SEABIRD AND MARINE MAMMAL MONITORING ON OFFSHORE ROCK ISLANDS IN SONOMA COUNTY AND MENDOCINO COUNTIES, CALIFORNIA

2007

PRELIMINARY REPORT*
FINDINGS
AND
PROTOCOL DOCUMENTATION

United States Department of the Interior
Bureau of Land Management, California State Office

and

The Sea Ranch California Coastal National Monument Stewardship Task Force

***Subject to Revision**

18 October 2007

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Title Page Photo by Marge Anthony

SUMMARY

Background and Purpose

The Sea Ranch California Coastal National Monument Stewardship Task Force and the United States Department of Interior's Bureau of Land Management (BLM) and Fish and Wildlife Service investigated the populations of seabirds and marine mammals before, during and after an 18-minute fireworks display held on 06 July 2007 in the town of Gualala, Mendocino County, California. Populations from Gualala Point Island in Sonoma County to Fish Rocks in Mendocino County were monitored using multiple methods and media between 30 May and 30 August 2007. Task Force volunteers and federal agency staff wanted to determine whether the fireworks display affected the nesting and resting populations of six species of seabirds and one marine mammal which are all resident in the region at the time of the fireworks display. The most intensive monitoring effort focused on the seabird populations of Gualala Point Island, located 1.8 km from the firing site for the pyrotechnics - six days before, the night of, and six days after the fireworks display to discern immediate, real-time responses and longer-term outcomes to adult seabirds and their reproductive successes.

Monitoring Protocols and Approaches

Volunteers and agency staff used multiple approaches to monitoring with varying success. Diverse approaches to data acquisition tested which methods produced results that best revealed and communicated the responses of seabirds and marine mammals to fireworks. The observation program adopted existing monitoring protocols from the Fish and Wildlife Service for seabird censuses from mainland vantage points and for aerial photography. Harbor seals (*Phoca vitulina*) were monitored according to the protocol established by the Point Reyes National Seashore.

At the same time each day, one of the three professional photographers volunteering recorded images of the surface of Gualala Point Island and its resident seabirds. Photographs documented visible differences in distribution and behavior of some seabird species, which were substantiated by data collected for daytime population counts. Nighttime photo monitoring required both careful planning and novel techniques to test the efficacy of equipment. Photography and monitoring took place at night on dates without a fireworks display as well as on the night of the fireworks display, 06 July 2007. The photographers were able to document the response of Brandt's cormorants (*Phalacrocorax penicillatus*) with digiscoped and infra- red photographs. Other volunteers recorded on video the response vocalizations of seabirds in synchrony with fireworks explosions.

Two acoustical engineers provided advice and equipment for monitoring on the night of the fireworks display and a physicist arranged time-referenced decibel readings to be filmed during the display.

Results and Findings

The species most affected by the fireworks display was Brandt's cormorant (*Phalacrocorax penicillatus*). Eleven percent (ten nests) of 2007 Brandt's cormorant nests were abandoned on Gualala Point Island in two days between 05 July and 07 July. This event contrasts with the loss of seven nests for the remaining 39 days in the period between 04 June and 12 July.

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Real-time digiscoped and infra-red photography of Gualala Point Island during the fireworks display showed Brandt's cormorants quickly coming to erect posture at the first fireworks and many birds leaving the island. Western gulls also circled and called during the fireworks display. For one day after the fireworks display, the island gull population dropped significantly but rebounded on 08 July 2007. All but one western gull nest had hatched young by the date of the fireworks display and no western gull nesting failures occurred during the monitoring period. The difficulty tracking mobile western gull chicks made population counts to detect response or trend before and after the fireworks display impossible.

In the days after the fireworks display, the two nests of pelagic cormorant (*P. pelagicus*) in view on Gualala Point Island were abandoned. Two nests of this species observed at Robinson Point on northwest-facing mainland cliffs north of the center of Gualala, however, were successful.

Some species of seabirds were too few in number for observers to discern detectable response, i.e., California brown pelican (*Pelecanus occidentalis* ssp. *californicus*) and American black oystercatcher (*Haematopus bachmanni*). California brown pelican populations did not arrive on Gualala Point Island in large numbers until after the date of the fireworks display. Pigeon guillemots (*Cepphus columba*), crevice-nesting birds, were not detectable at their nest sites and could not be viewed at night. No significant response was detectable for harbor seals as well. Other species of seabirds responded with differing sensitivities and time lengths of response.

Additional Items in the Report

Apart from the fireworks, disturbance agents and disturbances to the seabird colonies, whether human- or animal-caused, were rare during the intensive monitoring period.

To assist other researchers and stewards of seabirds in California, the Task Force has documented its monitoring protocol in detail. In this way, a larger audience can critique and help refine the monitoring program being implemented for the BLM California Coastal National Monument. This report also contains an initial set of proposals for ways to improve monitoring so that it is both more effective and efficient. Expenses and volunteer hours were tracked to provide a realistic estimate of costs for comparable monitoring efforts.

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SECTION 1: CONTEXT

1.1 Purpose of the Monitoring Study

This monitoring study responds to the immediate need to determine how a recently initiated annual Independence Day fireworks display in the town of Gualala, Mendocino County, California, affects nesting and resting seabird colonies and marine mammals on nearby rock islands in both Sonoma and Mendocino County that comprise part of the California Coastal National Monument (CCNM) administered by the US Department of the Interior, Bureau of Land Management (BLM).

Concern stems from observers seeing large numbers of birds being disturbed and flying into the darkness above Gualala Point Island on 02 July 2006 during the First Annual Gualala Festivals Committee's fireworks display held in Gualala. Observer accounts from the 2006 disturbance are attached to this document as Appendix 1.

1.2 Purpose of the Protocol Documentation

This report also provides a detailed account of the protocol undertaken by the BLM with major assistance from The Sea Ranch Association CCNM Stewardship Task Force to gather information to determine whether the annual fireworks display by the Gualala Festivals Committee held on 06 July 2007 negatively impacted seabirds nesting or resting on Gualala Point Island and at other locations north of Gualala. Many people had active roles in gathering information of different kinds. Their accounts of the details of preparation and execution of the protocol are critical to replicating the same tasks in future years and at other sites. All participants have submitted elaborations and corrections so that all details are captured in one place for subsequent reference and citation.

1.3 Biological Concerns

The Bureau of Land Management and its partner wildlife agencies, the California Department of Fish and Game, the US Fish and Wildlife Service and the National Oceanic and Atmospheric Administration's National Marine Fisheries Service, want to obtain observations of seabirds and marine mammals to determine whether:

1. Seabirds may abandon their nests and young during or after fireworks events and other celebratory explosions such as cannon fire.

2. Mortality of young seabird chicks increases after these disturbances.

3. Individual seabird and marine mammal species respond differently to these disturbances.

4. Other disturbances are major factors in seabird breeding success on islands.

5. Human disturbances interact synergistically to impact seabird breeding success on islands.

6. Changing the timing and location of fireworks displays might avoid or mitigate impacts to seabird and mammal colonies.

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1.4 Hypotheses Examined

Not all concerns listed in Section 1.3 are tested in the protocol used in the specific context here. The protocol and resulting information described herein examine the following hypotheses:

1. A fireworks display increases the rate of nest failure of seabird species over a background or natural rate of nest failure.

2. A fireworks display reduces the number of marine mammals using a site near the display for hauling out to rest.

3. A fireworks display affects seabird species differently.

4. The rate of recovery to a fireworks display differs among seabird species.

5. Disturbance by fireworks secondarily causes greater predation on seabird nests (eggs and young) by predator bird species such as western gull and common raven.

1.5 Geographic Scope

The area of geographic focus encompasses two seabird colonies within 1.25 miles of the fireworks launch site and one colony more distant:

Colony 1 - CA Seabird Colony Number SO-384-01 - Gualala Point Island, Sonoma County, 0.68 miles distant;

Colony 2 – CA Seabird Colony Number ME-384-11 - Collins Landing to Gualala River, Mendocino County 1.12 miles distant; and

Colony 3 – CA Seabird Colony Number ME-384-10 - Fish Rocks, Mendocino County, four miles distant.

The most intensive effort focuses at Colony 1 located south of Gualala opposite Gualala Point in northernmost Sonoma County. Colony 2 stretches north of the town of Gualala, principally from Robinson Reef to Castle Rock. Species composition and numbers of birds differ substantially between the two colonies. Fish Rocks (Colony 3) is a seabird-rich complex of two tall islets connected by a sand bar that attracts marine mammals at low tide. Direct comparability of the colonies is not likely or intended.

Colony 1 is 1.8 km (1.12 miles) from the fireworks launch site;
Colony 2 is 1.1 km (0.68 miles) from the launch site
Colony 3 is 6.4 km (4.0 miles) from the launch site

In the course of completing aerial photography for the three colonies, Gerry McChesney and Craig Tooley photographed the entire island surface of both Gualala Point Island and the Fish Rocks. Fish Rocks has a larger colony of Brandt's cormorants than that of the Gualala Point Island. The Sea Ranch CCNM Stewardship Task Force is interested in colonies 1 and 3 to ascertain whether distance from the fireworks display might be a factor in disturbance response by Brandt's cormorant to the fireworks display.

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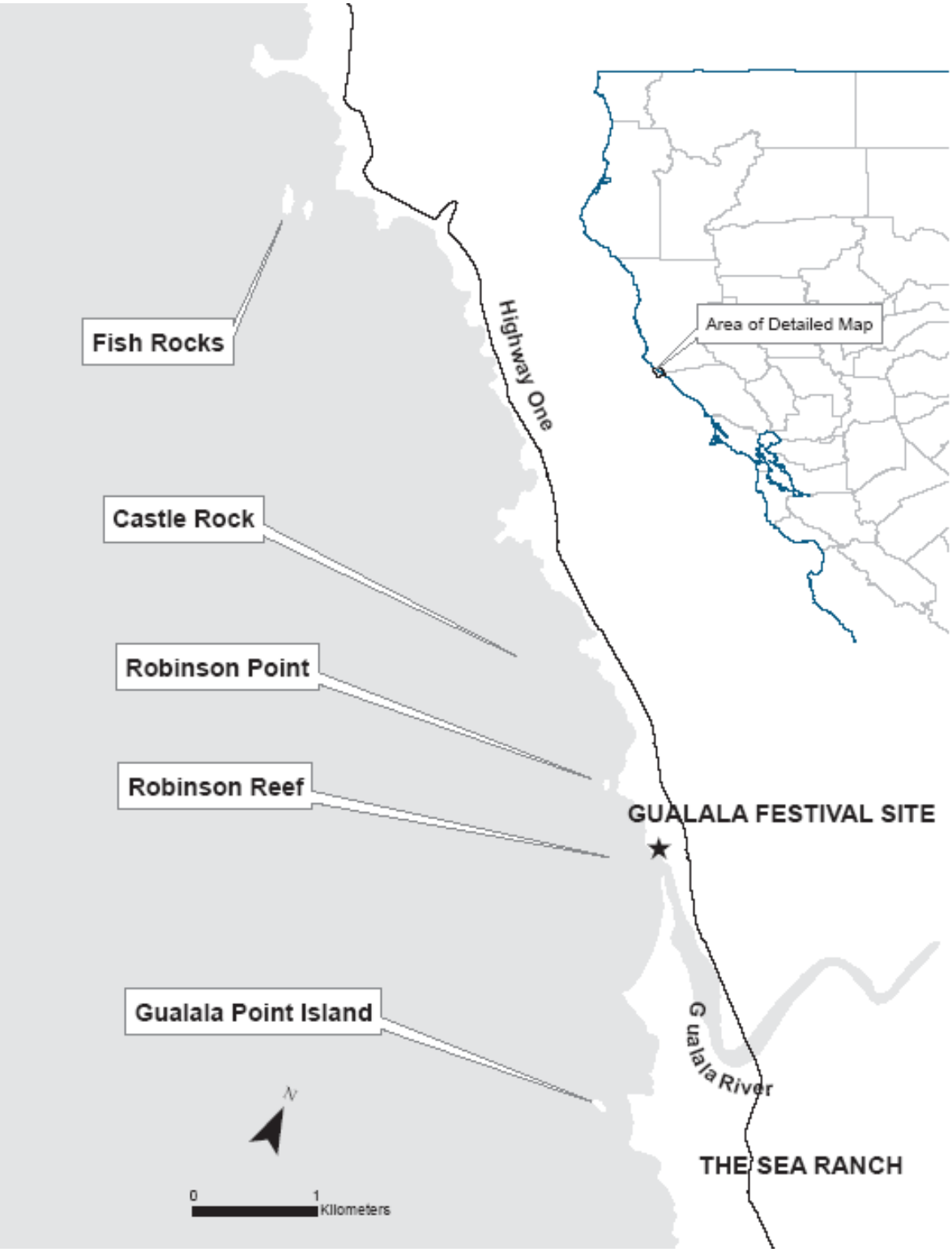
Figure 1 Map of the study area, Mendocino and Sonoma counties, California



