SEABIRD AND MARINE MAMMAL MONITORING AT GUALALA POINT ISLAND, SONOMA COUNTY, CALIFORNIA, MAY TO AUGUST 2008

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EXECUTIVE SUMMARY

This study is part of an on-going effort to examine colony attendance patterns and relative breeding parameters for seabirds and marine mammals at Gualala Point Island. The impetus for the original study was to examine potential impacts of a fireworks display conducted from a low coastal bluff 1.8 km from the island on 6 July 2007. Data from 2008 provide a baseline of information for the island with no fireworks occurring. As a part of the Sea Ranch Stewardship Agreement with the Bureau of Land Management for the California Coastal National Monument (CCNM), the long-term monitoring effort was expanded in 2008 to include a quarterly Coastal Island Survey along the ten miles of the Sea Ranch coastline, a monthly Non-breeding Season Survey at three islands, a weekly Breeding Season Survey at the three islands and the daily Intensive Monitoring at Gualala Point Island.

The 2008 season data expand information that will guide future monitoring efforts, management, or other studies. Surveys demonstrated the same five species of seabirds nesting on Gualala Point Island in 2008 as in the previous surveys of the island (Carter et al. 1992, Weigand and McChesney 2008). Nesting populations of most species were similar to 2007 except for Brandt's Cormorant, which increased slightly.

While data were collected on all species observed, efforts focused on the colony of Brandt's Cormorants because of their known sensitivity to human disturbance (Hunt *et al.* 1981, McChesney 1997, Wallace and Wallace 1998, Thayer *et al.* 1999) and the relatively large sample that could be monitored. For this species, colony monitoring combined land-based nest monitoring and bird counts with data from a series of aerial photographs. The aerial photography established "snapshots" in time and provided coverage of the entire cormorant colony. Land-based nest monitoring, however, was limited because only about 12% of the colony was visible from the mainland vantage point. Still, land-based nest monitoring provided relatively detailed information on the nests that could be viewed and helped interpret aerial photographic results.

From the aerial photographs, 145 breeding pairs of Brandt's Cormorants were identified on Gualala Point Island in 2008. Overall, 55% of nests did not hatch eggs and a maximum of 27% fledged chicks. Unlike 2007, where significant nest failure was correlated to the fireworks event (Weigand and McChesney, 2008), nest failures were not correlated to any event after the presumed effects of a May heat wave. The heat wave caused extensive cormorant nest abandonment in colonies to the south of Gualala Point Island. Total nesting success cannot be compared between 2007 and 2008 because the data collected in 2007 focused on determining the impacts of the fireworks, while the 2008 efforts were designed to gather data that can be used for long-term population monitoring.

Western Gulls apparently nested in larger numbers than in 2007, with 35 nests in 2008 and only 17 being monitored in 2007. Apparent nesting success was also higher, with a hatching rate of 2.82 chicks per nest in 2008 compared to 2.29 in 2007.

Other species such as Pelagic Cormorants, Pigeon Guillemots, Black Oystercatchers, Brown Pelicans and Harbor Seals were also monitored.

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INTRODUCTION

This report summarizes the second year of monitoring to better understand the habitat use of Gualala Point Island by seabirds and marine mammals. The California Coastal National Monument (CCNM) is administered by the US Department of Interior, Bureau of Land Management (BLM). Population estimates and characterization of disturbances to seabirds during their reproductive cycles are two critical elements for analysis that guides BLM resource specialists to adaptively manage preservation and augmentation of California seabird populations. Well-documented sources of human disturbance include habitat destruction, close-approaching boats, humans approaching on foot, and low-flying aircraft (*e.g.*, McChesney 1997, Carney and Sydeman 2003, Rojek *et al.* 2007).

Seabird monitoring began in response to a 2006 Independence Day fireworks display near Gualala Point Island, an island within the CCNM. Concern about potential impacts to nesting seabirds originated from reports of large numbers of birds on Gualala Point Island that flushed and flew into the darkness above the island on 2 July 2006 during the First Annual Gualala Festivals Committee Independence Day fireworks display. Extensive documentation of the seabirds and the impact of the fireworks display were gathered in 2007 (Weigand and McChesney 2008). That study indicated a distinct impact on nesting Brandt's Cormorants (*Phalocrocorax penicillatus*) from the fireworks display.

The BLM and its partner regulatory wildlife agencies, the California Department of Fish and Game, the US Fish and Wildlife Service (USFWS), and the National Oceanic and Atmospheric Administration's National Marine Fisheries Service, wanted to assess whether the Gualala fireworks display impacted breeding success or attendance patterns of seabirds and marine mammals at Gualala Point Island and to learn the current status of the island's natural resources. For the second year, BLM and USFWS biologists worked with The Sea Ranch CCNM Stewardship Task Force (hereafter "the Task Force") to monitor seabirds and marine mammals on Gualala Point Island during the seabird nesting season using a combination of aerial and land-based techniques. No fireworks display took place during 2008. This report summarizes the study results from 2008. Besides the Brandt's Cormorants, four other species were monitored: Pelagic Cormorant (*Phalacrocorax pelagicus*), Black Oystercatcher (*Haematopus bachmanni*) Western Gull (*Larus occidentalis*), and Pigeon Guillemot (*Cepphus columba*).

METHODS

Study Area

Gualala Point Island (California Seabird Colony Number SO-384-01; 38˚45'04" N, 123˚31'42" W) is located just offshore at the northern border of Sonoma County, California, and just south of the Gualala River mouth (Figure 1). Weigand and McChesney (2008) described the geology of the island:

"Geological factors combine to make Gualala Point Island a unique and favorable habitat for colonial seabirds. Gualala Point Island is part of the Gualala Block, a narrow crustal sliver that extends roughly from Point Arena in Mendocino County south to Fort Ross in Sonoma County. The Gualala Block consists predominantly of sedimentary formations deposited originally hundreds of miles south of their current location and subsequently transported northward along the San Andreas Fault System. The Gualala Block is the most northerly large assemblage of rocks on the west side of the San Andreas Fault (M. Lane, pers. comm.).

Additionally, the large-scale movement has brought to the Gualala area some rocks, such as limestones, that are uncommon along the northern California Coast. This small area of well-bedded sedimentary rocks contrasts sharply with the heterogeneous lithologies of the Franciscan Group prevalent north of San Francisco.

Gualala Point Island bedrock consists of interbedded shales and massive sandstones of the Paleocene-Eocene Germán Rancho Formation. However, at this locality, crustal deformation associated with northward transport of the Gualala Block has caused the bedding planes to twist and become vertical. The result is a corrugated effect to the rocks, with the softer shales eroding more rapidly than the massive resistant sandstones. Crevices that form between the interbedded rock layers form nesting sites for Pigeon Guillemots and rock ledges create nesting habitat for Pelagic Cormorants. Brandt's Cormorants nest primarily on the limestone flats of the island."

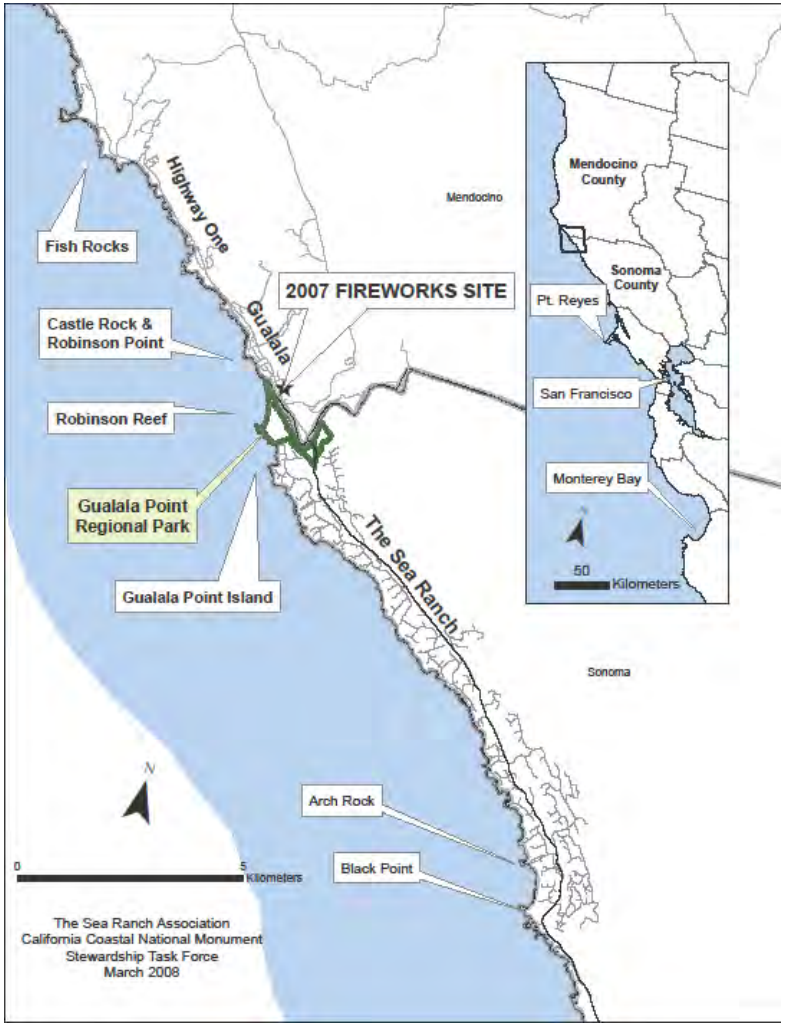


Figure 1 – Map of Gualala Point Island and vicinity, Mendocino and Sonoma counties, California.

Monitoring

The study period extended from 8 May to 5 September 2008, with a more intensive 20-day monitoring period (hereafter referred to as the "count period") between 25 June and 14 July 2008 (ten days before and ten days after the date of fireworks display in 2007). Multiple methods recorded bird and mammal numbers, reproductive success, and potential impacts from disturbances. These methods included aerial photography, land-based surveys, and land-based photography. Task Force volunteers and BLM staff collected data except as indicated below. The author of this report analyzed and interpreted the data.

Documentation of the monitoring protocol used for this study (USDI Bureau of Land Management and The Sea Ranch CCNM Stewardship Task Force 2008) is available from The Sea Ranch CCNM Stewardship Task Force.

Aerial Photography: The USFWS, in cooperation with Humboldt State University and the California Department of Fish and Game, photographed Gualala Point Island on 2 June 2008 during an annual aerial photographic survey of Common Murre, Brandt's Cormorant, and Double-crested Cormorant colonies in northern and central California. This flight was conducted at 210-230 m (700-750 ft) altitude in a fixed-wing, high-wing Partenavia aircraft. Photographs were taken through a belly port by two photographers with Canon 30D digital cameras and 70-200 mm or 300 mm telephoto lenses. Subsequently, a volunteer pilot and a volunteer professional photographer flew additional surveys of Gualala Point Island on 9 June, 2, 5, 9, and 18 July, 1 and 17 August and 5 September, using a protocol comparable to that used by the USFWS. These flights were conducted above 300 m (1000 ft) altitude in a fixed-wing Cessna 172-M aircraft and digital photographs were taken through open side window with unobstructed view as requested by the US Fish and Wildlife Service. Survey altitudes were flown high enough to alleviate disturbance to seabirds from these types of fixed-wing aircraft. Photographs were taken of the entire island, with a focus on the Brandt's Cormorant colony.

From each aerial survey, the photograph with the highest quality and most complete coverage of the cormorant colony was the primary photo source used, augmented by additional photos as needed for complete views of all Brandt's Cormorant nests. From the photographs, active nest sites were identified and assigned unique site numbers. For each survey, the status of each nest was coded as follows:

E = empty nest
C = chick(s) visible
S = adult sitting on nest
D = adult standing at nest site
T = territorial site, *i.e.*, adult bird(s) on territory but no nest
V = vacant site, *i.e.*, no birds present

"Active nests" were nests with either an adult sitting on the nest or standing at a nest containing visible eggs or visible chicks. "Territorial sites" had one of three characteristics: adults standing or sitting at a potential nest site with little or no nesting material; adults on a poorly-built nest; or adults sitting or standing at a well-built or fairly well-built nest that was visibly empty or known to have failed recently. These data established a chronology of each nest site, including seasonal site status (breeding or territorial), approximate breeding phenology, and whether or not the nest failed during the survey period. Breeding sites were those with confirmed eggs or chicks or where breeding was inferred by nest status. Territorial sites were those where breeding could not be confirmed or inferred by nest status.

