Black Oystercatcher Reproductive Success Monitoring
California Central Coast
2018

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INTRODUCTION – STUDY AREAS

In 2018, the California Central Coast Black Oystercatcher Project monitored nesting activity for a total of 70 Black Oystercatcher territorial pairs in the Monterey Bay Region, from Point Lobos State Natural Reserve to Pescadero State Beach, covering coastal sections in three counties and approximately 160 kilometers (100 miles) of coastline. The Monterey Bay Region is separated into two study areas: (1) Monterey Bay South Coast (northern Monterey County) and (2) Monterey Bay North Coast (northern Santa Cruz County and southern San Mateo County).

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.

Monterey Bay South Coast is located along the northern portion of the Monterey County coast extending north from the south end of Point Lobos State Nature Reserve to the east side of the Coast Guard Pier in the City of Monterey and is broken into three sections: (1) Point Lobos (PL) (Point Lobos State Nature Reserve), (2) Pebble Beach (PB) (Stillwater Cove to Point Joe), and (3) Monterey Peninsula (MP) (Asilomar State Beach to Monterey). The Monterey Bay North Coast extends north from the south end of Natural Bridges State Beach to the north end of Pescadero State Beach and consisting of two sections: (1) northern Santa Cruz County coast (SC) and (2) southern San Mateo County coast (SM).

METHODS

The monitoring methodology used is based on the Black Oystercatcher standardized protocols for monitoring population size and reproductive success developed by the U.S. Geological Survey (Elliott-Smith & Haig 2011), with slight modifications adapted by Audubon California. The primary monitoring was conducted during the breeding season from mid April through the end of September.

Although the project is overseen by professional biologists from Audubon California and the California Coastal National Monument, it is currently operated as a Community Science effort using primarily BLM volunteers. The BLM volunteers consist of Community Science monitors from the Pacific Grove Museum of Natural History volunteers and docents from the Point Lobos State Natural Reserve. For a sixth year, the project also used an intern from the Environment for the Americas shorebird program for Latino youth (*Celebra las Aves Playeras*) to assist with the monitoring and outreach.

Observations were conducted on 70 Black Oystercatcher territories throughout the Monterey Bay Region. The 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 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. With 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 more than 30 to 60 minutes while chicks were present. During the entire monitoring period, the lead data collector, a contracted biologist, monitored every one of the 70 territories at least once a week. This provided a consistent monitoring base for each of the 70 territories. 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 minimal in order to document nesting success, predation, human interactions, and inform people about wildlife disturbance and Black Oystercatchers. In the North Coast, the Wilder Ranch State Park portion in the Santa Cruz County section that includes approximately 6.5 kilometer (4 miles) of coastline required the use of a bicycle in order to efficiently monitor 8 territorial pairs within a reasonable timeframe.

NUMBER OF MONITORS, MONITORING HOURS & OBSERVATIONS

For the 2018 breeding season, the California Central Coast Black Oystercatcher Project used a total of 42 Community Science monitors and the lead data collector. All of the Community Science volunteers were distributed throughout the Monterey Bay South Coast. A total of 22 volunteers were used on the Monterey Peninsula, 5 volunteers were used at Pebble Beach, and 15 volunteers were used in Point Lobos.

For the 43 Black Oystercatcher territories of the Monterey Bay South Coast, there were 1,553 hours of monitoring from 1,930 observations. For the 27 Black Oystercatcher territories of the Monterey Bay North Coast, the monitoring was done solely by the lead data collector for a total of 249 monitoring hours from 621 observations. As a result, a total of 1,802 monitoring hours were conducted from 2,551 observations for the entire Monterey Bay Region (includes a total of 706 monitoring hours from 1,012 observations carried out by the lead data collector). Table 1 provides a breakdown of the number of monitoring hours and observations for each study area and individual section.

Table 1: 2018 Black Oystercatcher Monitoring Hours & Observation Numbers - Monterey Bay Region

Study Areas & Sections	# of Monitoring Hours	# of Observations
MB South Coast		
Monterey Peninsula (MP)	890	1,047
Pebble Beach (PB)	393	472
Point Lobos (PL)	270	411
Sub-Totals	**1,553**	**1,930**
MB North Coast		
Santa Cruz County (SC)	127	391
San Mateo County (SM)	122	230
Sub-Totals	**249**	**621**
Grand Totals	**1,802**	**2,551**

MONITORING RESULTS

Distribution. The Monterey Bay South Coast study area is composed of 43 territorial pairs: 16 along the Monterey Peninsula (See Image 1), 14 along Pebble Beach (See Image 2), and 13 along Point Lobos State Nature Reserve (See Image 3). Of the 43 territorial pairs, there were 29 nesting pairs found and 14 pairs with an unknown nesting status. Most of the pairs with an unknown nesting status were presumed to have not nested. A total of three new pair were identified of which

two nested. One pair was found early in the season doing territorial activity with a known pair (MP12) at the John Denver Memorial Rock in the Monterey Peninsula section. The new pair (MP15) was defending the eastern end of the rock. The pair was not reliably found throughout the season. A second pair (MP16) was found nesting between two existing territories (MP4 & MP5) on Point Pinos Islet in the Monterey Peninsula section. A third pair (PB15) with one medium size chick was found in late June on the north side of Cypress Point in the Pebble Beach section. This territory is off private property with only a limited view from the public road.

The Monterey Bay North Coast study area is composed of 27 territorial pairs – 17 along the northern Santa Cruz County coast (See Image 4) and 10 along the southern San Mateo County coast (See Image 5). There were a total of 23 nesting pairs found and 4 pairs with an unknown nesting status. A total of three new pairs were identified of which two nested. One new pair (SC16) was found nesting on Davenport Bluffs between two other territories (SC12 & SC13) in the Santa Cruz County section. A second pair (SC17) was found along the Wilder Ranch State Park coast defending a territory and nest building. The pair was reliably found throughout the season but a nest was never recorded. The third pair (SM10) with one small chick was found in late June on Pescadero Rock in the San Mateo County section. After loosing the chick, the pair was harder to identify as it relocated among the other oystercatchers that utilize Pescadero Rock.

