

**Black Oystercatcher Reproductive Success
California Central Coast
2017**



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Bureau of Land Management, U.S. Department of the Interior

INTRODUCTION - STUDY AREA

In 2017, the California Central Coast Black Oystercatcher Project monitored nesting activity of a total of 64 Black Oystercatcher territorial pairs along the Monterey Bay region, from Point Lobos State Natural Reserve to Pescadero State Beach, covering three counties and approximately 160 kilometers (100 miles) of coastline. The Monterey Bay region was separated into two study areas due to one side of the coast having more monitoring history and in order to compare the productivity between the two study areas. The two study areas are Monterey Bay South Coast (northern Monterey County) and Monterey Bay North Coast (northern Santa Cruz County and southern San Mateo County). Monterey Bay South Coast extends from Point Lobos State Natural Reserve on the south end to the City of Monterey on the north end and is broken into three sections -- Point Lobos, Pebble Beach, and Monterey Peninsula. Monterey Bay North Coast extends from Natural Bridges State Beach on the south end to Pescadero State Beach on the north end and consisting of two sections -- Santa Cruz County and San Mateo County.

METHODS & MATERIALS

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 April through September.

Although the project is overseen by professional biologists from Audubon California and the California Coastal National Monument, it is currently operated as a citizen science effort using primarily BLM volunteers. The BLM volunteers incorporated citizen science monitors from Pacific Grove Museum of Natural History volunteers and docents from the Point Lobos State Natural Reserve. For a third 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. In 2017, the number of citizen science monitors increased to more than 40 at the beginning of the breeding season.

Observations using binoculars and spotting scope from land were made in each Black Oystercatcher territory for a minimum of 30 to 60 minutes at least once a week during the breeding season. Nests with known hatching dates or with chicks were monitored as frequently as two times a day for as much as an hour or more during each observation session.

Territory size was determined as a result of observations made of the individual pair's foraging distance, encounters with neighboring pairs, and distance of territorial chases of interloping oystercatchers. Google Earth Pro was used to obtain GPS coordinates, map nest locations, and delineate territory size.

RESULTS

Distribution

The Monterey Bay South Coast is composed of 40 territorial pairs – 13 around the Monterey Peninsula (See Image 1), 13 along Pebble Beach (See Image 2), and 14 at Point Lobos State Natural Reserve (See Image 3). Of the South Coast's 40 territorial pairs, there were 29 breeding pairs and 10 re-nesting attempts for a total of 39 clutches. Of the 11 territorial pairs that did not nest this season, 9 have a history of nesting. It is also possible that for some of the Pebble Beach and Point Lobos pairs that were labeled as "Not Nesting" could have nested, but due to the complexity of the coast and access limitations in the monitoring locations, nesting sites were not found.

The Monterey Bay North Coast is composed of 24 territorial pairs – 15 along the Santa Cruz County Coast (See Image 4) and 9 on the San Mateo County Coast (See Image 5). The north coast had 19 breeding pairs and 4 re-nesting attempts for a total of 23 clutches. A total of 5 pairs were labeled as "Not Nesting", however, some of these pairs could have attempted nesting in areas not visible to the monitors.

Overall, there were a total of 48 breeding pairs, 14 re-nesting attempts, and a total of 62 clutches that were monitored in the Monterey Bay region.

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 2011 and first observed in Pacific Grove in the winter of 2014, found a mate and claimed a territory in 2016, attempted to nest in the spring of 2017. Unfortunately, their attempt failed and she was replaced by another female. The banded female was then seen moving around to the west of her former territory and occasionally in the company of another male in another territory more than a kilometer away from her original territory.

Timing of Breeding and Egg Laying

Nesting along the Monterey Bay region started in late April with two pairs in the Monterey Bay South Coast. A total of 31 nests were found in the month of May with most nesting during the third and fourth week of that month. A total of 9 additional nests were initiated in June with the majority during the first week. Re-nesting started as early as the third week of May by the same individuals that started nesting in late April. There were an additional 5 re-nesting attempts in June, 6 in July, and 1 in August. Additionally, there were two pairs that tried nesting a total of three times. Figure 1 provides a graph of the egg laying dates for the entire Monterey Bay region.