Seabird Counts from Mainland Vantage Points: The Task Force and BLM wildlife biologists conducted these counts . Adults and ambulatory chicks of all seabirds on Gualala Point Island were counted through 20x to 60x spotting scopes from two mainland vantage points twice daily (05:30 and 10:30 h) for 20 days, visibility permitting, during the 25 June to 14 July count period. Weekly counts were conducted 10 April – 19 June and again from 17 July – 28 August between 07:00 and 08:00. One vantage point viewed the north side, and the south vantage point viewed the southeast side of the island (Figures 2-3).

While the views from the mainland vantage points do not give a complete view of the colonies, the data gathered are valuable from a long-term monitoring perspective. These data are summarized briefly here. The complete data sets are available from the Task Force.

UTM locations in Zone 10N (NAD 1983) of the vantage points are as follows:
North Vantage Point: 454244 E 4289459 N about 245 m from the island
South Vantage Point: 454411 E 4289224 N about 305 m from the island

Figure 2. Gualala Point Island from North Vantage Point for mainland-based surveys. Photo ©Rozanne Rapozo

Figure 3. Gualala Point Island from South Vantage Point for mainland-based surveys. Photo ©Rozanne Rapozo

Seabird Nest Monitoring from Mainland Vantage Points: A modified version of the USFWS Common Murre Restoration Project protocol for Brandt's Cormorant nest monitoring (McChesney *et al.* 2007) was used. Along with Brandt's Cormorants, the protocol included nest monitoring of four other species on Gualala Point Island: Pelagic Cormorant (*Phalocrocorax pelagicus*), Black Oystercatcher (*Haematopus bachmannii*), Western Gull (*Larus occidentalis*), and Pigeon Guillemot (*Cepphus columba*). Observations were recorded during the same times that seabird counts took place. For each

species, visible nests were assigned unique numbers and identified on photographs. During the count period, the status of each nest was identified by recording the number of adults present, adult behavior (sitting or standing), and the number of eggs and chicks visible.

Mobile Chick Monitoring: During the period of daily monitoring, mobile Western Gull chicks were counted, and attempts were made to associate these chicks with a specific nest. Counts were undertaken specifically for this species as the chicks move about away from the nest itself and thus are easier to view, unlike other species monitored during this project.

Daytime Marine Mammal Monitoring: The count form for monitoring Harbor Seals (*Phoca vitulina*) at Point Reyes National Seashore and along the Sonoma County coast including The Sea Ranch (Manna *et al.* 2006) was adopted for this project. Censuses of Harbor Seals took place at the daytime low tide closest to seabird count times. In addition, as time permitted, seals were counted during seabird counts.

Daytime Disturbance Monitoring: Disturbances to seabirds were recorded systematically. The protocol to monitor and characterize disturbances combined pre-established protocols from PRBO Conservation Science (unpublished data), USFWS (McChesney et al. 2007), and Jaques and Strong (2002). All aircraft flying below 300 m (1000 ft) and boats approaching to within 300 m (1000 ft) of Gualala Point Island were recorded, as well as any visible disturbance behaviors by seabirds or seals (*e.g.*, flushing or displacement).

Daytime Land Photography from Mainland Vantage Points: An initial photographic survey of Gualala Point Island was conducted at the onset of the count period. Photographers used DSLR cameras with a minimum of 10 megapixels. Cameras are equipped with a minimum 300mm focal length lens using a 1.4x or 1.7x teleconverter. Nikon image-stabilized f4.0, 200-400mm zoom telephoto lens, combined with a 1.4x teleconverter or f2.8 300mm prime lens with a 1.7x teleconverter were routinely used in addition.

RESULTS

Brandt's Cormorant

Aerial Photography of the Brandt's Cormorant Colony

In 2008, the Brandt's Cormorant colony was situated on the southwest side of Gualala Point Island (Figure 4) as in 2007. The east edge of the colony had a larger number of nests than in 2007. Figure 5 (a-i) shows aerial photographs of the entire Gualala Point Island Brandt's Cormorant colony from nine surveys between 2 June and 5 September 2008. During the survey period, a total of 145 sites were identified and assigned unique site numbers that are indicated in the photos. Histories of each site are shown in Appendix 1. A small number of apparent territorial sites that were present on single surveys only were not assigned site numbers.

Figure 4 Aerial photograph of Gualala Point Island from the southeast, 9 June 2008. The arrow points to the Brandt's Cormorant colony, indicated by the dark mass of nests and birds surrounded by white guano. Photo © Craig Tooley, The Sea Ranch School of Photography.

Of all sites followed, 129 were identified as breeding sites and 16 as territorial sites (*i.e.*, where egg-laying was not likely to have occurred). About half (55%) of breeding sites recorded during the study period were active when the colony was first photographed on 2 June (Table 6); most likely had eggs at that time based on well-formed nest structures and adults sitting in incubation postures. Nest establishment continued and by 5 July an additional 67 nests were added. This increase in nesting effort relatively late in the season is unusual. Ainley and Boekelheide (1990) indicate that the typical egg-laying period on the Farallon Islands is during April and May. Only four of the twelve seasons reported by Ainley and Boekelheide (1990) had significant egg laying in June. The late arrival may be related to a heat wave on the coast of northern California that peaked on 15 May when the daytime high temperature reached 29.1° C (84°F) at Point Reyes Lighthouse, Marin County, (Western Regional Climate Center data). On the Farallon Islands and on Alcatraz Island in San Francisco County, many Brandt's Cormorants abandoned their nests during this heat wave (P. Warzybok, pers. comm.). On Gualala Point Island late arriving cormorants may have abandoned nests elsewhere and attempted nesting a second

time. Another possible explanation is that the small colony on Gualala Point Island may typically begin nesting later than the larger colony on the Farallon Islands. Future survey seasons may explain this anomaly.

Nests initiated between 5 July and 9 July did not reach the chick stage. By 2 July, three nests had visible chicks (*ca.* two to four weeks old), seven had visible chicks on 5 July and 35 had visible chicks on 9 July. In the period of more frequent aerial surveys, designed to gauge impacts in the absence of fireworks, only two nests failed and 33 hatched. The other 110 nest or territorial sites exhibited no change in the week period (Table 1).

July 2-9		
No Change	110	76%
Failed	2	1%
Hatched	33	23%
Total	**145**	**100%**

Table 1. Brandt's Cormorant nest fates during the period 2 July to 9 July.

In comparison, the period between 9 July and 18 July had eight (6%) newly failed nests, 13 (9%) that hatched and 124 that exhibited no change in the nine-day period (Table 2).

July 9-18		
No Change	124	86%
Failed	8	6%
Hatched	13	9%
Total	**145**	**100%**

Table 2. Brandt's Cormorant nest fates during the period 9 July to 18 July.

On 18 July 46 nests had visible chicks, the peak for the season. Between 18 July and 1 August eleven (8%) nests failed before visible hatching, 24 (17%) failed after hatching (*i.e.*, chicks present on 18 July that could not be found on 1 August) and seventeen (12%) more that hatched, and 93 exhibited no change in the fourteen-day period (Table 3).

July 18 - August 1		
No Change	93	64%
Failed	11	8%
Failed with chicks	24	17%
Hatched	17	12%
Total	**145**	**100%**

Table 3. Brandt's Cormorant nest fates during the period 18 July to 1 August.

By 17 August, it appeared that chicks had fledged from 22 nests and possibly fledged from another two nests (Table 4). Fifteen further nests failed after hatching chicks. Eight more nests hatched, but all of these late hatching nests failed.

August 1 - 17		
No Change	98	68%
Probably Fledged Chicks	22	15%
Possibly Fledged Chicks	2	1%
Failed 8/17 with chicks	15	10%
Hatched	8	6%
Total	**145**	**100%**

Table 4. Brandt's Cormorant nest fates during the period 1 August to 17 August.

By 5 September, the colony was empty except for a few adults around the perimeter of the colony.

In summary, 145 pairs of cormorants appeared to either breed or set up a territorial site. Of these, 72 (50%) were unsuccessful at hatching chicks. Lack of success likely resulted from the late start as a result of hot weather in May. Eventually, 49 (34%) of the nests hatched chicks that probably did not make it to fledging, assuming 30 days until chicks can become independent from natal nests (Ainley and Boekelheide 1990, Carter and Hobson 1988). An additional two (1%) nests had chicks at the end of the survey period that had a good chance of fledging (possibly fledged) and another 22 (15%) of the nests had chicks that likely fledged (Tables 5, 6).

Season		
Did not hatch	72	50%
Hatched but did not fledge	49	34%
Possibly Fledged	2	1%
Probably Fledged	22	15%
Total	**145**	**100%**

Table 5. Brandt's Cormorant nest fates during the 2008 season.

Reproductive Stage	**2 June**	**9 June**	**2 July**	**5 July**	**9 July**	**18 July**	**1 August**	**17 August**	**5 September**
S	71	72	119	119	86	67	38	38	0
D	0	6	1	4	7	6	17	17	2
T	7	0	15	13	5	6	1	1	0
C	0	0	3	7	35	46	39	39	0
V	0	0	0	2	12	20	50	50	0
Active Nests	71	72	122	126	121	113	77	77	0
Nests with chicks	0	0	3	7	35	46	39	39	0
TOTAL	**78**	**78**	**138**	**145**	**145**	**145**	**145**	**145**	**2**
Percent Active	**55%**	**56%**	**95%**	**98%**	**94%**	**88%**	**60%**	**60%**	**0%**

Table 6. Summary of the status of Brandt's Cormorant nest and territorial sites as determined from aerial photographs, Gualala Point Island, 2 June to 5 September 2008. S = Adult sitting on nest, D = Adult standing at nest site, T = Territorial site, C = Chicks present, V = Vacant.

Figure 5 (a through i). Time series of aerial photographs of the Brandt's Cormorant colony on Gualala Point Island, 2 June to 5 September 2008. Site numbers used for monitoring are indicated in red in each photograph.

Photo by Gerard McChesney, US Fish and Wildlife Service

a) 2 June 2008

Photo © Craig Tooley, The Sea Ranch School of Photography

b) 9 June 2008

Photo © Craig Tooley, The Sea Ranch School of Photography

c) 2 July 2008

Photo © Craig Tooley, The Sea Ranch School of Photography

d) 5 July 2008

Photo © Craig Tooley, The Sea Ranch School of Photography

e) 9 July 2008

Photo © Craig Tooley, The Sea Ranch School of Photography

f) 18 July 2008

Photo © Craig Tooley, The Sea Ranch School of Photography

g) 1 August 2008

Photo © Craig Tooley, The Sea Ranch School of Photography

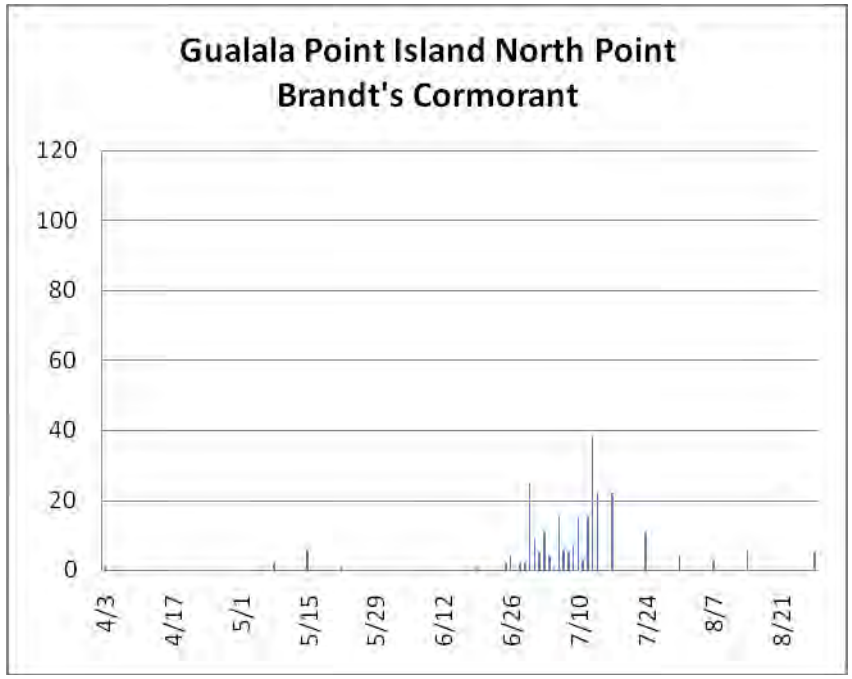
h) 17 August 2008

Photo © Craig Tooley, The Sea Ranch School of Photography

i) 5 September 2008

Brandt's Cormorant Counts from Mainland Vantage Points

Only a small portion (12%) of the Brandt's Cormorant colony was visible from the mainland and only from the South Vantage Point (Table 7, Figure 6). As happened last year, small numbers of non-breeding or post-breeding Brandt's Cormorants arrived and began roosting on Gualala Point Island after 10 July. Their different origin was apparent by the presence of immature birds, not previously recorded on the island during the count period, and a clear spatial segregation between the roosting birds and the nesting colony.



