

**Black Oystercatcher Reproductive Success  
California Central Coast, Monterey Bay Region  
2020**

Northern Monterey County  
(Point Lobos State Natural Reserve to City of Monterey)  
and  
Northern Santa Cruz County to Southern San Mateo County  
(Natural Bridges State Beach to Pescadero State Beach)



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## INTRODUCTION – STUDY AREAS

In 2020, the California Central Coast Black Oystercatcher Project monitored nesting activity for a total of 73 Black Oystercatcher (*Haematopus bachmani*) territories with currently 68 territorial pairs in the Monterey Bay region, from Point Lobos State Natural Reserve to Pescadero State Beach. This covers coastal sections in three counties and approximately 160 kilometers (100 miles) of coastline. The Monterey Bay region is separated into two study areas: Monterey Bay South Coast (northern Monterey County) and Monterey Bay North Coast (northern Santa Cruz County and southern San Mateo County) (Figure 1).

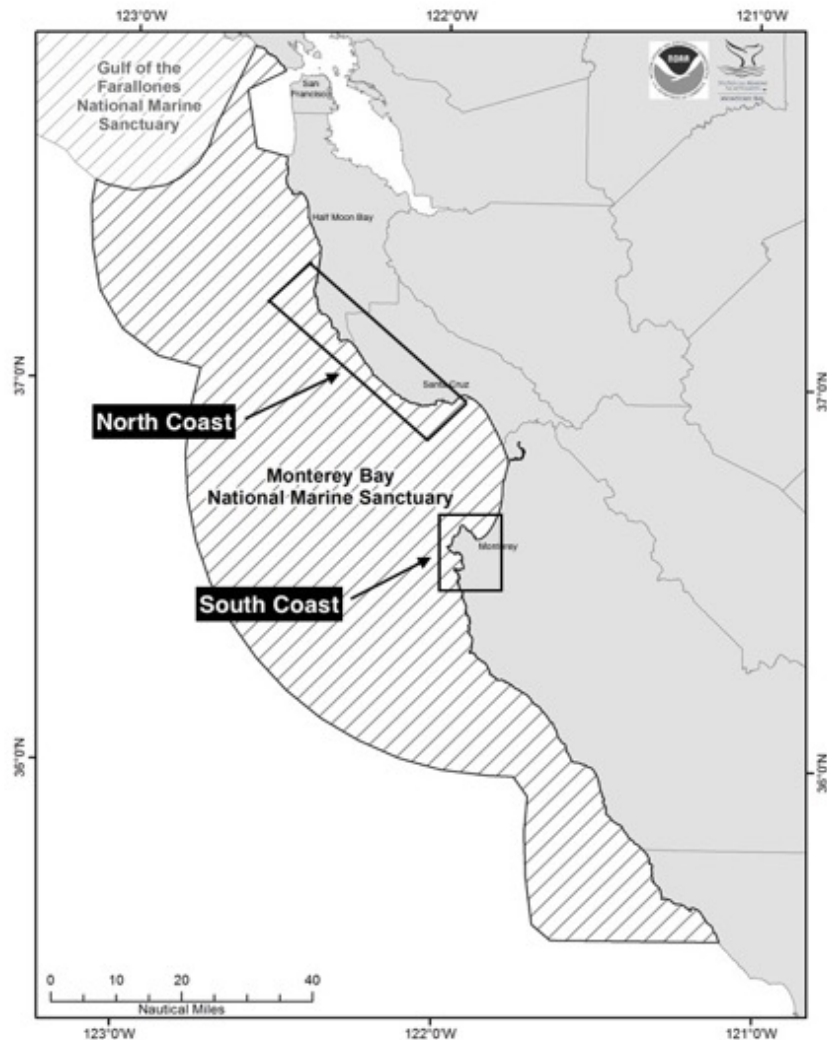


Figure 1. Map showing Monterey Bay South Coast and North Coast Study Areas

The separation of the Monterey Bay region into two study areas was done for the following reasons: (1) there is a large stretch of sandy shoreline of about 55 kilometers (34 miles) that separates the two study areas; (2) one side of the coast had more monitoring history; and (3) the separation allows for a clear comparison of the productivity between the two study areas.

The Monterey Bay South Coast study area (South Coast) is located along the northern portion of the Monterey County coast extending north from the south end of Point Lobos State Natural Reserve to the Coast Guard Pier in the City of Monterey and is broken into three monitoring sections: (1) Point Lobos (PL) (Point Lobos State Natural Reserve), (2) Pebble Beach (PB) (Stillwater Cove to Point Joe), and (3) Monterey Peninsula (MP) (Asilomar State Beach to Monterey). Both the Monterey Peninsula monitoring section and the Point Lobos monitoring section are completely covered, while the Pebble Beach monitoring section has a number of small breaks due to private property access restrictions.

The Monterey Bay North Coast study area (North Coast) extends north from the south end of Natural Bridges State Beach to the north end of Pescadero State Beach and consists of two monitoring sections: (1) northern Santa Cruz County coast (SC) and (2) southern San Mateo County coast (SM). It needs to be noted that each of the monitoring sections in the North Coast does not include the entire area of each section of coastline. The Santa Cruz monitoring section includes Natural Bridges State Beach, then a break until Wilder Ranch State Park's Wilder Beach to Three-Mile Beach, then a break until Yellow Bank Cove to Davenport, and finally a break until Pelican Rock to Greyhound Rock. The San Mateo monitoring section includes only the area around Pigeon Point Light Station State Historic Park and the coastline of Pescadero State Beach, this does not include Año Nuevo State Park. Images 1 through 9 in Appendix 1 show all of the monitoring sections in the Monterey Bay region.

### **Covid-19 Restrictions**

The 2020 monitoring season got off to a late start due to Covid-19 restrictions around the Monterey Bay area. Consistent weekly monitoring for most territories did not begin until mid-May. For a major part of the breeding season, special permission was granted to the staff of this project to enter Point Lobos State Natural Reserve during the Reserve's closure, but most importantly during the months of May and June. In addition, Stanford University's Hopkins Marine Station was closed to all access from March through September, allowing for no Black Oystercatcher monitoring on the marine station's grounds during that entire time.

### **California Fires**

In August, extra-ordinary weather events occurred beginning with lightning storms that produced some of the worst fires seen along the California Central Coast in 100 years. In the Monterey Bay region, there were four major fires that burned simultaneously. These were: (1) CZU Lightning Complex fires that started on 16 August on the west side of Santa Cruz County and burned into San Mateo County, continuing through September; (2) River Fire that broke out on 16 August on the east side of Salinas and burned south toward Gonzales and west towards Carmel Valley, burning for 19 days; (3) Carmel Fire that started 18 August on the Sky Ranch in Carmel Valley and burned from east of Gonzales and north to the southern end of Salinas, also

burned for 19 days; and (4) Dolan Fire that broke out on 18 August on the Monterey Ranger District of the Los Padres National Forest and burned northwest towards Fort Ord National Monument and continued burning in its interior into December. There were also fires burning all over the state due to the lightning storms. Along the North Coast, not only did the fires burn to the coastline in a few places, but smoke and particulates were very heavy for weeks across the entire state and out over the ocean. This also caused a health hazard for humans, and affected wildlife as well (See *Disturbance*). During this time many of the monitoring sites had limited accessibility and were too smoky to safely monitor.

## **METHODS**

The monitoring methodology used is based on the Black Oystercatcher standardized protocols for monitoring population size and reproductive success developed by the US Geological Survey (Elliott-Smith and Haig 2011), with slight modifications adapted by Audubon California. The primary monitoring usually is conducted during the breeding season from mid-April through the end of September. Due to Covid-19 restrictions as stated above, regular monitoring occurred from 15 May to 15 October. However, since there was some monitoring related to nesting activities in the later portion of April and the monitoring of fledgling related activities in October, we elected to focus the 2020 monitoring data for a monitoring period from 15 April to 15 October.

Although the project is overseen by professional biologists from Audubon California and the US Department of the Interior-Bureau of Land Management's California Coastal National Monument, it is currently operated as a community science effort using volunteers and docents from the Pacific Grove Museum of Natural History and Point Lobos State Natural Reserve. All of the Monterey Bay region's Black Oystercatcher monitors are also California Coastal National Monument volunteers. More than 30 community science volunteers were involved in the breeding season monitoring.

For 2020, with key funding from an anonymous donor and additional funding from other entities and various individuals, the California Central Coast Black Oystercatcher Project was able to continue the hiring of a Project Biologist and a Project Intern/Assistant Project Biologist. The Project Biologist covered all of the North Coast Black Oystercatcher territories once a week and all of the South Coast Black Oystercatcher territories once a month, while the Project Intern/Assistant Project Biologist covered all of the South Coast Black Oystercatcher territories once a week. In addition, due to closures of the Point Lobos State Natural Reserve and State Park's restrictions regarding the use of docents, the Project Biologist did weekly monitoring at Point Lobos State Natural Reserve with the Project Intern/Assistant Project Biologist and the Regional Coordinator. Collectively, this provided a consistent monitoring base for each of the 73 Black Oystercatcher territories throughout the Monterey Bay region.

Black Oystercatcher territory size was determined based on observations made of the individual Black Oystercatcher pair's foraging distance, encounters with neighboring pairs, and distance covered during territorial chases of interloping Black Oystercatchers, as well as areas traveled with young to forage post fledging. Google Earth Pro was used to obtain GPS coordinates, map nest locations, and delineate territory size.