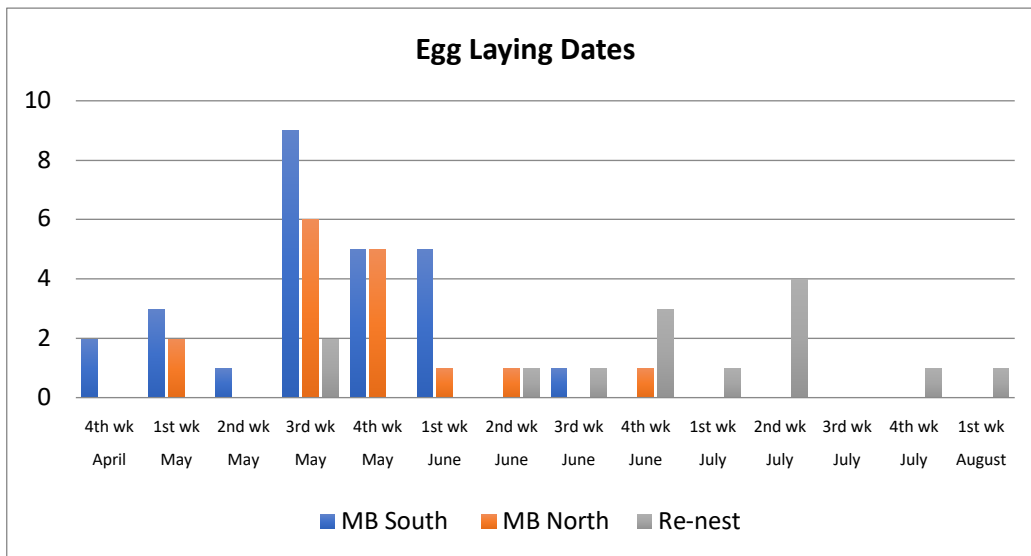


Figure 1: Egg laying dates for Monterey Bay South Coast and Monterey Bay North Coast.

Reproductive Success

During the 2017 breeding season, there were a total of 48 nesting pairs that produced a total of 62 nesting attempts.

The Monterey Bay South Coast (Point Lobos SNR - Monterey) had a total of 29 nesting pairs, 10 re-nesting attempts, and a reproductive success of 20.6%. A minimum of 87 eggs were produced but many clutches were lost before the 30-day hatching period, resulting in the South Coast having a 28.2% nesting success. At least 20 chicks were produced, but only 30% survived to fledgling age. As a result, the Monterey Bay South Coast had a total of 6 fledglings that came from three of the 29 breeding pairs. One pair in particular (PL10) successfully fledged three young.

The Monterey Bay North Coast (Natural Bridges State Beach - Pescadero State Beach) had a total of 19 breeding pairs, 4 re-nesting attempts, and a reproductive success of 84.2%. A minimum of 53 eggs were produced and resulted in a 78.3% nesting success. At least 35 chicks were produced and 45.7% made it to fledgling age. As a result, the Monterey Bay North Coast had a total of 16 fledglings from 12 of the 19 breeding pairs. Four of the 12 pairs that successfully fledged young were successful at fledging two birds.

As a whole, the Monterey Bay region had a reproductive success of 45.8%. A minimum of 140 eggs were produced and resulted in a 62.9% nesting success. At least 55 chicks were produced and 40% survived to fledgling age. As a result, the Monterey Bay Region produced a total of 22 fledglings from 15 of the 48 breeding pairs. (See Table 1).

Table 1: 2017 Black Oystercatcher Reproductive Success – Monterey Bay Region

2017 Black Oystercatcher Reproductive Success - Monterey Bay Region										
Site	Breeding Pairs	# of Eggs	# of Chicks	# of Fledglings	Nest Attempts	NS	HS	Per Pair	Per Nest	Survival to fledgling
Monterey Bay South Coast	29	87	20	6	39	28.2%	23.0%	0.21	0.15	30.0%
Monterey Bay North Coast	19	53	35	16	23	78.3%	66.0%	0.84	0.70	45.7%
Monterey Bay South + North	48	140	55	22	62	62.9%	39.3%	0.46	0.35	40.0%

Table 2: Monterey Bay South Coast - Monterey Peninsula (MP)