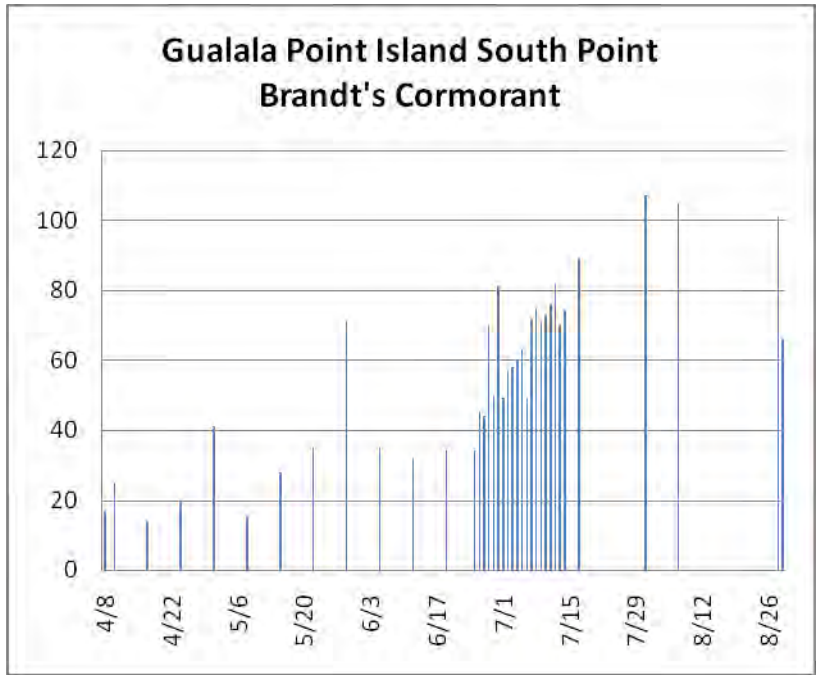


Table 7. Brandt's Cormorant (adult) counts weekly from 8 April – 28 August, and daily between 25 June and 14 July.

Brandt's Cormorant Nest Monitoring from Mainland Vantage Points: Although views were not ideal, the data obtained were sufficient to establish nesting status during the count period for eighteen sites (Table 8 a-c). Of these, fifteen nest sites had breeding confirmed by the presence of chicks. The other three sites were regularly attended, but no solid evidence of eggs or chicks was obtained.

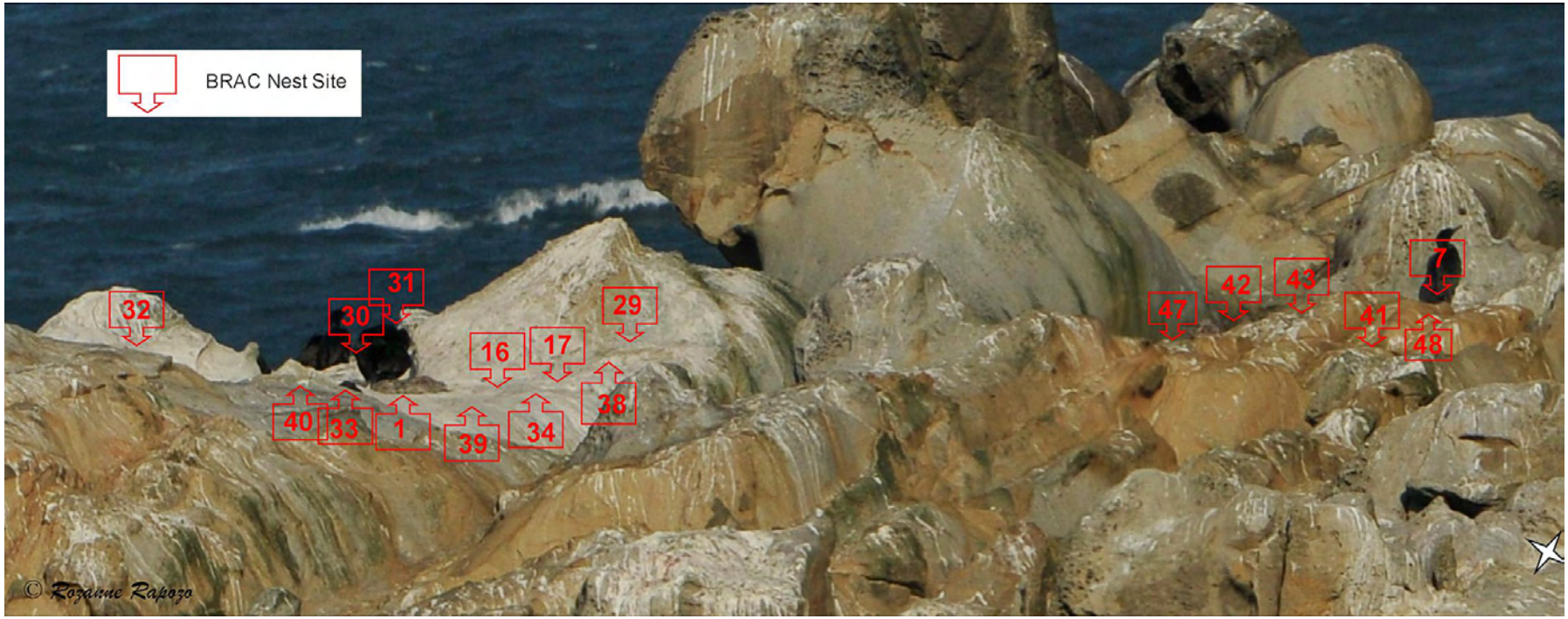


Figure 6. Brandt's Cormorant nests on Gualala Point Island monitored from the South Vantage Point.

Data on nest initiation data gathered from ground-based surveys were consistent with data documented from the aerial surveys. One nest was started as early as 8 May, a second nest by 15 May, two more by 29 May, six more by 5 June, and fifteen more by 25 June. The final two nests were not detected until 29 and 29 June respectively.

One nest hatched as early as 26 June, while the others hatched mostly in early to mid-July. These data are also consistent with the data from the aerial surveys.

Nesting success is difficult to assess from these data, as most of the fledging would have taken place in late July and early August, after the daily surveys were finished. During the weekly monitoring intervals after the count period, large chicks begin to wander substantially, and can show up at nest sites far removed from their hatch site.

Nest #	5/8	5/15	5/22	5/29	6/5	6/12	6/19
1	S	N	N	N	N	N	N
7		N	N		N	N	N
16			S	N	N	N	N
17			N	N	N	S	N
29					N	N	N
30					N	N	N
31					N	N	N
32					N	N	N
33					N	N	
34					N	N	N
38							
39							
40							
41							
42							
43							
47							
48							

Table 8a. Summary of status for the eighteen Brandt's Cormorants nests monitored weekly from the mainland on Gualala Point Island, 8 May – 19 June 2008. Nest numbers correlate with Figure 6[1]. Date of survey is listed on the top. S = Adults standing at nest. N = Adults sitting on nest.

[1]The sequence of numbered nests used here differs from the numbers used in Figure 5 and in Appendix 1. It is not possible to correlate the nests visible from the south vantage point with nests photographed from the air.

Nest #	6/25	6/26	6/27	6/28	6/29	6/30	7/1	7/2	7/3	7/4	7/5	7/6	7/7	7/8	7/9	7/10	7/11	7/12	7/13	7/14
1	N	1 C1	1 C1	3 C2	4 C	3 C2	N	2 C3	1 C3	3 C4	4	C4	N	1 C4	1 C4	1 C	2 C4	2 C4	3 C4	3 J
7	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
16	N	N	N	N	N	N	N	N	N	N	N	N	N	1 C	N	1 C2	2 C	1 C	3 C3	2 C4
17	N	N	N	N	N	N	N	N	N	N	N	N	N	N	2 C	N	N	1 C	N	2 C3
29	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1 C	N	N	N	N
30		N	N		N	N	N	N	N	N	N	N		N	S	S	1 C4	2 C4	N	
31	N	N	N	N	N	N	N	N		N	N	N	N	2 C	2 C3	S	N	1 C		S
32	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	2 C2	1 C2
33	N	N	N	N	N	N	N	N	N	? C3	N	S			N	N	S	S	N	S
34	N	N	N	N	N	N	N	N	S	N	N	N	N	N	N	N	N	N	N	N
38	N	S	S	N		S	S	N	N	N	N	S	N	N	N	S	S	S	N	S
39	N	S	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	S
40	N	N	N	N	N		S	N	N	N	N	N	N	N	N	N	S	S	2 C4	N
41	N	N	N	S	S	N	N	N	N	N	S	N	N	N	N	N	2 C	N	N	N
42	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
43	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	1 C	N	N
47				S	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
48					N	N	N	S	N	N	S	N	N	N	N	N	N	S	S	S

Table 8b. Summary of status for the eighteen Brandt's Cormorants nests monitored daily from the mainland on Gualala Point Island, 25 June – 14 July 2008. Nest numbers correlate with Figure 6[1]. Date of Survey is listed on the top. S = Adults standing at nest. N = Adults sitting on nest. Blue Cells indicate presence of chicks. The first number in the cell indicates the number of chicks. The size of the chicks is indicated when noted as C1-C4[2].

[1]The sequence of numbered nests used here differs from the numbers used in Figure 5 and in Appendix 1. It is not possible to correlate the nests visible from the south vantage point with nests photographed from the air.

[2]Key to abbreviations:

B = breeding site
T = Territorial site
C = cormorant chick(s) seen (unknown age)
C1 = cormorant chick(s) seen (1-8 days)
C2 = cormorant chick(s) seen (8-15 days)
C3 = cormorant chick(s) seen (15-25 days)
C4 = cormorant chick(s) seen (25-40days)
J = cormorant chick(s) seen (40+ days)
S = adult standing at nest or territorial site
N = adult sitting on nest

Nest #	Season Status	7/17	7/24	7/31	8/7	8/14	8/21	8/28
1	B	3 C4	3 C					
7	B	N	1 C	2 C3	3 C4			
16	B	2 C	3 C					
17	B	N	N	1 C	1 C4			
29	B	N	1 C	2 C4	1 C4	1 C		
30	B		3 C	2 C				
31	B							
32	B	N	1 C	2 C				
33	B	S	N					
34	B	N			2 C4			
38	T							
39	T							
40	B	S						
41	B	N						
42	B	N	S		1 C4			
43	B			N	N			2 J
47	B	N	S		N			3 J
48	T	S						

Table 8c. Summary of status for the eighteen Brandt's Cormorants nests monitored weekly from the mainland on Gualala Point Island, 17 July – 28 August 2008. Nest numbers correlate with Figure 6[1]. S = Adults standing at nest. N = Adults sitting on nest. Blue Cells indicate presence of chicks. The first number in the cell indicates the number of chicks. The size of the chicks is indicated when noted as C1-C4[2].
Date of Survey is listed on the top.