Observations were made using binoculars and spotting scopes from land at each Black Oystercatcher territory for a minimum of 30 to 60 minutes at least once a week during the initial portion of the breeding season. At nesting sites with incubation, the minimal observation time may have reduced to about 15 to 20 minutes, while for those nesting sites with chicks, the observations may have increased to 60 minutes or more while chicks were present or if other Black Oystercatcher activity warranted much longer observations.

In some cases, volunteer monitors with assigned territories made observations almost daily, but at a minimum once a week. In the South Coast, nests with known hatching dates, chicks, or near areas with high human disturbance were monitored more frequently than the minimum in order to document nesting success, predation, human interaction, and inform people about wildlife disturbance and Black Oystercatchers. In the North Coast, part of the Wilder Ranch State Park portion in the Santa Cruz monitoring section includes approximately 6.5 kilometer (4 miles) of a coastline trail with only one main access point. This required the use of a bicycle in order to efficiently monitor 10 territorial pairs within a reasonable timeframe.

### **NUMBER OF MONITORS, MONITORING HOURS & OBSERVATIONS**

For the 2020 breeding season, the California Central Coast Black Oystercatcher Project (BLOY Project) used a total of 30 community science monitors, along with a small BLOY Project staff consisting of the Regional Coordinator, the Project Biologist, and the Project Intern/Assistant Project Biologist, creating a cadre of 33 monitors. A large majority of the community science monitors were distributed throughout the South Coast with 26 monitors, most in the Monterey Peninsula monitoring section. The Project Biologist and the Regional Coordinator monitored all territories in both the North Coast and South Coast study areas, while the Project Intern/Assistant Project Biologist monitored the South Coast study areas. In addition, a few of the community science monitors, monitored in more than one of the five monitoring sections. Therefore, with some duplication, 23 monitors were used on the Monterey Peninsula (MP), seven monitors at Pebble Beach (PB), five monitors at Point Lobos (PL), six at the Santa Cruz (SC), and two at the San Mateo (SM) monitoring sections.

The number of monitors, monitoring hours, and observations were determined based on data entries on the Google Sheets set-up for each of the five monitoring sections monitored (MP, PB, PL, SC & SM). The number of monitoring hours and the number of observations between 15 April and 15 October were calculated for each individual monitor. For example, a single Google Sheets entry with two monitors listed for 30 minutes of monitoring was counted as two individual observations with 30 minutes of observation for each monitor (two observations for a total of one hour).

For the 73 Black Oystercatcher territories monitored in the Monterey Bay region, there were a total of 2,216 hours of monitoring from 3,325 observations – 1,570 hours from 2,177 observations in the South Coast and 646 hours from 1,148 observations in the North Coast (Table 1).

In the Santa Cruz monitoring section on the North Coast, one community science volunteer alone conducted 421 observations in five territories or 44% of the entire Santa Cruz monitoring section, 37% of the entire North Coast study area observations, and 13% of the entire Monterey

Bay Region. In the Monterey Peninsula monitoring section on the South Coast, two community science volunteers conducted 369 observations in six territories for 32% of the entire observations conducted in the Monterey Peninsula monitoring section (the section with the largest number of observations for the entire region), 17% of the entire South Coast study area observations, and 11% of the entire Monterey Bay Region. Together, the individual observations for the Regional Coordinator, Project Biologist and the Project Intern/Assistant Project Biologist totaled 1,397 observations or more than 42% of all the observations conducted during the 2020 breeding season.

Table 1. 2020 Black Oystercatcher Monitoring Hours & Observation Numbers - Monterey Bay Region

<b>Study Areas &amp; Monitoring Sections</b>	<b># of Monitoring Hours</b>	<b># of Observations</b>
<b>Monterey Bay South Coast</b>		
Monterey Peninsula (MP)	805	1,154
Pebble Beach (PB)	354	610
Point Lobos (PL)	411	413
<b>Sub-Totals</b>	<b>1,570</b>	<b>2,177</b>
<b>Monterey Bay North Coast</b>		
Santa Cruz County (SC)	402	951
San Mateo County (SM)	244	197
<b>Sub-Totals</b>	<b>646</b>	<b>1,148</b>
<b>Grand Totals</b>	<b>2,216</b>	<b>3,325</b>

## RESULTS

### Distribution

#### Monterey Bay South Coast

The South Coast study area had a total of 41 territorial pairs – 16 along the Monterey Peninsula (Appendix 1, Image 1), 13 along Pebble Beach (Appendix 1, Image 2), and 12 at Point Lobos (Appendix 1, Image 3). Of the 41 territorial pairs, there were a total of 25 nesting pairs and 16 pairs with an unknown status during the breeding season. Pairs with an unknown status were counted as not having nested.

One pair in the Monterey Peninsula section (MP10), that is only viewable from on campus, was not accessible for observation due to Covid-19 restrictions at Hopkins Marine Station until October when one monitor had limited access to the marine station. A second pair (MP8) at Hopkins Marine Station had a failed nest that was visible from off the Hopkins campus. However, because of the lack of access, there is no confirmation whether this pair tried nesting again in another section of their territory (Limited observations from outside the marine station seemed to indicate that the pair re-nested, but this could not be confirmed). Also, in the Monterey Peninsula section, one previous territory (MP15) is now considered abandoned. Territories classified as “abandoned” are territories that Black Oystercatchers were not reliably observed and where no nesting occurred. Per the 2019 final report, one territory in Pebble Beach (PB13) is still considered abandoned and two territories (PB9 & PB10) remained as a neutral zone (Parkin et al., 2019). A “neutral zone” is an area without a territorial Black Oystercatcher



pair, but with unattached Black Oystercatchers, and may include sub-adults and paired Black Oystercatchers without established territories. Along the Point Lobos (PL) monitoring section, two previous territories are now considered abandoned territories (PL9 & PL11). One of these (PL11) was classified as abandoned last year.

Four new pairs claimed territorial areas in three of the monitoring sections this year. A zone previously described as a neutral zone (MP9) on the Monterey Peninsula was used by a new pair that nested with two attempts. Monterey Peninsula had a second pair (MP17) that tried to establish some territory in the western part of the MP6 territory, but appeared to have abandoned that attempt, and instead settled into the western portion of MP9, with no nesting attempts in either location. In Pebble Beach, a new pair (PB16) claimed the northern end of PB8 territory. This pair did not nest. At Point Lobos, a new pair (PL14) claimed the northern section of PL4 territory with a lot of interactions from many other Black Oystercatchers in the area and with no nesting attempts.

### Monterey Bay North Coast

The North Coast study area had a total of 27 territorial pairs – 17 along the Santa Cruz monitoring section (Appendix 1, Images 4, 5 & 6) and 10 along the San Mateo monitoring section (Appendix 1, Images 7, 8 & 9). Of the 27 territorial pairs, there were a total of 22 nesting pairs and five pairs with an unknown status.

In the Santa Cruz (SC) section, one territory remained classified as abandoned (SC11) since there were no birds observed regularly in the territory. A new pair (SC18) carved out a nesting spot and some territory in the middle of the SC7 territory.

### **Timing of Breeding**

The Monterey Bay region had a total of 65 nesting attempts (including replacement clutches). Of these, 64 nests were observed within one to seven days of initiation. Some nests were back calculated from date of hatching to determine approximate nest initiation dates and were included in the nesting attempts.

In the Monterey Bay region, nesting started in late April and early May (Figure 2). Based on back calculations of chicks hatched, one nesting attempt occurred in late April (SC1). A total of 11 nesting attempts in early May were observed, four in the South Coast and seven in the North Coast. The greatest number of nesting attempts, with 19 attempted initiations, occurred during the second half of May, nine in the South Coast, including one replacement clutch (MP13.2), and 10 in the North Coast, with one replacement clutch (SC4.2).

Early June had 10 nesting attempts, seven in the South Coast, and three in the North Coast, including one replacement clutch (SC6.2). During the second half of June a total of 15 nesting attempts were recorded, eight in the South Coast, including two replacement clutches (MP7.2 & PL7.2) and seven in the North Coast, with five replacement clutches (SC3.2, SC7.2, SC8.2, SC12.2 & a third clutch in SC4.3). A total of eight nesting attempts occurred in early July, seven replacement clutches in the South Coast (MP5.2, MP6.2, MP9.2, PB1.2, PB12.2, PB14.2 & PL5.2), and one first attempt in the North Coast (SC18). Lastly, a third nesting attempt in the

South Coast (MP13.3) occurred in late July. This is the fourth consecutive year that this pair (MP13) has had three nesting attempts in one breeding season. The SC4 pair also had three nesting attempts.