Nest #	Name	# of Eggs	# of Chicks	End Result
MP1	Gazebo	2	0	Failed
MP2	Gull Rock West	2*	0	Failed
MP3	Gull Rock East	0	0	Not Nesting
MP4	Point Pinos West	2	1	Failed
MP5	Point Pinos East	2	1	Failed
MP5.2	Point Pinos	1	0	Failed
MP6	13 th Street	1	0	Failed
MP6.2	13 th Street	3	0	Failed
MP6.3	13 th Street	1	0	Failed
MP7	Hopkins West	2*	1	Fledged 1
MP8	Hopkins East	2	0	Failed
MP9	Lovers Point West	2*	0	Failed
MP9	Lovers Point West	2*	0	Failed
MP10	Hopkins North	3	0	Failed
MP10.2	Hopkins North	2	0	Failed
MP11	Asilomar	0	0	Not Nesting
MP12	Crespi Cove	1	0	Failed
MP13	Coast Guard Pier	3	0	Failed
MP13.2	Coast Guard Pier	2	2	Failed
MP13.3	Coast Guard Pier	3	0	Failed
MP14	3 rd Street	2*	0	Failed
Total:				
		38* Eggs	5 Chicks	1 Fledgling

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

Table 3: Monterey Bay South Coast - Pebble Beach (PB)

Nest #	Name	# of Eggs	# of Chicks	End Result
PB1	Stillwater Cove East	3	3	Fledged 2
PB2	Stillwater Cove South	2*	0	Failed
PB3	Stillwater Cove West	3	0	Failed
PB4	Ghost Tree (Stillwater Point)	0	0	Unknown
PB5	Lone Cypress	2*	0	Failed
PB6	Cypress Point Lookout	2*	0	Failed
PB7	Bird Rock South	0	0	Failed
PB8	Bird Rock North	2*	0	Failed
PB8.2	Bird Rock North	2	0	Failed
PB9	Ocean Road	0	0	Neutral Zone
PB10	China Rock South	0	0	Not Nesting
PB11	Point Joe	3	3	Failed
PB11.2	Point Joe	3	1	Failed
PB12	Stillwater Cove North	0	0	Unknown
PB13	Stillwater Cove Southside	2*	1	Failed
PB14	Bird Rock West	0	0	Unknown
Total:				
		24* Eggs	8 Chicks	2 Fledgling

Table 4: Monterey Bay South Coast - Point Lobos (PL)

Nest #	Name	# of Eggs	# of Chicks	End Result
PL1	Bird Island SE	3	0	Failed
PL2	Bird Island NE	2*	1	Failed
PL3	China Cove (Weston South)	2*	0	Failed
PL4	Sand Hill Cove (Weston North)	0	0	Not Nesting
PL5	Sea Lion Cove	0	0	Not Nesting
PL6	Headland Cove South	0	0	Not Nesting
PL7	Whalers Cove	3	0	Failed
PL8	Moss Cove	2*	0	Failed
PL8.2	Moss Cove	2*	0	Failed
PL9	Middle Rock North	3	0	Failed
PL10	Cypress Cove	3	3	Fledged 3
PL11	Headland Cove North	0	0	Unknown
PL12	Bird Island Rocks	2*	0	Failed
PL13	Guillemont Rock	3	3	Failed
Total:		25* Eggs	7 Chicks	3 Fledgling

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

Table 5: Monterey Bay North Coast - Santa Cruz County

Nest #	Name	# of Eggs	# of Chicks	End Result
SC1	Natural Bridges	0	0	Failed
SC2	Wilder Beach East	0	0	Unknown
SC3	Wilder Beach West/Fern Grotto West	0	0	Not Nesting
SC4	Fern Grotto East	3	2	Failed
SC5	Sandplant Beach West	3	2	Fledged 1
SC6	Strawberry Beach East	3	2	Fledged 1
SC7	Strawberry Beach West	2*	2	Fledged 2
SC8	3-Mile Beach East	3	2	Failed
SC9	3-Mile Beach West	0	0	Unknown
SC10	Shark Fin Cove	3	3	Failed
SC10.2	Shark Fin Cove	2*	0	Failed
SC11	Shark Fin Cove East	2	1	Failed
SC12	Davenport Beach East	1	1	Fledged 1
SC13	Davenport Pier Beach West	2*	0	Failed
SC13.2	Davenport Pier Beach West	3	3	Failed
SC14	Greyhound Rock	3	2	Fledged 1
SC15	Pelican Rock	2*	0	Failed
SC15.2	Pelican Rock	2*	2	Fledged 1
Total:		34 Eggs	22 Chicks	7 Fledglings