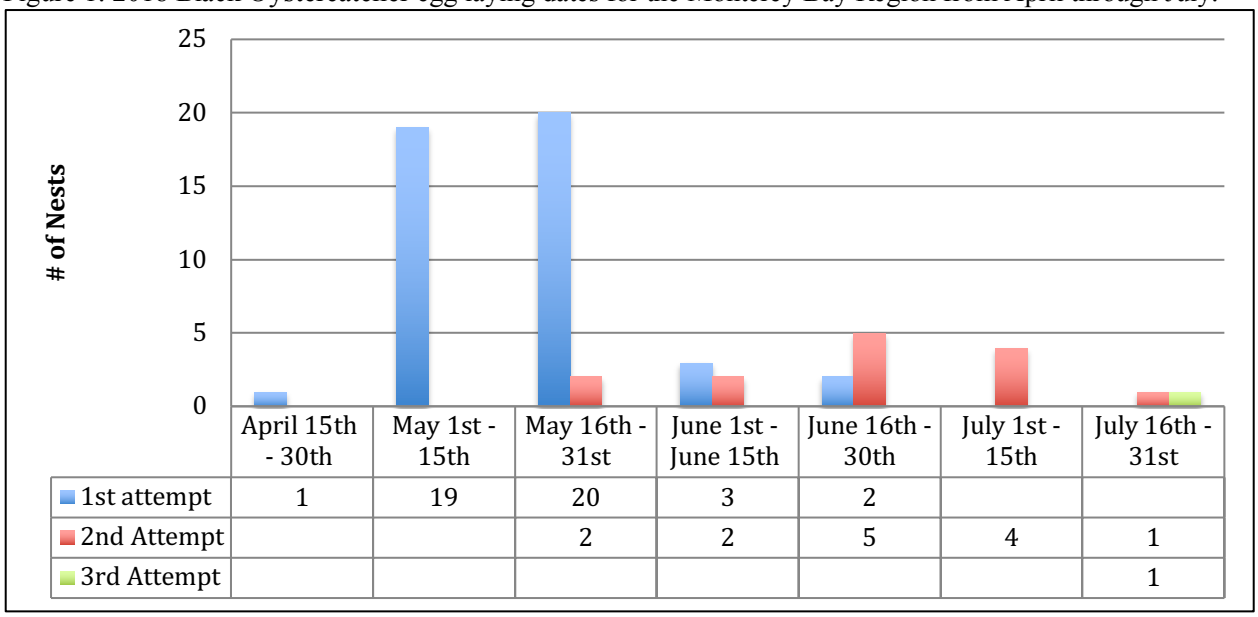
Overall, of the 70 territorial pairs monitored in the Monterey Bay Region, only 52 pairs were identified as having nested.

Additionally, the banded female Black Oystercatcher (turquoise on the right leg and black over silver on the left leg), that was banded as a chick on the Farallones National Wildlife Refuge in the summer of 2011 and first observed in Pacific Grove in the winter of 2014, was seen throughout the breeding season moving around the Monterey Peninsula section by itself and also with other oystercatchers. During the 2018 nesting period, this female was observed as not having a mate or a territory.

Timing of Breeding. The Monterey Bay Region had a total of 67 nesting attempts (including replacement clutches) of which only 60 were found 1 to 6 days after their initiation. Six nests were discovered late in the season with chicks and one site could not be accessed from April through May due to Harbor Seal pupping season closures. Therefore, only 60 nesting attempts were used to determine timing of breeding.

Nesting along the Monterey Bay Region started in late April with one pair found nesting on 30 April (MP13). The first half of May produced a total of 19 attempts -- 9 from the South Coast and 10 from the North Coast. The second half of May produced a total of 22 nesting attempts including 2 replacement clutches (MP7.2 & SC12.2) -- 11 from the South Coast and 11 from the North Coast. Nesting attempts decreased noticeably in June. All of the North Coast nesting pairs started nesting in the month of May and only produced four replacement clutches in June. The first half of June had a total of 5 nesting attempts including 2 replacement clutches (SM6.2 & SM9.2) -- 3 from the South Coast and 2 from the North Coast. The second half of June produced a total of 7 nesting attempts including 5 replacement clutches (PL1.2, PB8.2, SC6.2, SM2.2 & MP13.2) -- 5 from the South Coast and 2 from the North Coast. The first half of July produced a total of 4 replacement clutches (MP8.2, PL7.2, PB3.2 & PB11.2), all from the South Coast. Lastly, the second half of July produced a total of 2 replacement clutches (PL8.2 & MP13.3), all from the South Coast. See Figure 1 below for egg laying dates for the Monterey Bay Region.

Figure 1: 2018 Black Oystercatcher egg laying dates for the Monterey Bay Region from April through July.



	April 15th - 30th	May 1st - 15th	May 16th - 31st	June 1st - June 15th	June 16th - 30th	July 1st - 15th	July 16th - 31st
1st attempt	1	19	20	3	2		
2nd Attempt			2	2	5	4	1
3rd Attempt							1

Reproductive Success. During the 2018 breeding season, a total of 70 territorial pairs were identified but only 52 pairs were found nesting.