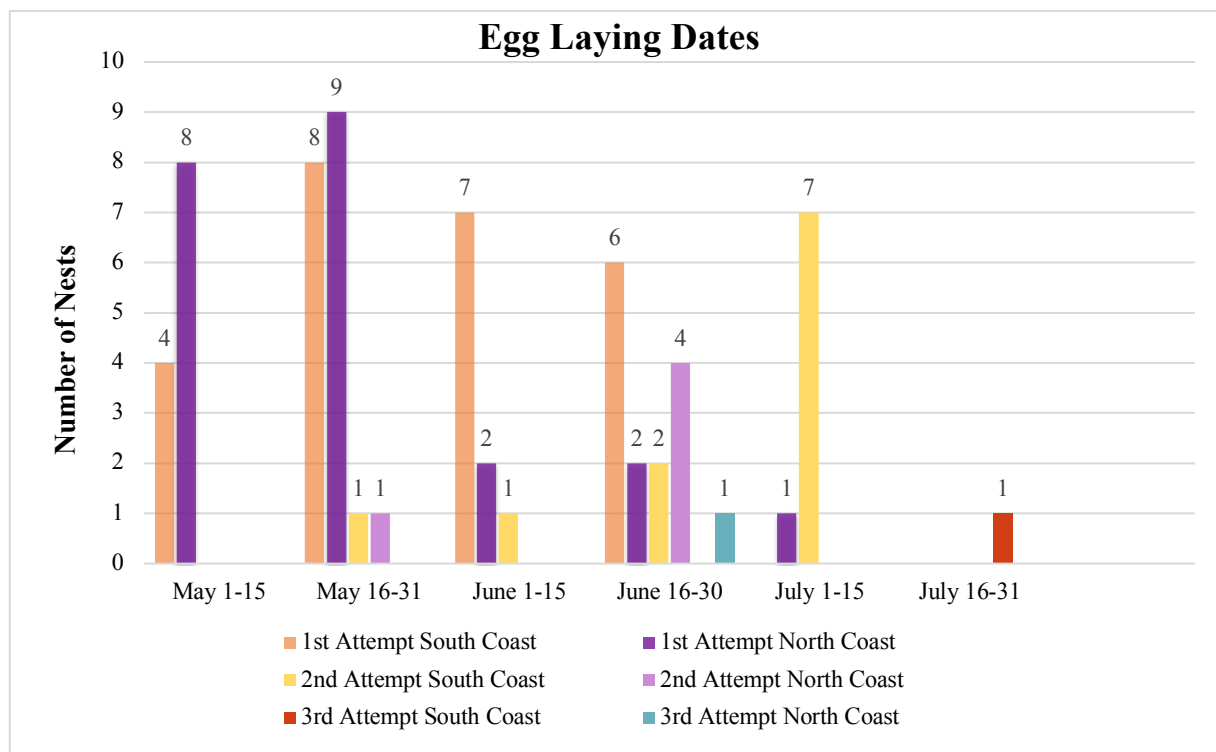


Figure 2. 2020 Monterey Bay region Black Oystercatcher egg laying dates

### Reproductive Success

During the 2020 breeding season, a total of 68 territorial pairs were identified but only 47 pairs were observed nesting. Due to the diverse coastal topography throughout the Monterey Bay region, exact clutch size for all nesting attempts was not attainable. Many nests were viewed with spotting scopes from distant observation points on land. Therefore, many nesting attempts had an estimated clutch size of two eggs, an average number for this species, when confirmation was not possible.

A total of 25 nesting pairs and 11 re-nesting attempts occurred along the South Coast, for a total of 36 nesting attempts. A minimum of 75 eggs were produced and resulted in 28% nesting success (# of clutches that produced young / # of clutches) (Table 2). The total number of chicks hatched was 21 with 43% surviving to fledging (# of chicks fledged / # of chicks). The South Coast had a total of nine fledglings from five pairs and a reproductive success of 0.36 per pair (# of fledglings / # of breeding pairs). One pair from Point Lobos (PL1) produced one fledgling, while four pairs produced two fledglings each, one from Pebble Beach (PB12.2) and three from Point Lobos (PL6, PL7.2 & PL13). Two of these pairs succeeded with their second clutch.

From the 16 nesting attempts that could be monitored, this was an exceptionally poor reproductive season for the Monterey Peninsula monitoring section. For the second year, no fledglings could be confirmed. However, three unaccounted fledglings appeared along the

Monterey Peninsula in September and October (See *Monterey Peninsula Fledgling Search*). It is possible that these could be fledglings from the two pairs on Hopkins Marine Station that could not be monitored due to the pandemic closure.

A total of 22 nesting pairs and seven re-nesting attempts occurred along the North Coast, for a total of 29 nesting attempts. A minimum of 60 eggs were produced and resulted in 52% nesting success (Table 2). The total number of recorded chicks hatched was 26, with 23% surviving to fledging. A total of six fledglings from five pairs were recorded and resulted in a reproductive success of 0.27 per pair (Table 2). Four pairs (SC2, SC13, SM2 & SM9) produced one fledgling each and one pair (SC7.2) produced two fledglings from a second clutch.

Overall, the reproductive success of the Monterey Bay region was 0.32 per pair (Table 2). A minimum of 135 eggs were produced and resulted in 39% nesting success. At least 47 chicks hatched and 32% survived to fledging. The 2020 breeding season produced a total of 15 fledglings from 10 of the 47 breeding pairs that attempted nesting. The greatest number of fledglings were produced from Point Lobos (7) and the second greatest number from the Santa Cruz section (4). Tables 3 through 7 in Appendix 2 show detailed 2020 productivity results for each territory within each section.

Table 2. 2020 Black Oystercatcher Reproductive Success – Monterey Bay Region

Study Areas	# of Breeding Pairs	# of Eggs	# of Chicks	# of Fledglings	# of Nest Attempts	Nesting Success (%)	Hatching Success (%)	Per Pair	Per Nest	Survival to Fledging (%)
Monterey Peninsula (MP)	10	32	3	0	16	12.5	9.4	0.00	0.00	0.0
Pebble Beach (PB)	8	24	10	2	11	36.4	41.7	0.25	0.18	20.0
Point Lobos (PL)	7	19	8	7	9	44.4	42.1	1.00	0.78	87.5
<b>Monterey Bay South Coast</b>	<b>25</b>	<b>75</b>	<b>21</b>	<b>9</b>	<b>36</b>	<b>27.8</b>	<b>28.0</b>	<b>0.36</b>	<b>0.25</b>	<b>42.9</b>
Santa Cruz County (SC)	14	42	13	4	21	38.1	31.0	0.29	0.19	30.8
San Mateo County (SM)	8	18	13	2	8	87.5	72.2	0.25	0.25	15.4
<b>Monterey Bay North Coast</b>	<b>22</b>	<b>60</b>	<b>26</b>	<b>6</b>	<b>29</b>	<b>51.7</b>	<b>43.3</b>	<b>0.27</b>	<b>0.21</b>	<b>23.1</b>
<b>Monterey Bay South + North Coast</b>	<b>47</b>	<b>135</b>	<b>47</b>	<b>15</b>	<b>65</b>	<b>38.5</b>	<b>34.8</b>	<b>0.32</b>	<b>0.23</b>	<b>31.9</b>

Reproductive success in 2020 (0.32 per pair) is the lowest since the North Coast study area was added to the monitoring project in the Monterey Bay region in 2016 (Table 8). Reproductive success decreased by 16% from 2019. The comparison to previous years indicates a decrease of 0.08 from the lowest year (2016 at 0.40 per pair). For the first time, the North Coast reproductive success is below the South Coast and well below the North Coast’s previous low in 2019 of 0.71, a 44% decrease. In the South Coast, the Point Lobos section had a significantly improved reproductive success, increasing from last year’s 0.17 per pair to 1.0 per pair, an 83% increase (Parkin et al., 2019).

Table 8. Black Oystercatcher Reproductive Success Per Pair for 2016 through 2020 - Monterey Bay Region

Site	2016	2017	2018	2019	2020
Monterey Bay South Coast	0.14	0.21	0.31	0.24	0.36
Monterey Bay North Coast	0.82	0.84	0.74	0.71	0.27
<b>Monterey Bay South + North Coast</b>	<b>0.40</b>	<b>0.46</b>	<b>0.50</b>	<b>0.48</b>	<b>0.32</b>

[Ref.: Ceja & Hanks 2016, 2017 & 2018; Parkin et al. 2019]

## **Nest Locations**

A total of 65 nesting attempts occurred in the Monterey Bay region. Of those, 43.1% (n=28) nested on offshore rocks (rocks separated from coastal access during higher tides), 52.3% (n=34) nested on mainland rocks (bluffs, onshore rocks, and outcrops), and 4.6% (n=3) nested on beaches (mainly rocky beaches).

Of the 25 pairs that produced young, 52% (n=13) nested on offshore rocks, 44% (n=11) on mainland rocks, and 4.0% (n=1) on beaches. Ten breeding pairs fledged young, 50% (n=5) on offshore rocks and 50% (n=5) on mainland rocks. No fledglings were produced from pairs nesting on beaches. Fledglings were produced equally from mainland rocks and offshore rocks this year.

Images 1, 2, and 3 in Appendix 1 show the 2020 Black Oystercatcher territories and nest locations for the three monitoring sections of the Monterey Bay South Coast study area – Monterey Peninsula, Pebble Beach, and Point Lobos. Image 4 in Appendix 1 shows the entire stretch of the Santa Cruz monitoring section with the Black Oystercatcher territories and nest locations, while Images 5 and 6 in Appendix 1 show in more detail the 2020 territories and nest locations for the Santa Cruz monitoring section. Image 7 in Appendix 1 shows the entire stretch of the San Mateo monitoring section with the Black Oystercatcher territories and nest locations, while Images 8 and 9 in Appendix 1 show in more detail the 2020 territories and nest locations for the San Mateo monitoring section.

