# Monitoring Black Oystercatcher Reaction to Sea Otter Disturbance Study Drone (UAS) Flights – Summary Report

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## Black Oystercatcher Project & Drone Monitoring

The California Central Coast Black Oystercatcher Project (BLOY Project) is part of the larger California coastwide project to assess the status and breeding success of the Black Oystercatcher (*Haematopus bachmani*), a shorebird species of conservation concern (and hereafter referred to as BLOY, using the International Ornithologists' Union's common name abbreviation). The local BLOY Project operates under Monterey Audubon Society in collaboration with the California Coastal National Monument (under the management of the US Department of the Interior, Bureau of Land Management), Pacific Grove Museum of Natural History, and California State Parks. The BLOY Project in the Monterey Bay region focuses on a section of the California coast from the northern portion of Monterey County to the southern portion of San Mateo County, California.

Part of the BLOY Project objectives are to assess the habitat and threats to the habitat and develop conservation measures to assist with the long-term success of the species. Since a drone (unmanned aerial system or UAS) can cause a major disturbance to BLOY, the BLOY Project has been working with various research teams using drones. The BLOY Project monitors these drone flights in order to: (1) record BLOY reactions to a variety of drones, drone flight patterns, and drone operations; (2) document BLOY reactions to the drones during both the breeding season and the non-breeding season; and (3) reduce or prevent disturbance by the various drone flights to BLOY and other wildlife, especially other avian species.

## BLOY Project & Involvement with Sea Otter Disturbance Study Drone Flights

Sea Otter Disturbance Study (Otter Study) researchers invited the BLOY Project staff and community science monitors to monitor for Black Oystercatcher and other avian wildlife disturbance. Other drone research projects the BLOY Project has collaborated with did not provide the time span, protocol consistency, and site diversity as the Otter Study, which included the following:

- **Flight Protocol.** Controlled research study with a single flight protocol.
- **Events & Flights.** The BLOY Project monitored 42 drone events with 108 drone flights (A ***drone event*** is a drone flight or a group of drone flights by a specific entity or organization on a specific day at a specific site or location, while a ***drone flight*** is a launching and landing of the drone regardless of the time in flight)
- **Years.** Multiple years (2020 & 2022)
- **Months.** Every month of the year, except for January
- **Weather.** Variety of weather conditions (e.g., clear & calm, cloudy, windy, & foggy)

- **Sites & Areas.** Four different launch sites in two specific areas -- San Carlos Beach-Cannery Row in Monterey (Coast Guard Pier & El Torito) and Otter Point-Perkins Park in Pacific Grove (Perkins Park Vista & Otter Point)
- **BLOY Seasons.** During both the BLOY nesting and non-nesting seasons
- **BLOY Nests & Chicks.** Situations with incubating BLOY, BLOY with chicks, and BLOY with a fledgling

## BLOY Project Monitoring Protocol for Drone Events & Flights

For every Otter Study event monitored for BLOY and avian wildlife disturbance, there were as few as one and as many as six BLOY Project monitors depending on such factors as the drone launching/landing location, the time of year, and the presence and absence of BLOY, as well as the availability of BLOY Project monitors. The normal number of BLOY Project monitors was two to three for each drone flight. At least one person was at the launch site to record the launching and landing time of each flight, as well as tracking the minute-by-minute flight, including transiting to and from the hover spots, and the descent and ascent of the drone over the otters. The BLOY Project monitor at the launch site would also inform the drone operator and Otter Study researchers of any BLOY disturbance that required the drone to be brought down. For each drone event, each BLOY Project monitor had a standard drone monitoring data sheet (Attachment 1) to track and record the drone flight(s) and any BLOY or avian wildlife reactions to the drone. At the conclusion of each drone event, the data sheets were collected, and a summary report was prepared for each event. Attachment 2 provides an example of a summary report of BLOY Project monitoring of a drone event.

## BLOY Reactions to Drone Flights

During the 42 drone events and the 108 drone flights monitored, various BLOY reactions to the drones were observed. These reactions are summarized in the attached table (Attachment 3). They can be analyzed much further, but the following is a summary in bullet form of the main findings regarding BLOY (and Western Gull) reactions, with examples from the individual flight event summary reports:

- **BLOY are most likely to react to a drone that is powering up, such as during a launch or landing or when a drone is powering to transit out or back or to another location.**

  EXAMPLES:
  - August 14, 2020: *Alarm calls (3 straight) from male BLOY during second minute of launch and transit to kelp bed and a few alarm calls from female BLOY during same time of third flight…*
  - August 5, 2020: *The brief alert or alarm calls coincided with elevating the drone to 200' during the launch and when the drone elevated to 200' before transiting back….*

- **The distance of more than 1,000' (305 meters) appears to reduce BLOY reactions to looking and listening.**

  EXAMPLE:
  - August 5, 2020: *The distance of more than 1,000' (305 meters) appears to reduce BLOY reactions to looking and listening.*

- **A BLOY initial response to a drone may be looking in the direction of the drone and/or doing head tilts searching for the drone, followed by alert calls and then alarm calls if the threat continues.** NOTE: An *alarm call* is a four-note call, three short notes followed by a long note (..._, …_, etc.), while an *alert call* is a single high-pitched note either done once or repeated (-, -, etc.).