Table 6: Monterey Bay North Coast - San Mateo County

Nest #	Name	# of Eggs	# of Chicks	End Result
SM1	Prisoner Rock	0	0	Unknown
SM2	Pigeon Point North	2*	2	Failed
SM2.2	Pigeon Point North	2*	0	Failed
SM3	Pescadero Rock 1	2*	0	Failed
SM4	Pescadero Rock 2	3	2	Fledged 1
SM5	Pescadero Rock 3	2	2	Fledged 2
SM6	Pescadero Rock 4	1	1	Fledged 1
SM7	Pescadero Rock 5	2	2	Fledged 2
SM8	Pescadero Rock 6	3	2	Fledged 1
SM9	Pescadero Rock 7	2*	2	Fledged 2
Total:		19 Eggs	13 Chicks	9 Fledglings

Nest Locations

Of the 62 nest locations in the Monterey Bay region 52% were found on offshore rocks, 27% were on the mainland rock, 13% were on bluffs, and 8% on the beach. There was no significant difference in productivity between offshore (8 successful pairs) and mainland (mainland rocks, bluffs, and beach, 7 successful pairs) nesting pairs. Most of the Black Oystercatcher territories along the Monterey Bay South Coast stretch have been identified except for the area on the west side of Bird Island and some areas along the rugged and private coast of Pebble Beach. Does not include coast to the south of Point Lobos State Natural Reserve. The Monterey Bay North Coast on the other hand, is believed to have more territories that have not yet been identified due private property, accessibility, and lack of volunteers.

Disturbance

Based on limited observations made when monitoring 1-2 times a week for 30 to 60 minutes, it seems that the Monterey Bay South Coast had the most observed disturbances, in particular the Monterey Peninsula stretch, from Monterey through Asilomar State Beach. This stretch had the highest amount of human, dog, and drone disturbance recorded. This section of the coast is the most accessible to people out of the entire survey area. The topography is ideal for climbing and photography and unfortunately those are the same rocks on which oystercatchers are choosing to nest. Such activities could discourage Black Oystercatchers from nesting or re-nesting. Dogs and drones in particular, will cause oystercatcher to react even when they are many meters away from the nest, as long as dogs or drones are within hearing or viewing range. The other two monitoring areas in the South Coast, Pebble Beach and Point Lobos, are less likely to have similar impacts due to the topography and having rules preventing people from going off trail and/or trespassing. The two most common disturbances in these two stretches were people and drones as well, but to a lesser extent than the Monterey Peninsula.

The Monterey Bay North Coast had low human disturbance throughout the coastal area. Most Black Oystercatchers nested on offshore rocks and on bluffs in places that were difficult for humans to access. The north coast, in many cases, is separated by what appears to the public to be a barrier of private property. Even for monitoring purposes, the only way to reach a number of the nesting sites is by hiking or biking into them. The only areas in the North Coast that received

human disturbance include Natural Bridges and Greyhound Rock on the Santa Cruz County coast and Pescadero Rock at Pescadero State Beach on the San Mateo County coast. Pescadero Rock receives the most human disturbance during low tide when compared to the other areas in the North Coast. Early on in the season, it was obvious that people were going to be an issue after witnessing people fishing from the rock or simply climbing out on the rock during low tide. More than 50 meters of rope with signs was placed around the beach side of the nesting rock to discourage people from climbing. We believed this strategy was successful based on observations made of people approaching the rock and then turning around after reading the signs. A sign was also temporarily mounted on a separate nesting rock just north of Pescadero Rock. This single sign appeared to have reduced human disturbance as well. Furthermore, Greyhound Rock had people climbing up and down the middle of the rock. No precautionary measures were taken at this site and the oystercatchers were still successful at fledgling one bird. Nonetheless, people were climbing up the ridge of the rock as oppose to the side of the rock where the oystercatchers nested.

Overall, people walking too close to nests were an issue only at certain sites (MP4, 5, 6, 12, 13, and PB8.2, 11) where the coast is easily accessible. People with dogs on leash and off leash near nesting areas was an issue (MP4, 5, 6, and 12), as observed by oystercatchers reacting to their presence, even when dogs were many meters away. For the first time in the six years of monitoring there were an increase of drones observed throughout the Monterey Bay region. Monitors observed approximately 30 drone flights. The presence of a drone in a territory that is within viewing or hearing distance of a nesting pair will cause continual alarm calls and at least one of the nesting pair to take to the air and make striking attempts at the drone until the drone leaves the area or is landed. Other roosting seabirds are also flushed off the rocks when a drone is around.