## **Disturbance**

### **Vulnerability to Disturbance**

The five monitoring sections of the Monterey Bay region differ greatly in topography, accessibility, land use, and regulations, making each area distinctively different in its vulnerability. Along the South Coast, Point Lobos State Natural Reserve has strict regulations, limited and difficult access to some areas, and the presence of docents discouraging people from accessing some of the rocky areas. However, some Black Oystercatcher territories are still impacted by humans walking out on rocky outcroppings. Pebble Beach has even fewer access points, due to private homes, fencing, and natural barriers. Many of the Black Oystercatchers nesting there are more prone to special events and increased tourism. The Monterey Peninsula is the most vulnerable to disturbance because it has the most accessible areas of the entire Monterey Bay region. Along the coastline, it has recreational trails, substantial coastline development and parking areas, as well as numerous rocky outcroppings that are easily accessed, especially at low tide. It is extremely important to use protective measures at many of the Monterey Peninsula nesting spots to prevent human related access.

The North Coast has a mixture of rugged topography and accessible coastline. The Santa Cruz monitoring section consists mainly of coastal bluffs and farmland, making human access difficult. These areas are less vulnerable to human disturbance. The stretch along Wilder Ranch State Park to Davenport contained 11 of the 14 nesting pairs for this monitoring section. Natural Bridges State Beach and Greyhound Rock nesting areas are more accessible to humans via beaches and can suffer reproductive losses due to both human and natural disturbances. The San

Mateo monitoring section is the most vulnerable of the North Coast. Most of the coast and offshore rocks can be accessed during low tide from a number of parking areas along Highway 1 that are a short walking distance from the intertidal zone. Pescadero Rock is particularly vulnerable at negative low tides when access by humans is less impeded. Given that seven Black Oystercatcher pairs have territories on Pescadero Rock (six of which nested during the 2020 season) and two pairs used separate rocks accessible off the beach, one major incident could have detrimental effects on all of these pairs. It is, therefore, important to use protective measures in this area.

### Types of Disturbance

Black Oystercatchers nesting in all five sections of the Monterey Bay region experienced varying degrees of natural and human caused disturbances. A disturbance was recorded when a pair (or one individual of a pair) was seen chasing or flying away, making alert calls, or territorial calls toward any threats. The most frequently observed natural disturbance for the entire Monterey Bay region was from Black Oystercatcher interlopers (248 observations). The second was from other avian species (e.g. Brandt's Cormorant, Brown Pelican, Heermann's Gull, Western Gull, American Crow, Common Raven, Red-tailed Hawk, Red-shouldered Hawk, Turkey Vulture, Peregrine Falcon, Great Blue Heron, and Great Egret) roosting, nesting, flying, or hunting near nesting sites (104 observations). Land mammals (e.g. coyotes, weasels, ground squirrels, foxes, and raccoons) and pets accounted for lower observed disturbances (six observations) and may occur more frequently at night or when observers are not present.

Interlopers. Several pairs throughout the Monterey Bay region were occupied with territorial disputes from Black Oystercatcher interlopers. Some of these interloper pairs were very persistent in attempting to claim territories. This may account for this year's increased number of observed interloper incidents compared with the previous year (192 observations; Parkin et al., 2019). Some examples included the new pair, SC18, that eventually nested in the middle of the SC7 territory. In the early part of the breeding season, the SC18 pair created a fair amount of disturbance to several pairs (SC6, SC7 & C8). A similar pattern occurred in Monterey Peninsula with a new pair (MP17) moving between the Esplanade Neutral Zone and the MP9 territory. This pair may have impacted both the MP9 and MP6 pairs.

Brown Pelicans. Some examples of natural disturbance during the 2020 season included fledgling and sub-adult Brown Pelicans arriving on the North Coast in late June that trampled a nest with eggs (SC14) on Pelican Rock. The pair attempted to defend the nest site, but ultimately the eggs and nest were lost. This particular pair had a late start to the nesting season and the offshore rock used for nesting has frequent Brown Pelican and Brandt's Cormorant flocks utilizing it through the summer months. In Point Lobos (PL10), another pair that began a late nesting attempt experienced being over-run by Brown Pelicans at their chosen nest site.

Peregrine Falcons. This year, a Peregrine Falcon regularly roosted early in the nesting season near several nest sites on the Monterey Peninsula (MP2, MP4, MP5 & MP16). Point Lobos had two Peregrine Falcon pairs, one that nested on the north side of The Pinnacle in the PL10 territory and one that nested in the trees on the south side of the Reserve and regularly roosted and hunted in the vicinity of China Cove, affecting the nesting sites on Bird Rock (PL1 & PL2).

On the North Coast there were resident Peregrine Falcons in the vicinity of SC5 and near the Pescadero Rock area (SM3-SM10). The Peregrine Falcon nesting site near the SC5 nesting site produced two fledglings, and the parents and fledglings regularly hunted near the SC5 nesting site. During this period, the SC5 chick disappeared in its third week. The impacts of Peregrine Falcon nests nearby cannot be confirmed for all of these nesting sites, however, chick survival at several of these nesting sites was very poor (MP2, SC5 & SM4-SM10). One pair (PL1) was able to succeed in raising and fledging their one chick. The adults kept the chick hidden in the rocks until it was just about ready to fledge.

Humans. Various human disturbances throughout the region included: researchers (14 observations) and an unusually high number of people walking out onto rocky outcroppings and offshore rocks at low tides (40 observations). Another example of human disturbance occurred at the MP6.2 nest site below the bluff near the Monterey Bay Coastal Recreation Trail. A dirt slide, that appears to have been caused by someone attempting to climb down the cliff, resulted in totally covering the nest with two eggs (Images 10 & 11). There were 14 drone observations, not including collaboration on drone flights (See *BLOY-Drone Monitoring & Sea Otter Detection Study*). Finally, fishing, both from land and on boats accounted for five observations.



Images 10 & 11. MP6.2 nesting site before (left) and after dirt slide that completely covered the nest (right); Arrows indicate nest location. Dirt slide appears to have been caused by someone attempting to climb down on the cliff. [Cover photo is MP6.2 nest with eggs]

Smoke. Other major disturbances included heavy smoke and altered sunlight caused by the high number of simultaneous wildfires burning in California. During the months of August and September, the level of smoke and particulates in the air due to the California wildfires may have changed the behavior of the Black Oystercatchers. BLOY Project Staff witnessed some adult Black Oystercatchers with fledged young discontinuing care for those young earlier than normal (PL6) and fledglings gone from their natal territories much earlier than usual. Fledglings were

seen in Pebble Beach's Ocean Road Neutral Zone (PB9) in mid-August, although this did not occur with every pair that had fledglings. There was one particular day along the coastline of the entire Monterey Bay region that the sun was so obscured, that it was as dark as twilight for the entire day. In addition, there was a period of at least a week with smoke-covered days along the coast that made sunsets appear as they might in December or January. This may have triggered the diurnal clock of the Black Oystercatchers in the region to change to the winter mode of behavior.

Fire & Covid-19 Closures. Due to the Covid-19 closures in April and May and then the fire threat and smoky conditions in the area during August and September many monitoring areas were restricted. After restrictions and closures were lifted there appeared to be quite an increase in the number of people visiting certain areas along the coast. Monterey Peninsula saw an increase of people walking along the coastal trail and parking along the pullouts between Pacific Grove and Asilomar State Beach. More people were observed fishing, collecting shellfish, and going out on rocks than in previous years.

Pebble Beach was quieter than previous years with a lot less people stopping along 17-Mile Drive. Due to the Covid-19 restrictions, Pebble Beach was closed to the public as of 24 March. Also, many employees were furloughed during that time, which decreased the human and car traffic along 17-Mile Drive. On 5 May, two of the Pebble Beach golf courses reopened, but general public access to Pebble Beach was not restored until 15 July and only at certain times of the day. During the 4<sup>th</sup> of July and Labor Day weekends, the Pebble Beach Company closed 17-Mile Drive to tourist traffic, and also closed its beaches during those two holiday weekends, along with both the cities of Monterey and Pacific Grove.

Point Lobos State Natural Reserve incurred both a decrease in foot traffic and an increase. The Reserve was closed due to Covid-19 from 11 April to 29 June and then again, due to the fires and poor air quality from 20 August until 15 September. The BLOY Project staff was given limited access with the renewal of the project's scientific research permit with State Parks. It appeared that much of the local wildlife benefitted from the lack of human disturbance. However, when the Reserve re-opened, the number of people visiting the Reserve in July and August seemed much greater than previous years. It could not be determined whether the opening had a negative impact on Black Oystercatchers.

The Santa Cruz monitoring section did not see a huge increase in the number of people using the coastal areas except for Natural Bridges State Beach, Shark's Tooth Rock, and Greyhound Rock. Pescadero State Beach did seem to have more people visiting and had a large increase in the number of people fishing and collecting shellfish, often climbing onto some of the Black Oystercatcher nesting rocks (primarily SM6 & SM8).

Fireworks. Although banned, fireworks were quite prevalent around the coastline of the Monterey Bay region, especially during the two weeks around the Fourth of July. In Santa Cruz County, three nearly fledged chicks on Natural Bridges Rock (at Natural Bridges State Beach) were lost over the Fourth of July weekend. Witnesses observed a lot of fireworks on the beach right below this nesting site (SC1), and it may have had an impact.



## PROTECTIVE MEASURES

### Ropes & Signs

In an attempt to try to minimize human disturbance to nesting pairs, protective measures using ropes with signs or stakes with signs were put in place at nesting locations known to have high human activity. The protective measure used depended on what was feasible for the particular nesting area. This year, the seasonal protective measures were implemented from May through October due to Covid-19 precautions and a later start to the monitoring season.