  EXAMPLES:
  - August 14, 2022: *Alarm calls (3 straight) from male BLOY during second minute of launch and transit to kelp bed and a few alarm calls from female BLOY during same time of third flight...*
  - October 12, 2020*…BLOYs made alarm calls when the drone was at 200' transiting back.*

- **Head tilting is not a common BLOY behavioral trait, it is usually associated with the presence of a raptor, but it is also a BLOY reaction associated with a drone.**

  EXAMPLE:
  - March 2, 2022: *…the MP13 BLOY pair did about a half dozen quick looks in the direction of the drone and three head tilting occurrences were observed….*
  - September 24, 2020: *Rising 70'-130' there were 9 recorded reactions to the drone from the standing MP13 BLOY -- head tilt (n=7), looking (n=1), and standing alert (n=1). There were no raptors or any other types of birds above or nearby to cause them to look up by tilting their heads.*

- **BLOY perceive a drone as they would other avian predators.**

  EXAMPLE:
  - June 21, 2020: *BLOY will continue to look for the aerial threat* [e.g., a drone, as if it were a raptor] *but will also continue some of their normal activities while remaining alert.*

- **When continually disturbed by a drone and perceived as an immediate threat, a BLOY will do alarm calls until the drone moves out of hearing range or is brought down.**

  EXAMPLE:
  - June 24, 2022: *The two BLOY pairs heard the drone as it transited to the otters and immediately did alert and then continuous alarm calls….*

- **A BLOY with a chick or chicks is more sensitive to drone flights and will do a slightly higher pitched alarm call (a "chick alarm call") directing the chick(s) to hunker down and stay down.**

  EXAMPLE:
  - June 24, 2022: *BLOYs with a chick have the chick hunker down while the parents are doing sporadic alarm calls* [same four-note pattern but at a slightly different pitch] *and the parent pair are more concerned with the drone than a pair without chicks (or a nest with eggs), remaining alert and doing alarm calls much longer than the non-breeding pair….*

- **A BLOY will fly out towards a drone only when it perceives the drone to be an imminent threat, and most common when it has a chick(s).**

  EXAMPLES:
  - June 17, 2022: *During 2$^{nd}$ Flight with drone rising from 130' to 180' to transit back, BLOY flew out looping west in the direction of the drone and back to rock….*
  - June 24, 2022: *…during the 2$^{nd}$ Flight, one of the MP13 BLOYs flew out towards the drone, but quickly returned most likely because of the [Western Gulls] mobbing the drone.*

- **BLOY can hear drones before they see them.**

  EXAMPLES:
  - July 21, 2020: *The two drone flights demonstrated that a BLOY hears a drone before the individual BLOY sees the drone.*
  - June 24, 2022: *…when conditions are right (e.g., clear and relatively calm), BLOYs can: (1) Hear a drone more than a 1000' (approx. 300 meters) away, and (2) Hear the drone well before they see it.*

- **Terrain and man-made structures, as well as wind and waves, can enhance or restrict the ability of BLOY to hear or see drones.**

  EXAMPLES:
  - July 21, 2020: *…the nesting site is a unique location with a concrete wall buffering it from directly hearing or seeing the drone, although once the sentinel BLOY was out near the water edge, it is in direct line of sight and sound of the drone.*
  - September 25, 2020: *Based on the distance of the drone, the high surf, and the basic behavior of the birds neither BLOY was reacting to the drone.*

- **When a BLOY perceives there is no threat from the drone, it may continue with its previous routine (e.g., foraging, preening, or roosting) but remaining aware or alert, occasionally looking, head tilting, and/or briefly standing alert.**

  EXAMPLES:
  - During the 1st Flight launch, ...it appeared that BLOY was looking when drone was transiting to the location of the otters....
  - August 15, 2022: *Most common BLOY reactions recorded during the drone flights were looking (n=26, including 10 head tilting), as well as standing alert (n=18), male alert while female preening (n=9), and male preening-looking-preening (n=4).*

- **When not protecting a nesting site, BLOY may fly off to a location further away from the drone.**

  EXAMPLE:
  - April 8, 2022: …the MP9 pair took off and flew back around to the east side of Lovers Point.

