2023 Report on Seabird Searcher Efficacy Trials for the Kaua'i Seabird Habitat Conservation Plan



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Executive Summary

The Kaua'i Seabird Habitat Conservation Plan (KSHCP) was developed to address light attraction impacts on the listed seabirds in several fallout hotspot areas on Kaua'i. All participants permitted under the KSHCP are required to monitor the number of birds impacted by the lights in their premises and implement a formally organized search strategy to find grounded seabirds twice per night during the fallout season.

This study was developed to perform the seabird search efficacy validation at the 1 Hotel Hanalei Bay in 2023. The 1 Hotel Hanalei was closed for renovations from April 2020 to February 2023 and thus was not included in prior searcher efficacy trials. Accordingly, 20 model birds (decoys) were installed at 1 Hotel Hanalei premises in randomly selected locations considered safe to search and in locations with various cover types such as vegetation or infrastructure. The participant was asked to find and report decoys throughout the seabird fallout season. Participants' searcher efficacy was measured through the number of decoys reported in various cover types and the time until the decoy was found. In 2023, 1 Hotel Hanalei found seven of 20 decoys resulting in a searcher efficacy of 35%.

The time that passes until the decoy is found after its deployment is an important parameter as live seabirds are known to seek cover after becoming grounded. The average time 1 Hotel Hanalei seabird searchers took to find the decoys was 92 minutes.

The consistency in searcher efficacy throughout the seabird fallout season is important as the fledgling season for many seabird species on Kaua'i spans months and participants are dealing with more than one covered species with different breeding schedules. This study has not investigated the consistency in detail but it does not appear that there was any drop in performance of the 1 Hotel Hanalei seabird search team throughout the season.

The authors think that the result of this study provides unbiased information on the search efficacy of 1 Hotel Hanalei in the 2023 fallout season. The participants in this study showed a significantly lower searcher efficacy rate than the 90% estimated in the Participant Inclusion Plan. We recommend the participant improve their search effort and methods in covered areas and areas off designated pathways. Finally, the searcher efficiency can be changed in time depending on several different factors, and therefore searcher efficacy validation should be carried out periodically for 1 Hotel Hanalei and other KSHCP participants.

Introduction

One of the major threats to breeding seabirds on Kaua'i is light pollution. Artificial lights at night cause young seabirds to become disoriented and become grounded (fallout) when they leave the colonies for the first time. The fallout started to be recorded intensely after the 1960s (Banko, 1980), coinciding with the increased tourism on Kaua'i (Bardolet & Sheldon, 2008). The Kaua'i Seabird Habitat Conservation Plan (KSHCP) was developed by the State of Hawaii, Department of Land and Natural Resources (DLNR) with technical assistance from the U.S. Fish and Wildlife Service (USFWS), and in consultation with various scientific experts in the field of seabird and turtle biology. The KSHCP aimed to address light attraction impacts on the listed seabirds in several fallout hotspot areas. Accordingly, multiple non-Federal entities (participants) that have the potential to cause unavoidable take of Kaua'i's listed seabirds applied for incidental take permit (ITP) and incidental take license (ITL) under KSHCP and asked to follow mitigation and minimization measures. To minimize the impact of light attraction on the endangered seabird populations, all participants permitted under the KSHCP are required to monitor the number of birds impacted by the lights in their premises and implement a formally organized search strategy to find grounded seabirds twice per night during the fallout season (between September 15 and December 15).

Historically, even well-trained biologists conducting intense searches have been unable to locate many of the birds. Therefore, KSHCP estimates that for every bird found alive, another downed bird remains unfound, resulting in a default 50% discovery rate (i.e. searcher efficacy). In the KSHCP, submitted estimates of searcher efficacy by the participants ranged from 50% up to 100% within searchable areas, but with little evidence to support these proposed numbers. KSHCP Administration developed and conducted a searcher efficacy validation study for various participants in 2021 and 2022. The results of these studies showed varying actual discovery rates ranging from 5% to 93% (Rossiter, 2021). The KSHCP states that if the results of the validation program indicate a participant's discovery rate is lower than the discovery rate identified in their approved PIP, the agencies will recommend measures that could be undertaken to raise the discovery rate to the approved level (i.e., updated search protocols, staff training, predator control actions).