[1]The sequence of numbered nests used here differs from the numbers used in Figure 5 and in Appendix 1. It is not possible to correlate the nests visible from the south vantage point with nests photographed from the air.
[2]Key to abbreviations:

B = breeding site
T = territorial site
C = cormorant chick(s) seen (unknown age)
C1 = cormorant chick(s) seen (1-8 days)
C2 = cormorant chick(s) seen (8-15 days)
C3 = cormorant chick(s) seen (15-25 days)
C4 = cormorant chick(s) seen (25-40days)
J = cormorant chick(s) seen (40+ days)
S = adult standing at nest or territorial site
N = adult sitting on nest

Figure 7. Right Portion Gualala Point Island – North Vantage Point

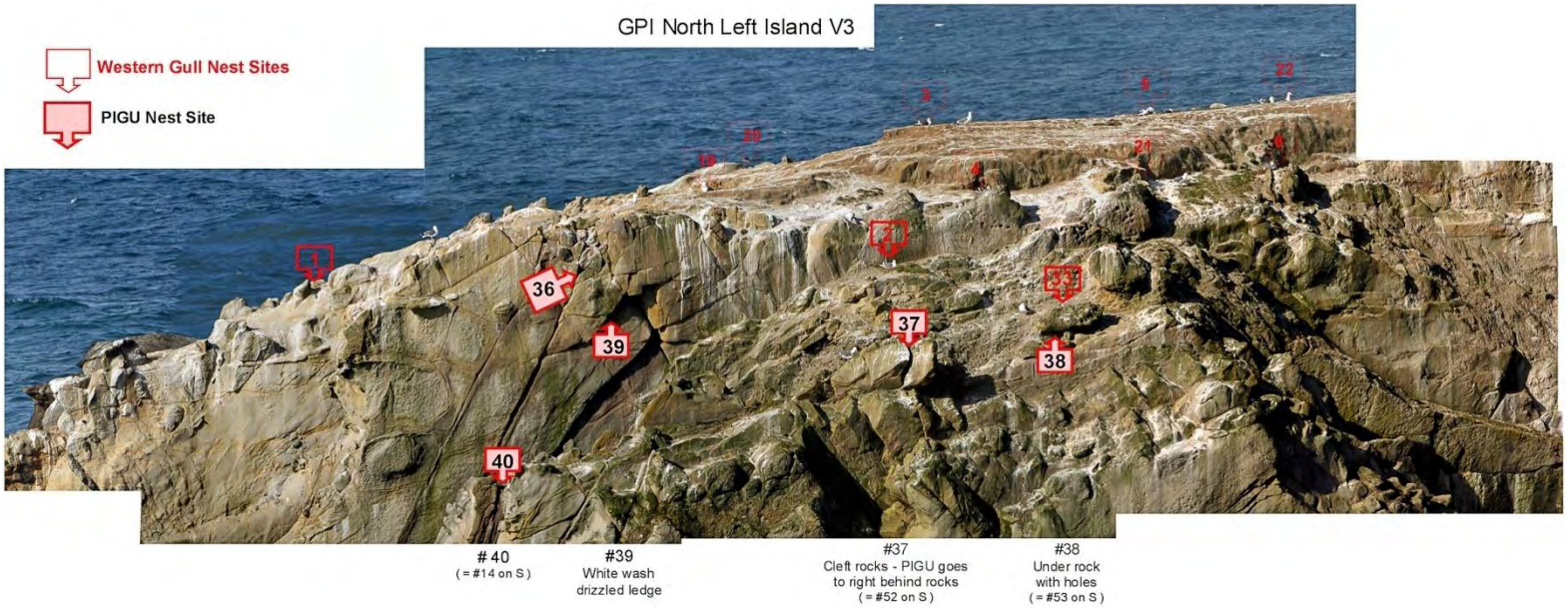


Figure 8. Left Portion Gualala Point Island – North Vantage Point

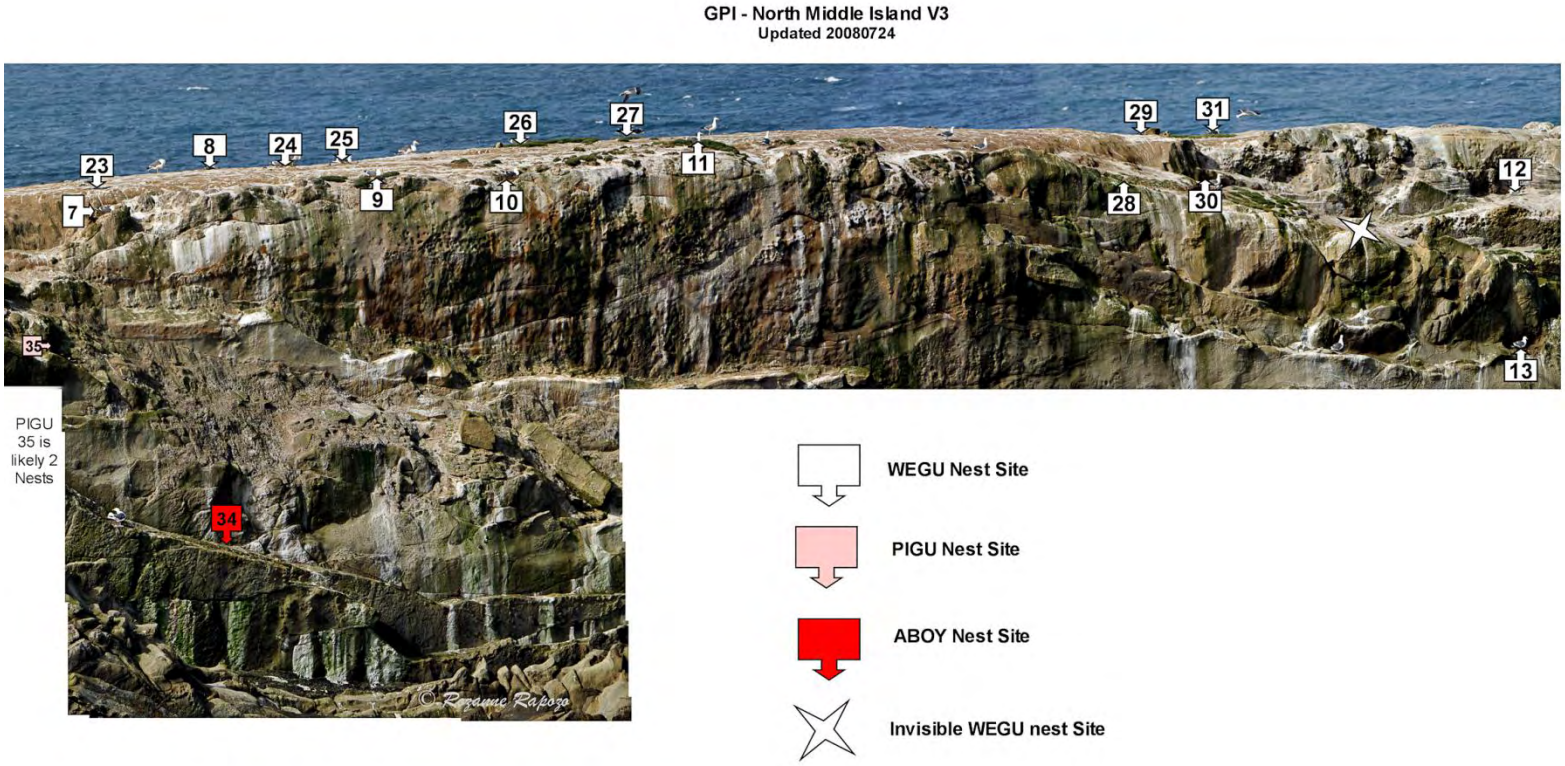


Figure 9. Middle Portion Gualala Point Island – North Vantage Point

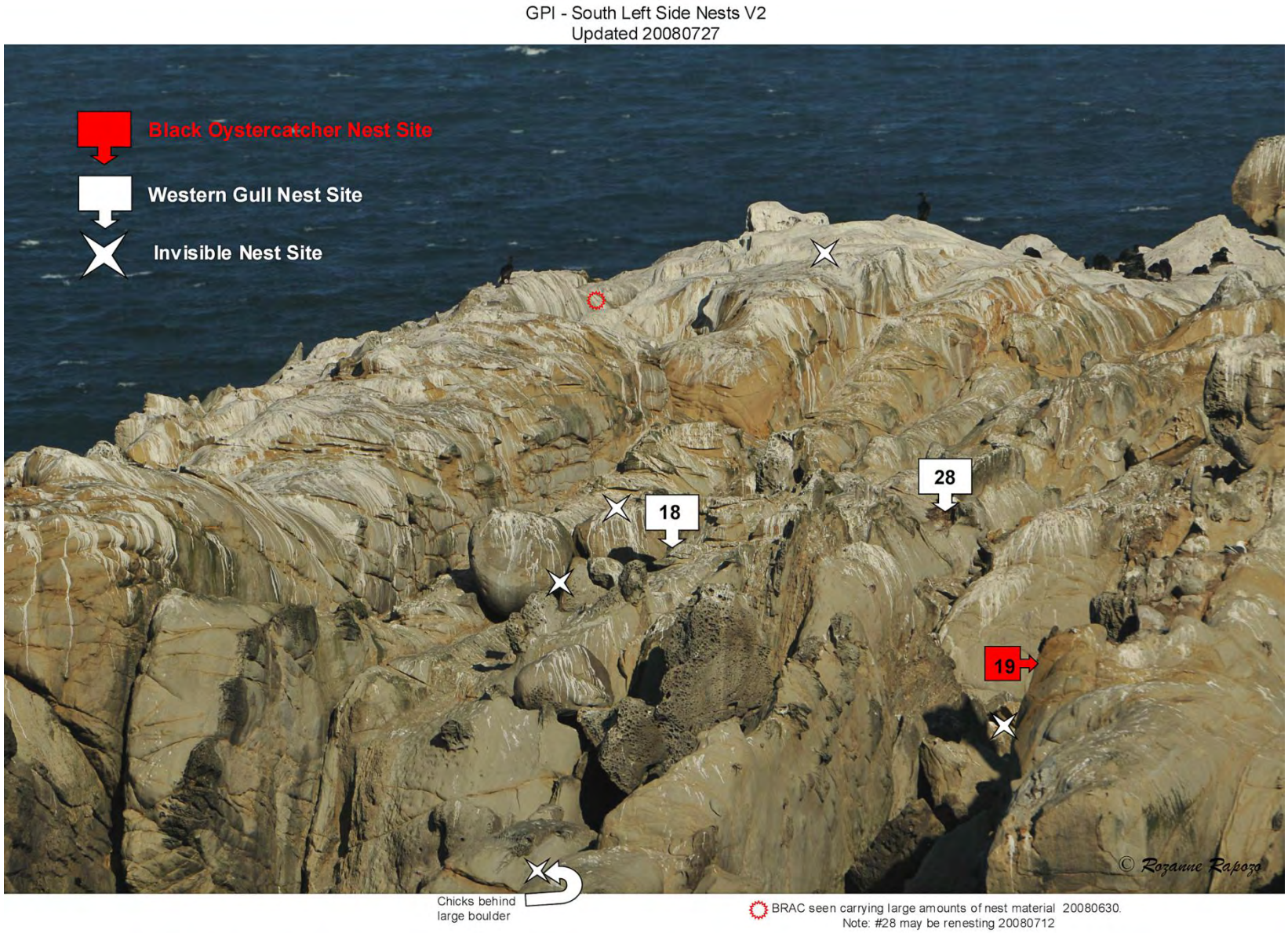


Figure 10. Left Portion Gualala Point Island – South Vantage Point

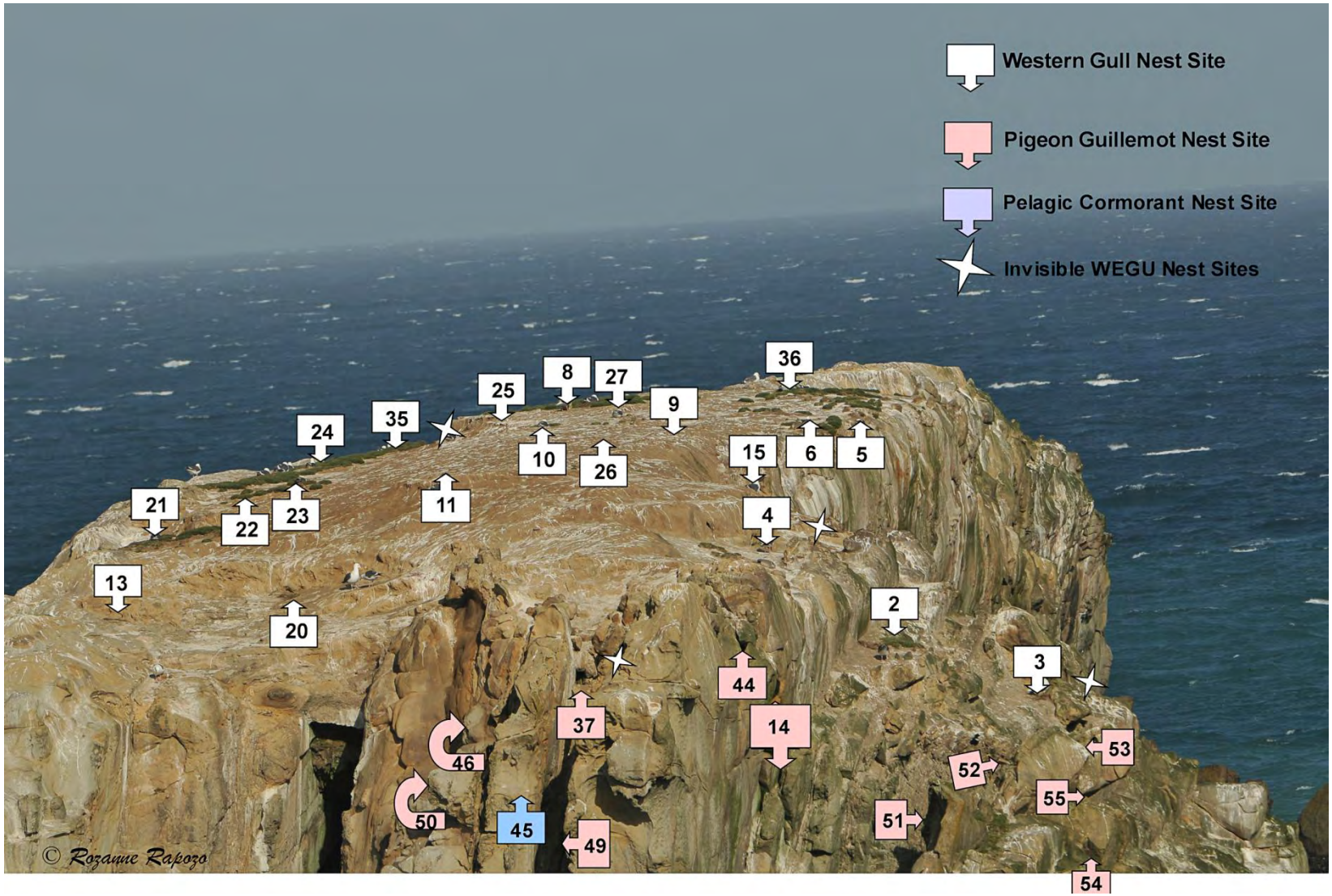


Figure 11. Right Portion Gualala Point Island – South Vantage Point

Pelagic Cormorant

Pelagic Cormorant Counts from Mainland Vantage Points

Counts of Pelagic Cormorants on Gualala Point Island consisted mostly of non-breeding birds. Most birds congregated on ledges along the north side of the island. Bird counts indicated about ten birds on most days during the daily counts (Table 9). No particular trend in counts was evident during the count period. Numbers of adults were similar to those recorded during 2007 (Weigand and McChesney, 2008).

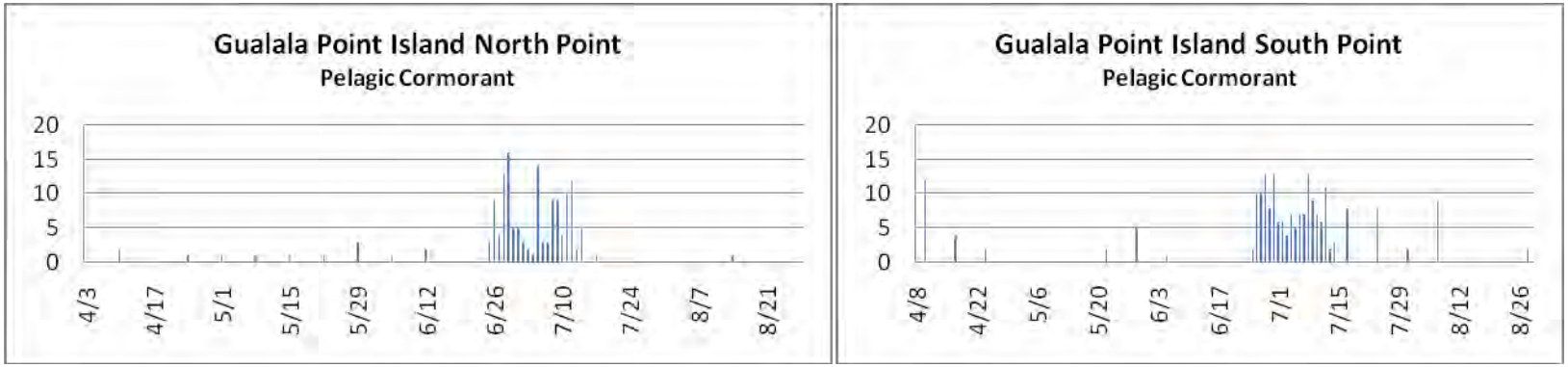


Table 9. Pelagic Cormorant counts weekly from 8 April – 28 August, and daily between 25 June and 14 July.

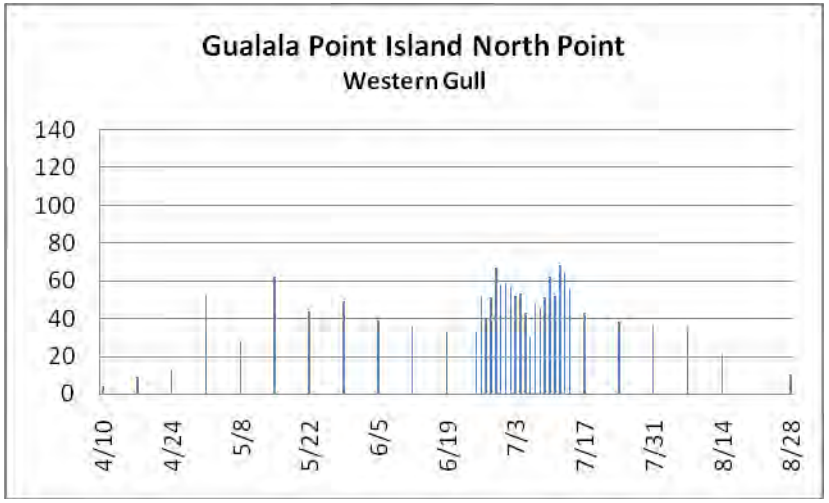
Pelagic Cormorant Nest Monitoring

Only one Pelagic Cormorant nest was located on Gualala Point Island during 2008, and this nest was unsuccessful (Figure 11). This lower reproductive effort is consistent with the decline of Pelagic Cormorants along the north coast over the past few years. The number of nests was low in comparison to 2006, when seven nests were recorded on the east side cliffs of the island (R. Kuehn, pers. comm.).

Western Gull

Western Gull Counts from Mainland Vantage Points

Although more Western Gull nests were visible from the North Vantage Point, counts of adult Western Gulls were consistently higher from the South Vantage Point (Figures 7-11, Table 10). As noted last year (Weigand and McChesney, 2008), immature Western Gulls were virtually absent from the island during the count period. Most adult gulls not attending nests roosted on the sparsely vegetated flat top of the north end of the island. Also as noted last year, a distinct dip in the numbers took place in early July, this year on 6 July, but the variation was not clearly attributable to any disturbance event as the dip took place over a period of a few days and was gradual.



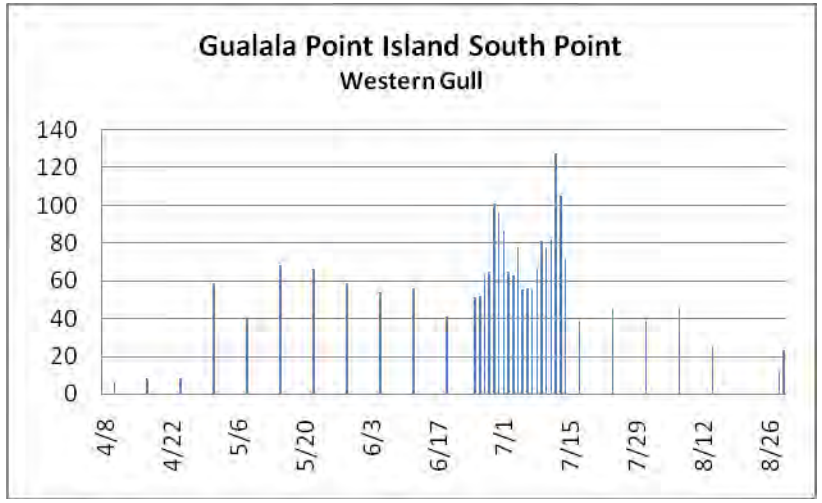


Table 10. Western Gull counts weekly from 8 April – 28 August, and daily between 25 June and 14 July.

Western Gull Nest Monitoring from Mainland Viewpoints and Mobile Chick Monitoring

Observers at both the north and south vantage points observed Western Gull nests and young in nests weekly from 15 May to 19 June and then daily from 25 June to 14 July. Western Gull nests occupied either the relatively flat top surface at the north end of the island or wide ledges and nooks just below the top of the island. Eleven nests were visible only from the North Vantage Point, two nests were visible only from the South Vantage Point and an additional 22 nests were visible from both locations for a total of 35 monitored nests (Table 11).