Physical protective measures were used on 14 territories with 15 nesting attempts in three of the Monterey Bay region’s monitoring sections – Monterey Peninsula, Pebble Beach, and San Mateo. As seen in Table 9, these seasonal measures attempted to provide protection for a total of 14 nesting pairs (MP1, MP3, MP4, MP5, MP9, MP16, PB8, SM4, SM5, SM6, SM7, SM8, SM9 & SM10). All but one (PB8) of the seasonal protective measures were put in place for Black Oystercatcher territorial pairs nesting or attempting to nest on offshore rocks that fall within the jurisdiction of the California Coastal National Monument, with six territorial pairs on the Monterey Peninsula (MP1, MP3, MP4, MP5, MP9 & MP16), one at Pebble Beach (PB8), and seven in the San Mateo (SM4, SM5, SM6, SM7, SM8, SM9 & SM10) monitoring sections.

In addition, State Parks placed a temporary closure on Gazebo Rock (MP1) off the shoreline at the northern end of Asilomar State Beach. Instead of physically roping and signing the nesting location, State Parks used a “virtual roping” technique. A notice that included an aerial view of the coastline and Gazebo Rock with an outline of the closure area was posted on traffic A-frames that were placed on three of the stairway access points (Images 12 & 13).



Images 12 & 13. State Parks area closure notice on traffic A-frame and the notice with BLOY image, Asilomar State Beach.

Although the ropes, signs, and posted closures were successful in keeping the vast majority of people off of the nesting sites, a total of only one fledgling (SM9) was produced within the roped or closed areas. This was a very unusual occurrence, especially for Pescadero Rock, that in the



past has had five to nine fledglings per season. The one fledgling accounted for less than 7% of the fledglings produced in the Monterey Bay region. That is a significant drop from previous breeding seasons.

Table 9. 2020 Monterey Bay Region Black Oystercatcher Nesting Site Protection Measures

Region & Section	Nest #	Nest Location	Protection Method	# of Chicks	# of Fledglings
<b>Monterey Bay South Coast</b>					
Monterey Peninsula	MP1	Gazebo Rock	Posted Closure	0	0
	MP3	Barnacle Rock	Ropes & Signs	0	0
	MP4	Point Pinos West	Ropes & Signs	0	0
	MP5	Point Pinos East	Ropes & Signs	0	0
	MP5.2	Point Pinos East	Ropes & Signs	0	0
	MP9	Oak Rock	Sign on Spike	0	0
	MP16	Point Pinos Middle	Ropes & Signs	0	0
Pebble Beach	PB8	Bird Rock North	Stakes & Signs	2	0
<b>Monterey Bay North Coast</b>					
San Mateo	SM4	Pescadero Rock 2	Ropes & Signs	3	0
	SM5	Pescadero Rock 3	Ropes & Signs	0	0
	SM6	Pescadero Rock 4	Ropes & Signs	2	0
	SM7	Pescadero Rock 5	Ropes & Signs	2	0
	SM8	Pescadero Rock 6	Rope & Sign	2	0
	SM9	Pescadero Rock 7	Ropes & Signs	1*	1
	SM10	Pescadero Rock 8	Ropes & Signs	1*	0
			<b>TOTAL:</b>	<b>13</b>	<b>1</b>

\*Unknown clutch size

## **Outreach**

Due to the Covid-19 pandemic, outreach activities were extremely limited. Some outreach continued in the form of contacts between monitors and curious locals and coastal visitors, including many international tourists, but these contacts were only a fraction of past efforts. In order to avoid contact, only a few of the small stickers with the logo of the Black Oystercatcher Project were given out to kids. On the Monterey Peninsula, almost none of the wildlife disturbance brochures, developed two years ago by a multi-agency/multi-organization working group and paid for by the Monterey Peninsula Audubon Society, were handed out, nor was the card with the City of Pacific Grove’s ordinances related to drone operation and wildlife disturbance.

During the winter of 2020, before the Covid-19 lockdown, the BLOY Project staff and some volunteers monitored Black Oystercatchers while a film crew from Netflix’s Wild Space used drones to film parts of the Monterey Peninsula. To thank the BLOY Project for its assistance, Wild Space purchased bright orange vests with the Black Oystercatcher Project logo on the back (Images 14, 15 & 16). These vests became particularly useful for staff while putting up and taking down ropes and signs on nesting sites. It seemed that the public respected the “official” vest and did not follow staff onto the rocks as they have sometimes done in years past. When Point Lobos State Natural Reserve was closed and the BLOY Project staff was allowed to

conduct the Black Oystercatcher monitoring, the vests allowed for instant recognition of the Black Oystercatcher monitors by State Park personnel, even from a distance.



Images 14, 15 & 16. Black Oystercatcher Monitoring Project vest provided by Netflix’s Wild Space helped with visibility for the project and when monitoring or on the rocks putting up and taking down ropes and signs.

## **RELATED MONITORING ITEMS**

### **Unusual Breeding Season for Fledglings**

With the fires in the Monterey Bay region throughout August and September, at times the smoke was so thick that at 4:30 p.m. in the afternoon it was as dark as if it were January or February at that time. This situation coincided with observations within the Monterey Bay region of parent Black Oystercatchers chasing their fledglings out of their territory months earlier than normal (e.g., PL6 with 2 fledglings) or fledglings appearing in areas where we recorded no successful nesting attempts (e.g., Monterey Peninsula). On the Monterey Peninsula, none of the 15 Black Oystercatcher territories monitored produced fledglings, but as early as 8 September, fledgling sightings along the Monterey Peninsula were first reported. The closest known fledglings (PB1) were in the southern end of the Pebble Beach monitoring section and too far away for newly fledged Black Oystercatchers to travel. However, due to the COVID-19 pandemic and the closure of Hopkins Marine Station during the entire Black Oystercatcher breeding season, the BLOY Project was unable to monitor the two Black Oystercatcher territories (MP8 & MP10) with possible nesting sites that could only be monitored from on the grounds of the marine station. It is, therefore, very likely that the unattached fledglings that were being reported in the Monterey Peninsula monitoring section were fledglings from both the MP8 and/or MP10 nesting pairs. Without monitoring observations, this cannot be substantiated, and, therefore, these three fledglings were not included in our official breeding season count.

### **Early Gatherings of Black Oystercatchers**

Shorter days during the winter months leads to Black Oystercatchers occasionally congregating together and has been observed in a few locations around the Monterey Bay region. This year, a number of large gatherings of Black Oystercatchers were noticed. Starting on 25 August, there

were 9 Black Oystercatchers gathered at the PL14 territory at Point Lobos. This area continued to have gatherings for each weekly observation through September with the greatest number of Black Oystercatchers at one time being 16 on 9 September. This unusual early gathering of Black Oystercatchers also occurred in the Pebble Beach monitoring section on 3 August with 18 observed in the Ocean Road Neutral Zone (PB9), in the San Mateo monitoring section at Pescadero Rock when 16 were observed together on 19 October, and in the Monterey Peninsula monitoring section on 22 October with 18 Black Oystercatchers on the Gate 15 Rock off Asilomar State Beach. These early gatherings seem to have coincided with the period of heavy smoke and dark skies.

### **BLOY-Drone Monitoring & Sea Otter Detection Study**

The BLOY Project had the opportunity to monitor Black Oystercatcher responses to controlled drone flights being conducted as part of a collaborative effort with Stanford University-Department of Civil and Environmental Engineering, California Department of Fish and Wildlife-Office of Spill Prevention and Response, U.S. Fish and Wildlife Service-Southern Sea Otter Project, and Sea Otter Savvy-Sea Otter Science and Community Outreach. The Sea Otter Detection Study's objectives are to: (1) Determine reactions of Monterey Peninsula sea otters to a small quadcopter drone; (2) Develop recommended best practices for the use of small quadcopter drones around sea otters; and (3) Determine whether there is an optimal altitude for capturing images with a small quadcopter drone so that images are useful for auto-detection. The quadcopter drone used is a DJI Mavic 2 Pro drone equipped with a 322x242x84 mm & camera with optical image resolution of 5472x3648 with 1" CMOS sensor & electronic rolling shutter.

While the Sea Otter Detection Study was doing a study with controlled variables over select sea otter groups, the BLOY Project was assessing Black Oystercatcher reactions to the drone activity if any were present in the vicinity of the drone flights. BLOY Project Staff developed a regular protocol using a data form specifically designed to record Black Oystercatcher behavior during drone flights and a summary write up of these observations for each flight day and location. It has, nonetheless, given the BLOY Project the opportunity to record Black Oystercatcher reactions and add to our understanding of what may be best practices concerning the use of drones within Black Oystercatcher territories. To date, BLOY Project monitors have covered all of the more than two dozen of the otter study's drone launches as shown in Appendix 3, Table 10.

### **Monterey Peninsula Fledgling Search**

On 8 September, nearing the end of the 2020 Black Oystercatcher breeding season, and with all monitored nesting attempts in the Monterey Peninsula (MP) monitoring section having failed, it was unusual to find an unaccounted fledgling on Oak Rock in the MP9 territory. An "unaccounted fledgling" is a fledgling that cannot be attributed to a specific territorial pair. The fledgling was being chased out of the MP9 territory by the territorial pair, a pair that did not nest. During September, the lone fledgling was observed on numerous occasions, primarily within the MP9 and MP17 territories. The following month, on 12 October, a pair of unaccounted fledglings were found in the MP13 territory resting with the territorial pair, until the

MP13 pair attempted to chase the two fledglings out of their territory. The MP13 pair had three failed nesting attempts this season.