The Monterey Bay South Coast (Point Lobos State Nature Reserve to Monterey) had a total of 29 nesting pairs, 10 re-nesting attempts, 9 fledglings, and a reproductive success of 0.31 (per pair) (# of fledglings / # of breeding pairs). Of the pairs that produced fledglings, a total of five pairs produced one fledgling each (MP5, PB3, PB13, PB15 & PL1) and two pairs produced two fledglings each (MP1 & PL10). A total of two fledglings came from two replacement clutches (PB3.2 & PL1.2) and three fledglings came from areas that had protective measures in place to reduce human disturbance (MP1 & MP5). For the second year, MP13 produced a total of three nesting attempts.

The Monterey Bay North Coast (Natural Bridges State Beach to Pescadero State Beach) had a total of 23 breeding pairs, 5 replacement clutches, 17 fledglings, and a reproductive success of 0.74 (per pair). Of the pairs that produced fledglings, a total of three pairs produced one fledgling each (SC5, SC14 & SM1) and a total of seven pairs produced two fledglings each (SC7, SC8, SC13, SM5, SM7, SM8 & SM9). Only two fledglings came from one replacement clutch (SM9.2). A large percentage of the fledglings (76.5%, n=13) came from two areas alone -- Wilder Ranch State Park in Santa Cruz County and Pescadero Rock in San Mateo County. A total of eight fledglings (47%) came from two rocks that had protective measures in place to reduce human disturbance at Pescadero State Beach. Two nests were lost prior to the placement of the rope with signs at Pescadero Rock and it is unknown how it happened, but it is speculated that it had to do with human disturbance and Western Gulls.

Overall, the Monterey Bay Region had a total of 52 nesting pairs, 15 replacement clutches, 26 fledglings, and a reproductive success of 0.50 (per pair). A total of eight pairs produced one fledgling each and nine pairs produced two fledglings each. Only four fledglings came from three replacement clutches. A total of six of the seventeen (35%) nesting pairs that produced fledglings had protective measures in place that discourage human disturbance and were likely responsible for their success. Lastly, the North Coast produced almost two times more fledglings than the South Coast and was more likely for successful pairs to produce more then one fledgling each. See Table

2 below for more information regarding performance for individual sites throughout the study areas, and Tables 3 through 7 for productivity results for each territory within each section.

Table 2: 2018 Black Oystercatcher Reproductive Success - Monterey Bay Region

Site	Breeding Pairs	# of Eggs	# of Chicks	# of Fledglings	Nest Attempts	Nesting success	Hatching Success	Per Pair	Per Nest	Survival to Fledgling
Monterey Peninsula (MP)	11	37	9	3	15	33.3%	24.3%	0.27	0.20	33.3%
Pebble Beach (PB)	10	31	7	3	13	46.2%	22.6%	0.30	0.23	42.9%
Point Lobos (PL)	8	27	18	3	11	72.7%	66.7%	0.38	0.27	16.7%
Monterey Bay South Coast	**29**	**95**	**34**	**9**	**39**	**48.7%**	**35.8%**	**0.31**	**0.23**	**26.5%**
Santa Cruz County (SC)	14	40	23	8	16	68.8%	57.5%	0.57	0.50	34.8%
San Mateo County (SM)	9	30	17	9	12	66.7%	56.7%	1.00	0.75	52.9%
Monterey Bay North Coast	**23**	**70**	**40**	**17**	**28**	**67.9%**	**57.1%**	**0.74**	**0.61**	**42.5%**
Monterey Bay South + North Coast	**52**	**165**	**74**	**26**	**67**	**56.7%**	**44.8%**	**0.50**	**0.39**	**35.1%**

Note: Table is separated into three parts - MB South Coast, MB North Coast, and MB South Coast & MB North Coast Combined.

Table 3: Monterey Bay South Coast Productivity Results - Monterey Peninsula (MP) Section

Nest #	Name	# of Eggs	# of Chicks	# of Fledglings
MP1	Gazebo	2	2	2
MP2	Gull Rock West	2	0	0
MP3	Barnacle Rock	0	0	0
MP4	Point Pinos West	3	1	0
MP5	Point Pinos East	2	2	1
MP6	13th Street	3	2	0
MP7	Hopkins West	2*	0	0
MP7.2	Hopkins West	2*	0	0
MP8	Hopkins East	2	0	0
MP8.2	Hopkins East	2	0	0
MP9	Lover Point West (Oak Rock)	0	0	0
MP10	Hopkins North	3	0	0
MP11	Asilomar	0	0	0
MP12	Crespi Cove	0	0	0
MP13	Coast Guard Pier (El Torito)	3	2	0
MP13.2	Coast Guard Pier (El Torito)	3	0	0
MP13.3	Coast Guard Pier (El Torito)	3	0	0
MP14	3rd Street	3	0	0
MP15	John Denver Rock East	0	0	0
MP16	Point Pinos Middle (New)	2	0	0
Total:		**37**	**9**	**3**

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

Table 4: Monterey Bay South Coast Productivity Results - Pebble Beach (PB) Section

Nest #	Name	# of Eggs	# of Chicks	# of Fledglings
PB1	Stillwater Cove East	3	1	0
PB2	Stillwater Cove South	1	1	0
PB3	Stillwater Cove West	2	0	0
PB3.2	Stillwater Cove West	3	1	1
PB4	Ghost Tree (Stillwater Point)	3	0	0
PB5	Lone Cypress	3	1	0
PB6	Cypress Point Lookout	2*	0	0
PB7	Bird Rock South	0	0	0
PB8	Bird Rock North	2*	0	0
PB8.2	Bird Rock North	3	0	0
PB9	Ocean Road Neutral Zone (ORNZ)	--	--	--
PB10	China Rock South	0	0	0
PB11	Point Joe	3	0	0
PB11.2	Point Joe	2	0	0
PB12	Stillwater Cove North	0	0	0
PB13	Stillwater Cove South	2*	2	1
PB14	Bird Rock West	0	0	0
PB15	Cypress Point North	2*	1	1
Total:		**31**	**7**	**3**