Of these 35 monitored nests, a maximum of 79 chicks were present on 3 July and 14 July. As chicks began to move around, it became more and more difficult to associate them with a particular nest, but on the last day of daily surveys, 14 July, there were still 79 chicks present. Only one nest site (#32) never had chicks associated with it. Discounting the one unsuccessful nest, an average of 2.77 (range = 1-4, n=34) chicks were determined to be hatched from the remaining nests. This is substantially higher than the 2.29 chicks per nest from 2007 (Weigand and McChesney, 2008).

The first chicks were noted on 5 June and all successful nests contained visible chicks by 27 June. No obvious nest failures or chick fatality trends were observed during the count period; however three nests went multiple days without chicks being detected. Mobile chick monitoring data tracked the growth of chicks and contributed to the timing of the reproductive effort of the Western Gulls between 25 June and 14 July. Table 11 contains these data. Because the Mobile Chick Monitoring effort focused primarily on the chicks, the number of chicks reported in Table 11 between 25 June and 14 July are from this effort. The maximum number of chicks recorded each day is reported when there were multiple counts from the same nest. Chick numbers reported outside this date range are from the Nest Monitoring data. Even though it is rare for any nest to have more than three chicks associated with it, numbers greater than three were reported so that total chick numbers represent all chicks present even if chicks were observed at a nest other than their natal site.

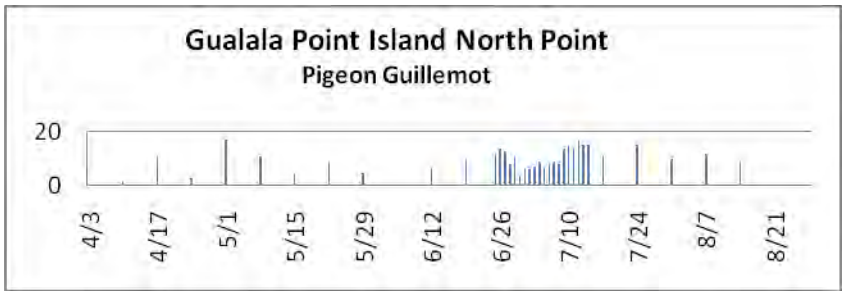
Nest #	5/15	5/22	5/29	6/5	6/12	6/19	6/25	6/26	6/27	6/28	6/29	6/30	7/1	7/2	7/3	7/4	7/5	7/6	7/7	7/8	7/9	7/10	7/11	7/12	7/13	7/14
1		N	N	N	N	N	N	N	2	2	2	2	2	N		2	1	1	3		2	3	2	1		1
2	N	N	N	N	3		3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2	3	3	3	3
3	N	N	N	N	N	N	2	2	2	2	2	2	2	2	3	2	3	2	2	2	2	2	1		2	2
4	N	N	N	N	N	N	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
5	N	N	N	N	N	N	3	3	2	3	3	3	3	4	3	3	3	3	3	3	5	3	5	3	3	3
6	N	N	N	N	1	N	3	3	3	2	3	5	3	6	5	3	3	3	3	3	3	3	3	3	3	3
7		N	N	N	N	N	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8	N	N	N	N	N	2	2	3	3	0	2	2	0	3	3	3	3	3	3	3	2	3	3	2	3	3
9	N						3	3	3	3	3	3	3	3	3	3	2	2	3	3	4	3	3	3	3	3
10	N	N	N	N	2	2	3	3	3	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
11	N	N	N	N	1	1	4	4	3	3	3	3	4	4	3	4	4	4	4	4	4	4	4	4	4	4
12	N	N	N	N	N	N	N	1	0	0	2	0	0	2	0	2	2	2					3			1
13	N	N	N	N	N	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
14		N	N	N	1		2	2	2	1	2	1	2	2	0	2	1	2	0	2	1	2	0	2	1	2
15		N	N	N	N	N	N	1	1	1	1	1	1	1	3	1	1	1	1	1	0	0	1	1	1	1
16		N	N	N	N	2	3	3	2	2	0	3	0	1	2	2	2	2	2	2	2	2	2	2	2	2
17		N	N	N	N	N	3	3	3	3	2	2	0	2	0	3	3	3	3	3	3	2	2	2	2	2
18		N	N	N	N	N	2	3		2	2	1	3	0	2	1	2	2	2	2	2	2	2	2	2	2
19		N	N	N	1	1	0	0	0	0	0	2	2	2	2	1	2	2	2	2	2	1	2	0	1	3
20		N			1		1	2	2	3	1	3	2	2	2	1	1	1	1	0	2	2	2	0	2	N
21			N		2		1	2	1	1	1	1	2	3	3	1	1	1	1	2	2	3	0	1	1	4
22			N	3		3	3	3	3	2	3	3	3	2	3	3	2	3	3	2	3	3	3	3	2	3
23			N			2		3	3	2	2	2	0	3	3	0	0	0	3	3	3	3	3	0	3	3
24			N				3	2	3	2	1	3	1	1	3	4	3	0	3	1	4	1	3	3	3	3
25			N					3	2	2	3	2	0	1	3	2	0	0	3	3	2	2	2	0	1	3
26			N				1	3	3	3	3	2	3	3	3	3	3	2	3	3	3	3	3	3	3	3
27			N						2	3	2	3	3	0	0	0	0	0	0	0	3	N	N	N	N	
28			N			2	1	2	2	2		1	1	1	1	1	0	1	1	1	1	1	1	1	1	N
29			N						2	2	2	2	0	1	2	2	0	0	2	2	0	2	2	2	0	2
30			N				3	2	2	4	2	1	2	3	2	2	2	2	1	3	2	2	2	2	2	2
31			N		1			3	3	3	3	3	3	3	3	3	2	3	3	3	3	2	3	3	2	3
32					N							N				N	N	N	N	N	N	N				
33					N		1	2	2	1	2	2	2	2	2	2	2	1	2	2	2	1	2	2	2	2
35				N					1	1	3	0	0	3	3	0	0	0	0		0	0	0	0	1	0
36					N		3	3	3	1	0	2	0	1	4		4	2	4	3	4	3	1	0	3	6
Active Nests	**11**	**19**	**29**	**20**	**24**	**19**	**27**	**30**	**31**	**31**	**30**	**33**	**25**	**32**	**29**	**31**	**29**	**29**	**31**	**30**	**31**	**32**	**31**	**26**	**31**	**32**
# Chicks	**0**	**0**	**0**	**3**	**13**	**18**	**56**	**74**	**73**	**70**	**68**	**73**	**60**	**74**	**79**	**69**	**65**	**61**	**74**	**70**	**78**	**70**	**73**	**58**	**66**	**79**