Lastly, there were no observations of natural predation on the eggs or chicks, but many observations of Black Oystercatchers reacting to other animals were observed. In the South Coast, Black Oystercatchers were seen reacting to Peregrine Falcon, Red-shoulder Hawk, Turkey Vulture, American Crow, Western Gull, Brown Pelican, Brandt's Cormorant, and Ground Squirrel. In the North Coast, Black Oystercatchers were seen reacting to Peregrine Falcon, Common Raven, Northern Harrier, Western Gulls, Brown Pelican, and Brandt's Cormorant.

USE OF WILDLIFE CAMERAS

The 40 Black Oystercatchers territories in the Monterey Bay South Coast were assessed for the possible placement of wildlife cameras. Criteria for placing a camera was that it must be in a location that: (1) is accessible for camera placement; (2) has a low probability for the camera being stolen or vandalized; (3) has a reasonable possibility that if nesting disturbance occurred, it would be recorded; and (4) placing the camera would not cause unnecessary disturbance to the nesting pair.

The nesting sites in all 40 Black Oystercatcher territories were assessed using the four criteria. If it was clear that anyone of the four criteria could not be met for a nesting site, then that site was dropped from consideration. If there was a possibility that all four criteria could be met, further consideration was given to that site. During the wildlife camera placement assessment period, the question arose regarding the legality of placing "surveillance cameras" along the coast and whether it would infringe on anyone's private rights? It took a number of weeks to get this issue resolved. A two-page briefing paper was prepared and its conclusion is that the use of such cameras is not prohibited (See Attachment).

The question regarding the legality of placing “surveillance cameras” along the coast arose during the beginning of the nesting season and caused a delay in the possible placement of cameras. By the time the legal question was looked into and resolved, it was evident that some nesting sites did not meet the criteria, one did not nest, and a couple were in Point Lobos where State Parks had direct control over placement and timing. Other potential sites were paused due to the uncertainty of camera’s capturing information due to distance, location of nest, and private property.

A Reconyx™ Hyperfire HC600 camera was placed at one nesting site in the South Coast (MP4), a site that was roped-off with a rope with “Keep Off” signs attached. In order to avoid disturbing the nesting birds, the camera was fasted on a rock outcropping about 30 meters away from the nesting site. With a new memory (SD) card and new lithium batteries, and an estimate battery life of 90 days of running time, the camera was set for a continuous photo at an interval of 1 frame per minute. The camera was set-up on 22 May 2017 and stopped on 8 June 2017, running only for 17 days. It took 23,758 photos. The night hours appeared useless; however, it may have been able to pick-up a large warm-bodied animal (e.g., a raccoon), but none were on site during the running time. It is also possible that the range setting was not set to Max Range. Several morning hours were not usable because of fog and/or moisture on the lens. During the 17 days that the camera was running, there was no sign of any predation or human disturbance. The head of the nesting Black Oystercatcher was often visible during the day and the partner off the nest was regularly visible while it was in sentinel mode. The camera did pick-up the usual suite of seabirds (i.e., Western Gulls, Brandt’s Cormorants, and Brown Pelicans) that occupy the rock on which the Black Oystercatcher pair nests.

In addition, at the beginning of the breeding season and before nesting was established, State Parks personnel at Asilomar State Beach placed a Reconyx™ Hyperfire Semi-Covert HC500 camera in a metal lock box that was bolted to a very heavy but portable granitic rock and placed near a nesting site that was used in previous years by a territorial pair. The nesting site was also roped and signed. Unfortunately, the Black Oystercatcher pair did not nest this season. Nonetheless, the camera was in place for about 4 months. Unlike the HC600 that was set for a continuous photo taken every minute, the HC500 was on the default motion detection setting of 3 photos per second whenever triggered. The camera was checked about every 2 weeks. At that time, the SD card was checked and downloaded, and the camera was wiped down to remove the salt build up from the sea mist. Although the camera did not pick-up any Black Oystercatcher activity, it did pick-up a couple photos of raccoons, 2 photos of a crow, and 1 photo of a dog. Humans within the roped off area triggered the camera on 27 occasions, including 2 possible attempts to tamper with the camera box. The greatest amount of human activity was recorded during the Fourth of July weekend.

With only two wildlife cameras used this season, assessment of their usefulness for detecting Black Oystercatcher nesting disturbance could not be determined. A larger number of cameras will need to be placed in order to accomplish this task. It does appear that a continually recording camera would be ideal, but that would take more camera power, more memory, and more maintenance, regardless of the type of cameras used.