One of the participants of the KSHCP, 1 Hotel Hanalei was not included in the previous searcher efficacy trials due to ongoing large-scale renovations at the hotel premises. 1 Hotel Hanalei started to operate in early 2023. We conducted a validation study at 1 Hotel Hanalei premises to document their searcher efficacy for the first time since the initiation of the KSHCP. This report presents the results of 1 Hotel Hanalei searcher efficacy trial and makes recommendations to increase the discovery rate of this participant.

Methods

The searcher efficacy study was carried out following the methodologies set in the 2021 and 2022 studies (Rossiter 2021; Shepherd and Sahin, 2022) with no major changes.

This study was conducted between October 9 and December 15, which coincides with the seabird fallout season on Kaua'i that runs from September 15 through December 15. As in the previous studies, the participant was informed about the implementation of this study, potentially creating experimental biases that arise from a participant's expectations or awareness. Moreover, the researchers deploying the decoys had to use access paths that were visible to 1 Hotel Hanalei security, potentially increasing the experimental bias. Every effort was made to minimize these biases and replicate the realistic level of required effort in seabird searches. Deployment date, number of decoys deployed per visit, decoy location, and cover type were randomized and the number of blank visits was increased.

Seabird Decoys

Seabird decoys were 3D printed out of white PLA plastic and painted to match the black and white color of a sitting Newell's Shearwater (Figure 1). Given the overall similarities in size and color pattern of two of the covered species, Newell's Shearwater and Hawaiian Petrel, the decoy serves as a rough analog for the detectability of both species. However, Band-rumped Storm-petrels are much smaller and rarer so the searcher efficiency estimate from this work should not be assumed to be equal for this more elusive species.



Figure 1 Seabird decoy modeled after sitting Newell's Shearwater or Hawaiian Petrel

Printed instructions on the underside of the decoy provided detailed information on how to report the decoy such as a phone number to call or text and where to find the decoy ID number to report.

Sample Size and Decoy Deployment Schedule

A total of 20 decoys were deployed at 1 Hotel Hanalei premises. A stratified randomization was used in deployment dates to replicate the fluctuations in fallout intensity and required search effort throughout the fallout season. Due to the restricted time frame of deployments, instead of four "blocks", as in 2022, in 2023 the whole deployment period was divided into three "blocks" of time (Table 1). These blocks were designed to primarily mimic Newell's Shearwater fledging period which begins in late September and continues through early December with peak fledging levels in October (Raine et al., 2023). Data from the Save Our Shearwaters program also shows a marked increase in the number of Newell's Shearwater fledglings rescued in October compared to other months (Raine et al., 2017, 2023). We followed the fallout trends of fledging Newell's Shearwater as they are the listed species and age group most impacted by light attraction and constitute the highest levels of take in the KSHCP.

Table 1 Stratified randomization was followed and deployments were implemented in three blocks throughout the fallout season.

Block	Date Range	Number of Decoys Placed					
1	October 9 - 31	10					
2	November 1 - 23	5					
3	November 24 - December 15	5					

Our goal was to ensure the peak fallout period (i.e. October) gets at least half of the decoys. With the condition of one decoy on the first visit and a maximum of three decoys at any visit, we obtained a range of one to four visits at each site in each block. The use of blocks was made to ensure testing of properties' search efficacy throughout the fallout season, to increase the number of deployment visits, and to account for extremes in randomization; e.g., all 20 decoys being deployed in consecutive visits or three decoys deployed on each visit thus a site only being visited seven times etc. A detailed schedule with the number of decoys deployed at each visit is given in Appendix 1.

Decoys were deployed between 30 minutes to two hours after sunset, but before the first scheduled downed bird search as recommended by the KSHCP (three to four hours after sunset). This deployment schedule ensures that decoys are in place by the hours of peak Newell's Shearwater fledging (Raine et al., 2023). Based on the experience from the 2021 study showing the difficulty of surreptitiously deploying decoys after midnight, pre-dawn deployments were not included in this study.

As the project team needed to use routes either going through or visible to security to access 1 Hotel Hanalei premises, extra measures were taken to prevent potential biases. Specifically, the number of blank visits in the schedule increased in the 1 Hotel Hanalei study. A minimum of one blank visit a week was made in seven out of ten weeks of the study period. The team also used the public access path more than the route going through the security.