Table 11. Western Gull nest status by survey date. N = Adults at nest site, # = number of chicks observed. Blue shaded cells denote the presence of chicks.

Pigeon Guillemot

Pigeon Guillemot Counts from Mainland Vantage Points

Observers at both the north and south vantage points regularly noted Pigeon Guillemots resting on ledges and cliffs as well as entering crevices where birds were believed to be nesting (Figures 8, 9, 11). Numbers were fairly consistent throughout the season and similar to last year's numbers (Table 12). Pigeon Guillemot nests are difficult to locate from land, and even more difficult to assess nesting success. Of the sixteen nest sites that were identified, observers visually identified a single chick in the crevice for one day at four nests and two chicks on multiple days at a fifth nest.



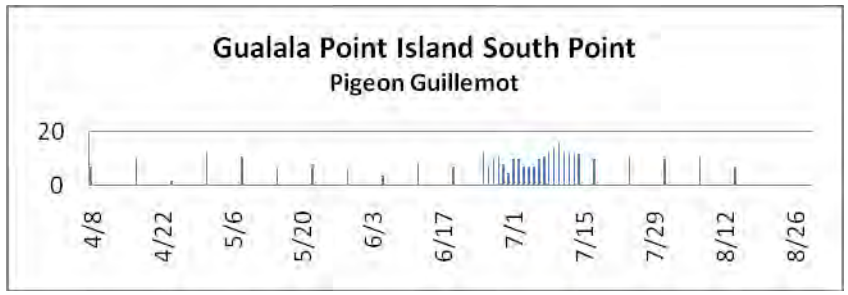


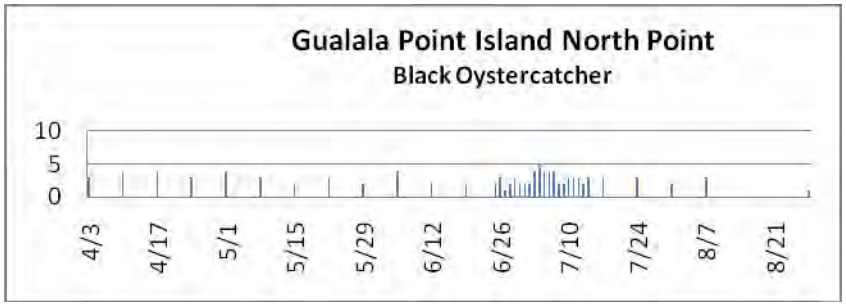
Table 12. Pigeon Guillemot counts weekly from 8 April – 28 August, and daily between 25 June and 14 July.

Black Oystercatcher

Black Oystercatcher Counts from Mainland Vantage Points

Two breeding pairs of oystercatchers were detected, one pair visible from the North Vantage Point and another pair visible from the South Vantage Point (Figures 9, 10). Adults were seen carrying food but only rarely were the chicks seen. Each nest potentially fledged one or two chicks.

On most days, the total numbers of adult oystercatchers using Gualala Point Island for feeding and resting included more than the breeding pair visible from each vantage point. Most activity of visiting oystercatchers occurred in the intertidal foraging zone. They were also regularly seen in transit between the island and the mainland. Daily maximum counts ranged from two to six birds (Table 13).



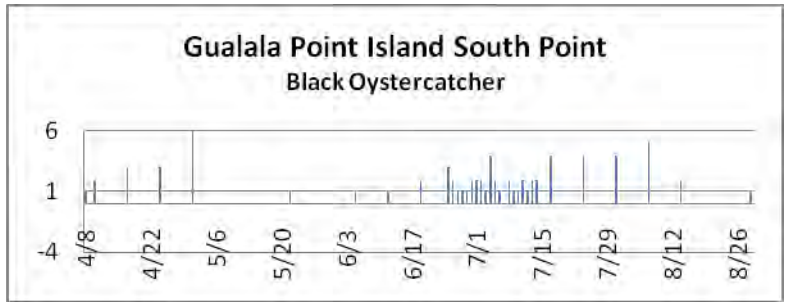


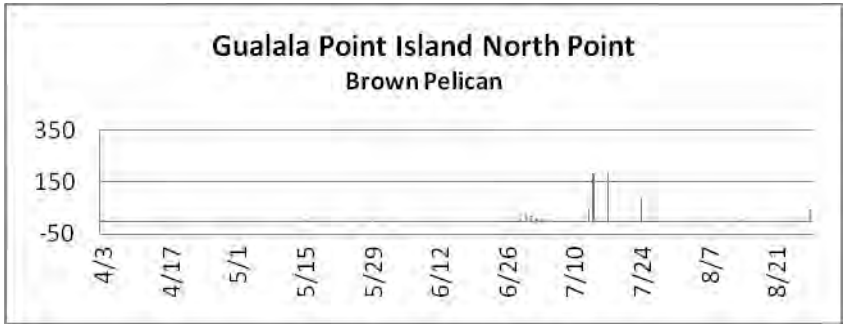
Table 13. Black Oystercatcher counts weekly from 8 April – 28 August, and daily between 25 June and 14 July.

Brown Pelican

Brown Pelican Counts from Mainland Vantage Points

Brown Pelicans do not nest north of Monterey County, but disperse north along the coast after their nesting season. Gualala Point Island is frequently a nocturnal roost for Brown Pelicans during their post-breeding dispersal. During the count period, many more pelicans were observed flying by Gualala Point Island than actually landing on the island. Large numbers of pelicans have roosted on Gualala Point Island in past summers, often reaching 100 birds before 1 July (R. Kuehn and G. Marshall, pers. comm.). In 2008, the occasional pelican was observed in late May, but in late June and July their numbers began to increase with peak numbers in mid-July numbering up to 185 visible from the North Vantage Point and 300 from the South Vantage Point (Table 14). When present during the day, most birds roosted on the ridge line or descending wall of the north side of Gualala Point Island or occasionally the on lower rocks at the southwest corner of the island.

Many more pelicans arrive in northern California in the fall and can be quite numerous on many of the offshore rocks. Although these data do not provide definitive information on pelican population changes, they provide an important perspective on the potential impact of roosting pelicans on the local nesting seabirds. Brown Pelicans are known to occasionally have an adverse effect on breeding seabirds such as Common Murres (McChesney, pers. comm.; McChesney et al., 2008) and California Gulls (LeValley, pers. obs.) in northern California.



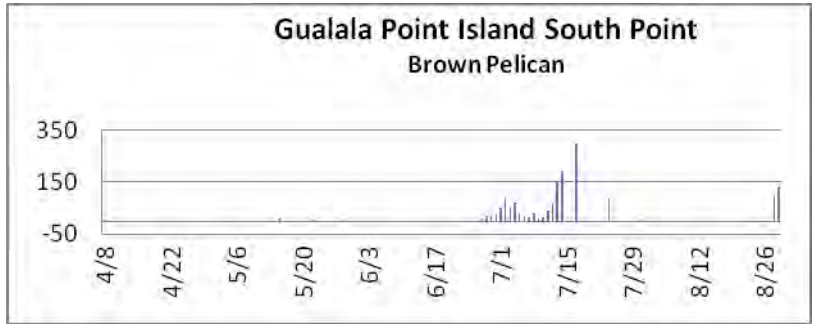


Table 14. Brown Pelican counts weekly from 8 April – 28 August, and daily between 25 June and 14 July.

Seabird Counts on Other Islands

Black Point

Western Gull

Twenty-seven nests were identified. At least 33 eggs were laid. Thirty-one chicks were seen in total with at least 24 still present on 16 July indicating that many of these likely fledged.

Black Oystercatcher

One pair apparently nested on the back side of the rock. One or two mobile chicks were noted during the July Breeding Bird Surveys, and one juvenile was noted on 20 August.

Pigeon Guillemot

Three potential nests were noted, only one confirmed with chicks (#30) on the basis of adults carrying food. Nest #28 and #29 had adults present from July 16 – August 13, and were both without birds on August 20.

Galleon's/Arch Rock

Western Gull

At least eight nest sites were observed, seven of which had chicks during late June or early July. A maximum of sixteen mobile chicks were seen on 30 June, but only two were seen in July. These latter two chicks likely fledged and were apparently the only ones to do so.

Black Oystercatcher

One chick was observed at a nest on 30 June and four mobile chicks were noted on 7 July. These nests were not easily visible from shore, thus the observations of the chicks are sporadic.

Cliff Swallow

Of interest was a colony of Cliff Swallows (*Petrochelidon pyrrhonota*) nesting on the island. At least 32 nests were counted on 16 June. Since most of the Cliff Swallows in California nest on bridges, overpasses and buildings, natural nesting sites such as this are notable.

Marine Mammal Surveys

Harbor Seals

Harbor Seal Counts from Mainland Vantage Points

For this protocol, the Task Force incorporated the existing protocol established by Sarah Allen at Point Reyes National Seashore. Area residents use this protocol to census Harbor Seals and to document disturbances to Harbor Seals. Harbor Seals were counted from the various locations at a time close to the low tide of the day. Seals were counted from fourteen different locations. However, the counts reported here represent only those seals present on the CCNM rocks, and therefore are not comparable to other counts performed at Sea Ranch for other purposes.

Breaker Reach – A maximum of 48 seals were counted on 5 May (Table 15a) and a maximum of one pup was noted on 14 April.

Buckeye -- A maximum of 26 seals were counted on 29 June (Table 15b) and a maximum of thirteen pups were noted on 29 June.