RECOMMENDATIONS

Ropes and Signs. For the fifth year in a row, preventative measure such as a rope with signs have been placed at select nesting rocks in the Monterey Bay region and have proven to be fairly successful at preventing people from adding additional stress to nesting birds based on observations made in the field. We highly encouraged to continue such measure at known nesting areas that have high foot traffic (MP4, 5, 11, 12, and Pescadero Rock) and, if possible, to do the same to all nesting rocks that have access during low tide (MP1, 3, 6, 9, 13). At a minimum, the use of ropes and signage should continue at Point Pinos (MP4 and MP5) and at the Pescadero Rock (SM3-9) in the North Coast. We recommended the placement of rope with signs by mid-April before the first nest of the season in order to allow oystercatchers to adjust and build a nest. The ropes and signs should remain in place until after Labor Day weekend, especially in locations where a breeding pair still has young.

Drone Disturbance. For the first time in six years of monitoring, there were recreational drones or UAS (Unmanned Aircraft System) observations made throughout the Monterey Bay region, particularly in the area between Monterey and Asilomar in the Monterey Peninsula stretch. In a few of these instances, a monitor contacted the drone operators who were willing to take the drones down or fly them away from the oystercatchers. In these incidents, the drone operators were not aware of the disturbance their drone was causing to the birds. The Endangered Species Act, Migratory Bird Treaty Act, and Marine Mammal Protection Act prohibit the disturbance of a variety of species and these federal acts apply to drones. We recommend initiatives such as Ocean Unmanned's new program termed ECO-Drone, for Environmentally Conscience Operations (See <http://ECO-Drone.org>), be supported and promoted throughout the Monterey Bay region and along the entire California coast in order to engage and educate recreational drone operators to respect ocean wildlife. It is also important to find ways to reduce or eliminate drone operations at known breeding areas from May to September in order to prevent additional stress to individual birds and minimize egg and chick loss.

Expanded Use of Wildlife Cameras. Little to none direct predation observations have been made since the beginning of the project in the central coast, but we suspect predation is the main cause of the loss of eggs and chicks. In order to better understand the level of human and natural disturbance to individual nests, expanding the placement of wildlife cameras is encouraged. This expanded use needs to be at relatively secure location that experience high levels of anthropogenic and natural disturbance, such as Point Lobos, Hopkins Marine Station, and area between Monterey and Asilomar. Camera use in these locations needs to meet the four criteria for wildlife camera placements mentioned above. Placement of the cameras should be done no later than when the first egg is found. Use of continually recording cameras should be investigated.

Banding. From the observed behavior of the only banded Black Oystercatcher seen within the study area, there appears to be a lot of Black Oystercatcher activity and interchange that cannot be easily detected without being able to uniquely identify individuals. It is, therefore, recommended that banding be investigated and the benefits and reasons for undertaking such an initiative be discussed with Audubon California, California Department of Fish and Wildlife, and other appropriate entities, and, if it is deemed feasible, develop a banding proposal to be submitted to the Bird Banding Laboratory at the Patuxent Wildlife Research Center in Laurel, Maryland.

MONITOR NUMBERS & MONITORING HOURS

The California Central Coast Black Oystercatcher Project used a total of 42 citizen science monitors in 2017. The two regional project co-coordinators covered the entire region. In addition, for the South Coast study area, there were 12 Point Lobos section monitors, 4 Pebble Beach section monitors, and 24 Monterey Peninsula section monitors. For the North Coast study area, only the two project co-coordinators covered the Santa Cruz and San Mateo sections. In total, 1,743 monitoring hours were recorded. These hours are only those involved in Black Oystercatcher observations as recorded on the Google Docs™ spreadsheets or nest monitoring field data sheets. The hours do not include hours involved in the training/refresh orientation sessions or travel to and from the monitoring sites. With more than half of the citizen science monitors being in the Monterey Peninsula section, 1,076 monitoring hours were recorded there. For the rest of the South Coast study area, 299 monitoring hours were recorded for the Point Lobos section and 193 monitoring hours for the Pebble Beach section. For the North Coast study area, there were 175 monitoring hours for Santa Cruz section and 70 monitoring hours for San Mateo section.

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A very special thank you to all of the volunteers from BLM/California Coastal National Monument, Pacific Grove Museum of Natural History, and Point Lobos State Natural Reserve. Without your monitoring work and dedicated effort, this project would not be possible.