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

Table 5: Monterey Bay South Coast Productivity Results - Point Lobos (PL) Section

Nest #	Name	# of Eggs	# of Chicks	# of Fledglings
PL1	Bird Island SE	3	2	0
PL1.2	Bird Island SE	2*	2	1
PL2	Bird Island NE	3	3	0
PL3	China Cove (Weston South)	0	0	0
PL4	Sand Hill Cove (Weston North)	0	0	0
PL5	Sea Lion Cove	0	0	0
PL6	Headland Cove South	0	0	0
PL7	Whalers Cove	3	3	0
PL7.2	Whalers Cove	2*	0	0
PL8	Moss Cove	2	0	0
PL8.2	Moss Cove	2*	0	0
PL9	Middle Rock North	2*	2	0
PL10	Cypress Cove	3	3	2
PL11	Headland Cove North	3	1	0
PL12	Bird Island Rocks	0	0	0
PL13	Guillemot Rock	2*	2	0
Total:		**27**	**18**	**3**

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

Table 6: Monterey Bay North Coast Productivity Results - Santa Cruz County (SC) Section

Nest #	Name	# of Eggs	# of Chicks	# of Fledglings
SC1	Natural Bridges	2*	2	0
SC2	Wilder Beach	0	0	0
SC3	Fern Grotto Beach South	2*	1	0
SC4	Fern Grotto Beach North	3	2	0
SC5	Sand Plant Beach North	2	2	1
SC6	Strawberry Beach South	2	0	0
SC6.2	Strawberry Beach South	2*	0	0
SC7	Strawberry Beach North	3	2	2
SC8	3 Mile Beach South	3	2	2
SC9	3 Mile Beach North	0	0	0
SC10	Shark's Tooth Rock	3	3	0
SC11	Shark's Tooth Cove South	2	0	0
SC12	Davenport South	2*	0	0
SC12.2	Davenport South	3	0	0
SC13	Davenport North	2*	2	2
SC14	Pelican Rock	3	2	1
SC15	Greyhound Rock	3	3	0
SC16	Davenport Bluff Middle	3	2	0
SC17	Ohlone Bluff	0	0	0
Total:		**40**	**23**	**8**

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

Table 7: Monterey Bay North Coast Productivity Results – San Mateo County (SM) Section

Nest #	Name	# of Eggs	# of Chicks	# of Fledglings
SM1	Prisoner Rock	2	2	1
SM2	Pigeon Point	2*	0	0
SM2.2	Pigeon Point	2*	0	0
SM3	Pescadero 1	0	0	0
SM4	Pescadero 2	3	2	0
SM5	Pescadero 3	3	2	2
SM6	Pescadero 4	2	0	0
SM6.2	Pescadero 4	3	3	0
SM7	Pescadero 5	3	3	2
SM8	Pescadero 6	3	2	2
SM9	Pescadero 7	2	0	0
SM9.2	Pescadero 7	3	2	2
SM10	Pescadero 8	2*	1	0
Total:		**30**	**17**	**9**

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

Nest Locations. The topography throughout the study areas varies noticeably. Portions of Point Lobos, Pebble Beach, and most of Santa Cruz County coast sections have limited access, whereas Monterey Peninsula (City of Monterey and City of Pacific Grove, including Asilomar State Beach) and San Mateo County coast sections tend to be fairly accessible.

Of the 67 nesting attempts that were recorded in the Monterey Bay Region, 46% (n=31) nested on mainland rocks (onshore rocks, outcrops, cliffs, etc.), 46% (n=31) nested on an offshore rock (disconnected from the mainland by water at some time), and 8% (n=5) nested on the beach. Offshore rocks were more likely to produce young (63%, n=24) when compared to mainland rocks (34%, n=13), and beach (3%, n=1) nesting pairs. Of the 17 breeding pairs that fledged young, 59% (n=10) nested on an offshore rock and 41% (n=7) nested on a mainland rock. Zero fledglings came from pairs nesting on the beach.

Maps. The following are Google Earth Pro maps of each section with territory boundaries and nesting locations:

Image 1: 2018 Black Oystercatcher territories and nest locations for the Monterey Peninsula (MP) section.