Table 15a. Harbor Seal Counts at Breaker Reach

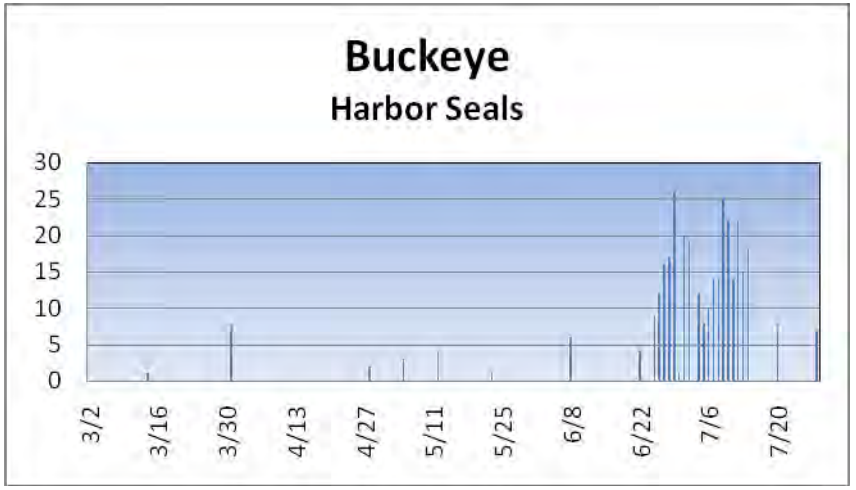


Table 15b. Harbor Seal Counts at Buckeye

Cormorant Close – A maximum of 64 seals were counted on 12 May (Table 15c) and a maximum of seventeen pups were noted on 12 May. On 31 March one seal with multiple lacerations was seen. The wounds were thought to be from a shark.

Dune Drift -- A maximum of 32 seals were counted on 20 July (Table 15d) and a maximum of nine pups were noted on 5 May.

Table 15c. Harbor Seal Counts at Cormorant Close

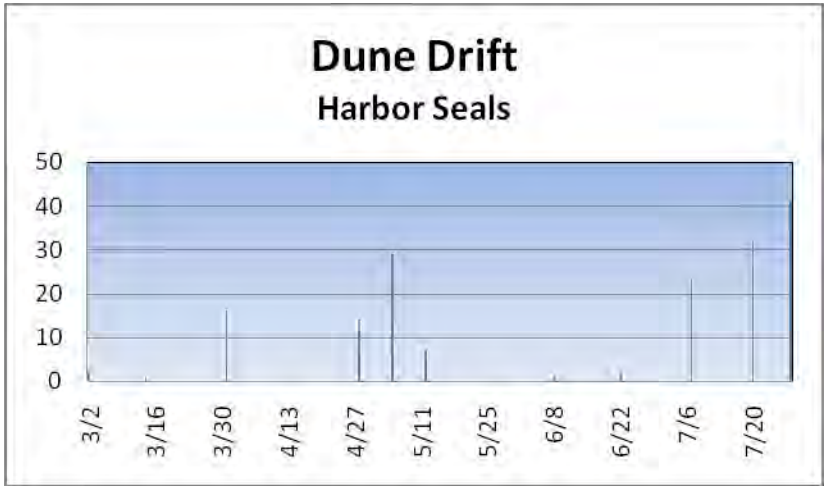


Table 15d. Harbor Seal Counts at Dune Drift

Del Mar (N) – A maximum of 27 seals were counted on 22 June (Table 15e) and no pups noted.

Del Mar (S) – A maximum of fourteen seals were counted on 31 March (Table 15f) and no pups noted.

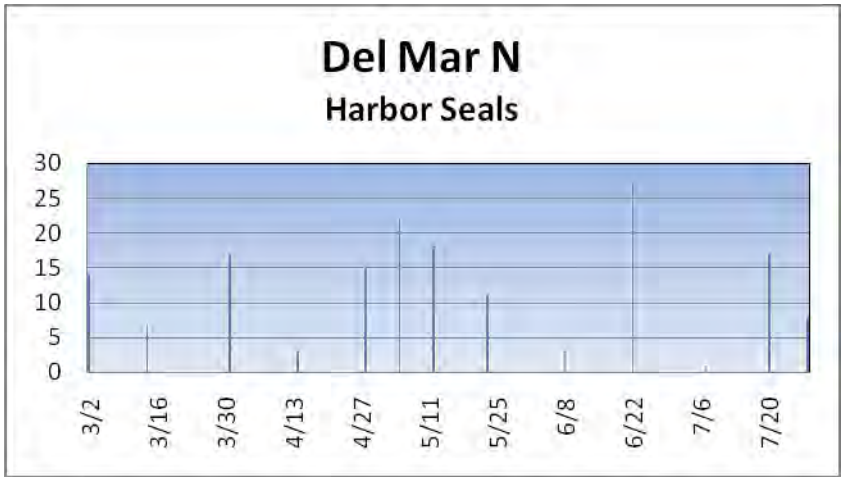


Table 15e. Harbor Seal Counts at Del Mar N

Table 15f. Harbor Seal Counts at Del Mar S

Gualala Pt. Island (S) -- A maximum of seventeen seals were counted on 12 May (Table 15g) and a maximum of four pups were noted on 29 June.

Gualala Pt. Island (N) -- A maximum of fourteen seals were counted on 14 July (Table 15h) and a maximum of five pups were noted on 29 June.

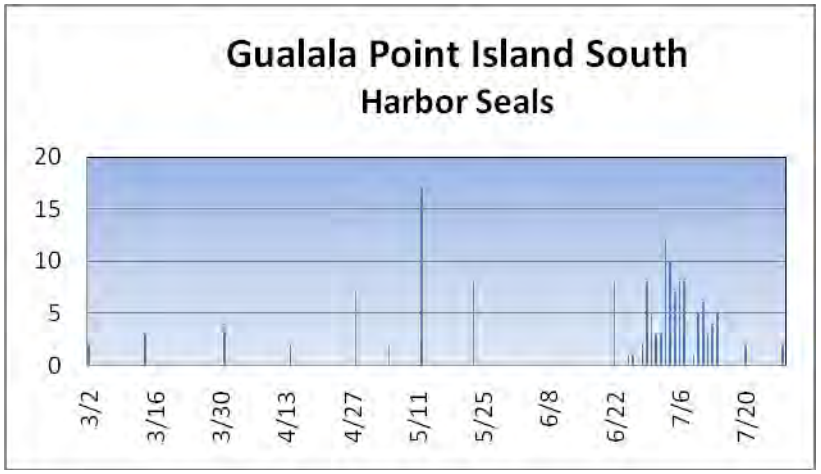


Table 15g. Harbor Seal Counts at Gualala Point Island South

Table 15h. Harbor Seal Counts at Gualala Point Island North

Galleons/Arch Rock No Harbor Seals were recorded at this site (Table 15i).

Green Cove-- A maximum of 63 seals were counted on 20 July (Table 15j) and a maximum of three pups were noted on 28 April.

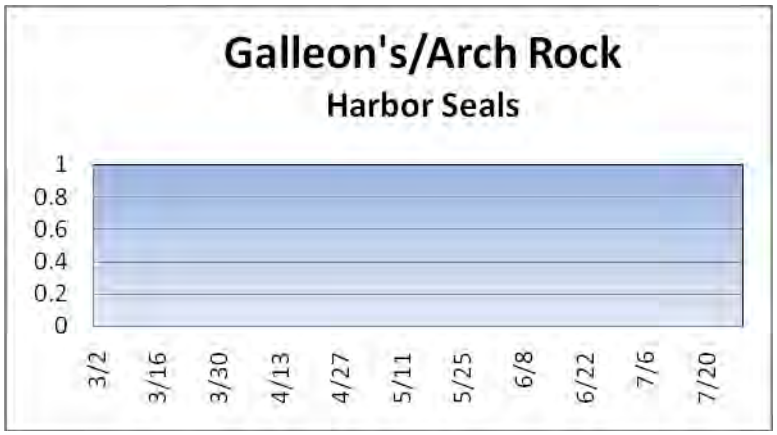


Table 15i. Harbor Seal Counts at Galleon's/Arch Rock

Table 15j. Harbor Seal Counts at Green Cove

Pebble Beach -- A maximum of fifteen seals were counted on 31 March (Table 15k) and a maximum of one pup was noted on 5 May and 12 May.

South of The Lodge -- A maximum of 36 seals were counted on 22 June (Table 15l and a maximum of nine pups were noted on 22 June. On 20 July one seal was observed with an apparent shark bite.

Table 15k. Harbor Seal counts at Pebble Beach

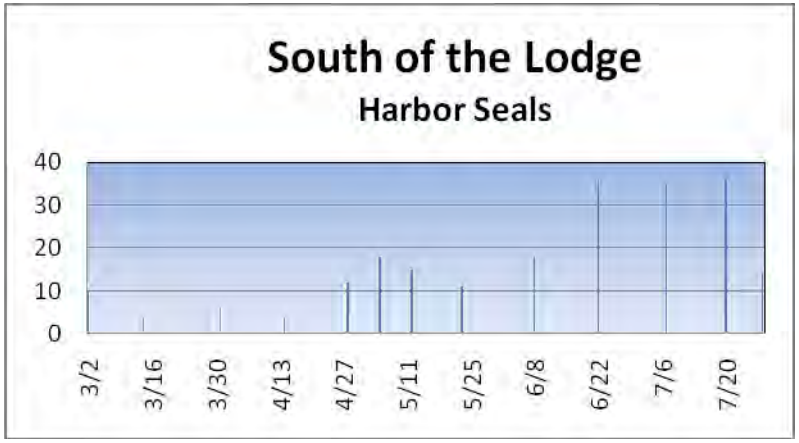


Table 15l. Harbor Seal Counts at South of the Lodge

Tidepool Rookery -- A maximum of 125 seals were counted on 5 May (Table 15m) and a maximum of thirteen pups were noted on 5 May. On 28 April, two dead pups were observed and on 12 May one dead pup was observed.

Public Shell -- A maximum of fifteen seals were counted on 28 April (Table 15n) and a maximum of one pup was noted on 28 April.

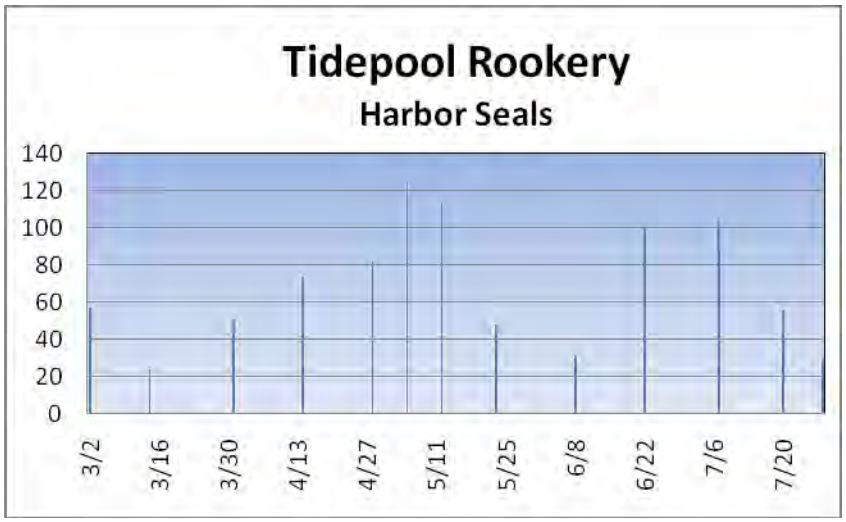


Table 15m. Harbor Seal Counts at Tidepool Rookery

Table 15n. Harbor Seal Counts at Public Shell

Daytime Disturbance Monitoring

Aircraft and boat disturbances may impact certain seabird colonies in central California and elsewhere (Carney and Sydeman 1999, Rojek *et al.* 2007). To assess overall agents of disturbance and their effects at Gualala Point Island, all potential human disturbances and all non-human disturbances were recorded during daytime seabird counts (Table 16). Daytime disturbance agents and disturbances to seabirds, whether human- or animal-caused, were mostly rare and minor during the count period. Of all aircraft recorded, only one helicopter and the Outback Steakhouse airship flew below 300 m. Fishing boats and kayakers caused minimal disturbance.

Notable disturbances are discussed below.

On 12 March, six people and a dog were noted walking and photographing on a coastal island group near the Tide Pool seal rookery. This caused about 50 Harbor Seals and two Western Gulls to leave the island. Fortunately, this event was early in the seabird season and had little consequence for the seals.

On 6 July the Outback Steakhouse airship cruised low over Gualala Point Island from around 13:30 to 13:33. The airship cruised at an altitude of about 400-500 feet and flushed nesting Brandt's Cormorants and Western Gulls from their nests. Fortunately, this disturbance was short in duration and many cormorants returned to their nests within a few minutes. The aerial surveys indicate that only two nests failed during the period between July 2 and July 9.

Three instances of disturbance involved helicopters. On 28 June a Coast Guard Helicopter crossed about 600 feet above the Gualala Point Island and on 29 June a REACH Helicopter flew over at around 400 feet altitude. In both cases, small numbers of birds took off from the island but returned quickly and no major effects were recorded. On 10 April, early in the season, a private helicopter flew over the island both before and after landing at the Gualala airstrip. At the time Brandt's Cormorants came to alert.