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ATTACHMENT

Use of Remote Wildlife Monitoring Cameras & California State Law: A Brief Assessment

By: Herrick (Rick) E. Hanks, for California Central Coast Black Oystercatcher Project

Background: The National Park Service and other governmental agencies, as well as universities and researchers, have used remote wildlife-viewing cameras for years for research and management. Their use has contributed to reports that have been made available to the public. In order to minimize accidental disturbance by animals, vandalism, or theft, cameras are placed in carefully chosen locations and often designed with drab or camouflage outer casings. Such cameras should display information about who to contact if visitors find these cameras and have questions.

Does the use of remote wildlife monitoring cameras infringe on anyone's privacy rights? This is the main question that needed to be addressed. Where the location of these cameras (and the images they are intended to capture) are all in or focused on areas that are considered public, then the answer is no. In these situations, the images are similar to those captured by someone taking a picture of another person, animal, or other object or scenery in a public area.

When does the use of a surveillance camera infringe on anyone's privacy rights? Unlike the U.S. Constitution, the California Constitution contains an explicit guarantee of privacy in Article I, Section 1 of its *Declaration of Rights*. California courts have applied this protection to the workplace, schools, and the state government. For this right to be violated, video surveillance must fulfill three criteria: (1) It constitutes an intrusion; (2) It intrudes in a location or context where there is a reasonable expectation of privacy; and (3) It outweighs other interests by the gravity of the alleged violation. A good example of a constitutional violation would be if a boss installed a hidden camera inside the toilet stall of a restroom. That would be a location where privacy is assumed and the location could not be justified as a security risk (as opposed to near a cash register).

California Penal Code Section 647(j)(3) PC involves the use of a hidden camera to record someone in a private area. California considers it a misdemeanor to use a camera or any other recording device to view or capture interiors of bathrooms, dressing rooms, and any other interior location where a person has a reasonable expectation of privacy, without permission, with the intent to invade that person's privacy. California court cases have ruled that where a hidden surveillance system were narrowly tailored in time, location, and scope, and were motivated by legitimate concerns, the invasion of privacy was not an issue since it was not highly offensive nor an egregious (flagrant) violation of prevailing social norms.

What constitutes a "public area" or "public place"? A "public area" or a "public place" is generally an indoor or outdoor area, whether privately or publicly owned, to which the public have access by right or by invitation, expressed or implied, whether by payment of money or not, but not a place used exclusively by one or more individuals for a private gathering or other personal purpose.

Is there a requirement to sign or post the presence of surveillance cameras? While there doesn't appear to be any California statute requiring that hidden surveillance cameras be

posted, it is usually a good idea to do so even in public places in order to avoid claims of invasion of privacy. This can be accomplished on signs that include a statement such as, “This site is under surveillance” (and it doesn’t have to be in large font if the main posting is something like “Keep Off” or “Do Not Enter” or “Temporarily Closed”).

Conclusion: The use of remote wildlife monitoring cameras for the Black Oystercatcher monitoring project can be used in public areas that will not violate anyone’s privacy rights. Almost all of the areas currently monitored for Black Oystercatchers in the Monterey Bay region fall under the definition of “public area” or “public place” (e.g., California Coastal National Monument, Point Lobos State Reserve, Asilomar State Beach, City of Pacific Grove coastal property, Pebble Beach public access areas, and even Stanford University’s Hopkins Marine Station) since most of these locations are not places used exclusively by one or more individuals for a private gathering or other personal purposes. The use of remote wildlife monitoring cameras in the Black Oystercatcher project is for specific research that is “narrowly tailored in time, location, and scope” and will not intrude on anyone’s privacy. Unless the individual entity that owns or administers the land on which the monitoring cameras will be used requires a specific permit or authorization to temporarily place the cameras on their site, there is no permit requirement for the type of remote wildlife monitoring cameras that will be used in the Black Oystercatcher project.

Sources Used:

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<http://www.camerasurveillancesigns.com/where-place-surveillance-cameras.html>

<https://www.law360.com/articles/647851/do-s-and-don-ts-of-video-surveillance-in-calif-workplaces>

<https://definitions.uslegal.com/p/public-place/>

<https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=47313>

MAPS



Image 1: 2017 Black Oystercatcher territories and nest locations for Monterey Bay South Coast, Monterey Peninsula (MP1-MP14).