1.6 Geology as the Basis for High-Quality Habitat for Nesting Seabirds

Geological factors combine to make Gualala Point Island a unique and favorable habitat. Gualala Point Island is part of the Gualala Block, a narrow crustal sliver that extends roughly from Point Arena south to Fort Ross. 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. Because the Gualala Block is the most northerly large assemblage of rocks on the west side of the San Andreas Fault, the area has been extensively studied. Various matches of Gualala Block formations with rocks east of the San Andreas Fault and much farther south provide clues about extent and timing of fault movement.

Additionally, the large-scale movement has brought to the Gualala area some rocks 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.

At 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 be 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.

The Brandt's cormorant nests observed on Gualala Point Island are all in the upended limestone layers. The limestone erodes to form shallow depressions affording protection to nesting and roosting birds from sea winds.

1.7 Land-Based Vantage Points

UTMs in Zone 10N (NAD 1983) of vantage points on the mainland are as follows:

<u>Colony 1 – Gualala Point Island</u>

North End Vantage Point:	454244 E	4289459 N	about 245 m from the island
South End Vantage Point:	454411 E	4289224 N	about 305 m from the island

<u>Colony 2 - Collins Landing to Gualala River</u>

North End Vantage Point:	453016 E	4291706 N	about 39 m from Robinson Point Island, on the deck of a private home in Gualala
South End Vantage Point:	453438 E	4291447 N	about 512 m from Robinson Reef islands, on the deck of a private home in Gualala

The vantage points for Gualala Point Island were agreed upon by Richard Kuehn, Sandy Bush and Jim Weigand on 19 June 2007 after a Task Force meeting. Vantage points for the Collins Landing to Gualala River colony were established by Julie Verran and Jim Weigand on 29 June 2007.

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The Sea Ranch Association (TSRA) staff marked the exact reference points for observation of Gualala Point Island with a cadastral monument using rebar and BLM/TSRA identification caps flush with ground on 29 June 2007 in advance of monitoring. No rebar monuments are in place at vantage points at private homes in Gualala as reference points were established on ocean-facing home decks.

During the monitoring period Task Force members also visited a third home north of Gualala that offered a vantage point of the south end of Fish Rocks. No land-based vantage points were established for Colony 3 – Fish Rocks, and no protocol censuses of seabird populations were taken at the time from land. The task of observing seabirds at this site from the mainland exceeded the capacity of the Task Force at the time and would have been intrusive to the residents who had invited the Task Force to view Fish Rocks from their home.

1.8 Species of Interest and Basis for Interest

Based on previous censuses of seabirds and marine mammals from Gualala Point Island (Carter et al., 1992), the BLM staff selected the following species of interest for monitoring:

<u>Bird Species</u>

California Brown Pelican	(*Pelecanus occidentalis* ssp. *californicus*)
Brandt's Cormorant*+	(*Phalacrocorax penicillatus*)
Pelagic Cormorant*+	(*Phalacrocorax pelagicus*)
American Black Oystercatcher*+	(*Haematopus bachmani*)
Western Gull* ‡+	(*Larus occidentalis*)
Pigeon Guillemot* ‡+	(*Cepphus columba*)
Common Raven	(*Corvus corax*)

An asterisk (*) signifies breeding birds on Gualala Point Island, a rod (‡) signifies breeding on Castle Rock and a plus (+) signifies breeding on Fish Rocks. Other CCNM islands in the Collins Point to Gualala River colony (Robinson Reef islands and Robinson Point Island) appeared not to have nesting seabirds in view from the mainland vantage points. Pelagic cormorants nested on mainland cliffs to the south of the north vantage point for Collins Point to Gualala River. Although they did not nest on rock islands in the CCNM, they were included in data observations for this study.

Regulatory Basis for Monitoring Seabirds on Gualala Point Island

California brown pelicans (*P. occidentalis* ssp. *californicus*) are regular visitors to Gualala Point Island in the summer but do not breed in the region. The California brown pelican is listed both federally and by the State of California as an endangered species.

All of the bird species of interest fall under provisions of the Migratory Bird Treaty Act of 1918 as well.

Concern for Predation

Common ravens, brown pelicans and western gulls are known to be predators of seabirds at breeding colonies, robbing unprotected nests of their eggs or small chicks. Nest robbing by these species could occur when adult seabirds leave their nests after a loud noise, for example, after an explosion of fireworks.

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Marine Mammal Species
Harbor Seal (*Phoca vitulina*)

Harbor seals use Gualala Point Island as a haulout at low tide. Immature and adult seals haul out at the lower perimeter of the island close to the surf. No harbor seal pups were seen at Gualala Point Island during the field observation period 01 July through 12 July 2007. Because the pupping season for Harbor Seals runs from April through May, distinguishing pups from immature seals becomes difficult by July. The presence of a nursing pup in July would be unusual

Protection of the harbor seal population falls under the Marine Mammal Protection Act (MMPA). The MMPA was passed by the U.S. Congress in 1972 and was amended substantially in 1994. The MMPA forbids the killing, harming or harassing of any marine mammal.

1.9 The Monitoring Team

The Sea Ranch CCNM Stewardship Task Force of The Sea Ranch Association led the monitoring effort in 2007. The Task Force is composed of residents of The Sea Ranch. The Sea Ranch Association has had a signatory agreement with the Bureau of Land Management since January 2006 to serve as a Steward of the islands, rocks and pinnacles above mean high tide within twelve nautical miles offshore that are a part of the California Coastal National Monument. A copy of that agreement is found in Appendix 2. In addition, colleagues with birding experience from Gualala, Point Arena and Santa Rosa, plus the Sonoma County Department of Parks and Recreation participated. Three biologists from the BLM assisted with monitoring: Gary Diridoni, Paul Roush and Jim Weigand. Gerry McChesney of the US Fish and Wildlife Service advised the monitoring team when key questions of data, methods and interpretation arose.

The team list of volunteers in the BLM / Sea Ranch CCNM Stewardship Task Force's monitoring effort appears in Appendix 3.

1.10 Volunteer Activities

Beginning with their 16 June 2007 meeting, volunteer stewards from the Task Force made many insightful suggestions and initiated advances for improvements by offering their personal resources of time, equipment and materials to expand and refine the scope of the protocol. Among the changes and additions made during the days before monitoring began were: collecting data at additional sites, recruiting volunteers from the wider geographic area and expanding the scope of monitoring activities well beyond the original monitoring proposal from BLM and the US Fish and Wildlife Service, including specific disturbance monitoring. During the ensuing period, several volunteers contributed their time and equipment to accomplish the goal. Their contributions are covered in detail later in this document.

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Photo 1 The Sea Ranch CCNM Stewardship Task Force volunteers, July 2007

Photo © Rozanne Rapozo, Nature As I See It

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SECTION 2: RESULTS AND FINDINGS

Summary of Key Findings

Data gathered during the observation period produced the following key findings in regard to the five hypotheses listed in Section 1.4:

1. *A fireworks display increases the rate of nest failure of seabird species over a background or natural rate of nest failure.*

   The fireworks display coincided with an abnormally high spike in failures of Brandt's cormorant nests on Gualala Point Island. In the period between 05 July and 07 July, at least eleven percent of Brandt's cormorant nests failed. Failures for other seabird species was not conclusively evident because populations of species were too small (American black oystercatcher) or too cryptic (pigeon guillemot) or because species response was unclear because of a lag time between the fireworks display and nest abandonment (pelagic cormorant).

2. *A fireworks display reduces the number of marine mammals using a site near the display for hauling out to rest.*

   The data did not show that the fireworks display affected the population of adult and immature harbor seals that haul out on Gualala Point Island.

3. *A fireworks display affects seabird species differently.*

   The most noticeable effects on resident seabirds were apparent for the most numerous species on Gualala Point Island: Brandt's cormorant and western gull. Western gulls immediately took flight with the first explosion of the fireworks display and circled above Gualala Point Island and giving alarm calls that were audible about the ambient sound. Some western gulls appeared to come back to rest on the island during the fireworks display only to rise in flight again during the finale of the fireworks display.

   Brandt's cormorants photographed during the fireworks rose from resting to alert position, perched on rock observation points, and then many flew off – at a staggered and slower pace than the western gulls.

4. *The rate of recovery to a fireworks display differs among seabird species.*

   Adult western gull populations returned to normal numbers within 48 hours of the fireworks display. Young western gulls had mostly fledged by 06 July 2007. Thus, loss of gull nests did not occur. Loss of young western gulls from temporary abandonment by adults was not apparent from the daily population counts of young western gulls.

   Brandt's cormorants abandoned a large number of nests between 05 July and 07 July – more than over the entire remaining 39 days between 04 June and 12 July 2007 (ten nests in the two-day period vs. seven for all the remaining days). Adult birds in some cases returned to abandoned nest sites, attempted to mate, and resume nesting. However, none of the attempts to resume nesting were successful. A photograph of the colony from 30 August 2007 shows the site empty of nests and young when successful nesting would have shown young birds present. There was no recovery for lost reproductive effort.

5. *Disturbance by fireworks secondarily causes greater predation on seabird nests (eggs and young) by predator bird species such as western gull and common raven.*

   Observers recorded no evidence of predation by western gulls or common ravens. The eggs and nest materials of abandoned nests disappeared quickly after bird abandonment. However, actual egg predation was not witnessed.

The following subsections give details of data collected during the observation period.

Data Collection during the Gualala Festivals Committee Fireworks Display, 06 July 2007

Weather Conditions on the Evening of 06 July 2007 at Gualala Point

During the 02 July 2006 fireworks display, when local residents at Gualala Point first saw disturbance of seabirds on Gualala Point Island from the fireworks display in the town of Gualala, the air was clear and the wind virtually still at the coast. Conditions on 06 July 2007 were markedly different. The wind during the 2007 fireworks was blowing strongly at Gualala Point during the fireworks display, which ran from 21:35 to 21:53.