Of special note was the presence of a pair of Common Ravens (*Corvus corax*) stealing an egg from Black Point Island. Ravens can be important predators on seabird eggs and chicks.

Disturbance Agent	Total Number of Events	Duration in Minutes	Number of Disturbance Events	Species Affected
Aircraft				
Airplane	6	1-7	0	None
Military Jets	1	<1	0	None
Helicopter	4	1-5	2	Cormorants, Pelicans
Paraglider	1	<1	0	None
Airship	1	13	1	See discussion above
People and dog on island*	1	15	1	Harbor Seals, Western Gulls
Kayakers	1	15	1	Pelicans alert
Fishing Boats	7	1-21	2	Gulls, Cormorants,
Avian Sources				
Great Blue Heron	1	2	1	Gulls call and chase bird away, cormorants alert
Turkey Vulture	1	<1	1	Gulls call and chase bird away
Common Raven	1	??	1	One chick or egg (probably Western Gull) taken by raven. Other gulls distressed.
Unknown	3	1-7	2	Gulls and pelicans fly up, cormorants alert.
Total	**28**		**12**	--

Table 16 – Summary of daytime disturbances on Gualala Point Island and adjacent coastal rocks recorded during seabird counts and nest surveys
* This event took place outside the normal monitoring schedule.

Discussion

This study continued for a second year a survey of the breeding seabirds on Gualala Point Island and other nearby islands in Sonoma County, California, as well as of daytime human disturbances occurring in the area. The significance of breeding seabird data at Gualala Point Island acquired in summer 2008 benefits from a review of seabird nesting results in two ways: (1) a look at results in 2008 from other closely studied colonies south of the Gualala Point Island; and (2) a review of nesting in previous years on Gualala Point Island itself. Discussion here focuses on four topics: the breeding success of Brandt's Cormorants, increasing presence of Common Murres during the nesting season, potential predation from Common Ravens, and human disturbances to seabird colonies.

BRANDT'S CORMORANT BREEDING SUCCESS

More pairs of Brandt's Cormorants established active nests on Gualala Point Island in 2008 overall than in 2007. The nesting effort was very high (a total of 145 nest sites) but productivity was very low (< 50% of nest sites hatched chicks). A major difference between the two years was the timing of nest establishment as follows:

	2007	2008
Active Nests on June 5/9	83	72
Active Nests on July 5	84	126

Between 5 June and 5 July 2007, the number of active nests increased slightly; by contrast in 2008, between 9 June and 5 July the number of active nests rose from 72 to 126 nests, an increase of 75%. From the new nest sites recorded from aerial photographs on 5 July 2008 (sites 84 and above), only two produced chicks that possibly fledged by the end of the nest season. The late influx of cormorant pairs between 9 June and 5 July 2008 may represent cormorants that nested unsuccessfully at other colonies to the south impacted by the mid-May heat wave and low food supplies. The 54 late-arriving pairs most likely were attempting to nest on Gualala Point Island for a second time, away from their original colonies. Assuming that the late arrivals were nesting a second time, the number of first-time active nest sites of the core Gualala Point Island colony as of 9 June 2008 was down by eleven active nests compared to roughly the same time in 2007. No evidence of nest abandonment after the May heat wave was found on Gualala Point Island, however, as ground-based surveys showed that few Brandt's Cormorants established nests on the island before 15 May 2008.

Populations of Brandt's Cormorants at two other colonies in northern California where nesting starts earlier, Southeast Farallon Island and Alcatraz Island, also showed anomalous nesting behavior in 2008 (R. Bradley, R. Warzybok, S. Acosta, J. Thayer, personal communications 2008). Air temperature at Southeast Farallon Island reached 25° C in mid-May, the highest recorded temperature since seabird studies by PRBO Conservation Science began on the island. Unlike recent years at Southeast Farallon Island, Brandt's Cormorants in 2008 had low productivity (~0.4 chicks per pair) overall. The Brandt's Cormorant breeding population declined by 75 percent in 2008 and nest abandonment was high compared to 2007. On Alcatraz Island, the Brandt's Cormorant breeding population declined by 15 percent, with 1.5 fledged chicks per breeding pair. The May heat wave caused Alcatraz Island cormorants to abandon their nests, and in some cases die from heat stress. These occurrences are not typical and at this time are not thought to be part of a trend in breeding outcomes.

PRESENCE AND PREDATION OF COMMON RAVENS

In 2008, observers found Common Ravens for the first time at a seabird colony (Black Point Island) offshore from the Sea Ranch during the nesting season – in contrast to 2007, when ravens were frequent on the mainland coast opposite Gualala Point Island but not observed on the island. Collaborative efforts on the part of the Bureau of Land Management, the Sonoma County Department of Parks and Recreation, local businesses, and areas residents may be necessary to manage factors promoting the increase in Common Ravens in the area for deterring predation of seabird colonies during the breeding season.

POTENTIAL EXPANSION OF COMMON MURRES

During the nesting season, Common Murres visited ("prospected") more frequently and more abundantly on Gualala Point Island in 2008 than in 2007. They do not nest on the island at present. It is unclear as yet whether a trend in increasing visitation is occurring. Since 1996, seabird biologists have succeeded in reintroducing murres to Devil's Slide Rock in San Mateo County, and overall murre numbers in Mendocino and Humboldt counties are increasing.

HUMAN DISTURBANCE

Many California seabird colonies such as Devil's Slide Rock (G. McChesney, pers. comm.) are experiencing increased disturbances from human sources, including aircraft, recreation activities, and pyrotechnic displays. Impacts from human disturbances during seabird breeding are not completely understood and little documentation and research in California presently exists. The concern about human disturbances has prompted the NOAA Gulf of the Farallones National Marine Sanctuary to establish systematic documentation of human disturbances, likewise adopted by the federal and state of California agencies, to gather data on the impacts of disturbance throughout the year. Intensive monitoring of disturbances to seabirds at Gualala Point Island contributes to the NOAA effort and is revealing much more disturbance than local residents previously thought.

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Appendix 1

Chronology of Brandt's Cormorant nest and territorial sites recorded in aerial photographs, Gualala Point Island, 2 June to 5 September 2008.[1]

Nest #	6/2	6/9	7/2	7/5	7/9	7/18	8/1	8/17	9/5
1	S	D	D	T	V	D	D	D	
2	S	D	S	S	S	S	C	C	
3	S	S	S	S	C	C	C	C	
4	S	S	S	S	C	C	C	C	
5	S	S	S	S	S	S	C	C	
6	S	S	S	S	C	C	E	E	
7	S	S	S	S	S	S	S	S	
8	S	S	S	C	C	C	C	C	
9	S	S	S	S	S	C	C	C	
10	S	S	S	S	S	S	E	E	
11	S	S	S	S	S	C	C	C	
12	S	S	S	S	S	S	S	S	
13	S	S	S	S	S	C	C	C	
14	S	S	S	S	S	S	S	S	
15	S	S	S	S	S	C	E	E	
16	T		T	S	V	V	V	V	
17	S	S	S	S	S	C	E	E	
18	S	S	S	S	C	C	C	C	
19	S	S	S	S	S	C	E	E	D
20	S	S	S	S	C	C	C	C	
21	T		S	S	S	V	V	V	
22	S	S	S	S	S	S	C	C	
23	S		S	S	V	V	V	V	
24	S	S	S	S	S	S	S	S	
25	S	S	S	S	C	C	DE	DE	
26	S		S	S	S	V	V	V	
27	S	S	S	S	C	C	C	C	
28	S	S	S	S	C	C	C	C	

29	S	S	S	S	S	C	C	C
30	T	S	S	S	S	S	S	S
31	S	S	S	S	S	S	D	D
32	S	S	S	S	C	C	DE	DE
33	S	S	S	S	S	S	C	C
34	T	D	S	S	S	S	S	S
35	S	S	S	S	C	S	E	E
36	S	S	S	S	C	C	C	C
37	S	S	S	S	C	S	E	E
38	S	S	S	S	C	C	E	E
39	S	S	S	S	C	C	DE	DE
40	S	S	C	C	C	C	DE	DE
41	T	D	S	S	S	S	C	C
42	S	S	S	S	C	C	C	C
43	S	S	C	C	D	D	V	V
44	S	S	S	S	S	C	DE	DE
45	S	S	S	S	C	C	E	E
46	S	S	S	S	S	S	C	C
47	T	S	S	S	S	S	C	C
48	S	S	C	C	C	C	C	C
49	S	S	S	C	C	C	DE	DE
50	S	S	S	S	C	C	DE	DE
51	S	S	S	S	C	C	C	C
52	S	S	S	S	C	C	E	E
53	S	S	S	S	C	C	E	E
54	S	S	S	S	C	C	C	C
55	T	S	S	S	S	S	C	C
56	S	S	S	S	C	C	C	C
57	S	S	S	S	C	C	E	E
58	S	S	S	S	C	C	DE	DE
59	S	S	S	S	S	S	C	C
60	S	S	S	S	C	C	E	E
61	S	S	S	S	C	C	C	C

62	S	S	S	C	C	C	DE	DE
63	S	S	S	S	S	C	C	C
64	S	S	S	C	C	C	DE	DE
65	S	S	S	S	S	S	S	S
66	S	S	S	S	C	C	C	C
67	S	S	S	S	S	S	C	C
68	S	S	S	S	C	C	E	E
69	S	S	S	S	S	C	DE	DE
70	S	S	S	S	S	S	S	S
71	S	S	S	S	S	C	C	C
72	S	S	S	S	S	S	C	C
73	S	S	S	S	S	C	E	E
74	S	S	S	S	S	C	DE	DE
75	S	S	S	S	S	S	C	C
76	S		S	S	S	S	S	S
77	S	S	S	S	C	C	C	C
78	S	D	S	S	S	S	C	C
79		D	S	S	S	S	S	S
80		S	S	S	S	S	S	S
81		S	S	S	S	S	C	C
82		S	S	S	S	S	DE	DE
83		S	S	S	S	S	C	C
84			S	S	S	V	V	V
85			T	T	V	V	V	V
86			T	V	T	V	V	V
87			S	S	S	V	V	V
88			T	T	V	V	V	V
89			T	V	V	T	V	V
90			T	T	T	T	V	V
91			S	S	S	S	S	S
92			S	S	S	S	S	S
93			S	S	S	S	C	C
94			S	S	S	S	V	V

95	S	S	S	D	V	V	
96	T	D	D	D	V	V	
97	T	T	V	T	T	T	
98	S	S	S	S	S	S	
99	S	S	S	S	S	S	
100	S	S	D	S	D	D	
101	S	S	S	S	C	C	
102	T	T	V	T	V	V	
103	S	S	S	S	V	V	
104	S	S	S	S	V	V	
105	S	S	S	S	S	S	D
106	S	S	S	S	V	V	
107	S	S	S	S	S	S	
108	S	S	S	S	V	V	
109	S	S	D	D	V	V	
110	T	T	T	V	V	V	
111	S	S	S	S	S	S	
112	T	S	S	V	V	V	
113	T	T	V	V	V	V	
114	S	S	S	S	S	S	
115	S	S	S	S	S	S	
116	S	S	S	S	S	S	
117	S	S	D	V	V	V	
118	S	S	D	V	D	D	
119	S	S	S	S	S	S	
120	T	S	S	D	V	V	
121	S	S	S	S	S	S	
122	T	T	V	V	V	V	
123	S	S	S	S	S	S	
124	S	S	S	S	S	S	
125	S	S	S	S	S	S	
126	S	S	S	S	S	S	
127	S	S	S	S	S	S	

128	S	S	S	S	S	S
129	S	S	S	S	S	S
130	S	S	S	V	V	V
131	S	S	S	S	V	V
132	S	S	S	S	S	S
133	S	S	S	S	S	S
134	T	T	V	V	V	V
135	S	S	S	S	S	S
136	S	S	S	S	S	S
137	S	S	S	S	S	S
138	S	S	S	S	S	S
139		S	S	S	S	S
140		D	S	V	V	V
141		T	T	T	V	V
142		T	V	V	V	V
143		D	T	T	V	V
144		D	S	S	S	S
145		T	D	V	V	V

[1] Codes are as follows:

Nest Site Condition by Date:

D = adult standing at nest site
S = adult sitting on nest
T = adult bird(s) on territory with little or no nest material
C = chick(s) visible in nest
V = vacant site
E = empty nest

Color Codes are as follows:

Nest Present
Chicks present, likely not fledged
Chicks present, possibly fledged
Chicks present, probably fledged
Failed nest