events in the assessment of annual take estimates. In the present study, restricting the hours of observation introduced bias in the study design and likely resulted in lower discovery rate estimates than what actually may have occur for a given site.

General conclusion

We believe the study design and analysis which appears to test the ability of facility monitoring staff to find live hiding birds based on an assumption that all downed birds move to cover before daylight, likely introduced bias into the study design that underestimated the actual discovery rate of facilities by:

1. Over emphasizing the degree to which live seabirds actually move and find cover, which is influenced by the condition of the seabird when down and site specific habitat conditions, making detections less likely than actually occurs; and
2. Limiting the study search hours to the PIP required ideal monitoring hours, and not taking into consideration potential discoveries by monitoring efforts in the first several hours following daybreak, along with detections by secondary support staff. Including monitoring efforts and detections that occur during daylight hours would likely increase the estimated discovery rate at some facilities.