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Sounds during the Fireworks Display

Observers in 2006 noted the loud noises that seabirds made when the first salutes introduced the fireworks display, and thereafter, seabirds continued calling throughout the display. Loud sounds reverberated from the coastal cliffs and the cliffs on Gualala Point Island. The Task Force recorded calls of western gulls during the display in 2007 as well, but the wind appeared to mute the sound of birds. Additionally, the onshore wind dampened the sound of the fireworks, at least right at the coastline. By contrast, residents away from the coast in The Sea Ranch and Gualala remarked how loud the fireworks were.

Observers also believed that the operators of the fireworks display in 2007 made two noteworthy changes from 2006 to avoid impacts to the seabird colonies on Gualala Point Island: (1) the two very loud introductory salutes in 2006 were omitted from the 2007 program; and (2) the firing direction for the fireworks appeared to be pointed away from Gualala Point Island.

Data from the fireworks display operator were not available to compare how the contents of the fireworks displays differed.

Acoustical Readings

A windscreen was not used to shield the sound recording instrument and the wind turbulence caused high background readings. Siegfried Linkwitz has suggested that sound analysis will require more complex filtering of background noise from this procedure. Task Force members, George Bush and Bryant Hichwa and BLM ecologist Jim Weigand will work further to analyze the recordings with software for generating sound spectrograms.

Seabird Observation

On the night of 06 July 2007 two teams of volunteers staffed the two vantage points of Gualala Point Island. At the north vantage point, a team of four volunteers ran the sound monitor and video cameras. Additional volunteers were discouraged from being present in the vicinity of recording devices so that extraneous sound was limited. At the south vantage point, a team of three volunteers ran camera equipment and a team of three volunteers were stationed with scopes and binoculars. Two additional monitoring volunteers were present.

The Task Force invited to the monitoring site a reporter from the Independent Coast Observer in Gualala, CA; a Park Ranger from the Sonoma County Regional Parks; and other disinterested visitors to quietly observe - without disturbing – the monitoring effort during the Gualala Festival Committee fireworks display on the night of 06 July 2007.

A bird census was taken at 21:00 before the start of the fireworks. One volunteer recorded the observations and two volunteers viewed and stated observations. At the start of the fireworks (indicated by light or sound), a stopwatch was started by the recorder. Volunteers recorded statements about what they heard and saw as the birds reacted to the fireworks.

The following is a statement of the observations made from the South vantage point viewing Gualala Point Island during the fireworks of 06 July 2007:

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"At 21:00 I could see 19 Brandt's cormorants, 8 Pigeon guillemots, 1 American Black oystercatcher and close to 100 Western gulls on the rock.

At 21:35 the fireworks began with no loud "salutes" but with light burst[s] and pops. There was lots of noise from the birds as soon as the fireworks started. We heard the bird cries from 1000 feet away. The gulls are up and flying immediately and constantly calling. Cormorants are moving around at the nest area; a few are up and flying also. Birds are flying higher and higher. Lots of bird noise. Birds are high enough to silhouette above the fog bank. None are seen landing at this time. Birds are up 1½ times higher than the island's height. Fireworks "pops" every 1 to 1½ seconds. No break between fireworks; steadily shot off. About 9:45 it is quieter: we cannot hear the gulls nor see them in flight. Have they landed? About 9:50 we lost visibility to the dark and the fog bank background. The right corner of the upper face of Gualala Point Island is lit up 3 times by fireworks. The finale is very loud and frequent explosions. Right face of the rock is lit up. Birds are flying again and calling loudly through the finale. 18 minutes total disturbance time."

Nighttime Photography of Responses of Brant's Cormorants to Fireworks

Accompanying this document are two electronic files: (1) a PowerPoint slide show of the digiscope nighttime photographs of the Brandt's cormorants before and during the fireworks display; and (2) a slide file with the synchronized sound recorded on a video camera. Additional photographs are available upon request to The Sea Ranch CCNM Stewardship Task Force.

Daytime Observations

Bird Species of Concern Not Recorded on Gualala Point Island, 01 through 12 July 2007

Common Raven	*Corvus corax*

Bird Species in Addition to Species of Concern Recorded on Gualala Point Island, 01 through 12 July 2007

Double-crested Cormorant	*Phalacrocorax auritus*
Unknown Sandpiper	*Calidris* spp.
Whimbrel	*Numenius phaeopus*
Ring-billed Gull	*Larus delawarensis*
Heermann's Gull	*Larus heermanni*
Common Murre	*Uria aalge*
Cliff Swallow	*Petrochelidon pyrrhonota*
Barn Swallow	*Hirundo rustica*
European Starling	*Sturnus vulgaris*
Brewer's Blackbird	*Euphagus cyanocephalus*

California Brown Pelicans – Gualala Point Island

California brown pelicans spend the post-breeding period in northern California, primarily between June and November, fishing offshore and resting on rocks, isles and islands in the CCNM. Large numbers of pelicans have roosted on Gualala Point Island in past summers often reaching 100 birds before 01 July (R. Kuehn and G. Marshall, pers. comm.).

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The Sea Ranch CCNM Stewardship Task Force and BLM wildlife biologists collected and compiled census counts of California brown pelicans during the period from 01 through 12 July 2007 to determine whether the fireworks display sponsored by the Gualala Festivals Committee disturbs California brown pelicans and alters their use of Gualala Point Island.

Habitat Use

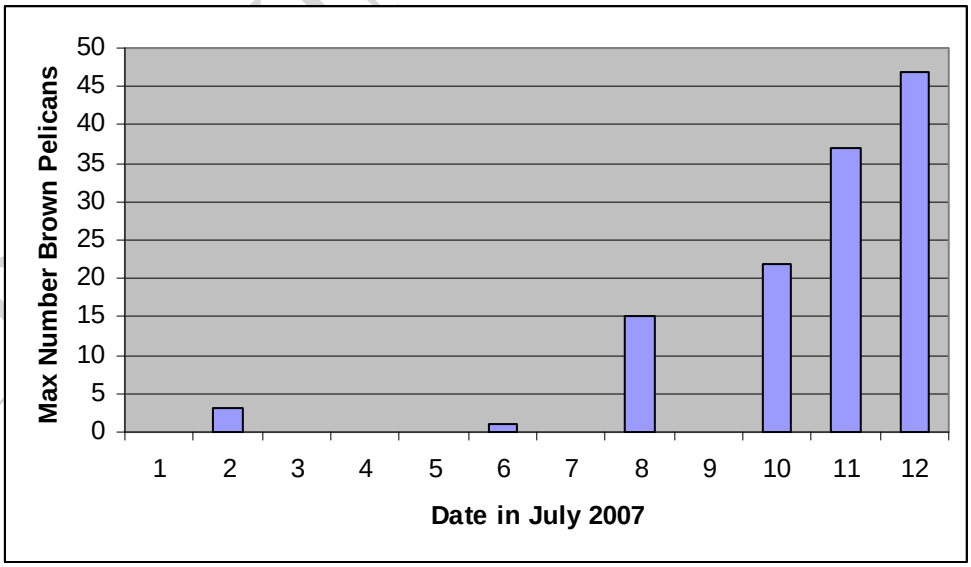
During the census period, California brown pelicans used Gualala Point Island as a resting site during the day. The Island did not appear to be a significant nocturnal roost site during the census period. Most birds congregated on the lower rocks at the west end of Gualala Point Island or occasionally on the lower rocks on the east end of the Island. They remained aloof from nesting bird colonies although gulls, particularly Herrmann's Gull, accompanied resting pelicans frequently.

Gualala Point Island may not have been a favored roosting site at this time of year as western gulls were nesting. Monitors observed one group of brown pelicans attempting to land and subsequently being chased to the water level by adult western gulls. Brown pelicans were not noted on Gualala Point Island the night of the fireworks this year, though observers had reported them present at that same time in 2006.

Population Counts

Many more pelicans flew by the Island than actually landed during the observation period. Counts of fly-by pelicans were not kept as part of the data collection effort. Not until after the 06 July 2007 fireworks display and the end of western gull nesting did California brown pelicans become numerous on the island. Pelicans were absent on most days before the fireworks display.

Figure 2 Maximum counts of California brown pelican, Gualala Point Island, 01 through 12 July 2007



Adaptations to California Brown Pelican Monitoring Protocols for Consideration in 2008

Gualala Point Island may not be the best site or at the best scale for detecting behavioral changes in California brown pelicans in the event of a fireworks display.

PRELIMINARY REPORT

1. The data collected from Gualala Point Island this year does not demonstrate a population response that coincides with the fireworks display. Because pelicans do not nest in the area, their distribution is likely to be opportunistic, that is following the distribution of prey fish, especially Northern Anchovies, which changes yearly. A more helpful monitoring protocol might include searches in the vicinity of Gualala to locate where brown pelicans are regularly roosting before the monitoring period commences. Observers during the census period would monitor the roosting or resting sites, particular to the year or the season.

2. Distribution of feeding California brown pelicans in the vicinity of Gualala (e.g., at the mouth of the Gualala River) in the days before and following the fireworks display may indicate a secondary response to disturbance. If pelicans departed from the area because of fireworks disturbances, their failure to appear on the day or days following the fireworks might be an indicator of disturbance or "take". An investigation of the population immediately offshore of Gualala before and after the fireworks might be helpful to determine whether the fireworks display affects diurnal feeding.

<u>Brandt's Cormorants - Gualala Point Island and Fish Rocks</u>
The Sea Ranch CCNM Stewardship Task Force is concerned about the apparent decline in the size of the Brandt's cormorant (*Phalacrocorax penicillatus*) colony that nests on Gualala Point Island. Brandt's cormorants have been the most numerous nesting species on the island. Historically, there were 1,240 breeding Brandt's cormorants reported in 1975-1980, but only 521 by 1989-1991 (Carter et al., 1992 Draft).

The Task Force questioned whether the Gualala Festivals Committee's fireworks display during the Independence Day celebration disturbs nesting birds and disrupts their breeding cycle, causing adults birds to abandon their nests, resulting in a further decline of this seabird species, already in serious decline statewide.

The Sea Ranch CCNM Stewardship Task Force and BLM wildlife biologists focused their principal monitoring effort on data collection and analysis of Brandt's cormorants on Gualala Point Island. Data consisted of land-based counts of Brandt's cormorants visible from the two vantage points at The Sea Ranch, daytime observations of Brandt's cormorant nests visible from the south vantage point at The Sea Ranch, aerial photographs of the colony obtained between 30 May 2007 and 30 August 2007 and real-time data on Brandt's cormorants' response to the fireworks display, obtained using nighttime photography.

Habitat Use on Gualala Point Island
The nesting colony of Brandt's cormorant was located on top in the southwest portion of Gualala Point Island. Photo 2 shows the position of the colony on the surface of the island. The site appears to be in a more sheltered location and less visible from the mainland when compared with photos from recent years.