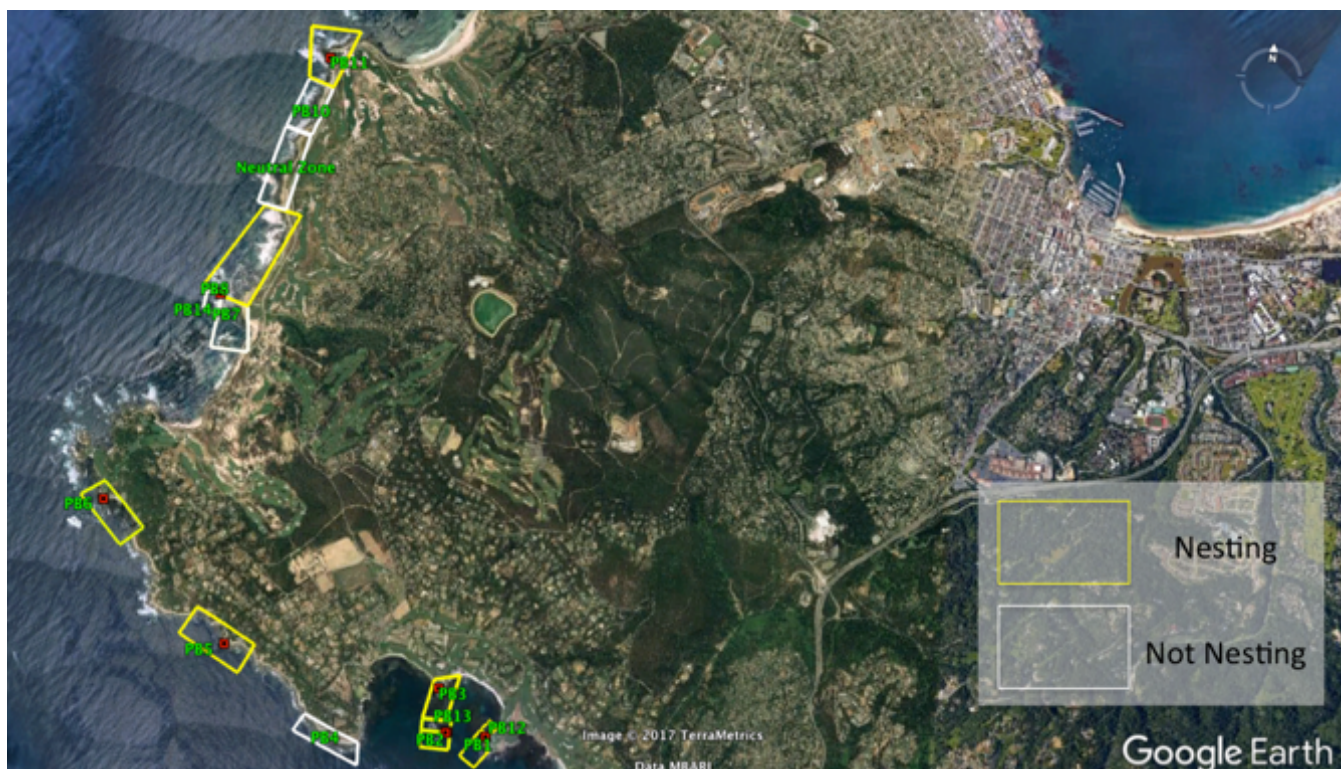


Image 2: 2017 Black Oystercatcher territories and nest locations for Monterey Bay South Coast, Pebble Beach (PB1-PB14).



Image 3: 2017 Black Oystercatcher territories and nest locations for Monterey Bay South Coast, Point Lobos (PL1-PL13).



Image 4: 2017 Black Oystercatcher territories and nest locations for Monterey Bay North Coast, Santa Cruz County, Natural Bridges State Beach through Wilder Ranch State Park (SC1-SC9).



Image 5: 2017 Black Oystercatcher territories and nest locations for Monterey Bay North Coast, Santa Cruz County, Davenport area (SC10-SC13).



Image 6: 2017 Black Oystercatcher territories and nest locations for Monterey Bay North Coast, Santa Cruz County, Greyhound Rock area (SC14-SC15).



Image 7: 2017 Black Oystercatcher territories and nest locations for Monterey Bay North Coast, San Mateo County, Pigeon Point Lighthouse area (SM1-SM2).



Image 8: 2017 Black Oystercatcher territories and nest locations for Monterey Bay North Coast, San Mateo County, Pescadero Rock at Pescadero State Beach (SM3-SM9).