Decoy Locations

Decoy placement points were randomly generated in QGIS V3.28.3-Firenze (QGIS Development Team, 2023). The study area was determined by property maps provided by the participant at the beginning of the study. A total of 20 random points were generated with 10 points "in cover" following the assumption that grounded birds will seek cover, and 10 were "no cover". Points that fell on flat or gently sloping roofs, in swimming pools, steep slopes hazardous to human safety, fully fenced areas, inside buildings, and in the middle of driving paths were discarded from the survey. A new randomized point was then created in replacement so that the total number of deployments remained the same. Although live birds can and do fallout in all of these areas, the logistical constraints associated with placing a decoy in these locations necessitated their exclusion.

Points that fell onto a location opposite the designated cover type (i.e. an "in cover" point in the middle of a lawn or conversely a "no cover" point in vegetation) were moved to the nearest possible location which fulfilled the necessary cover type description. For all decoy placements, the amount of cover at the actual placement point was judged based on:

- the maximum distance away that a person could stand and still see the decoy,
- the minimum distance away that a person could stand and look in the direction of the decoy and be blocked from seeing it,
- whether there was cover within a few inches of the decoy's head
- subjective assessment of the amount of artificial light illuminating the decoy (none, low, med, high)

Based on these metrics a subjective categorization summarizing the placement as in the open (no cover), partially in cover, or in full cover was made. For example, a decoy visible from a distance from a majority of angles would be considered open, a decoy either shielded from view from more than 50% of angles or with some overhead cover would be considered partial cover, and a decoy not visible from a distance from any angle and/or close overhead cover would be considered in full cover (see visual examples below). Decoys considered to be in full cover often require changing stances (crouched or on knees), moving raised cover items (valet trolley, wheeled dumpsters, etc.), or searching under dense vegetation to find. There was no predetermined ratio of partial cover vs. full cover and the ensuing cover type was a result of the closest available cover to the randomized point. Some examples of cover types are given in Figures 2 to 4 below.

Participants were told that placements would be spatially randomized but not told that 50% would be placed in the open and 50% in covered locations.



Figure 2 Examples of decoys placed in 'open' or 'no cover' areas



Figure 3 Examples of decoys placed in 'partial cover' areas



Figure 4 Examples of decoys placed in 'full cover' areas

A photograph of each decoy taken *in situ* after deployment, either at night or during retrieval the next day is provided in Appendix 2. While the intent was to take a picture of a decoy in the relevant lighting conditions (i.e., decoy detectability may in part be determined by light illumination in the area) pictures were not taken if it was believed that the act of taking a picture or the associated flash (if needed) would draw extra attention to the decoy location.

Decoy Retrieval and Reporting

The reporting cut-off time for decoys was 40 minutes before sunrise for decoys in the "open" category and sunrise time for decoys in the "cover" category. Decoys were retrieved as soon as possible after sunrise, which varied throughout the season from 06:31 in early October to 07:09 in mid-December.

A free Google Voice account was created specifically for reporting purposes. Text instructions printed on the underside of the decoy instructed finders to either send a picture of the decoy or a voicemail with relevant information proving a decoy was found. The time of discovery was determined either by the time indicated in the message or if no time was stated, the time the message was received. The hotline was tested by calling at the beginning of every deployment night.

Discovery Rate and Confidence Intervals

The discovery rate (i.e., the searcher efficacy) was calculated as the number of successes in finding the decoy divided by the number of deployments.

With the assumption that finding the decoy (X) is a Bernoulli random variable; the probability of success in finding a decoy is the same for each deployment and the deployments are statistically independent, interval estimate of a success probability (i.e., binomial proportion confidence interval) based on the observed data is constructed. Based on maximum likelihood estimates, the Wald method was employed to construct confidence intervals at a 95% level for the probability of finding the decoy. All calculations are implemented in base R (R Core Team, 2023).