Photo 2 Location of the Brandt's cormorant colony on Gualala Point Island, view to the northwest, 30 May 2007

PRELIMINARY REPORT

Photo by Gerry McChesney, US Fish and Wildlife Service

Daytime Monitoring

Monitors at both the north and south vantage points observed Brandt's cormorants on Gualala Point Island daily from 01 through 12 July 2007. Adults and chicks were counted. In 2007, only a small portion of the colony of nesting Brandt's cormorants was visible and just from the south vantage point. During the census period, nine nesting Brandt's cormorants and eight nests were visible from the south vantage point. This number amounts to about ten percent of the Brandt's cormorant nests recorded in aerial photographs. Figure 3 shows the maximum daily counts from the south vantage point.

The number of Brandt's cormorants recorded daily on Gualala Point Island was greatest during the earliest shift at 05:30. On 06 July, the only day with fog and poor visibility that prevented censusing of some bird species, it was impossible to count Brandt's cormorants until the 10:30 shift. Therefore, the maximum count for 06 July may be a low estimate due to lack of an early morning census as this event affects our ability to discern whether the smaller numbers of Brandt's cormorants on 07 and 08 July were a response to the fireworks event. Total maximum cormorants from land-based counts did not show any abrupt response in decreased or increased numbers immediately after the fireworks display.

On 11 and 12 July, an influx of non-breeding or post-breeding Brandt's cormorants arrived on Gualala Point Island. Their different origin was apparent because of the presence of immature birds, not previously recorded on the Island during the census period and the tight spatial segregation of the new arrivals from the Brandt's cormorant nesting colony.

The following sequence of photographs show how the number of Brandt's cormorants visible at the nest colony from the south vantage point for Gualala Point Island noticeably decreased on 07 July in comparison to 06 July.

PRELIMINARY REPORT

Photo 3(a – d) The colony of Brandt's cormorants as viewed from the south vantage point for Gualala Point Island on four days in early July 2007

Brandt's Cormorants GPI-S 20070706

Brandt's Cormorants GPI-S 20070707

Brandt's Cormorants GPI-S 200707010

Brandt's Cormorants GPI-S 20070712

Photos © Rozanne Rapozo, Nature As I See It

Figure 3 Summary of maximum daily counts of all adult Brandt's cormorants on Gualala Point Island, 01 through 12 July 2007, from the south vantage point

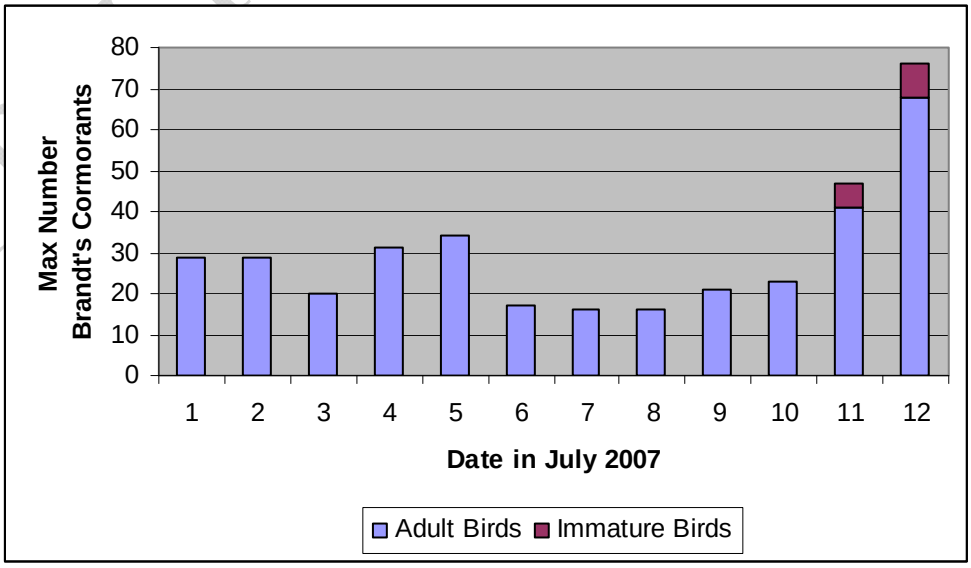


Table 1 Summary of nest conditions for the nine nesting Brandt's cormorants observed from the south vantage point for Gualala Point Island, 01 through 12 July 2007

NEST	JULY DAY											
	1	2	3	4	5	6	7	8	9	10	11	12
A-1	N	N	N	N	N	N	N	V	V	V	V	V
B-2	N	C	N	C	C	N	C	N	N	N	C	N
C-3	N	N	N	N	N	N	?	V	V	V	V	V
D-4	N	N	N	N	N	N	N	N	N	N	C	N
E-13	?	N	N	N	N	N	N	N	N	C	?	C
F-14	N	N	?	N	N	N	N	N	N	?	N	N
G-15	T	N	N	N	N	N	N	N	N	N	N	N
H-16*	N	N	N	N	N	N	N	N	N	N	N	N
I-18	?	?	?	?	?	?	?	?	C	C	C	?

Note: The numbered nests below are different from the schema used in Photo 4(a – f) or in Table 2 for nests viewed from above in aerial photographs

Key:

C = cormorant chick(s) seen

N = adult on nest during the day

T = adult at nest territory, but no nest is yet present

V = nest site vacated

? = status of nest not apparent because of fog or cormorants obstructing view of nesting adult or chick(s)

*The nest for this bird was hidden behind a rock. Nesting was surmised because the adult bird remained in place for the entire period.

Nighttime Photography

Nighttime images from 04 July 2007 show the typical behavior of the western gulls and Brandt's cormorant. Sunset was at 20:35. Prior to sunset, the birds were somewhat active. After sunset, monitors observed the bird behavior for approximately 80 minutes. Monitors saw minimal activity of the birds during this time. Both the Brandt's cormorants and the western gulls appeared in the same position from image to image. Images were recorded every several minutes during this time period.

On 06 July 2007 for the 55 minutes before the start of the fireworks, both the Brandt's cormorants and western gulls were very quiet. Again, from image to image, the birds do not move during this time period from sunset to the start of the fireworks. The fireworks started at 21:35:19 on 06 July 2007. The images show disturbance of the cormorants. The birds first come to an alert pose from a resting pose and then move unexpectedly and erratically. In several cases, birds that had been resting moved from the nesting area to several protruding rocks and then took flight. Another example is a resting bird that first becomes alert, looks to the left, then to the right and then lifts off and vacates the rookery. These examples demonstrate the effect of the fireworks on the nesting bird colony of Brandt's cormorants.

PRELIMINARY REPORT

Aerial Photography

The data from land-based monitoring the Brandt's cormorant colony on Gualala Point Island from the two mainland vantage points is augmented by the series of aerial photographs of the Gualala Point Island colony by Gerry McChesney and Craig Tooley. The following series of six photographs shows the progression of nesting at the colony during the late spring and early summer 2007 to a final photograph of the colony taken on 30 August 2007.

PRELIMINARY REPORT

Photo 4(a – f) Dated series of aerial photographs of the Brandt's cormorant colony on Gualala Point Island, May to August 2007

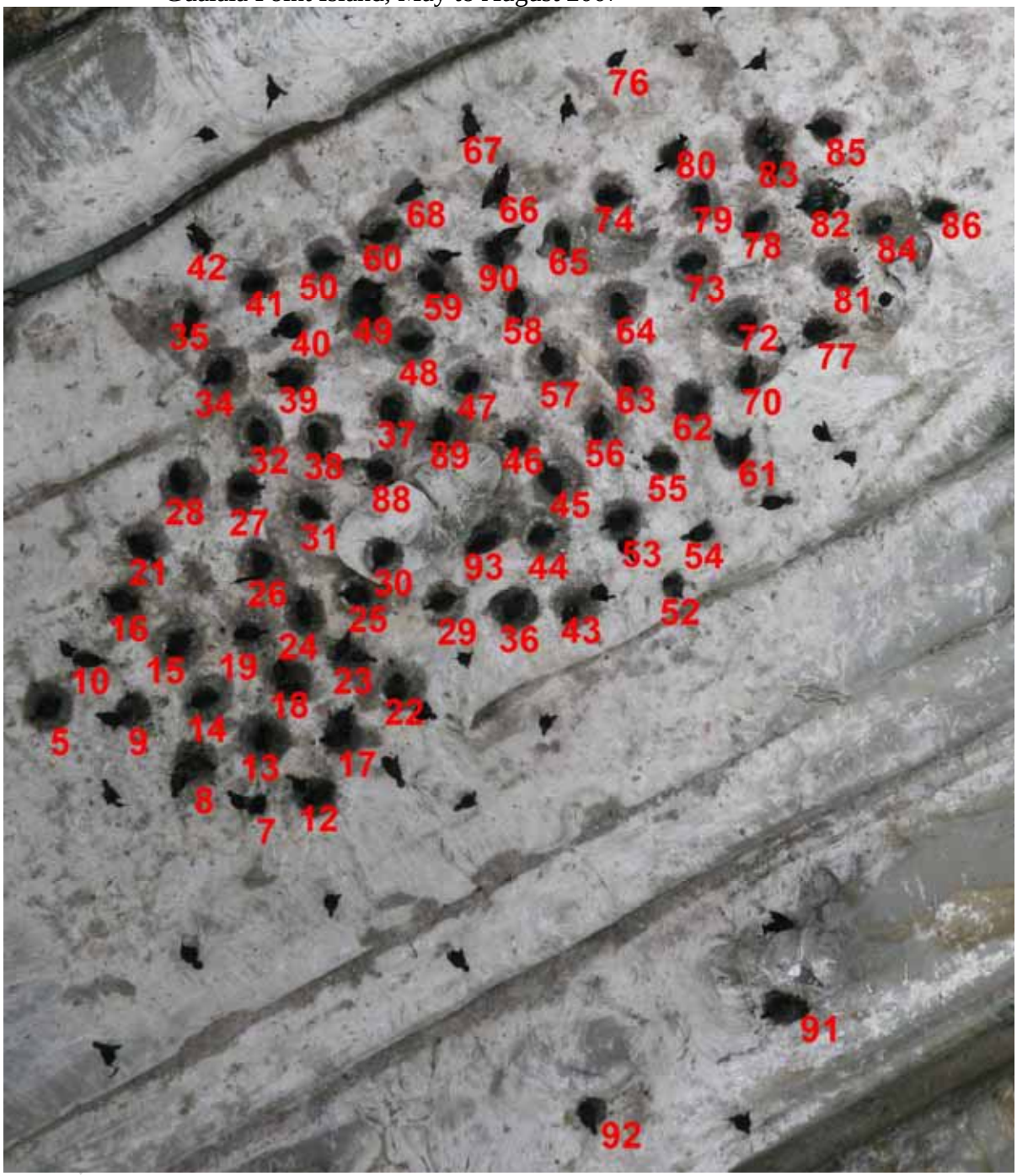


Photo by Gerry McChesney, US Fish and Wildlife Service

30 May 2007

This photograph was one of a series taken for the US Fish and Wildlife annual aerial survey each spring of nesting seabird colonies on the California coast.

Photo © Craig Tooley, The Sea Ranch School of Photography

04 June 2007

In the five days since the previous photograph, Brandt's Cormorants established the twelve new nests: 1 – 4, 11, 20, 33, 51, 69, 71, 75 and 87. Most of these nests are at the periphery of the colony. No nests appear to be abandoned. Nests 91 and 92 are not visible in this photograph.