As a result of the observations of unaccounted fledglings, a Black Oystercatcher fledgling search on the Monterey Peninsula was organized. The purpose was to attempt to find all of the juveniles around the Monterey Peninsula, verify that the juveniles actually were fledglings, ensure that the observations were different fledglings and there were no duplications, and get quality photos of any juveniles found in order to determine if the fledglings could be identified by their individual beak coloration.

On 22 October, the Black Oystercatcher fledgling search on the Monterey Peninsula was conducted. Fourteen monitors participated in this effort. The Monterey Peninsula was divided into eight contiguous sections with one or two monitors assigned to each section. For each fledgling found, an observation data sheet was completed.

The search verified that there were three unaccounted fledglings. Of the three unaccounted fledglings, one was located on Marine Garden Rock and two fledglings were located on John Denver Rock. In addition, at least three sub-adults were found among a “flock” of 18 Black Oystercatchers roosting on the Gate 15 Rock along the shoreline of Asilomar State Beach. A further discussion of the results and findings can be found in a report on the fledgling search (Hanks 2020A). The fledgling search report is supplemented with a complementing report on Black Oystercatcher growth and development (Hanks 2020B).

## **ACKNOWLEDGEMENTS**

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We are also appreciative for a variety of small donations from a number of individual donors. We thank you all!

A special thank you to Monterey Audubon Society for managing the project’s funding account.

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Thanks to the BLM's California Coastal National Monument for overseeing the California Central Coast Black Oystercatcher Project and providing technical guidance as needed. And thanks to California State Parks for permitting access to continue monitoring at their locations within the Monterey District and for closing off a section of Asilomar State Beach in order to protect a nesting site.

A thanks to the Pacific Grove Museum of Natural History for hosting the California Central Coast Black Oystercatcher Project as one of the museum's community science programs.

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Thanks to the folks involved with the California Department of Fish and Wildlife-Office of Spill Prevention and Response, U.S. Fish and Wildlife Service-Southern Sea Otter Project, Stanford University-Department of Civil and Environmental Engineering, and Sea Otter Savvy for involving us in the monitoring for Black Oystercatcher reactions as part of their uses of a drone in their sea otter detection and disturbance study.

And finally, a special thanks to the staff and film crew from Netflix's Wild Space who not only allowed us to monitor their use of drones during their drone flights while filming around the Monterey Peninsula, but who also provided us with the bright orange vests with the BLOY Project logo on the back. We were able to use the sale of these vests to add a little more funding to our BLOY Project account.

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**MONTEREY BAY REGION**  
**BLACK OYSTERCATCHER TERRITORIES & NESTING SITES**  
**2020**



Image 1. 2020 Black Oystercatcher territories and nest locations for the Monterey Peninsula (MP) monitoring section.

MONTEREY BAY REGION - BLOY TERRITORIES & NESTING SITES 2020 (Cont'd.)

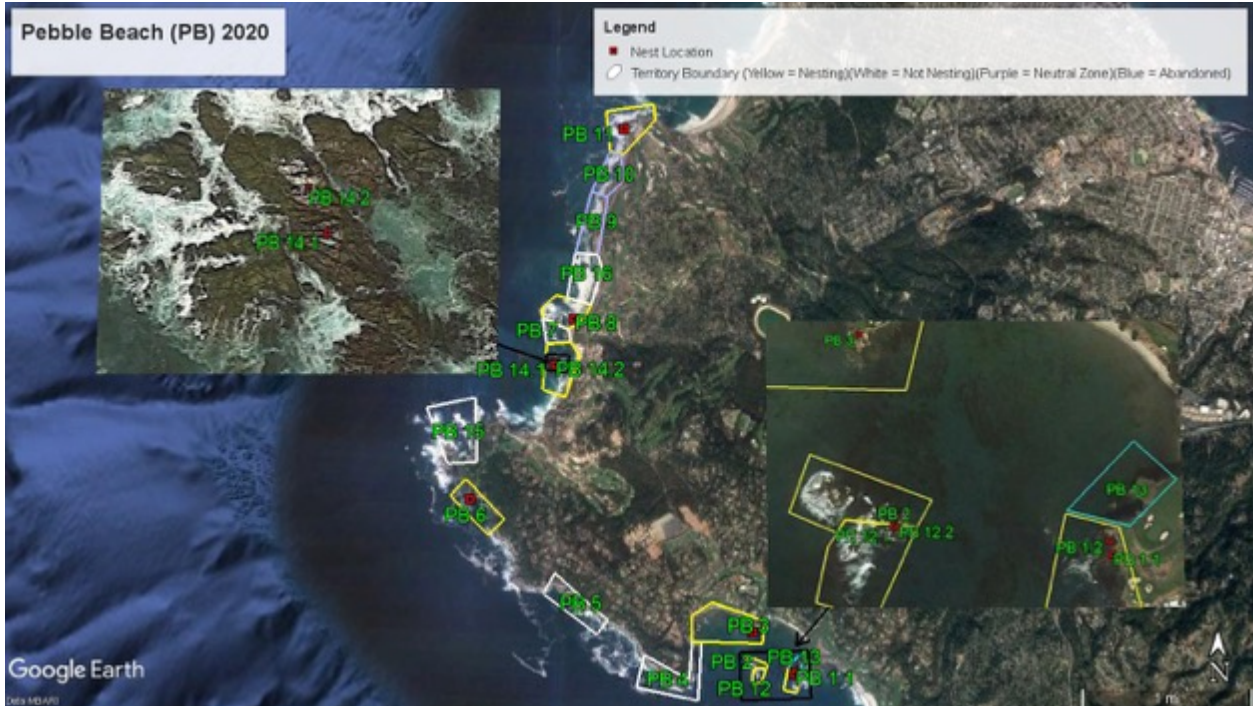


Image 2. 2020 Black Oystercatcher territories and nest locations for the Pebble Beach (PB) monitoring section.

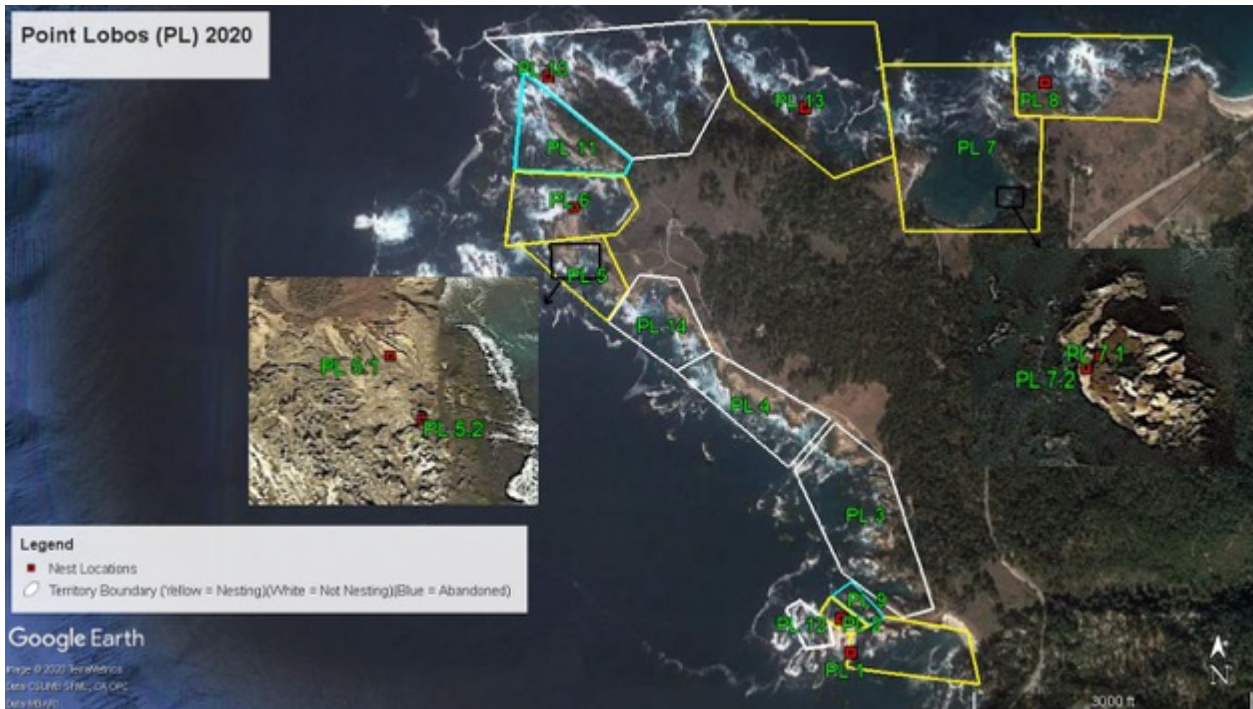


Image 3. 2020 Black Oystercatcher territories and nest locations for the Point Lobos (PL) monitoring section (Point Lobos State Natural Reserve)