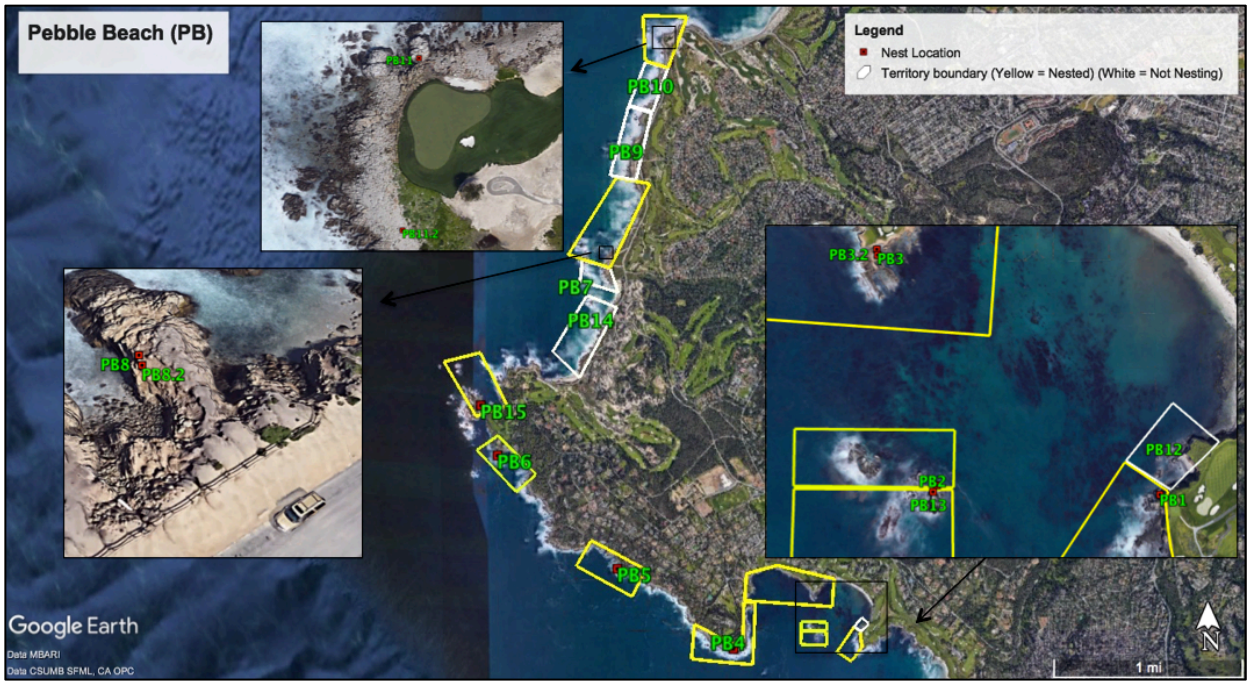


Image 2: 2018 Black Oystercatcher territories and nest locations for the Pebble Beach (PB) section.

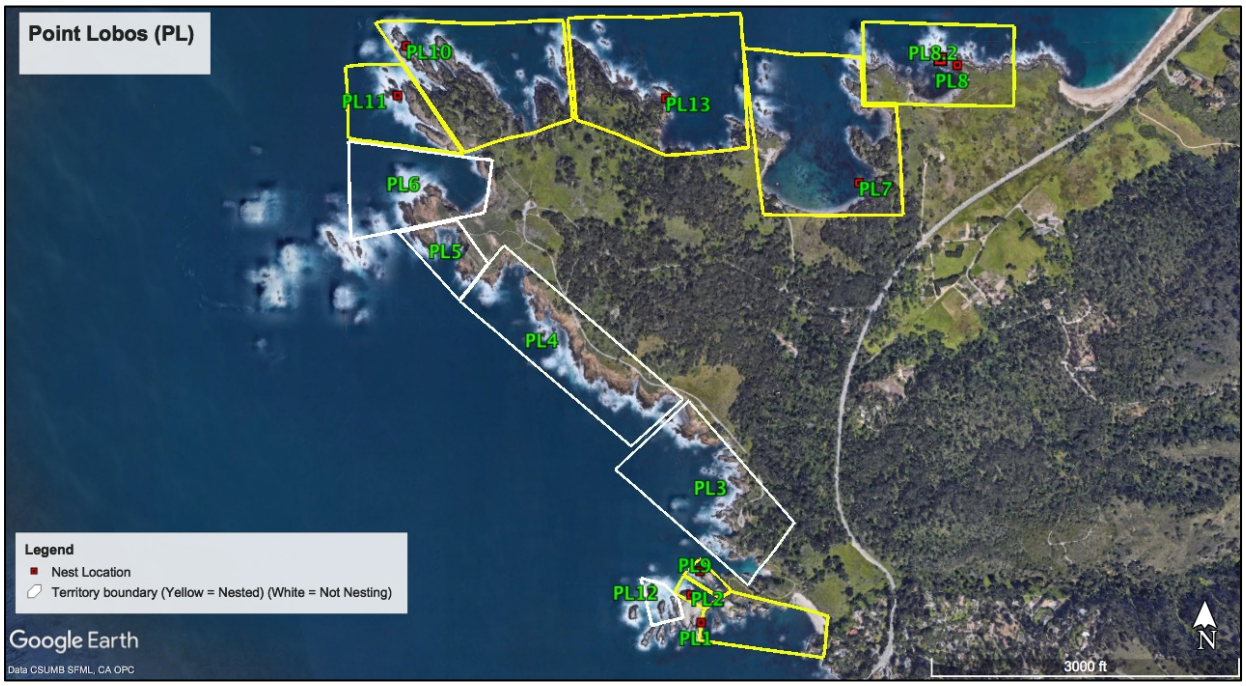


Image 3: 2018 Black Oystercatcher territories and nest locations for the Point Lobos (PL) section.

Image 4: 2018 Black Oystercatcher territories and nest locations for the Santa Cruz County (SC) section.