Results and Discussion

Discovery Rate

Out of 20 decoys placed throughout the fallout season in 2023, 1 Hotel Hanalei seabird search team reported seven decoys, making their searcher efficacy 35% (Cl 17% - 57%). The 1 Hotel Hanalei team located 60% (6 of 10) of the decoys placed in open areas and 10% (1 of 10) of the decoys placed in covered areas. The single decoy found in the cover was categorized as a "partial cover," and none of the full cover decoys (n=3) were reported. Additionally, two more decoys were reported but were discovered after the accepted reporting window had closed, and were excluded from the analysis.

Cover Type	# Deployed	# Found	Discovery Rate				
Open	10	6	60%				
Partial Cover	7	1	14%				
Full Cover	3	0	0%				
TOTAL	20	7	35%				

Table 2 Details of decoys deployed and reported at 1 Hotel Hanalei Bay



Figure 5 Locations, types, and status of decoys placed at 1 Hotel. Numbers indicate decoy points. Green: reported decoys, Red: not reported. Circles: Open, Squares: in cover. The blue line delimits the property boundary with red hashed areas deemed unsafe to search. The yellow line indicates the search path of downed seabird searchers, provided by 1 Hotel.

Time until Reported

The average time to discovery (i.e., the time when the decoy was first reported) for all decoys found by 1 Hotel Hanalei team was 92 minutes. The average was 84 minutes (n=6, range 27-174 minutes) for decoys in open areas and 139 minutes (n=1) for decoys in cover. According to the KSHCP, the first seabird search of the night is recommended to take place three to four hours post-sunset. By this time 100% of the decoys had been found.

1 Hotel Discovery Times



Figure 6 The time (minutes) between when the decoy was deployed and when the first report was received. Note: Decoy Point Number can be linked to the numbers in Figure 5 to see the locations.

Based on decoy reports, it appears that the majority or all of the decoys were discovered by 1 Hotel Hanalei staff members. Specifically, four decoys were located by individuals who self-identified as part of the downed seabird search team, and two decoys by members of the loss prevention team. The reporter did not specify their affiliation, if any, in the case of the two decoys reported.

Encounter with Seabird Predator Species

Only one cat was observed on the property during decoy deployments and was immediately reported to the 1 Hotel Hanalei Loss Prevention team.

Suggestions for Improvement

According to 1 Hotel Hanalei's Downed Seabird Implementation Plan, 90% searcher efficacy was claimed. The results of this trial show a significantly lower rate of searcher efficacy and reveal potential deficiencies in the search methods employed. While it is anticipated that most, if not all, of the decoys placed in open areas would be found, only 60% (6 out of 10) of these were reported. Notably, some of the missed decoys were situated in well-lit or heavily trafficked zones such as the parking lot and beach area. It appears that the unreported decoys in the "open" category were likely further from the projected search route than those that were found (Figure 5). For instance, the two decoys, #11 and #15 placed in the parking lot with comparable lighting and general visibility (Figure 7), decoy #11, which was placed on the search route was reported whereas unreported #15 was placed about 10 meters / 32 feet outside of the route. This indicates that searchers covered a narrow area along the search route even in open areas. Even if the search is being carried out along a specific route, we recommend the 1 Hotel Hanalei team to scan a wider area with flashlights to increase the chance of locating grounded birds.



Figure 7. Decoys #11 (left) and #15 (right) were placed in the parking lot. Only decoy #11 was reported.

The 1 Hotel Hanalei team performed poorly in reporting decoys placed in cover. Moving forward, there should be a focus on searching along vegetation lines and within ornamental vegetation. Notably, nine out of the ten "cover" decoys were positioned within approximately three meters / ten feet of a paved walking path or lawn edge. This proximity reflects the likely area where a live, downed bird might initially seek cover after landing in the open, underscoring its importance in the search efforts.

As 1 Hotel Hanalei has a large area, one recommendation is to break down the property into distinct search areas and employ more than one searcher in each search session. The search areas could be delineated with consideration for the difficulty of the search area (i.e., lots of obstacles or vegetation to search). While it might be reasonable for a searcher to confidently scan an open field and verify the absence of birds while walking a single path, areas with obstacles like cars, beach cabanas, or obstructive vegetation warrant more meticulous and time-consuming searches. Searching between and under objects and viewing areas from multiple angles becomes essential in such areas to ensure comprehensive coverage. Having more than one searcher each session would ensure that each type of area is searched in detail. This approach would enhance the effectiveness of the search strategy and increase the likelihood of locating downed birds, particularly in challenging environments.