Photo © Craig Tooley, The Sea Ranch School of Photography

05 July 2007

In the month since the 04 June 2007 photograph, five Brandt's Cormorant nests were abandoned: 7, 43, 76, 86, and 87. Nest 6 is the only new nest to appear in the intervening period. All abandoned nests were on the periphery of the colony. Nest 88 is not visible in this photograph. The Task Force intended to fly on both 05 July and 06 July 2007, but fog was too heavy on 06 July to permit safe flying.

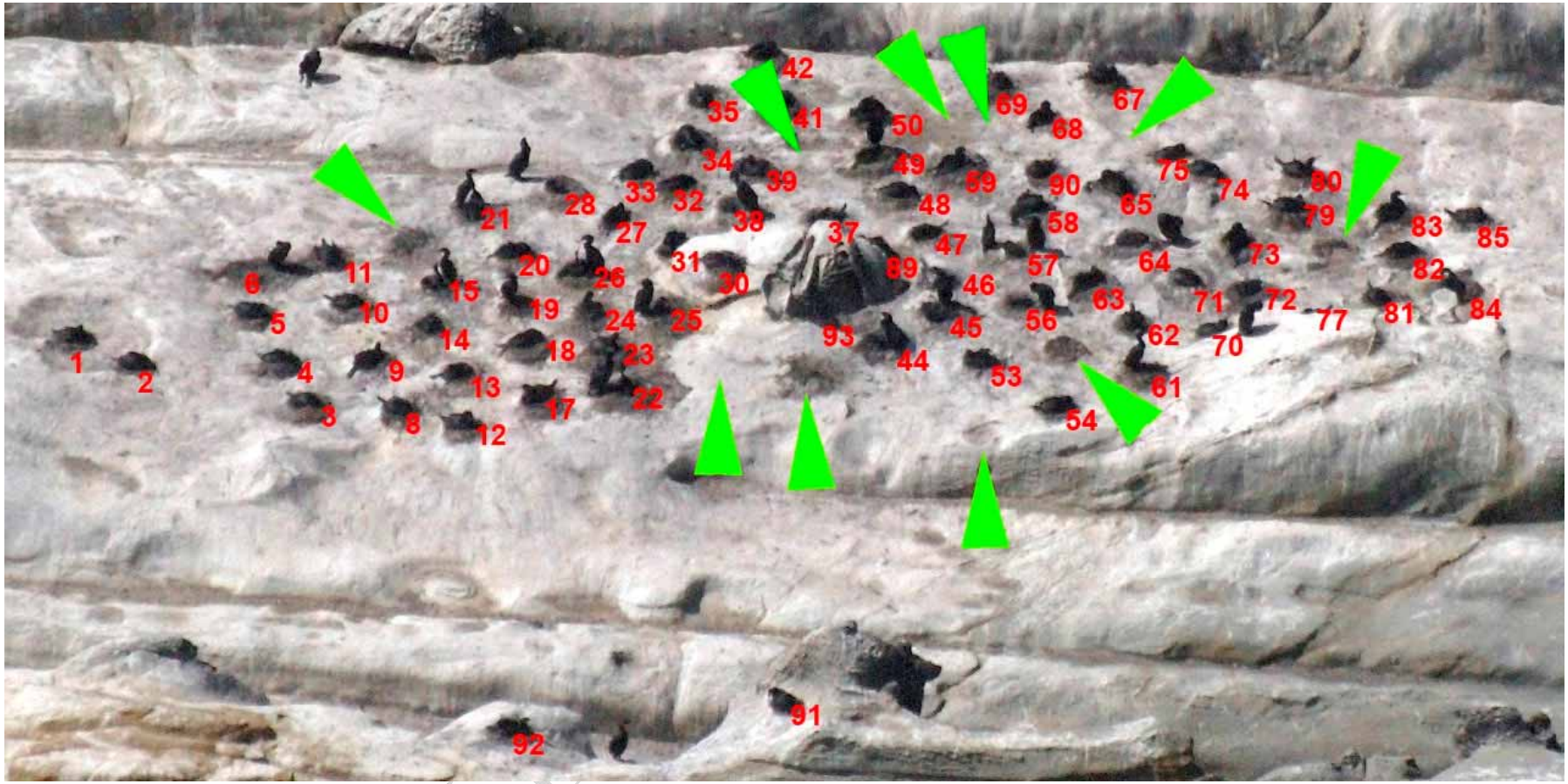


Photo © Craig Tooley, The Sea Ranch School of Photography

07 July 2007

In the two-day interval between 05 and 07 July during which the Gualala Festival Committee fireworks display took place, ten Brandt's Cormorant nests were abandoned: 16, 29, 36, 40, 51, 52, 55, 60, 66, and 76. Most of these nests were at the periphery of the colony. Green arrows point to the sites of the ten abandoned nests.

PRELI

Photo © Craig Tooley, The Sea Ranch School of Photography

12 July 2007

Green arrows above mark two additional nests (70 and 92) that Brandt's cormorants abandoned between 07 and 12 July. These nests were on the periphery of the colony. Some Brandt's cormorants returned by 12 July to previously abandoned nests and were observed engaging in courtship, copulation and nest building as though they were attempting to re-nest. To successfully rear a brood, these cormorants would have to mate, lay and incubate eggs, rear young at the nest and continue to feed the young in their crèches until they fledged. Incubation requires 29 days and rearing lasts on average 30 days (a total of 59 days). If second nesting attempts were to be successful, young Brandt's cormorants would still appear at the nesting colony at the end of August where they would be fed by adults.

Photo © Craig Tooley, The Sea Ranch School of Photography

30 August 2007

On 30 August, 56 days after the fireworks display, the Brandt's cormorant colony site was vacant of young cormorants in crèche groups and attentive adults were no longer present. Young birds from post-fireworks nesting attempts are not in view and re-nesting does not appear successful.

Table 2 Summary of the fates of Brandt's cormorant nests, Gualala Point Island, 30 May – 30 August 2007

Nest #	Date 05 30	06 04	07 05	07 07	07 12	08 30
1	V	S	S	S	S	V
2	V	T	S	S	T	V
3	V	S	S	S	S	V
4	V	S	S	S	E	V
5	S	S	S	S	S	V
6	V	V	S	E	T	V
7	D	S	**A**	**A**	**A**	V
8	S	S	S	S	S	V
9	S	S	S	S	S	V
10	T	S	S	S	E	V
11	V	S	S	S	S	V
12	S	S	S	S	S	V
13	S	S	S	S	S	V
14	S	S	S	S	C	V
15	S	S	S	S	C	V
16	S	S	S	**A**	T	V
17	S	S	S	S	S	V
18	S	S	S	S	S	V
19	S	S	C	C	C	V
20	V	S	S	S	S	V
21	S	S	S	S	C	V
22	S	S	D	C	C	V
23	S	S	S	S	C	V
24	S	S	S	S	C	V
25	S	S	C	C	C	V
26	S	S	C	C	C	V
27	S	S	S	S	S	V
28	S	S	C	C	C	V
29	S	S	T	**A**	**A**	V
30	S	S	S	S	S	V
31	S	S	C	S	C	V
32	S	S	S	S	S	V
33	V	S	S	S	C	V
34	S	S	C	S	C	V
35	T	S	S	S	S	V
36	S	S	S	**A**	**A**	V
37	S	S	S	S	C	V
38	S	S	S	C	C	V
39	S	S	S	S	C	V
40	T	S	S	**A**	C	V
41	S	S	S	S	C	V
42	T	S	S	S	S	V
43	S	S	**A**	**A**	**A**	V
44	S	S	S	C	C	V
45	S	S	C	C	C	V
46	S	S	S	S	S	V
47	S	S	S	S	C	V

Nest #	Date 05 30	06 04	07 05	07 07	07 12	08 30
48	S	S	S	S	S	V
49	S	S	S	S	C	V
50	S	S	D	S	C	V
51	V	S	S	**A**	T	V
52	S	S	S	**A**	**A**	V
53	S	S	S	S	C	V
54	T	S	S	S	S	V
55	S	S	S	**A**	C	V
56	S	S	C	C	C	V
57	S	S	S	C	C	V
58	S	S	D	C	C	V
59	S	S	C	S	C	V
60	S	S	E	**A**	T	V
61	S	S	D	C	C	V
62	S	S	S	S	E	V
63	S	S	C	S	C	V
64	S	S	C	C	C	V
65	T	D	S	S	C	V
66	T	S	S	**A**	C	V
67	T	S	S	S	S	V
68	T	S	S	S	S	V
69	V	S	S	S	S	V
70	S	S	S	S	**A**	V
71	V	S	S	S	C	V
72	S	S	S	S	C	V
73	S	S	S	S	C	V
74	S	S	S	S	S	V
75	V	S	S	S	S	V
76	T	D	A	**A**	**A**	V
77	S	S	S	S	E	V
78	S	S	S	**A**	C	V
79	S	S	S	S	C	V
80	S	S	S	S	C	V
81	S	S	S	S	S	V
82	S	S	S	S	C	V
83	S	S	S	S	C	V
84	S	S	S	S	C	V
85	S	S	S	S	C	V
86	S	S	**A**	**A**	**A**	V
87	V	T	**A**	**A**	**A**	V
88	S	S	C	C	C	V
89	S	S	S	S	C	V
90	S	S	S	S	C	V
91	S	n/a	S	S	S	V
92	D	n/a	S	S	**A**	V
93	S	S	S	S	S	V

Data Summary	Date 05 30	06 04	07 05	07 07	07 12	08 30
New abandoned nests	--	0	5	10	2	--
New established nests	--	11	1	0	0	--
Total active nests	80	91	85	75	73	--
Nests with new chicks	--	--	12	6	29	--

Key

A=nest abandoned
C=chick(s) present
D=adult bird standing at nest
E=eggs visible in nest
S=adult bird sitting at nest
T=bird on territory, no nest
V=nest site vacant

PRELIMINARY REPORT

A note is in order about the nests abandoned on 07 July (**A**) and that have cormorant chicks in them on 12 July (C). These chicks came from other nearby nests. The adults attending them could be either the parent bird or another bird, such as the original site holder of the abandoned nest. "Babysitting" is common at this stage. Once cormorant chicks are able to move about on their own, they will frequently wander from the nest site. In the younger stages, they often go to

other nests, even if these nests are vacant. Sometimes more than one brood will gather at a nest site. These nests are labeled “nest-site” crèches in seabird scientific literature.