- **More than half** (*n*=61) **of the 108 monitored drone flights** (57%) **had no observed BLOY reactions to the drone.**

  EXAMPLE:
  - February 25, 2022: *Based on the distance of the drone, the high surf, and the basic behavior of the birds neither BLOY was reacting to the drone.*

- **Five of the 42 drone events monitored** (12%) **had no BLOY presence.**

  EXAMPLE:
  - April 25, 2022: *MP 9 BLOY pair or any other BLOY were not seen or heard during the 3 flights.*

- **Western Gulls (WEGU) were the only other avian species that reacted as vigorously, if not more, to drones as the BLOY.** As seen in Attachment 3, at least 42 (39%) of the 108 drone flights involved WEGU reactions. On nine occasions the drone was brought in because of WEGU mobbing or threatening to attack the drone. On one flight, a WEGU hit the drone, damaging a propeller and ending the drone flights for the day.

EXAMPLES:

- April 13, 2022: *During the 10th minute of the 2nd Flight, Western Gulls called and flew out around the drone and gulls remained flying around the drone until it transited back 12-minutes later.*
- August 12, 2022: *When drone powered up and transited back, eight WEGU followed the drone until it landed.*
- September 9, 2022: *During 5th minute, one WEGU flying close to drone, joined by a second WEGU in 8th minute. One WEGU hit the drone in 9th minute, impairing drone propeller and causing flight to end.*

- **Other than BLOY and WEGU, no other avian species had more than a slight reaction to the drone.**

EXAMPLES:

- September 2, 2022: *Surfbird aware of drone and looking.*
- March 11, 2022: *At the time of the 3rd Flight, a Curlew, standing on a rock about 25 meters (82') west of the launch site, called and flew off at the time the drone had launched to 200' and was transiting out to the otters.*

## Recommendations

- Avoid flying drones in the vicinity of nesting (incubating and especially hatching) BLOY.
- Whenever possible, keep drone flights more than 1000' (at least 300 meters) away from active BLOY nesting sites during the BLOY nesting season (mid-April to mid-September along the California central coast). NOTE: This distance from an active nesting site, however, can vary depending on the terrain, type of man-made structures (e.g., multi-storied buildings or concrete walls), and/or weather conditions around the nesting site and/or in the vicinity of the drone flight area.
- Launch/land sites should be chosen carefully, with terrain, man-made structures, and weather conditions scrutinized for possible noise and visual impact to BLOY.
- Listen for alarm calling or more noise from BLOY than typically heard and look for BLOY (and WEGU) chasing and mobbing a drone. If this behavior is observed, immediately bring in the drone.
- Drone propeller guards and noise-reducing propellers should be used for drones flying in coastal areas.
- The use of smaller and quieter drone models appears to be less impactful to BLOY than larger and louder drone models.
- Trained and experienced BLOY monitors are needed in key locations to recognize the extent and degree of BLOY reaction to the drone flight, as well as specific adjustments needed to the drone operation (e.g., moving launch/landing site, adjusting drone flight pattern, or bringing in the drone when harm to the BLOY or drone are possible).
- Ensure sufficient pre-launch time is provided for BLOY and wildlife monitors to conduct a preliminary survey of the drone flight area for BLOY and other wildlife that may be affected by the drone.

- It is important that the researchers, BLOY monitors, and drone operators communicate and work closely and collaboratively before, during, and after each flight to ensure the safety of the BLOY and the success of the drone flights.

# BLOY Project Drone Monitoring Data Sheet

NAME: Weather:

DATE: Tide State: Location:

| TIME | BLOY Territory | # OF BLOY | BLOY RXN | APPROACH OF DRONE (landing, launching, hovering, veritical or horizontal) and distance to animals (feet) | DRONE TYPE | VIDEO OR PHOTO TAKEN? | OTHER FACTORS | COMMENTS: Duration of activity. What were birds/animals doing prior to disturbance? Observer location relative to wildlife and UAS pilot. Height of drone. |
|---|---|---|---|---|---|---|---|---|
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**Type of Reaction:**

**AL** = Alert call
**L** = Looking around
**AC** = Alarm calling
**F** = Flushed
**N** = No Reaction
**T** = Territorial display
**SF** = Stops foraging
**HR** = Head raise, keeps disturber in sight

**Other Factors:**

**1** = Other BLOY (territorial/general disturbance)
**2** = Other predators
**3** = People nearby
**4** = Other bird species
**5** = boats, helicopter, airplane, loud car/truck
**6** = Other marine mammals (i.e. harbor seal)

**Drone Approach Path:**

**LA** = Launch/Land
**BC** = Flyby for battery change (to get to/from launch site)
**TR** = Transect flight
**HO** = Hover