It is recommended to modify the seabird search protocol by initiating the second search of the night earlier so the morning search is completed before sunrise. Live seabirds seek cover in vegetation or dark enclosed spaces and become exceedingly difficult to find after sunrise. To mitigate the bias introduced by plastic decoys in the open, which cannot mimic the cover-seeking behavior of a live bird, the reporting cut-off time for decoys placed in the open was set at 40 minutes before sunrise, by which time the sky is lightening. During this study, decoys #9 and #15, both placed in the open, were reported after this cut-off time and were not credited as a successful find. Considering the several hours required for an effective and diligent seabird search in the 1 Hotel Hanalei premises, teams should aim to conclude the second search *before* daybreak. If logistical challenges preclude this from happening, the morning searches should prioritize efforts in areas with vegetation, along edges of open areas, or other potential hiding places.

For the reported decoys, the 1 Hotel Hanalei team performed well in 'time to discovery' and reported all decoys within the time frame of the first seabird search as recommended by KSHCP. However, it should be noted that six out of seven decoys found were placed in the open. Combining this with the poor performance in reporting the decoys placed in cover, more effort should be invested in increasing the efficacy of searches and aiming for a similar time to discovery performance for birds in cover. In addition to decoys, considering the live birds rescued by the 1 Hotel Hanalei team, several birds were found in the daytime indicating the need for improvement in the time to discovery.

It should be noted that 1 Hotel Hanalei is located in close proximity to major seabird breeding colonies where consistent high seabird activity has been recorded (Sahin 2023) and in one of the hotspots of seabird fallout across the island of Kaua'i (Save Our Shearwaters, unpublished data). High seabird activity around 1 Hotel Hanalei premises was also evident in the relatively high number of birds rescued by the hotel team in the 2023 fallout season (KSHCP, unpublished data). Given their high potential for seabird fallout but the low searcher efficacy obtained in this trial, we recommend 1 Hotel Hanalei team to improve their searcher efficacy considering the recommendations given in this report and beyond and/or reduce the light pollution in their property significantly.

Conclusions

The 2023 Seabird Searcher Efficacy Trials conducted as part of the Kauai Seabird Habitat Conservation Plan (KSHCP) aimed to assess the effectiveness of search efforts at 1 Hotel Hanalei Bay. Results show a lower than anticipated searcher efficacy rate of 35%. Recommendations include improving the searching efforts for birds under cover, and time to discovery. In addition, a change in the search methodology is recommended to be able to effectively cover areas that require different search efforts (e.g. vegetated and open areas).

Searcher efficacy trials should be carried out periodically at 1 Hotel Hanalei and other KSHCP participants' premises to monitor the improvements and future needs in seabird searches.