Photo 5 Brandt’s cormorant colony, Fish Rocks, 05 July 2007

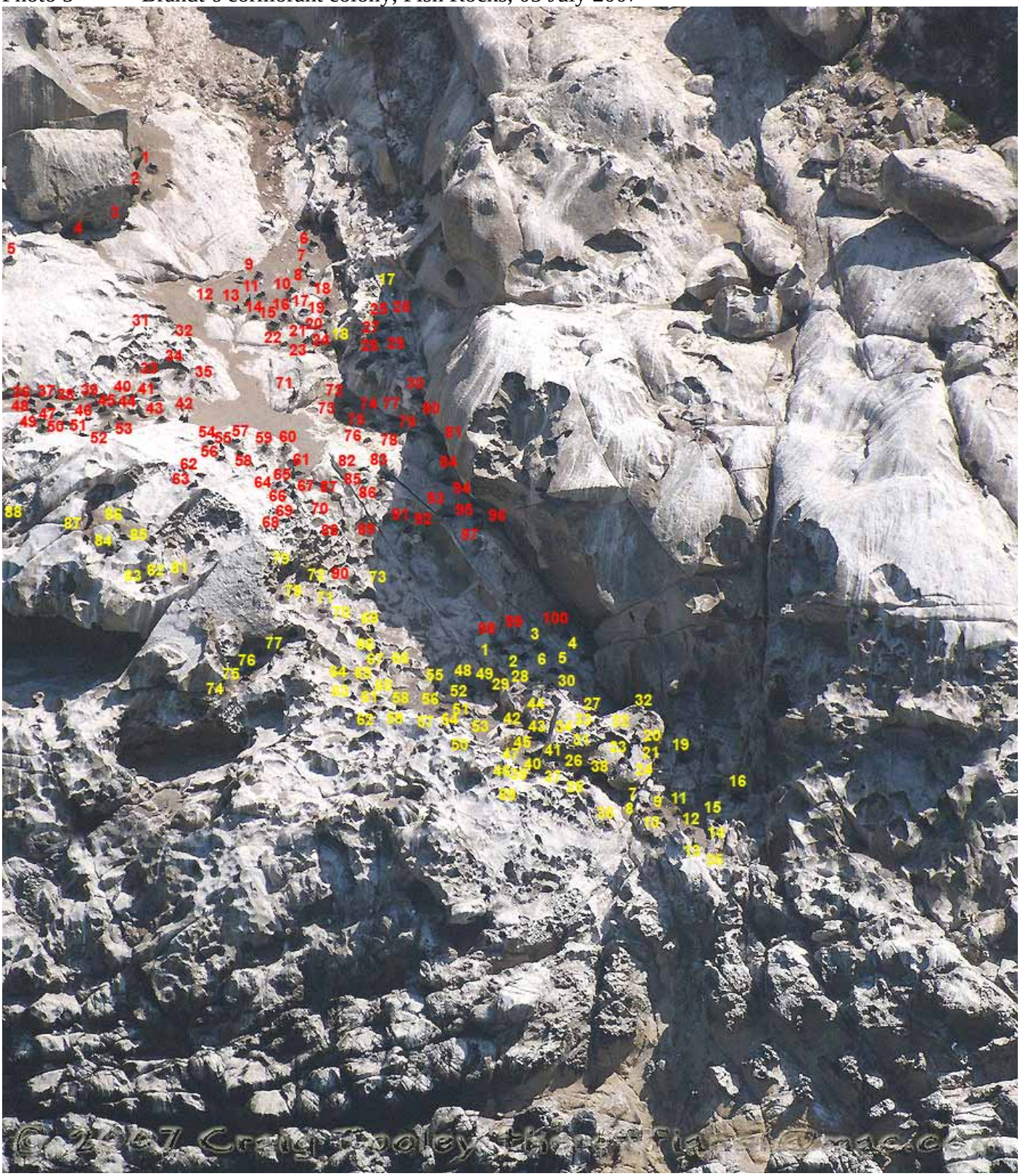


Photo © Craig Tooley, The Sea Ranch School of Photography

Habitat Use on Fish Rocks
A population of Brandt's Cormorants larger than that of Gualala Point Island nests in a canyon on the north side of Fish Rocks. Gerry McChesney's and Craig Tooley's photographs of the major population of Brandt's Cormorants on Fish Rocks have not yet been completely analyzed. Photo 5 shows the nearly 200 nests visible in a photograph taken 05 July 2007. (The nest sites marked with a two-digit yellow number are the second hundred-set of nests. By omitting the first "1" in the nest number and changing the color, space was made available for the numbering, especially within areas on the map where cormorant nests were particularly close together.)

Suggestions for Modifying the Monitoring Protocol for Brandt's Cormorants
1. The Task Force believes the best, albeit most expensive, data documenting the nesting success of Brandt's cormorants were derived from the series of aerial photographs. While data observations from the mainland may have limited value if the location of the nesting Brandt's cormorants is as hidden as in 2007, it furthers our understanding of breeding behavior of the species. Allocating the time of Task Force members and other volunteers differently might be desirable to reduce 'burn-out', while still obtaining extensive observation data.

2. Once weekly flights from the third week of May through second week of August might be the most efficient means to acquire data for useful analysis.

<u>Pelagic Cormorants - Gualala Point Island and Robinson Point</u>
The Sea Ranch CCNM Stewardship Task Force and BLM wildlife biologists collected and compiled census counts of pelagic cormorants during the period from 01 July through 12 July 2007 to determine whether the fireworks display by the Gualala Festivals Committee affects the nesting behavior of pelagic cormorants.

Habitat Use
Observers at both the north and south vantage points regularly noted pelagic cormorants resting on island ledges and cliffs of Gualala Point Island. Two pelagic cormorant nests were located on the same ledge on the north side of the Island. The number of nesting pelagic cormorants on Gualala Point Island was low in comparison with nesting in recent years. In 2006, by contrast, seven nests of pelagic cormorants were located on the south side cliffs of Gualala Point Island. After the fireworks display in July 2006, all seven pelagic cormorant nests visible from the mainland were abandoned (R. Kuehn, pers. comm.).

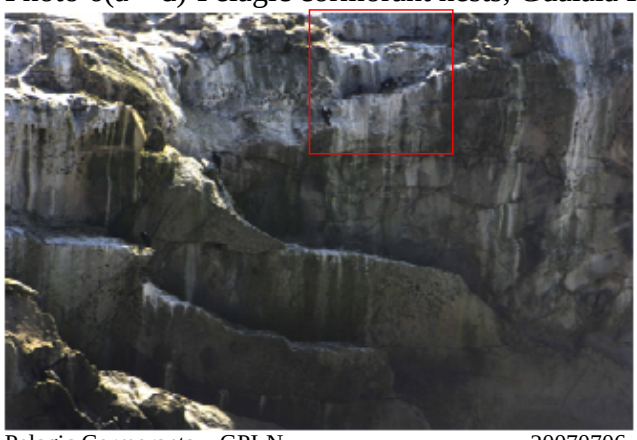
This year, one egg was visible in nest #2 on 03 July and on 05 July two plus eggs were visible from the mainland in nest #2. On 12 July, at least one egg was still visible, but by 16 July (outside the census period), nest #2 was abandoned.

On 10 July, the nesting cormorant on nest #1 was noted absent from the nest but returned subsequently. No eggs were visible in the nest at the time of absence. Intermittent absences continued through 12 July and the nest deteriorated. On 16 July, the nest was abandoned. Although the pelagic cormorant nests faced the fireworks display from the town of Gualala to the north, it is not possible to ascertain whether initial conditions for nest abandonment coincided with the fireworks display.

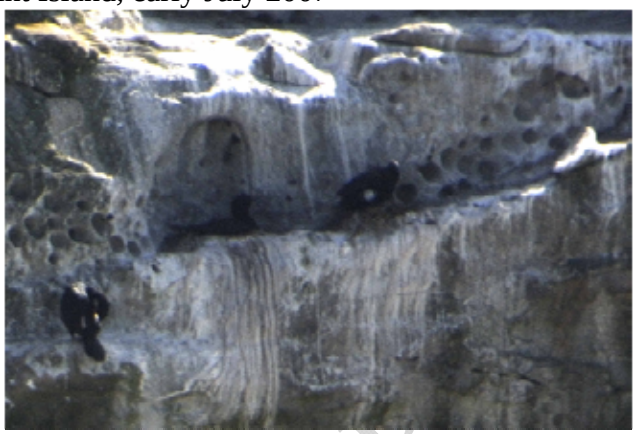
The photographs that follow show the ledge location of the two pelagic cormorant nests.

PRELIMINARY REPORT

Photo 6(a – d) Pelagic cormorant nests, Gualala Point Island, early July 2007



Pelagic Cormorants GPI-N 20070706



Pelagic Cormorants GPI-N 20070706

Pelagic Cormorants GPI-N 20070707

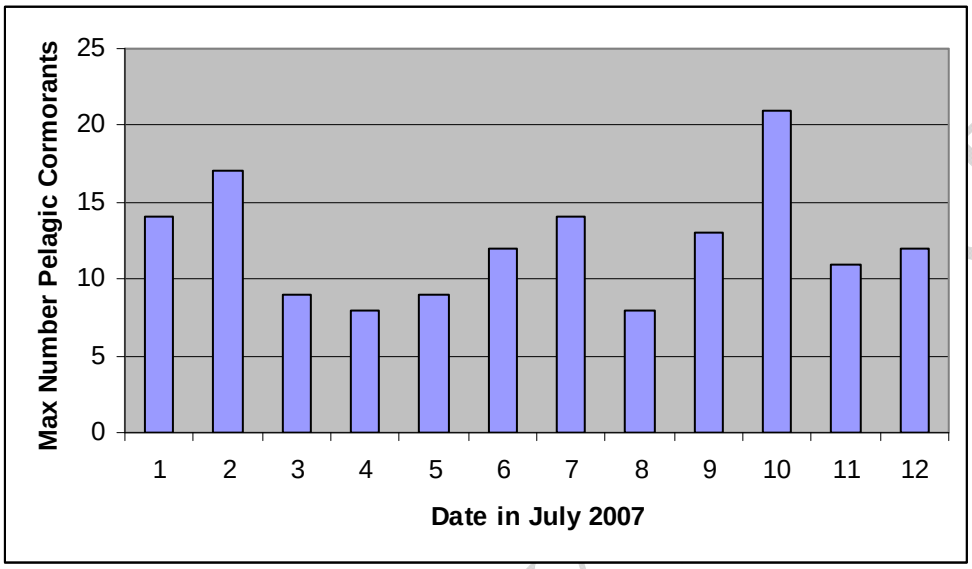
Pelagic Cormorants GPI-N 20070711

Photos © Rozanne Rapozo, Nature As I See It

PRELIMINARY DRAFT

Population Counts
Counts of pelagic cormorants from the north and south vantage points were of non-breeding birds. Birds congregated on ledges along the north side of the Island during the census period.

Figure 4 Maximum daily counts of pelagic cormorants from the north vantage point, Gualala Point Island, 01 through 12 July 2007



In the darkness, observers were not able to ascertain if there was any disturbance to pelagic cormorants during the GFC fireworks display on 06 July 2007.

No other adverse response to the Gualala fireworks display was detected statistically or visually in the days immediately following the display.

By contrast, two pairs of pelagic cormorants nested on mainland cliff ledges near Robinson Point Island within easy view for documentation. Pairs successfully raised two young birds in each nest during July and August 2007. These nests were on north faces at a sheltered cove north of the town of Gualala.

Adaptations to Monitoring Protocols for Consideration in 2008
If pelagic cormorants attempt to nest on Gualala Point Island, intensive observation of their behavior on and around nests may reveal causes or responses to eventual disturbances. Nighttime observation with a photographic record of nests may be useful to detect how the pelagic cormorants respond at the time of a fireworks display.

PRELIMINARY DRAFT

Photo 7(a – c) Pelagic cormorant nests and juvenile birds, Robinson Point, July and September 2007

2007 07 04

2007 07 12

2007 09 10

Photos © Rozanne Rapozo, Nature As I See It

PRELIMINARY REPORT

American Black Oystercatcher - Gualala Point Island

The Sea Ranch CCNM Stewardship Task Force has questioned whether the Gualala Festivals Committee's fireworks display harms or otherwise disturbs American black oystercatchers (*Haematopus bachmani*) found on and around Gualala Point Island.

An additional question that arose with the discovery of a nesting pair of oystercatchers on the island was whether fireworks displays would adversely affect nesting by oystercatcher pairs on Gualala Point Island.