**Drone Type:**

**M** = Meredith/ **H** = Heidi
**O** = Otter study
**W** = Wild Space

**ATTACHMENT 1**

**BLOY MONITORING OF DRONE (UAV) FLIGHTS**
**SUMMARY REPORT**
**EXAMPLE**

**Research Project:** Sea Otter Disturbance Study

**Institution/Organization(s):** California Department of Fish & Wildlife, USFWS, & Sea Otter Savvy (SOS)

**Date:** **June 24, 2022** **Scheduled Flight Time:** 0930-1100

**Location:** **Coast Guard Pier** (CGP), Monterey, CA **BLOY Territory:** **MP13** & **MP18**

**Weather:** Clear with fog moving in & out with slight breeze out of SSW, 53F **Tide:** Low High Tide at 0909 at +3.10'

**Drone Model:** DJI Mavic 2 Pro **Color:** Dark Gray **Flight Altitude:** 60'-180'

**Drone Specifications:** Hasselblad camera with 24mm wide angle lens; battery life about 30 minutes

**Drone Operator:** Jim Pinckney, professional photographer

**Otter Observers:** Colleen Young (CDFW-OSPR), Lillian Carswell (USFWS), & Michelle Staedler (SOS)

**BLOY Monitors:** H.E. Hanks (at El Torito), Amanda Preece (at launch site/CGP) & Miguel Alverado (at Chart House)

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0900 At El Torito for a pre-flight check; **MP13** BLOY pair with 1 large chick – 1 adult with chick & other adult flew in provisioning

0910 1 **MP13** adult BLOY chasing **MP18** pair; Chick sat until other **MP13** adult came in with food, chick stood & quickly consumed food, then sat in rest mode

0940 1 **MP13** adult & chick sitting in rest mode

0945 2 fishermen on rocks on west side of San Carlos Beach

0947 Chick standing & moving around a little & preening

0956 2nd **MP13** adult flew in from west, then both **MP13** adults called & flew off west to north side of El Torito

0957 1 **MP18** foraging on north side of Chart House Rock, while 2nd **MP18** BLOY standing preening about 2 meters away

0959 **MP13** pair back provisioning chick

1000 1 **MP13** took off west towards north side of El Torito

1002 1 **MP13** standing in sentinel mode, while chick sitting among rocks closer to shoreline

1004 Kayakers moving closer to **MP18** pair on north end of Chart House Rock but about 40 meters away

1008 Kayakers passed with no disturbance to **MP18** pair – 1 foraging & 1 preening

1010 Both **MP13** adult BLOYs standing on boulders on either side of sitting chick in rest mode

1016 **MP13** pair called & flew to north side of El Torito

**ATTACHMENT 2-1**

**BLOY DRONE MONITORING – 06/24/2022** (Cont'd)

**1st LAUNCH: Manually-controlled hover drop 180' to 60' at 1-minute 10' intervals**
**[Note: actual drone altitudes are reported here and were adjusted to correct for the elevation of the observers/drone launch site so that the drone would be the correct altitude above the focal otters.]**

1017 **DRONE LAUNCHED** from beach up to 193' & transit to otters

1018 Hover at 193' to find otters to be monitored; **Alarm calls from both MP13 & MP18 pair; MP13** pair flew to lower rocks along shoreline; **MP18** pair flew to lower rocks on SW side of Chart House Rock & stood together

1020 Drop to 133'; **MP13** pair back with chick & **doing alarm calls at least 6 times**

1021 Drop to 123'

1022 Drop to 113'

1023 Drop to 103'

1024 Drop to 93'

1025 Drop to 83'; **MP13 pair standing aware of drone**; **MP18 still standing together alert**; WEGUs mobbing & diving on drone

1026 Drop to 73'

1027 Drop to 63'

1028 Drop to 53'

1029 Up to 190' to shake WEGUs

1030 Drop to 73'; Both **MP13** & **MP18 pairs standing alert with occasional alarm calls**

1031 Hold at 73'

1032 Up to 190' **to bring back since WEGUs mobbing drone**

1033 Up to 190' transited back; **Heard about 3 alarm calls from MP13 & head tilts**

1034 **DRONE LANDING** (17-minute flight); **MP13** pair in rest mode & **MP18** sitting quietly

1037 1 **MP13** BLOY standing & looking around, while other in rest mode 1040 1 **MP13** BLOY flew off to forage

**2nd LAUNCH: Manually-controlled hover drop 180' to 60' at 1-minute 10' intervals**

1042 **DRONE LAUNCHED** up to 190' and transit to otters

1043 Transit to otters: WEGUs back out to mob drone

1044 Attempted to avoid WEGUs; **MP13 BLOY head tilt toward drone**

1045 **Maneuvered to avoid WEGUs**; **Alarm calls from MP18 pair** then sat quietly, while **1 MP13 BLOY flew out toward the drone but almost immediately turned back, presumably due to the number of WEGUs mobbing the drone and** flew to low concrete block on east side of cormorant nesting platform (old cannery remnant) and **stood alert**.