**MONTEREY BAY REGION - BLOY TERRITORIES & NESTING SITES 2020 (Cont'd.)**

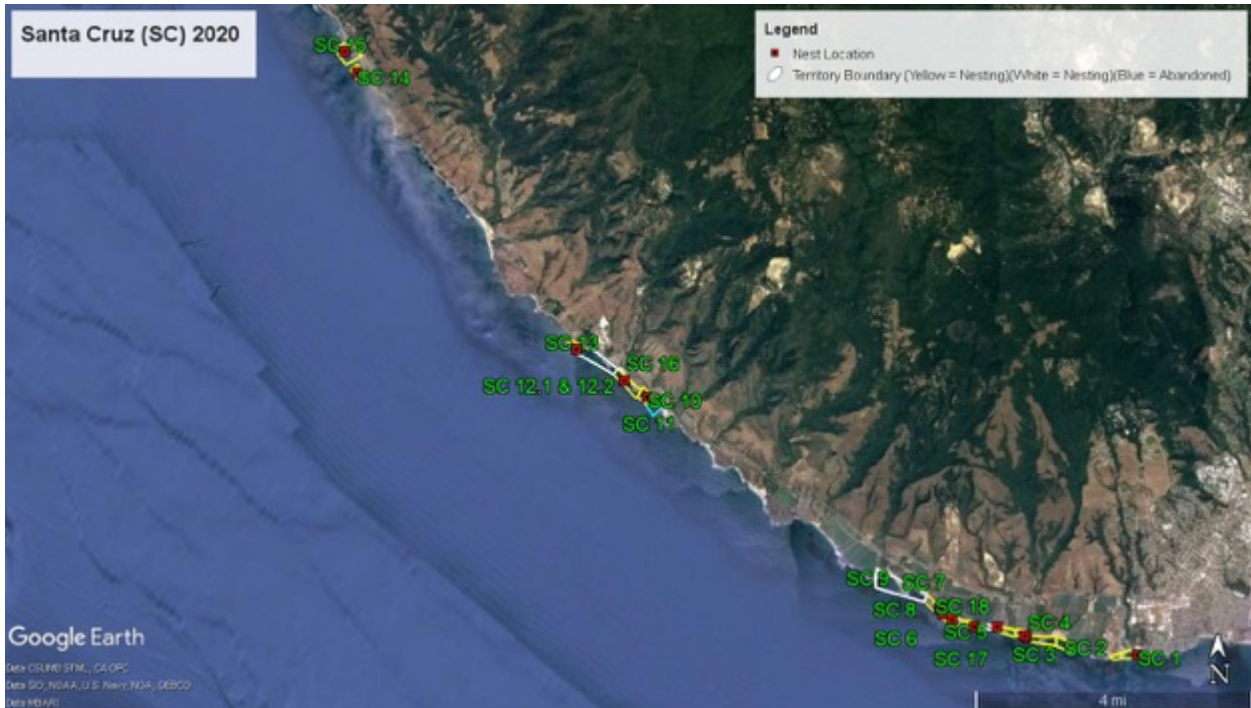


Image 4. 2020 Black Oystercatcher territories and nest locations for the Santa Cruz County (SC) monitoring section.



Image 5. 2020 Black Oystercatcher territories and nest locations for the Santa Cruz County (SC) monitoring section’s southern portion (Natural Bridges State Beach to 3-Mile Beach, Wilder Ranch State Park).

**APPENDIX 1-3**

MONTEREY BAY REGION - BLOY TERRITORIES & NESTING SITES 2020 (Cont'd.)



Image 6. 2020 Black Oystercatcher territories and nest locations for the Santa Cruz County (SC) monitoring section's northern portion (Shark's Tooth Cove to Greyhound Rock).

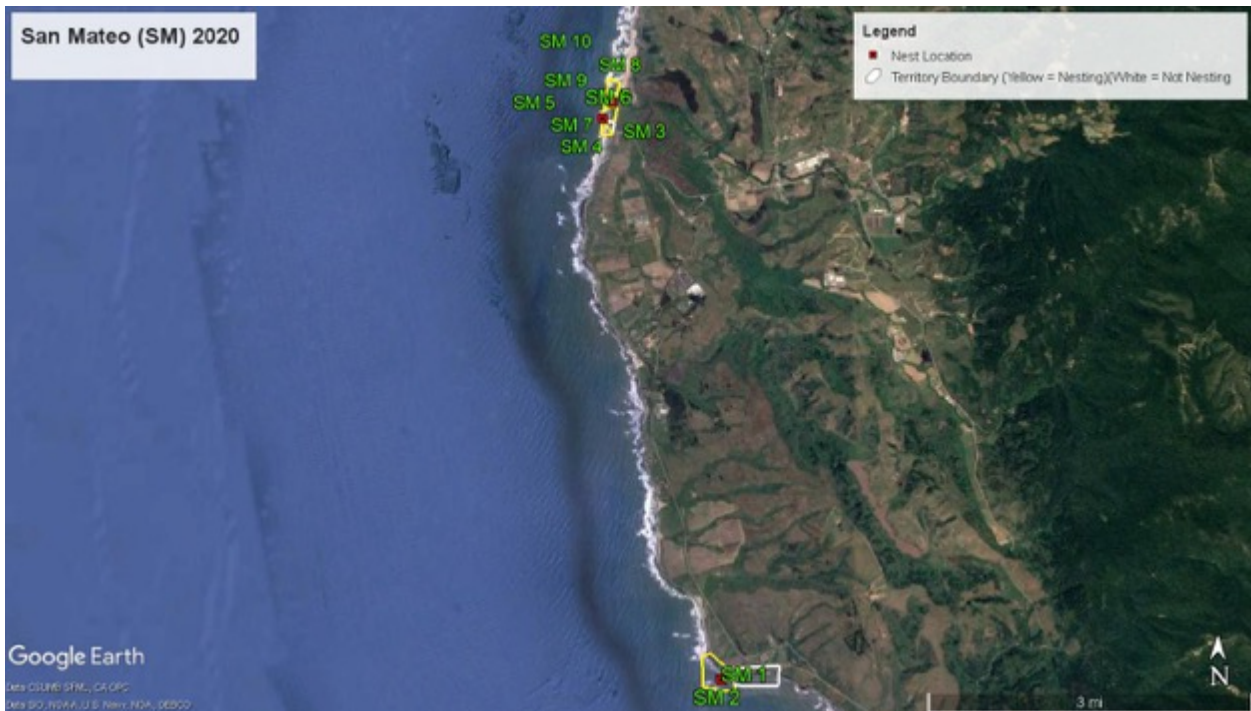


Image 7. 2020 Black Oystercatcher territories and nest locations for the San Mateo County monitoring section (SM).



**MONTEREY BAY REGION - BLOY TERRITORIES & NESTING SITES 2020 (Cont'd.)**



Image 8. 2020 Black Oystercatcher territories and nest locations for the San Mateo County (SM) monitoring section's southern portion (Prisoner Rock and Pigeon Point).



Image 9. 2020 Black Oystercatcher territories and nest locations for the San Mateo County (SM) monitoring section's northern portion off the shoreline of Pescadero State Beach.

**MONTEREY BAY REGION  
BLACK OYSTERCATCHER REPRODUCTIVE PRODUCTIVITY  
2020**

Table 3. Monterey Bay South Coast Productivity – **Monterey Peninsula (MP)** Monitoring Section

<b>Nest #</b>	<b>Name</b>	<b># of Eggs</b>	<b># of Chicks</b>	<b># of Fledglings</b>
MP1	Gazebo	2*	0	0
MP2	Gull Rock West	2*	1	0
MP3	Barnacle Rock	0	0	0
MP4	Point Pinos West	2*	0	0
MP5	Point Pinos East	3	0	0
MP5.2	Point Pinos East	2*	0	0
MP6	13 <sup>th</sup> Street	2*	0	0
MP6.2	13th Street	2	0	0
MP7	Hopkins West	2*	0	0
MP7.2	Hopkins West	2*	0	0
MP8	Hopkins East	2*	0	0
MP9	Lover Point West (Oak Rock)	2*	0	0
MP9.2	Lover Point West (Grand Street)	1	0	0
MP10	Hopkins North	0	0	0
MP11	Asilomar	0	0	0
MP12	Crespi Cove	0	0	0
MP13	Coast Guard Pier (El Torito)	2*	0	0
MP13.2	Coast Guard Pier (El Torito)	2	2	0
MP13.3	Coast Guard Pier (El Torito)	2*	0	0
MP14	3 <sup>rd</sup> Street	2*	0	0
MP15	John Denver Rock East	0	0	0
MP16	Point Pinos (Pyramid-Prom Rocks)	0	0	0
MP17	Perkins Park	0	0	0
<b>Total:</b>		<b>32*</b>	<b>3</b>	<b>0</b>

*\*Unknown clutch size; at least two eggs were believed to be present.*

**MONTEREY BAY REGION BLACK OYSTERCATCHER  
REPRODUCTIVE PRODUCTIVITY – 2020 (Cont'd.)**

Table 4. Monterey Bay South Coast Productivity – **Pebble Beach (PB)** Monitoring Section

<b>Nest #</b>	<b>Name</b>	<b># of Eggs</b>	<b># of Chicks</b>	<b># of Fledglings</b>
PB1	Stillwater Cove East	3	3	0
PB1.2	Stillwater Cove East	2*	0	0
PB2	Stillwater Cove South	2*	0	0
PB3	Stillwater Cove North	2*	0	0
PB4	Ghost Tree (Stillwater Point)	0	0	0
PB5	Lone Cypress	0	0	0
PB6	Cypress Point Lookout	2	2	0
PB7	Bird Rock South	0	0	0
PB8	Bird Rock North	3	3	0
PB9	Ocean Road Neutral Zone (ORNZ)	0	0	0
PB10	China Rock South	0	0	0
PB11	Point Joe	2*	0	0
PB12	Stillwater Cove Pescadero Rock	2*	0	0
PB12.2	Stillwater Cove Pescadero Rock	2*	2	2
PB13	Stillwater Cove Northeast [Abandoned]	0	0	0
PB14	Bird Rock West	2*	0	0
PB14.2	Bird Rock West	2*	0	0
PB15	Cypress Point North	0	0	0
PB16	Bird Rock East	0	0	0
<b>Total:</b>		<b>24*</b>	<b>10</b>	<b>2</b>

\*Unknown clutch size; at least two eggs were believed to be present.