The Task Force located one breeding pair from the north vantage point. Nesting at that site had been suspected since mid-June. The pair fed young throughout the census period after first being located on 02 July 2007. All three young birds were first seen together on 06 July 2007. The location of the nest is marked in red on Photo 8. From shore, the nest was never visible; however, very young birds were seen walking back and forth from a site hidden behind a rock face. By the end of the census period, ambulatory chicks had moved off the ledge location of the suspected nest to lower sites where they remained difficult to see except when adults fed them.

Habitat Use

Adult American black oystercatchers regularly probed the rock tide-line perimeter of the portion of Gualala Point Island visible from the vantage points on shore. They were also regularly in transit between Gualala Point Island and the mainland to gather food. Occasionally, oystercatchers were noted away from the immediate tide line, even in the vicinity of the Brandt's cormorant nesting colony at the top of Gualala Point Island (07 July).

Population Counts

On most days the total numbers of adult American black oystercatchers using Gualala Point Island for feeding and resting included more than the breeding pair. A maximum count of seven was recorded, having landed at the same time on the island 11 July 2007. Larger numbers of birds probably use the island than are visible from shore. A flock of nine birds was observed flying around the island on 11 July 2007, as well. These birds appeared to be non-breeding birds.

Photo 8 Location of the American black oystercatcher nest from the north vantage point, Gualala Point Island, July 2007

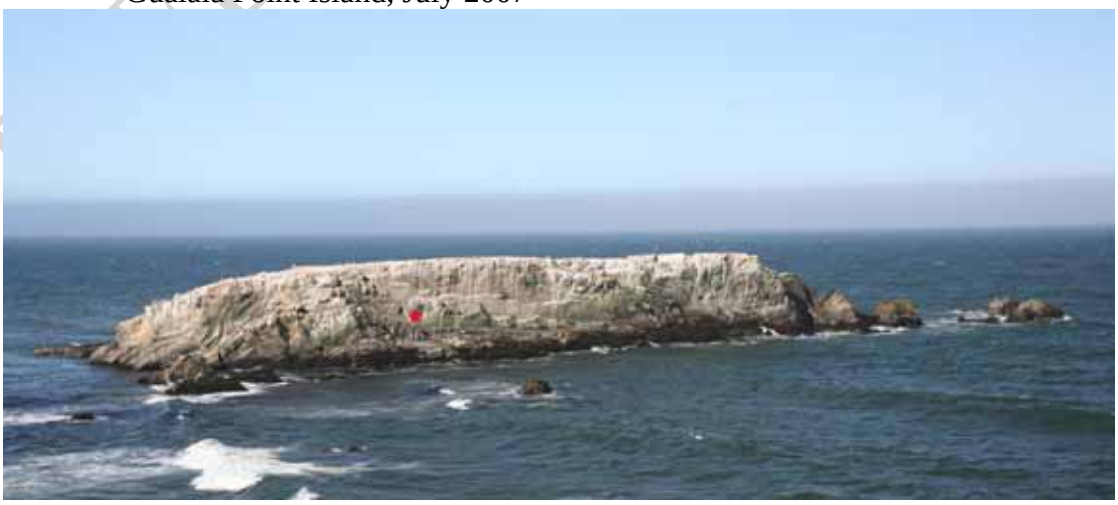
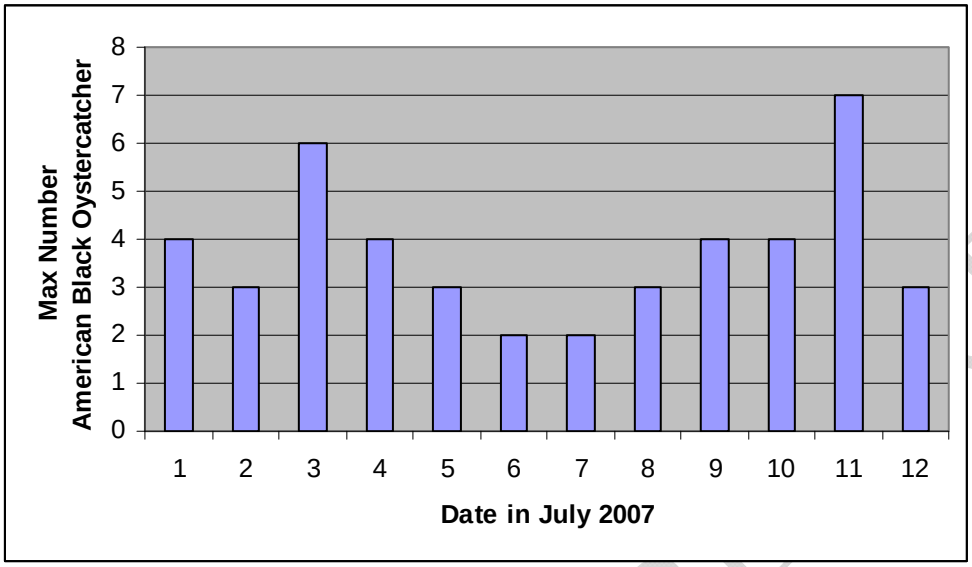


Photo by Paul Roush, USDI Bureau of Land Management

PRELIMINARY REPORT

Figure 5 Maximum population counts of American black oystercatchers, Gualala Point Island, 01 through 12 July 2007



Note: The counts here are the maximum count during a shift on one day from either of the vantage points. Most high counts came from the north vantage point.

The lowest number of adult oystercatchers was recorded on both 06 and 07 July 2007, both just before and just after the fireworks display. Given how variable and how small the number of oystercatchers was from day to day, it is not reasonable to attribute the low count to any effect from the fireworks display on the previous night.

Observational evidence indicates that the nesting pair and their three young were faring well throughout the census period and beyond.

Adaptations to Monitoring Protocols for Consideration in 2008
None

<u>Western Gull - Gualala Point Island</u>
The Sea Ranch CCNM Stewardship Task Force and BLM wildlife biologists collected and compiled census counts of adult western gulls and their young during the period from 01 through 12 July 2007 to determine whether the fireworks display by the Gualala Festivals Committee on 06 July affected the behavior of adult western gulls and the survivorship of western gull chicks.

Habitat Use
Observers at both the north and south vantage points to Gualala Point Island observed western gull nests, adults and young throughout the census period. Western gulls occupied the flat top surface at the east end of the Island as well as ledges just below the top of the island. Fourteen nests on the north side and eight nests on the south side of the island were observed daily for as long as the young gulls remained in the nest, near the nest, or until the nest itself disappeared. Some overlap in observations occurred because some gull nests were visible from both vantage points. Therefore, counts from each vantage point are not pooled.

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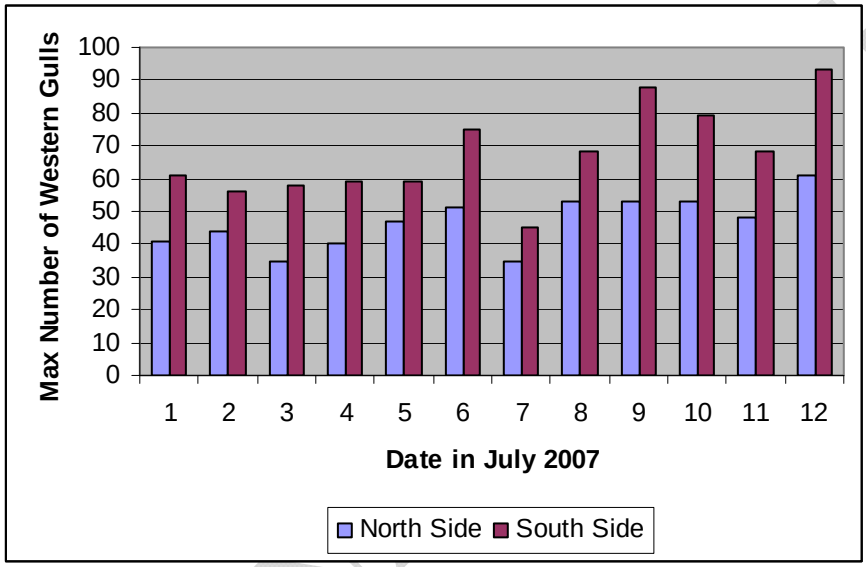
Photographs, one from each vantage point, follow below with the locations of western gulls marked. An arrow marks each nest site.

Population Counts

Although more nests were visible from the north vantage point of the island, the counts of adult western gulls were consistently higher from the south vantage point during the census period. Figure 6 shows the maximum daily counts of western gulls from each vantage point. Immature western gulls were virtually absent from the Island during this period, as noted in previous years (R. Kuehn, pers. comm.).

Figure 6 Maximum daily counts of western gull from both vantage points, Gualala Point Island, 01 through 12 July 2007



Note: These samples are not independent of each other.

Highest daily counts never occurred during the earliest shift but usually during the second or third shift (08:00 or 10:30).

From both vantage points, the maximum number of western gulls declined on 07 July 2007 the day after the fireworks display, when compared to previous days. Following are photos taken at about 10:30 each day on 06 July and 07 July to show the distribution and number of western gulls on the top of Gualala Point Island as viewed from the south vantage point.

One hypothesis to explain the outlier is that a disturbance from the fireworks display the preceding night may have caused adult western gulls, perhaps those not tending nests or young, to leave the Gualala Point Island. Nighttime observers from the south vantage point at the time of the fireworks display saw and heard many gulls flying above the Island as soon as the first fireworks shots were heard and again with the final volley of intense fireworks at the end of the display.

However, the departure of gulls appears to have been only a short-term effect. Numbers of adult western gulls rebounded on 08 July and thereafter.

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Photo 9(a –b) Western gulls at differing densities on the east end Gualala Point Island, 06 and 07 July 2007, mid-morning

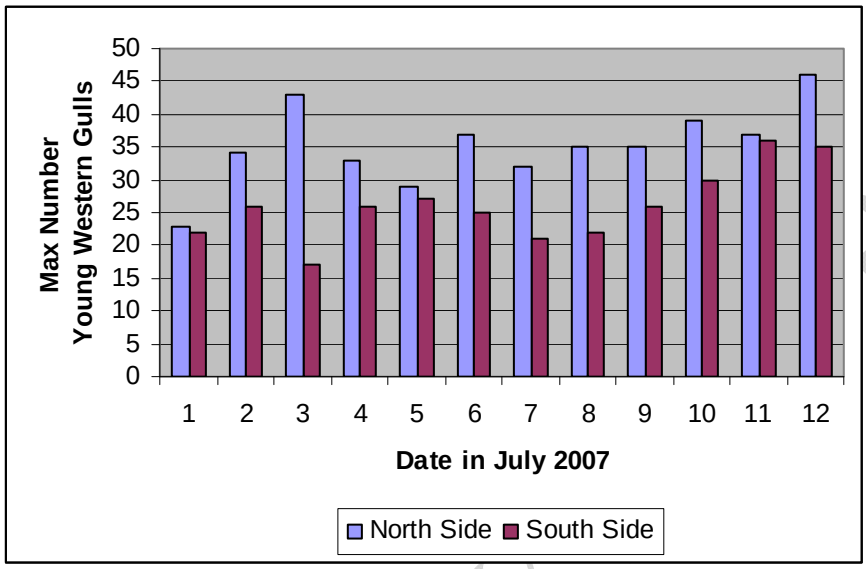
Western Gulls GPI-S
20070706

Photos © Rozanne Rapozo, Nature As I See It

Most western gull nests had hatched their chicks by 02 July. Late nesting gulls hatched chicks on 03 July (1 nest), 09 July (2 nests) and 12 July (1 nest). There were no nest failures observed during the census period. Census figures of chicks were often difficult to obtain because of high wind conditions, and the number recorded often depended on the amount of experience that an observer had had with identifying the chicks, which are often cryptic as they crouch out of the wind. As chicks grew larger, they were easier to detect, which may explain the continued rising trend in the population numbers of chicks toward the end of the census period, even though very few young hatched after 02 July (refer to Figure 7).