1046 Transited back; **MP18 stood together**

**ATTACHMENT 2-2**

**BLOY DRONE MONITORING – 06/24/2022** (Cont'd.)

1047 Drop to 0' to land; **MP13** **BLOY** on east side of cormorant platform still **standing & looking**

1049 **DRONE LANDED** (7-minute flight); Ended flights

1051 **1** **MP13** sentinel standing alert about 5 meters from standing chick, then a couple alarm calls from adult

1052 1 **MP13** sentinel standing on triangular concrete slab above chick

1053 **MP13** mate back with mussel meat, but standing alert & looking around distracted

1055 While distracted, **MP13** with mussel meat dropped it, then took it to water to drip it

1056 **MP13** provisioning BLOY kept meat, but **MP13** sentinel stood alert with chick hunkered down on south side of the triangular concrete slab

**OBSERVATION SUMMARY:**

- Attempted 2 hover drops (14 & 7 minutes sequentially) launched from south end of Coast Guard Pier and east side of San Carlos Beach in Monterey.
- Both flights were shorted due to WEGUs mobbing the drone – 1st Flight in 15th minute and 2nd Flight in 1st minute while transiting out.
- **MP13 with 1 large chick** (4-weeks old) and **MP18** **pair**s were present.
- Both BLOY pairs were aware of the drone, and during the 1st flight the BLOYs reacted as follows:
  - 1017: Launched and within a couple minutes, while hovering at 193' to find otters, there were alarm calls from both **MP13** and **MP18** BLOY pairs – **MP13** pair called and flew to lower rocks along shoreline and **MP18** pair called and flew to lower rocks on southwest side of Chart House Rock, and both pairs stood alert.
  - 1020: Drone dropped to 133', the **MP13** pair was back with the chick, but did alarm calls at least a half-dozen times.
  - 1025: Drone dropped to 83', both **MP13** and **MP18** pairs were standing alert.
  - 1030: Drone dropped to 73', both **MP13** and **MP18** pairs were standing alert making occasional alarm calls.
  - 1033: Drone up to 190' and transited back, there were about 3 alarm calls from **MP13** and a few head tilts; **MP18** sat quietly together.
- Both BLOY pairs were also aware of the drone during the brief 2nd flight, and the BLOYs reacted as follows:
  - 1042: Drone launched up to 190' and began transiting to otters, but WEGUs flew out towards drone.
  - 1044: **MP13** BLOY head tilt toward drone.
  - 1045: Alarm calls from **MP18** pair and then sat quiet, while 1 **MP13** BLOY flew out toward the drone but turned back almost immediately, presumably due to the number of WEGUs mobbing the drone and flew to low concrete block on east side of old cannery platform remnant and stood alert.

**ATTACHMENT 2-3**

**BLOY DRONE MONITORING – 06/24/2022** (Cont'd.)

- The launch site at the west end of the Coast Guard Pier and the southern end of San Carlos Beach in Monterey was almost 2000' (600 meters) from the location of the two BLOY pairs – **MP13** and **MP18**.
- The otters involved in the drone flights were located about 670' (200 meters) from the **MP18** BLOYs on Chart House Rock and about 800' (240 meters) from the **MP13** BLOYs on the rubble south southeast of El Torito Restaurant.
- The drone launch site was almost 2000' (approx. 600 meters) from El Torito restaurant and about 1000' (approx. 300 meters) from the Chart House.
- The two BLOY pairs heard the drone as it transited to the otters and immediately did alert and then alarm calls, and during the 2nd Flight, one of the **MP13** BLOYs actually flew out towards the drone, but quickly returned most likely because of the WEGUs mobbing the drone.
- These observations indicates that when conditions are right (e.g., clean and relatively calm), BLOYs can: (1) Hear a drone more than a 1000' (approx. 300 meters) away, and (2) Hear the drone well before they see it.
- Also, BLOYs with a chick have the chick hunker down during alarm calls and the parent pair are more concerned with the drone than a pair without chicks (or a nest with eggs), remain alert and doing alarm calls much longer that the non-breeding pair (or at least non-breeding at the time).

**ATTACHMENT 2-4**

## BLACK OYSTERCATCHER (BLOY) MONITORING OF DRONE (UAS) FLIGHTS
## Sea Otter Disturbance Study

California Department of Fish & Wildlife, US Fish & Wildlife Service, & Sea Otter Savvy