Acknowledgments

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			Rej Cut	oorting Repo off Time · Cuto	rting ff Time -				Reported in	n		Time to			Finding Method (based on self	Location selected by		Cover	Location	Location		Visible max max (Model no longer	
Point I # r	Deployme nt Week	Decoy I	OP dec	EN COV oys deco	ER ys	Date-time of Deployment	Date-time Collection	of Reported	Time I Window	Credited	Date-time of Report	Discove (mins)	y Finder / Reporter	Reporting Method	reporting from participant)	(odd=open, even=cover)	location txt directions	category (post hoc)	lighting on decoy	vegetation openness	Overhead cover?	visible this many feet away)	Notes
1	1		505	5:53	6:33	10/11/23 18:5) 12:45	No	No	No	-			-	-	cover		cover - full	medium	closed	Yes	5	
																							very dark at night. Without light decoy only visible within 15 feet
2	2	!	799	5:55	6:35	10/16/23 19:1	7:07	No	No	No	-	-	-			open	across from the pool/beach access point under some trees	open	dark	open	No	100	or so. When collected in morning you could see the decoy from quite a distance. I would have expected this to be found if searching with flashlights
3	2	!	518	5:55	6:35	10/16/23 19:3	7:01	No	No	No						cover	in the naupaka by the entry door to the Northern wing closest to Fort Alexander.	cover - full	dark	closed	No	5	Giving full cover because of it being dark and you pretty much have to be on top of it to see
																	just off public beach access path where the path runs "under" the east side of building, next to a support beam under	9					lightly obscured by pothos leaves. Although the distance the decov is visible from is short the cover itself is not worthy of the
4	2	!	799	5:56	6:36	10/19/23 18:5	7:15	No	No	No						cover	some large pothos leaves close to a bollard light	cover - partia	medium	light	No	10	full cover definition, as you can see the decoy relatively easily when standing on the path.
5			519	5.57	6.27	10/22/22 10:5	7:16	Van	Yee	Vee	10/00/00 00:4	5 174	Jasmine (Seabird Search Teom)	toxt	Cookird Coorebo		4th floor, first wing near elevators from ground. Near the stairway access in the middle of the wing. Sitting on approximate drainage.	0.000	light	0000	No	50	Eye level sitting on concrete drainageway running parallel with
5	2		516	5.57	0.37	10/22/23 19.3	7.10	Tes	165	res	10/22/23 22.4	5 174	realit)	ICAL	Seabild Searche	a open	under a beach lounge chair near the first cabana closest to public beach	open	ligni	open	NU	50	Under a beach lounge chair. From the right angle could be seen
6	3	1	799	5:58	6:38	10/24/23 19:0	7:41	No	No	No	-	-	- (Seabird	-	-	cover	access behind the trash receptical beach side	cover - full	dark	closed (unde	er Yes	15	from a longer range but should still qualify as full cover
7	3		697	5:58	6:38	10/24/23 19:1	7:40	Yes	Yes	Yes	10/24/23 21:3	0 139	Search Team)	text	Seabird Searche	er cover	of the bar. partially under some naupaka	cover - partia	dark	medium	No	15	lightly obscured by naupaka but not enough for full cover. Not visible from the opposite side of vegetation.
						1000000 10 5		v			10/20/20 00 1		Jasmine (Seabird Search				seedlings area, first floor stairwell. Nea	r				100	reported 3 times. Very obvious location. When deployed there was a cleaning trolley near the decoy providing some fake cover if you were looking from down the hallway. But coming from the
8	4	•	697	6:01	6:41	10/30/23 18:5	8:14	Yes	Yes	Yes	10/30/23 20:4	8 110	Team)	text	Seabird Searche	er open	a cleaning trolley.	open	light	none	NO	100	other way decoy is clearly visible.
9	4	Ļ	799	6:01	6:41	10/30/23 19:0	8:04	Yes	No	No	10/31/23 7:4	5 764		text		open	on the beach hear the beds. Definitely not hidden in anyway, should have easily been found.	open	dark	none	No	100	Seemed to be an event on the beach during the deployment. Uid searchers avoid the area because of this? Decoy should have been very easy to find.
10	4	ł	518	6:01	6:41	10/30/23 18:5	8:17	No	No	No	_	-		-	-	cover	across a grassy area from the western outdoor stairs leading up from the beach. Under woody shrub but very visible.	cover - partia	dark	light	No	100	very light "cover' if someone was walking the vegetation line here the decoy should have been very obvious. I'm guessing that the searchers walk the path and scan the lawn with a flashlight and I think the decoy would probably be too far to see from the walkwav.
																							min max only if you are looking from the other side of a car.
													Jasmine (Seabird										When I was collecting the decoy a member of the public was in the process of reporting the decoy. This is one of the first and only times that a decoy was reported from someone not employeed by the resort (including 2022) dispite some decoys being in very public visible areas. This person has is a Kauai resident and has rescued NESH in the past so is familiar with the