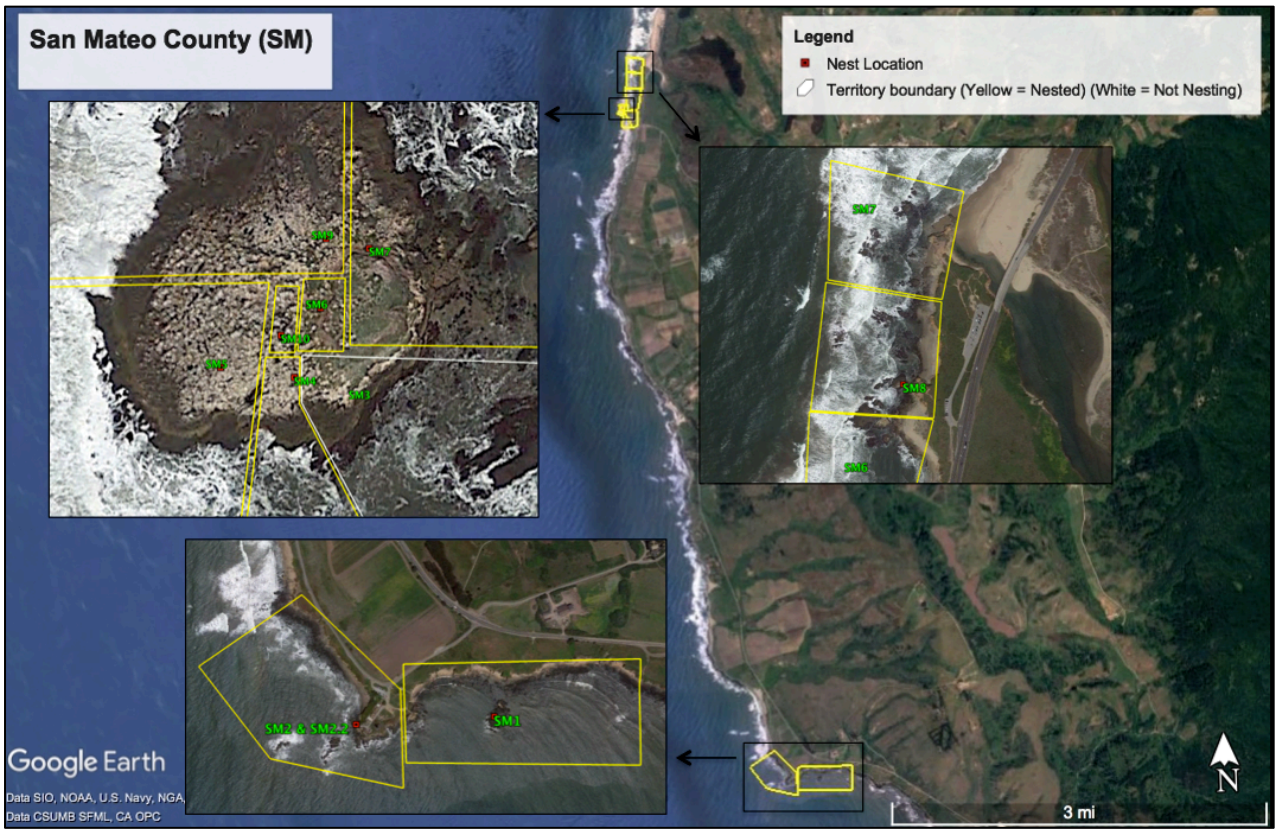


Image 5: 2018 Black Oystercatcher territories and nest locations for the San Mateo County (SM) section.

Disturbance. The five sections of the Monterey Bay Region study areas vary in terms of topography, land use, and accessibility.

In the Monterey Bay South Coast, the Monterey Peninsula section is by far the most accessible out of the five and it has the most nearshore development, recreational trails, and parking areas. The Point Lobos and Pebble Beach sections are both similar in terms of accessibility and topography. These two sections have a small percentage of areas that can be accessed and a large percentage of areas that are naturally difficult to access. Due to having privately owned homes in Pebble Beach and strict regulations in Point Lobos, both sections further limit the amount of human disturbance that is received by nesting oystercatchers.

The Monterey Bay North Coast has bluffs in the Santa Cruz County section and an accessible coastline in the San Mateo County section. As a result, the San Mateo County section is more vulnerable. Most of the coast and offshore rocks in the San Mateo County section can be accessed during low tide via one of the many parking areas along Highway 1 that are a short walking distance from the intertidal zone. Also, six of the ten nesting pairs in the San Mateo County section are nesting on Pescadero Rock, which can be accessed during negative low tides. One major disturbance on Pescadero Rock can have a big impact on the overall success for San Mateo County section and the overall Monterey Bay Region. Placing ropes and signs on Pescadero Rock for the last two seasons have helped reduce such disturbance. The Santa Cruz County section has very little access to nesting areas in Wilder Ranch State Park and Davenport, which include 11 of the 14 nesting pairs. The only two nesting areas in Santa Cruz County that receive human disturbance, include Natural Bridges and Greyhound Rock.

As a result, nesting Black Oystercatchers in the Monterey Bay Region received varying amounts of human and natural disturbances. A large portion of the observations for disturbance in this report were gathered by volunteers for the Monterey Peninsula, Point Lobos, and Pebble Beach sections. Disturbances were recorded from mid April through October and include nesting and non-nesting stages of identified breeding pairs. A disturbance was recorded anytime a pair was seen chasing, doing alert calls, or territorial calls towards any threats. The five common disturbances that were encountered during the season were: (1) humans near a nesting area (31 observations); (2) drones flying at or near a nesting areas (22 observations); (3) dogs on or off leash near a nesting area (13 observations); (4) fishing near a nesting area (5 observations); (5) avian species roosting or flying by nesting area (Western Gull, Heermann's Gull, Brown Pelican, Brandt's Cormorant, Red-shouldered Hawk, Turkey Vulture, Peregrine Falcon, Great Blue Heron, Great Egret, American Crow, and Common Raven) (55 observations); and (6) Black Oystercatcher interlopers passing through a nesting area (217 observations). Due to the Monterey Peninsula having a more accessible coast, as well as and more observations, it accounted for 29 human, 11 dog, 18 drone, and 3 fishing disturbances. Pebble Beach had 1 human, 2 drone, and 5 avian disturbances only. Point Lobos had 6 avian disturbances only. Santa Cruz County had 1 dog, 1 fishing, and 5 avian disturbances only. San Mateo County had 1 human, 1 dog, 2 drone, 1 fishing, and 1 avian disturbance only. No direct observations of natural predation on eggs or chicks were recorded this year.

PROTECTIVE MEASURES

Ropes & Signs. Protective measures using ropes with signs, stakes with signs, and at one site, lattice wood fencing with signs, were put in place at select nesting areas in an attempt to try to minimize human disturbance to nesting pairs in places known to have high human activity. Which

of these protective measures were used depended on what was feasible for the particular nesting area.