*BLOY monitoring by California Central Coast Black Oystercatcher Project*

| Date (MM/DD/YYYY) | Location | Flight | Nesting Status | BLOY Pair(s) & Interlopers | NO Reaction | Looking &/or Head Tilting | Alert Calls | Alarm Calls | Flew Off or Out | Flew at Drone | WEGU Reaction | Other Avian Species RXN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 07/21/2020 | CGP | 1st Flight | INC | MP13 | -- | X | XXX | -- | X | -- | -- | -- |
| TEST FLIGHT | | 2nd Flight | INC | MP13 | -- | XX | XXX | X | -- | -- | -- | -- |
| 08/05/2020 | OP | 1ST Flight | NN | MP9 | NP | -- | -- | -- | -- | -- | XXX | -- |
| TEST FLIGHT | | 2nd Flight | NN | MP9 | -- | XXX | XX | -- | -- | -- | X | -- |
| | | 3rd Flight | NN | MP9 | NP | -- | -- | -- | -- | -- | XX | -- |
| 08/14/2020 | CGP | 1ST Flight | INC | MP13 | -- | XXX | X | X | -- | -- | XX | -- |
| | | 2nd Flight | INC | MP13 | -- | XXX | -- | -- | -- | -- | X | -- |
| | | 3rd Flight | INC | MP13 | -- | XXX | X | XX | -- | -- | XX | -- |
| 09/08/2020 | OP | 1st Flight | NN | MP9 | NR | -- | -- | -- | -- | -- | -- | -- |
| | | 2nd Flight | NN | MP9 | NR | -- | -- | -- | -- | -- | -- | -- |
| | | 3rd Flight | NN | MP9 | -- | -- | XX | -- | Out | -- | X | -- |
| 09/22/2020 | OP | 1st Flight | NN | MP9 | NP | -- | -- | -- | -- | -- | XXX | -- |
| | | | n/a | UK fledgling | NR | -- | -- | -- | -- | -- | " | -- |
| 09/22/2020 | CGP | 1st Flight | NN | MP13 | NP | -- | -- | -- | -- | -- | -- | -- |
| | | 2nd Flight | NN | MP13 | NP | -- | -- | -- | -- | -- | -- | -- |
| | | 3rd Flight | NN | MP13 | NP | -- | -- | -- | -- | -- | X | -- |
| 09/24/2020 | CGP | 1st Flight | NN | MP13 | NP | -- | -- | -- | -- | -- | -- | -- |
| | | 2nd Flight | NN | MP13 | -- | XXX | -- | -- | -- | -- | X | -- |
| 09/25/2020 | OP | 1st Flight | NN | MP9 | NR | -- | -- | -- | -- | -- | -- | -- |
| | | 2nd Flight | NN | MP9 | NR | -- | -- | -- | -- | -- | -- | -- |
| | | 3rd Flight | NN | MP9 | NR | -- | -- | -- | -- | -- | -- | -- |
| 10/12/2020 | CGP | 1st Flight | NN | MP13 | -- | X | -- | X | -- | -- | -- | -- |
| | | 2nd Flight | NN | MP13 | -- | XX | X | -- | -- | -- | -- | -- |
| | | 3rd Flight | NN | MP13 | -- | X | X | XX | -- | -- | -- | -- |
| 10/22/2020 | OP | 1st Flight | NN | UK fledgling | -- | -- | X | -- | Off | -- | XX | -- |
| 10/22/2020 | CGP | 1st Flight | NN | MP13 | NP | -- | -- | -- | -- | -- | -- | -- |
| 10/30/2020 | CGP | 1st Flight | NN | MP13 | -- | XX | -- | -- | -- | -- | X | -- |
| | | 2nd Flight | NN | MP13 | -- | X | -- | -- | -- | -- | X | -- |
| | | 3rd Flight | NN | MP13 | -- | X | -- | -- | -- | -- | X | PECO |
| 02/25/2022 | PPV | 1st Flight | NN | MP9 | -- | -- | X | -- | X | -- | -- | -- |
| | | 2nd Flight | NN | MP9 | NR | -- | -- | -- | -- | -- | -- | -- |
| | | 3rd Flight | NN | MP9 | NR | -- | -- | -- | -- | -- | -- | -- |
| | | 4th Flight | NN | MP9 | NR | -- | -- | -- | -- | -- | -- | -- |
| 03/02/2022 | CGP | 1ST Flight | NN | MP13 | -- | XXX | -- | -- | -- | -- | -- | -- |
| | | 2nd Flight | NN | MP13 | -- | XX | -- | -- | -- | -- | -- | -- |
| | | 3rd Flight | NN | MP13 | NR | -- | -- | -- | -- | -- | -- | -- |
| 03/11/2022 | CGP | 1st Flight | NN | MP13 | NR | -- | -- | -- | -- | -- | -- | -- |
| | | 2nd Flight | NN | MP13 | NR | -- | -- | -- | -- | -- | -- | -- |
| | | 3rd Flight | NN | MP13 | NR | -- | -- | -- | -- | -- | -- | Curlew |
| 03/14/2022 | PPV | 1st Flight | NN | MP9 | NR | -- | -- | -- | -- | -- | XX | -- |
| | | 2nd Flight | NN | MP9 | NR | -- | -- | -- | -- | -- | -- | -- |
| | | 3rd Flight | NN | MP9 | NR | -- | -- | -- | -- | -- | -- | -- |
| 04/08/2022 | PPV | 1st Flight | NN | MP9 | NR | -- | -- | -- | -- | -- | XX | -- |
| | | 2nd Flight | NN | MP9 | -- | --- | -- | -- | Off | -- | -- | -- |
| 04/13/2022 | CGP | 1st Flight | NN | MP13 | NR | -- | -- | -- | -- | -- | -- | -- |
| | | 2nd Flight | NN | MP13 | NR | -- | -- | -- | -- | -- | XXX | --- |
| | | 3rd Fight | NN | MP13 | NR | -- | -- | -- | -- | -- | XX | -- |
| | | 4th Flight | NN | MP13 | NR | | | | | | | |
| 04/25/2022 | PPV | 1st Flight | NN | MP9 | NP | -- | -- | -- | -- | -- | -- | -- |
| | | 2nd Flight | NN | MP9 | NP | -- | -- | -- | -- | -- | -- | -- |
| | | 3rd flight | NN | MP9 | NP | -- | -- | -- | -- | -- | -- | -- |
| 05/05/2022 | PPV | 1st Flight | NN | MP9 | NR | -- | -- | -- | -- | -- | XX | -- |
| | | 2nd Flight | NN | MP9 | NR | -- | -- | -- | -- | -- | -- | -- |
| | | 3rd Flight | NN | MP9 | NR | -- | -- | -- | -- | -- | -- | -- |
| 05/18/2022 | PPV | 1st Flight | NN | MP9 | NR | -- | -- | -- | -- | -- | -- | -- |
| | | 2nd Flight | NN | MP9 | NR | -- | -- | -- | -- | -- | -- | -- |
| | | 3rd Flight | NN | MP9 | NR | -- | -- | -- | -- | -- | -- | -- |
| 05/23/2022 | CGP | 1st Flight | INC | MP13 | -- | -- | -- | X | -- | -- | -- | -- |
| | | 2nd Flight | INC | MP13 | NR | -- | -- | -- | -- | -- | -- | -- |
| | | 3rd Flight | INC | MP13 | NR | -- | -- | -- | -- | -- | -- | -- |
| 05/25/2022 | PPV | 1st Flight | NN | MP9 | NR | -- | -- | -- | -- | -- | -- | -- |
| | | 2nd Flight | NN | MP9 | NR | -- | -- | | -- | -- | -- | -- |
| | | 3rd Flight | NN | MP9 | NR | -- | -- | -- | -- | -- | -- | -- |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