**MONTEREY BAY REGION BLACK OYSTERCATCHER  
REPRODUCTIVE PRODUCTIVITY – 2020 (Cont'd.)**

Table 5. Monterey Bay South Coast Productivity – **Point Lobos (PL)** Monitoring Section

<b>Nest #</b>	<b>Name</b>	<b># of Eggs</b>	<b># of Chicks</b>	<b># of Fledglings</b>
PL1	Bird Island SE	2*	1	1
PL2	Bird Island NE	2*	0	0
PL3	China Cove (Weston South)	0	0	0
PL4	Weston Beach North	0	0	0
PL5	Sea Lion Cove	2*	0	0
PL5.2	Sea Lion Cove	2*	0	0
PL6	Headland Cove South	2*	2	2
PL7	Whalers Cove	2*	0	0
PL7.2	Whalers Cove	3	3	2
PL8	Moss Cove	2*	0	0
PL9	Middle Rock North	0	0	0
PL10	Cypress Cove	0	0	0
PL11	Headland Cove North [Abandoned]	0	0	0
PL12	Bird Island Rocks	0	0	0
PL13	Guillemot Rock	2*	2	2
PL14	Sand Hill Cove North	0	0	0
<b>Total:</b>		<b>19*</b>	<b>8</b>	<b>7</b>

*\*Unknown clutch size; at least two eggs were believed to be present.*

**MONTEREY BAY REGION BLACK OYSTERCATCHER  
REPRODUCTIVE PRODUCTIVITY – 2020 (Cont'd.)**

Table 6. Monterey Bay North Coast Productivity – **Santa Cruz (SC)** Monitoring Section

<b>Nest #</b>	<b>Name</b>	<b># of Eggs</b>	<b># of Chicks</b>	<b># of Fledglings</b>
SC1	Natural Bridges	3	3	0
SC2	Wilder Beach	2*	1	1
SC3	Fern Grotto Beach South	2*	3	0
SC3.2	Fern Grotto Beach South	2*	1*	0
SC4	Fern Grotto Beach North	1	0	0
SC4.2	Fern Grotto Beach North	2	0	0
SC4.3	Fern Grotto Beach North	2	0	0
SC5	Sand Plant Beach North	3	1	0
SC6	Sand Plant Beach South	2*	0	0
SC6.2	Strawberry Beach South	2*	0	0
SC7	Strawberry Beach North	2*	0	0
SC7.2	Strawberry Beach North	2*	2	2
SC8	3 Mile Beach South	2*	0	0
SC8.2	3 Mile Beach South	2*	2	0
SC9	3 Mile Beach North	0	0	0
SC10	Shark's Tooth Rock	2	0	0
SC11	Shark's Tooth Cove South	0	0	0
SC12	Davenport South	2*	0	0
SC12.2	Davenport South	2*	2	0
SC13	Davenport North	1*	1	1
SC14	Pelican Rock	2*	0	0
SC15	Greyhound Rock	2*	0	0
SC16	Davenport Bluff Middle	0	0	0
SC17	Ohlone Bluff	0	0	0
SC18	Strawberry Beach West	2*	0	0
<b>Total:</b>		<b>42*</b>	<b>13*</b>	<b>4</b>

\*Unknown clutch size; at least two eggs were believed to be present.

**MONTEREY BAY REGION BLACK OYSTERCATCHER  
REPRODUCTIVE PRODUCTIVITY – 2020 (Cont'd.)**

Table 7. Monterey Bay North Coast Productivity – **San Mateo** (SM) Monitoring Section

<b>Nest #</b>	<b>Name</b>	<b># of Eggs</b>	<b># of Chicks</b>	<b># of Fledglings</b>
SM1	Prisoner Rock	0	0	0
SM2	Pigeon Point	2*	2	1
SM3	Pescadero 1	0	0	0
SM4	Pescadero 2	3	3	0
SM5	Pescadero 3	2*	0	0
SM6	Pescadero 4	2*	2	0
SM7	Pescadero 5	3	2	0
SM8	Pescadero 6	2*	2	0
SM9	Pescadero 7	2*	1*	1
SM10	Pescadero 8	2*	1*	0
<b>Total:</b>		<b>18*</b>	<b>13*</b>	<b>2</b>

*\*Unknown clutch size; at least two eggs were believed to be present.*



**MONTEREY BAY REGION  
BLACK OYSTERCATCHER OBSERVATIONS  
MONITORING RESEARCH DRONE STUDY FLIGHTS  
2020**

Table 10. Observations from Monitoring Research Drone Study Flights

DATE	FLIGHT TIME	NESTING STATUS	LAUNCH LOCATION	FLIGHT TYPE	BLOY TERRITORY	BLOY RESPONSE	COMMENTS
07-21-2020	1100-1230 (2 flights)	Nesting	Coast Guard Pier	2 Hover Drop	MP13	Most common foraging-looking & preening-looking; Some alert & alarm calls	8 mins. Into 1 <sup>st</sup> Flight MP6 pair made alarm call & flew east & out of area
08-03-2020	0800-1000 (3 flights)	Non-Nesting	Lover's Point	1 Hover Drop 2 Programmed Transects	MP6 & 9	1 <sup>st</sup> flight MP6 alarm calls & flew out area; 1 <sup>st</sup> & 2 <sup>nd</sup> flights MP9 head tilting before back to preening and some alert calls	MP9 alert calls appear to be in response to numerous WEGU alarm calls; Other alert calls may have been due to WEGUs reactions
08-05-2020	0800-0940 (3 flights)	Non-Nesting	Otter Point	2 Hover Drops 1 Programmed Transect	MP9 & 17	3 brief alert or alarm calls recorded – 1 with launch up to 200' & 2 during quick lift from 100' to 200' at end of flight	MP9 pair appeared only during 2 <sup>nd</sup> flight & landed on Oak Rock; No sighting of MP17 pair; Calls coincided with numerous WEGU alarm calls; At no time did BLOYS move or flush from Oak Rock until flying off 6 minutes after 2 <sup>nd</sup> drone landing & before 3 <sup>rd</sup> launch
09-08-2020	0900-1100 (3 flights)	Non-Nesting	Otter Point	3 Hover Drops	MP9 & 17	MP9 BLOY looped out 40m toward drone & immediately back to south end rock east of Oak Rock & then MP9 pair stood alert with brief alert call before back to resting & preening	Shortly after the drone flight, MP9 BLOYS flew to Oak Rock to attempt to confront unaccounted fledgling & chasing it off to Sea Palm Rock; Also found MP17 pair on Siren Rock, located only about 90m from drone launch site; Therefore, 5 BLOYS within drone area, but only BLOY reacted in last few minutes of 3 <sup>rd</sup> drone flight when quickly rising from 50' to 200'
09-24-2020	0900-1000 (2 flights)	Non-Nesting	Fanshell Beach	2 Hover Drops	PB7, PB14 & FS	No response	Drone appeared to be too far away to cause any discernible reaction from any of the 8 BLOYS
09-24-2020	1050-1150 (2 flights)	Non-Nesting	Coast Guard Pier	2 Hover Drops	MP13	No response	There were as many as 10 BLOYS in the area of the drone flights, however, none were close enough to be affected by the drone activity
09-25-2020	0900-1015 (3 flights)	Non-Nesting	Otter Point	3 Hover Drops	MP9 & 17	No response	Only MP9 pair observed; Based on high surf & distance from drone, MP9 pair appeared unaffected by drone flights
10-12-2020	0930-1130 (3 flights)	Non-Nesting	Coast Guard Pier	3 Hover Drops	MP13	BLOYS appeared to have heard the drone, especially when transiting from & to launch site, listening and some head tilting, & couple of times stood alert	4 BLOYS included MP13 pair & 2 unaccounted fledglings roosting together during most of the flights; Limited or no disturbance
10-22-2020	0940-1005 (1 flight)	Non-Nesting	Otter Point	1 Hover Drop	MP9 & 17	Fledgling called & flew east	Only BLOY found was an unaccounted fledgling; When drone was moving up to 70', WEGUs called & flew around drone; Fledgling response appeared to result from WEGUs calling & flying nearby
10-28-2020	1430-1600 (3 flights)	Non-Nesting	Fanshell Beach	3 Hover Drops	PB7, PB14 & FS	Few occasional looks during flights; 3 <sup>rd</sup> flight landing caused 1 FS BLOY to fly out towards drone & immediately back	With 8 BLOYS (3 pairs, 1 subadult & 1 fledgling) in the area with only 1 serious reaction
10-30-2020	1530-1655 (3 flights)	Non-Nesting	Coast Guard Pier	3 Hover Drops	MP13	Mostly preening or foraging with occasional look or head tilt	MP13 pair aware of drone but expressed limited response