In total, sixteen nesting sites in the Monterey Bay Region received one of the above mentioned protective measures. This included a short-term effort by the City of Pacific Grove (MP14) and another at Pebble Beach with the approval of the Pebble Beach Company (PB8). Seasonal protective measures were put in place on seven offshore rocks that fall within the jurisdiction of the California Coastal National Monument in the Monterey Peninsula and San Mateo County sections. These seasonal measures protected a total of 13 nesting sites (MP3, MP4, MP5, MP12, MP16, SM3, SM4, SM5, SM6, SM7, SM8, SM9 & SM10). For the second year, State Parks closed off one site along Asilomar State Beach (MP1). The seasonal protective measures on the California Coastal National Monument and State Parks are implemented from April through September. For the first time, the City of Pacific Grove and Pebble Beach allowed for the closure of two nesting areas that were on the mainland under city and private jurisdiction respectively. The Pebble Beach protection measures on the mainland across from Bird Rock were implemented late in the season and gave protection to the second nesting attempt but not the first. The Pacific Grove protective measure of the nesting pair (MP14) across from 5th Street resulted from discussions with city officials and passionate volunteers voicing their opinion at City Hall meetings. As a result, the City of Pacific Grove agreed to temporarily placing lattice wood fencing across a point of entry near the nesting area.

Overall, the areas that were protected with ropes and signs produced a total of 11 fledglings and account for 42% of the fledglings produced in the Monterey Bay Region.

Image 6: Examples of the different types of protection measures implemented in the 2018 Black Oystercatcher breeding season in the Monterey Bay Region. Rope with signs at Pescadero Rock in San Mateo County (left), lattice wood fencing at 5th Street in Pacific Grove (middle), and stake with sign at Bird Rock in Pebble Beach (right).

Wildlife Cameras. Use of wildlife cameras in the Monterey Bay Region study area was minimal this year. Several sites along the Monterey Bay South Coast were considered for the placement of one of the California Coastal National Monument's Reconyx Hyperfire HC600 trail cameras, but none of the considered sites met the established criteria. Early in the season, an attempt was made at Point Lobos to place a State Parks' Reconyx HC600 trail camera across from the nesting site on an offshore rock in Whaler Cove (PL7) by attaching the camera to a tree branch overlooking the rock, but the attempt proved unsuccessful. The camera was set to motion triggered, but due to the

distance (~100 feet/30 meters), no images of wildlife were acquired. The only trail camera that was successfully placed and successfully captured images was a Reconyx HC500 attached to a heavy but portable granite rock and placed by State Parks at a nesting site along Asilomar State Beach (MP1). The camera was placed soon after the nest was found in late May and at a distance of approximately 20 feet (6 meters) away and was taken down when the chicks were near fledging age in early August. A rope with signs was also placed at the location by State Parks at all possible points of entry to the nesting rock. The main findings from the trail camera include two images of people near the nest and one image of a coyote on the nesting rock at 4:50 a.m. at the time when the chicks were larger and more mobile.

Image 7: State Parks employee placing the trail camera to monitor a nesting pair along Asilomar State Beach.

RECOMMENDATIONS

Ropes and Signs. The placement of protective measures such as a rope with signs or stakes with signs are a cost effective and productive effort that should be continued and used at other nesting areas that are vulnerable to human disturbance. For such areas that fall outside California Coastal National Monument jurisdiction, an effort to contact appropriate officials should be considered if any oystercatchers are observed doing nesting activity or found nesting in an area that would benefit from protective measures. An effort to protect nesting areas along the Hopkins Marine Station should be considered in order to protect pairs nesting on the mainland and on the beach. A simple sign on a stake with a caution message could be placed at strategic locations near the nesting sites in order to inform staff, students, and visitors. The placement of ropes with signs at all known nesting sites that receive human disturbance should be placed before April 15th and should remain in place until late September. Protecting nesting areas from April through September will give oystercatchers a safe start and ample time to raise their young if they are successful.

Nesting areas that should be protected are as follows:

- Nesting areas requiring annual protection are MP1, MP2 (Gull Rock East), MP4, MP5, MP16, PB8, and SM3 through SM10.

- Potential nesting areas that require annual monitoring in order to determine whether protective measures are needed are MP3, MP9, MP12, and MP14.

- Nesting areas that should be protected but require approval from private land owners are MP7, MP8, MP10, & possibly MP14 on Hopkins Marine Station, MP13 on private land on the

east side of the El Torito restaurant, and PB11 under the jurisdiction of the Pebble Beach Company.

An effort should be made to continue assessing the effectiveness of the ropes with signs, as well as the other protective measures. Monitoring human activity before and after the placement of ropes with signs and the other protective measures used, will provide useful data and will help improve protective measures. This effort will also provide an opportunity to interact with visitors and further inform people about wildlife disturbance, oystercatchers, intertidal ecosystems, and tidepool etiquette. Ideal locations for such monitoring include MP4 and MP5 at Point Pinos, MP1 along Asilomar State Beach, and along the recreational trail at MP14 at 5th street in Pacific Grove, if the pair decided to nest on the mainland again. Direct observations of people's behavior pre and post the placement of the rope with signs at specific nesting areas combined with breeding season results should demonstrate the effectiveness of the protective measures and can be a model for protecting important Black Oystercatcher nesting areas from human activities in places that need it.

Outreach. An effort to interact with visitors and locals along the coast should be considered in order to provide information about wildlife disturbance, drone restrictions, and nesting birds. In 2018, in an attempt to protect a nest that was on the mainland in Pacific Grove, many volunteers and one intern took turns throughout the day to interact with the public in order to prevent human disturbance to the nest and at the same time encourage people to be respectful to wildlife along the coast. As a result, throughout the month of June while the nest was active, volunteers were able to talk to hundreds of people, give out information, share stories, and, best of all show, people an active oystercatcher nest and, via spotting scopes, an up-close view of Black Oystercatchers. Everything was well received and provided a unique experience for both the volunteers and the visitors. A similar effort should be considered for future years in a location where a nesting pair exists and that has a lot of nearby human activity. The timing and duration of such effort should reflect the duration of the nesting pair of interest. The number of hours monitored daily will depend on the availability of volunteers and interns. Such effort will require at least one spotting scope, a pair of binoculars, brochures, stickers, and a poster or laminated sheets with Black Oystercatcher information.