**ATTACHMENT 3-1**

| Date (MM/DD/YYYY) | Location | Flight | Nesting Status | BLOY Pair(s) & Interlopers | NO Reaction | Looking &/or Head Tilting | Alert Calls | Alarm Calls | Flew Off or Out | Flew at Drone | WEGU Reaction | Other Avian Species RXN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 06/03/2022 | CGP | 1st Flight | PVC | MP13 | -- | X | X | -- | -- | -- | -- | -- |
| | | | NN | MP18 | NR | -- | -- | -- | -- | -- | -- | -- |
| | | 2nd Flight | PVC | MP13 | -- | X | X | -- | -- | -- | XX | -- |
| | | | NN | MP18 | -- | X | -- | -- | -- | -- | -- | -- |
| | | 3rd Flight | PVC | MP13 | NR | -- | -- | -- | -- | -- | XX | -- |
| | | | NN | MP18 | NR | -- | -- | -- | -- | -- | -- | -- |
| 06/17/2022 | PPV | 1st Flight | NN | MP9 | NR | -- | -- | -- | -- | -- | X | -- |
| | | 2nd Flight | NN | MP9 | -- | -- | -- | -- | Out | -- | XX | -- |
| | | 3rd Flight | NN | MP9 | NR | -- | -- | -- | -- | -- | X | -- |
| 06/24/2022 | CGP | 1st Flight | PVC | MP13 | -- | X | -- | XXX | -- | -- | XXX | -- |
| | | | NN | MP18 | -- | X | -- | XX | -- | -- | -- | -- |
| | | 2nd Flight | PVC | MP13 | -- | X | -- | -- | -- | X | XXX | -- |
| | | | NN | MP18 | -- | X | -- | X | -- | -- | ?? | -- |
| 07/21/2022 | CGP | 1st Flight | | MP13 | -- | X | X | X | -- | -- | ?? | |
| | | 2nd Flight | | MP13 | -- | X | X | X | -- | -- | | |
| 08/01/2022 | PPV | 1st Flight | NN | MP9 | -- | -- | X | -- | Off | -- | -- | -- |
| | | 2nd Flight | NN | MP9 | NR | -- | -- | -- | -- | -- | -- | -- |
| | | 3rd Flight | NN | MP9 | NR | -- | -- | -- | -- | -- | XX | -- |
| 08/12/2022 | PPV | 1st Flight | NN | MP9 | NR | -- | -- | -- | -- | -- | XX | -- |
| | | 2nd Flight | NN | MP9 | NR | -- | -- | -- | -- | -- | XX | -- |
| | | 3rd Flight | NN | MP9 | NR | -- | -- | -- | -- | -- | XX | -- |
| 08/15/2022 | CGP | 1 st Flight | PVF | MP13 | NR | -- | -- | -- | Off | -- | XXX | -- |
| | | | NN | MP18 | NR | -- | -- | -- | -- | -- | -- | -- |
| 08/15/2022 | PPV | 1 st Flight | NN | MP9 | NR | -- | -- | -- | -- | -- | -- | -- |
| | | 2nd Flight | NN | MP9 | NR | -- | -- | -- | -- | -- | -- | -- |
| 08/16/2022 | PPV | 1 st Flight | NN | MP9 | NR | -- | -- | -- | -- | -- | -- | -- |
| | | 2nd Flight | NN | MP9 | NR | -- | -- | -- | -- | -- | -- | -- |
| 09/02/2022 | PPV | 1 st Flight | NN | MP9 | NR | -- | -- | -- | -- | -- | -- | Surfbird aware |
| | | 2nd Flight | NN | MP9 | -- | -- | -- | X | -- | -- | -- | -- |
| | | 3rd Flight | NN | MP9 | NR | -- | -- | -- | -- | -- | -- | Surfbird looking |
| 09/07/2022 | CGP | 1 st Flight | NN | MP13 | NR | -- | -- | -- | -- | -- | XX | -- |
| | | | NN | MP18 | -- | X | -- | -- | -- | -- | " | -- |