11	4	ŀ	617	6:02	6:42	11/1/23 19:2	7:43	Yes	Yes	Yes	11/1/23 21:1	0 103	Search Team)	text	Seabird Searche	er open	under a parking lot light along the back row (northern side)	open	light	none	No	100	issues but even when he realized it was not a live bird was still willing to participate in the study by reporting the decoy. sitting on the lawn close to the edge. The fact that this was
																	same grass lawn as decov 10 hut out i						missed shows that the search team is only staying on the paths instead of walking along vegetation edges. Even if they just swept the lawn with a flashlight they would have seen it. I think this decroy and #10 shows that the search team is not reneerly doing a
12	5		241	6:06	6:46	11/6/23 19:0	7:53	No	No	No	-	-	-		-	open	nthe open	open	dark	none	No	100	seabird search.
13	F		617	6:07	6:47	11/9/23 19:0	8.07	No	No	No						cover	east of the main entrance past the bike racks. At the railing that overlooks the giant fans turn left and decoy was in the venetation by the path	cover - nartia	dark	closed	Yes	10	loosely buried in vegetation but right next to the walk way. I could see the decoy while using a flashlight but probably would need someone to
14	5		642	6:07	6:47	11/9/23 18:4	6 8:11	Yes	Yes	Yes	11/9/23 19:3	9 53	Unknown	text	Unknown	open	next to the towle hale, on the ground	open	medium	none	No	100	
45			044	0.07	6.47	44/0/00 40:0	0.04	¥	Ne	N-	44/40/00 7-0	5 747	(Loss Prevention				in the parking lot, grass strip between		1-64		Ne	400	reported by a groundskeeper to the seabird search team who
15	5	•	241	6:07	6:47	11/9/23 19:0	8 8:04	Yes	NO	NO	11/10/23 7:0	5 /1/	ream)	call		open	walkway above the giant fans East of main entrance past the bike racks.	open	light	none	NO	100	
16	7		505	6:13	6:53	11/21/23 18:2	8:02	Yes	Yes	Yes	11/21/23 19:0	4 35	Unknown	text	Unknown	open	bright light	open	dark	none	No	100	on open warkway, just outside of a service door, impossible to miss if someone walks past the location about 1m off the path in ornamental vertation. Light cover
17	g	,	505	6:23	7:03	12/5/23 18:4	7:47	No	No	No	-	-	-	-		cover	to the hallway, right of the main entrance/left of pavillion.	cover - partia	medium	medium	No	10	provided but should have been relatively easy to see if someone scanned the area with a flashlight.
18	g)	799	6:25	7:05	12/7/23 18:4	8:15	No	No	No		-	-			cover	Just off public access path ~1m off path, tucked up against the base of a palm. Slightly covered by vegetation	cover - partia	dark	medium	Yes	10	not entirely. I feel like this one could have been found by someone with a flashlight without having to leave the path. Easier to see coming downhill than up.
																	under large ornamental plants (monstera?), near the service road						along the main driveway. Right side heading out. Near the service road going downhill. Under large ornamental monstera, should have been easy to find by someone searching vegetation lines
19	g)	697	6:25	7:05	12/7/23 18:5	8:30	No	No	No	-	-	- Ignacio (Los	-	-	cover	leading downhill, close to public access path.	s cover - partia	light	light	Yes	40	with a fiashight. Area was fairly lit, especially with all the christmas lights.
20	ç	•	505	6:25	7:05	12/7/23 18:5	8:20	Yes	Yes	Yes	12/7/23 19:2	0 27	Prevention Team)	voicemail	Incidental	open	backside of the valet welcome desk area. Sitting on grass.	open	medium	none	No	100	in the open. Backside of the "port cashier" area/main entrance. Out in the open, able to be seen by cars passing by

Appendix 1 - Photos of Decoy Locations

#1 - Not Reported - Full Cover



#2 - Not Reported - Open



#3 - Not Reported - Full Cover





*Image used to show general area, the decoy #3 is not visible in this image.

#4 - Not Reported - Partial Cover





*Image used to show general area, the decoy #4 is not visible in this image.

#5 - Reported - Open



#6 - Not Reported - Full Cover





Detailed view of decoy #6

#7 - Reported - Partial Cover



#8 - Reported - Open



#9 - Not Reported - Open



#10 - Not Reported - Partial Cover



#11 - Reported - Open



#12 - Not Reported - Open



#13 - Not Reported - Partial Cover



#14 - Reported - Open

* Decoy was actually placed on the ground next to the Towel Hale but was apparently moved to the countertop at some point during the night*







#16 - Reported - Open



#17 - Not Reported - Partial Cover





*Image used to show general area, the decoy #17 is not visible in this image.

#18 - Not Reported - Partial Cover



#19 - Not Reported - Partial Cover



#20 - Reported - Open