Drone Disturbance. For the second year, a high number of drone observations were made in the Monterey Bay Region with most observations recorded in the Monterey Peninsula section (18 out of 22). As of December 2017, the City of Pacific Grove approved an ordinance (11.72.010) that prohibits the landing or launching of any UAS (Unmanned Aircraft System) without a permit from the City Manager or its designee. In addition, almost all sections in the study areas have some form of special rules or regulations in place that regulate or prohibit the use of drones. These include Federal Aviation Administration's regulations regarding drone use within 5 nautical miles of an airport covering the City of Monterey and much of the eastern portion the City of Pacific Grove's part of the Monterey Peninsula section; Monterey Bay National Marine Sanctuary's ban on aircraft flights, including drones, below 1000 feet for both the Santa Cruz County and San Mateo County sections; State Parks' ban on drone use on Point Lobos State Natural Reserve in the Point Lobos section and on Wilder Ranch State Park in the Santa Cruz County section and Pescadero State Beach in the San Mateo County section; and the Pebble Beach Company's restrictions on drone use within the Pebble Beach section. Nonetheless, enforcement of these restrictions is difficult, therefore drone use is not always prevented or detected.

In order to protect Black Oystercatchers during the breeding season, the following recommendations are provided:

(1) The City of Pacific Grove should restrict the issuance of permits that would involve launching or landing drones for use over the coastline from April through September. If any permits are to be issued, they should be restricted to professional drone operators and with the requirement that an experience Black Oystercatcher observer needs to be present in order to communicate any disturbance to the drone operator and to find the best possible way to accomplish the task with minimal disturbance to any nesting pairs in the area.

(2) Have Black Oystercatcher observers at known areas of high drone disturbance throughout the day during holidays and three-day weekends to interact with visitors and provide information. Areas of high drone disturbance are within the Monterey Peninsula section and include zones between Point Pinos and South Gull Roost, and to a lesser extent along the northwestern portion of Asilomar State Beach.

(3) Look into the possibility of collaborating with the Monterey Bay National Marine Sanctuary's (MBNMS) Bay Net program in order to increase Black Oystercatcher awareness and prevent drone disturbance at their Harbor Seal monitoring areas. The sanctuary has volunteers throughout the Monterey Peninsula and Pebble Beach sections that interact with visitors during Harbor Seal pupping season. Coincidently, one or two nesting pairs can sometimes be seen from those Harbor Seal monitoring areas and it would be very helpful if volunteers reported drone use to the authorities or made an attempt to politely communicate with the drone operator to bring the drone down. Such effort would benefit Harbor Seals and Black Oystercatchers.

Implementation of Wildlife Cameras. Very little information is known regarding predation of Black Oystercatcher eggs and chicks in the Monterey Bay Region. Nesting attempts fail with little to no evidence of the cause for the failure. For a second year in a row, State Parks attempt to document disturbance to nesting oystercatchers at Asilomar State Beach. Some useful information regarding night predators has been documented and is helping to provide a broader picture of the kinds of stresses nesting oystercatchers receive. There are a number nesting areas with nest failures in the Monterey Bay South Coast that could be monitored using a trail camera and possibly provide useful information that can help improve oystercatcher productivity. If the right locations for mounting a wildlife camera are determined and the proper tools are acquired prior to the nesting season then many nesting areas can benefit from the placement of one of the many wildlife cameras that the California Coastal National Monument and State Parks have available for use.

A total of 13 nesting sites were evaluated for the potential to receive a wildlife camera and the results show that at least 8 sites could receive a wildlife camera with low risks and high outcomes. Some of the best sites include MP1, PB3, MP7, MP8, MP10, PB8, PB11, and PL8. Special permission will be required for most of the sites from Hopkins Marine Station, Pebble Beach Company, and State Parks. With preparations over the winter, it is possible to implement wildlife cameras along the Monterey Bay South Coast next year. See Table 8 below for a list of potential nesting sites where a trail camera could be placed.

Table 8: An evaluation of 13 potential nesting sites along the Monterey Bay South Coast as to their potential for placement of a wildlife camera. Note: A score of 4 or 5 is a likely site.

Nest ID	Access to nesting area? (Y/N)	Risk of being stole? (Y/N)	Will it be effective in capture data? (Y/N)	Disturbance to nesting pair? (light/moderate/strong)	Location of placement? (Mainland/offshore)	Score (Positives vs. Negatives)
MP1	Yes	No	Yes	Light	Mainland	5
MP4	Yes (low tide)	Yes	Yes	Moderate	Offshore	3
MP5	Yes (low tide)	Yes	Yes	Moderate	Offshore	3
MP6	Yes	Yes	Yes	Moderate	Mainland	2
MP7	Yes	No	Yes	Moderate	Mainland	4
MP8	Yes	No	Yes	Moderate	Mainland	4
MP10	Yes	No	Yes	Moderate	Mainland	4
MP13	Yes	Yes	Yes	Moderate	Mainland	2
PB3	Yes	No	Yes	Light	Mainland	5
PB8	Yes	Yes	Yes	Moderate	Mianland	4
PB11	Yes	No	Yes	Moderate	Mainland	4
PL7	Yes (low tide)	No	Yes	High	Offshore	3
PL8	Yes	No	Yes	High	Mainland	4

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