| | | 2nd Flight | NN | MP13 | NR | -- | -- | -- | -- | -- | -- | -- |
| | | | NN | MP18 | -- | X | -- | -- | -- | -- | -- | -- |
| | | 3rd Flight | NN | MP13 | NR | -- | -- | -- | -- | -- | -- | -- |
| | | | NN | MP18 | NR | -- | -- | -- | -- | -- | -- | -- |
| 09/09/2022 | CGP | 1st Flight | NN | MP13 | NR | -- | -- | -- | -- | -- | XXX | [WEGU broke prop] |
| | | | NN | MP18 | NR | -- | -- | -- | -- | -- | XXX | " |
| 09/23/2022 | PPV | 1st Flight | NN | MP9 | NR | -- | -- | -- | -- | -- | -- | BLTU |
| | | 2nd Flight | NN | MP9 | -- | X | -- | -- | -- | -- | -- | -- |
| | | 3rd Flight | NN | MP9 | NP | -- | -- | -- | -- | -- | -- | -- |
| 09/24/2022 | CGP | 1st Flight | NN | MP13 | -- | -- | -- | -- | -- | -- | -- | -- |
| | | 2nd Flight | NN | MP13 | -- | XX | -- | -- | -- | -- | XX | -- |
| 10/11/2022 | CGP | 1st Flight | NN | MP13 | NR | -- | -- | -- | -- | -- | XXX | -- |
| 10/17/2022 | PPV | 1st Flight | NN | MP9 | NP | -- | -- | -- | -- | -- | -- | -- |
| | | 2nd Flight | NN | MP9 | NP | -- | -- | -- | -- | -- | -- | -- |
| | | 3rd Flight | NN | MP9 | NP | -- | -- | -- | -- | -- | X | -- |
| 11/22/2022 | PPV | 1st Flight | NN | MP9 | NP | -- | -- | -- | -- | -- | X | -- |
| | | 2nd Flight | NN | MP9 | NP | -- | -- | -- | -- | -- | -- | -- |
| | | 3rd Flight | NN | MP9 | NP | -- | -- | -- | -- | -- | -- | -- |
| 11/30/2022 | CGP | 1st Flight | NN | MP13 | -- | -- | -- | -- | Off | -- | XX | -- |
| | | 2nd Flight | NN | MP13 | NP | -- | -- | -- | -- | -- | XX | -- |
| | | 3rd Flight | NN | MP13 | NP | -- | -- | -- | -- | -- | XX | -- |
| 12/14/2022 | ET | 1st Flight | NN | MP13 | -- | -- | -- | X | -- | -- | -- | -- |
| | | | NN | MP18 | NR | -- | -- | -- | -- | -- | -- | -- |
| | | 2nd Flight | NN | MP13 | -- | -- | -- | X | -- | -- | -- | -- |
| | | | NN | MP18 | NR | -- | -- | -- | -- | -- | -- | -- |
| | | 3rd Flight | NN | MP13 | -- | -- | -- | X | -- | -- | XX | -- |
| | | | NN | MP18 | NR | -- | -- | -- | -- | -- | -- | -- |
| | | | | | | | | | | | | |

**KEY:**

| | |
|---|---|
| BLOY | Black Oystercatcher |
| BLTU | Black Turnstone |
| CGP | Coast Guard Pier |
| ET | El Torito |
| INC | Incubating |
| MP | Monterey Peninsula (monitoring section) |
| NN | Not Nesting |
| NP | Not Present |
| NR | No Reaction |
| OP | Otter Point |
| PECO | Pelagic Cormorant |
| PPV | Perkins Park Vista |
| PVC | Provisioning Chick(s) |
| PVF | Provisioning Fledgling(s) |
| RXN | Reaction |
| UK | Unknown/Unaccounted |
| WEGU | Western Gull |
| X | Slight |
| XX | Moderate |
| XXX | Extensive |
| -- | Nothing observed (space filler) |

**ATTACHMENT 3-2**