No information about the mortality of western gull chicks during the census period was obtained as the mobility of chicks after leaving the nest makes it difficult to ascertain which chick came from a particular clutch.

Figure 7 Maximum daily counts of western gull chicks, mobile outside of nests, from both vantage points, Gualala Point Island, 01 through 12 July 2007



Adaptations to Monitoring Protocols for Consideration in 2008

1. More information about the survival of young western gull chicks may come from a more intensive look at the nests of western gulls that are physically isolated from other western gull nests, for example nests on ledges on the east end of Gualala Island.

2. Western gulls may be good subjects to photograph for nighttime photography. Focusing on photographing a part of the colony on Gualala Point Island with high gull density might be another way to document the behavior of western gulls at night in response to disturbances.

<u>Pigeon Guillemot – Gualala Point Island</u>

The Sea Ranch CCNM Stewardship Task Force and BLM wildlife biologists collected and compiled census counts of pigeon guillemots during the period from 01 through 12 July to determine whether the Gualala Festivals Committee's fireworks display 06 July affects the nesting behavior of pigeon guillemots.

Habitat Use

Observers at both the north and south vantage points regularly noted pigeon guillemots resting on island ledges and cliffs on Gualala Point Island as well as entering crevices where pigeon guillemots were believed to be nesting.

Photographs, one from each vantage point, follow. Each shows a red star just above and to the left of a suspected nest crevice.

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Photo 10 Pigeon guillemot nest crevices detected as of 05 July 2005 from the south vantage point for Gualala Point Island

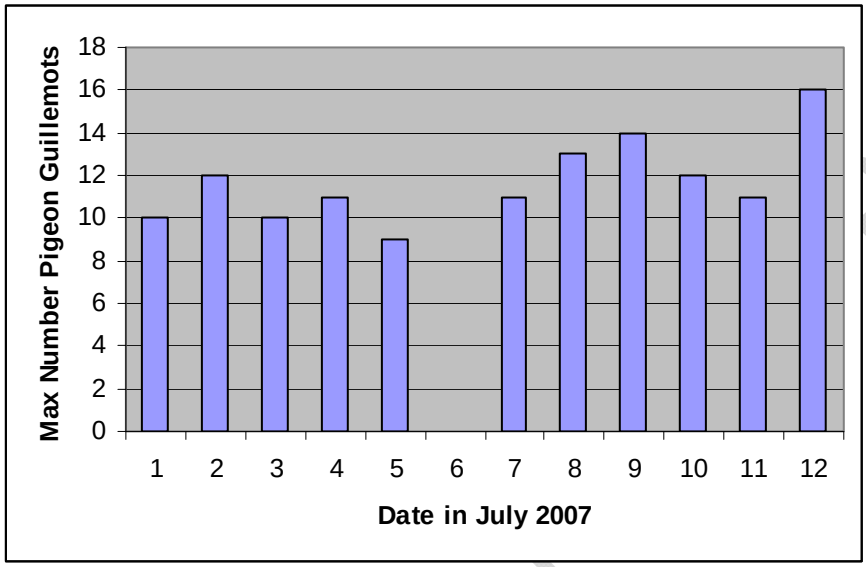
Photo by Paul Roush, USDI Bureau of Land Management

Photo 11 Pigeon guillemot nest crevices detected as of 05 July 2007 from the north vantage point for Gualala Point Island

Photo by Paul Roush, USDI Bureau of Land Management

Population Counts
Counts of pigeon guillemots from the north and south vantage points in many instances may contain birds visible to observers at both vantage points. Double counting is likely. Therefore, counts are not pooled as for harbor seals.

Figure 8 Maximum counts of pigeon guillemots from the south vantage point, Gualala Point Island, 01 through 12 July 2007



Data shown here came from the south vantage point. Highest counts occurred during the first two shifts each day. Data from 06 July is omitted from the chart. Fog limited the observers' view during the first two shifts in the early morning on 06 July when no birds were recorded.

Information about the nests and nesting success of pigeon guillemots was virtually impossible to obtain because the nests of pigeon guillemots in crevices were not visible. No nestling or immature birds appeared at crevice openings during the census period.

One hypothesis for the apparent slight positive trend in pigeon guillemot numbers may be that guillemot eggs had just hatched and young were growing at a fast pace during the census period. Chick weight doubles in the first five days and then triples by day 10. Increased trips to feed young may require that both pigeon guillemot parents spend more time outside the nest and are thus more visible, while seeking food for young than when one parent is brooding eggs virtually without interruption. Therefore adults gradually appear more numerous as eggs hatch and adults can leave young unaccompanied at the nest to fish for meals for the young. Most intensive feeding of young takes place in the early daylight hours (Ewins 1993), which confirms the greater early morning activity and numbers of pigeon guillemots.

With small black birds in crevices, it was not possible to see if disturbance occurred in the darkness during the fireworks on the night of 06 July.

No other adverse response to the Gualala Festivals Committee's fireworks display was detected statistically or visually in the days immediately following the display.

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Adaptations to Monitoring Protocols for Consideration in 2008

1. Progress of nesting appears nearly impossible to detect from the vantage points. Fiber optics or wi-fi transmitters inserted into crevices where pigeon guillemots nest might provide a remote-sensing option. Logistics of reaching crevices to insert electronics would be challenging. Timing to insert equipment would need to be before the male returns to a crevice nest site in the early spring.

2. Most pigeon guillemots observed during the census period confined themselves to the NE portion of Gualala Point Island. A vantage point midway between the two existing 2007 vantage points would look directly onto the NE end of the island where the pigeon guillemots congregate. This third vantage point might afford a better view for totaling all pigeon guillemots in the area.

3. Locating all crevices known to be used by pigeon guillemots within view of a vantage point might provide the actual physical limit to the carrying capacity of the guillemot population in any one year on Gualala Point Island.

Harbor Seals – Gualala Point Island

The Sea Ranch CCNM Taskforce has questioned whether the Gualala Fireworks Festival harms or otherwise disturbs adult and immature harbor seals (*Phoca vitulina*) found on and around Gualala Point Island.

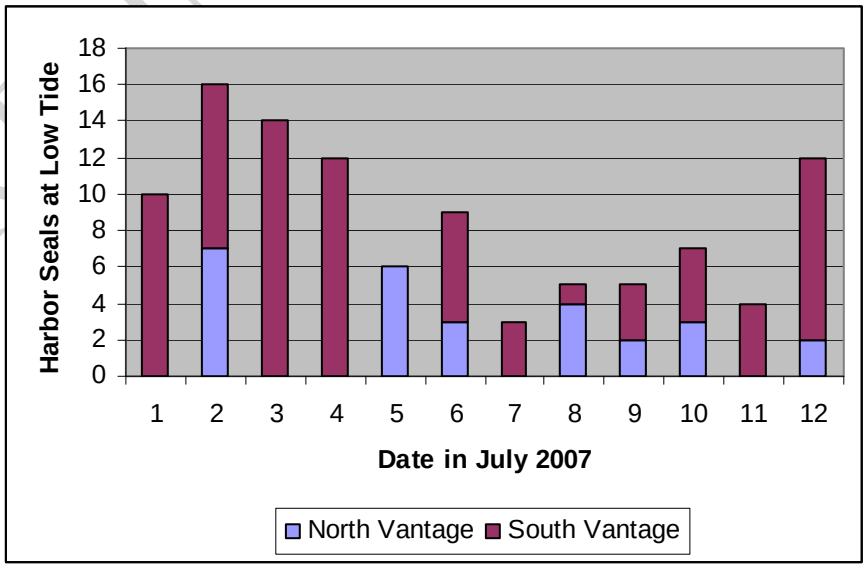
Habitat Use

Harbor Seals regularly haul out on the intertidal parts of Gualala Point Island and less often above the mean high tide line.

Population Counts

The protocol used by the Taskforce ensured that seals were not double-counted during simultaneous counts at each vantage point. Therefore, census results from north and south counts are pooled for a total daily maximum count in below. These figures show the same data but in different formats. In this way, readers may be able to look at data in different ways.

Figure 9 Census of harbor seals at low tide, Gualala Point Island, 01 through 12 July 2007



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Fog never limited observers' visibility during the census period. Thus, weather conditions did not impair census counts. Because the counts took place close to times of low tides, the times when harbor seals were counted changed from day to day.

Counts Considered by Date of the Month

The day with the lowest population count of harbor seals was 07 July, the day after the nighttime fireworks display. At first glance, this observation would indicate that there may have been a population response that at least coincided with (but not necessarily was caused by) the fireworks display.

However, the low number of harbor seals on 07 July may not be correlated to the fireworks display on 06 July. There are two grounds for skepticism. First, at 21:00 on 06 July, just before the Gualala fireworks displayed began, when the Island was still visible, Taskforce observers located no harbor seals from either vantage point on Gualala Point Island. Absence of harbor seals at the time of the fireworks may mean that harbor seals that regularly use Gualala Point Island were outside of any potential impact area at the time of the fireworks display. Secondly, the low count of harbor seals on 07 July is preceded by an apparent a drop in daily counts of harbor seals for all days between 02 July and 07 July save one – 06 July.

By contrast, for the period 07 July through 12 July, by contrast the number of harbor seals once again increases each day but two. The rate of increase is dampened in contrast to the rate of decrease in the days before 07 July. The overall pattern of the data appears to be harmonic, apparent even during this short period as a wave function.

Harbor Seal Data Recorded Incidentally by Seabird Watchers from the South Side of Gualala Point Island

As part of data recording, many Sea Ranch CCNM Task Members kept careful notes about the number of harbor seals that were visible from the vantage point where they were censusing seabirds on Gualala Point Island. These incidental data support the notion that the highest numbers of harbor seals, during the period under study, were found early in the day. Data here are taken only from the south vantage point as double-counting by seabird observers at the north vantage point of some of the same harbor seals was possible. The data are summarized in Table 3.

These data must be considered with some skepticism too because the blank observations may mean that no harbor seal were present or that the observer did not record the harbor seal observations incidentally. Nonetheless, the data would seem to indicate that patterns at two time scales might be at work: (1) that there was a trough in harbor seal numbers – noted in this case from 06 July to 11 July; and (2) that observers recorded harbor seals in larger numbers earlier (first two shifts) rather than later in the day (last two shifts).

The difference in the data in Table 3 from the data presented in Figure 9 is the lack of a decline in advance of 06 July and a more depressed population of harbor seals until 12 July. Further discussion is not possible on the significance of these data as they were not collected with the necessary rigor.

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Table 3 Incidental observations of harbor seals on Gualala Point Island by seabird observers from the south vantage point, 01 through 12 July 2007

Day of the Month July 2007	Observation Shift				Daily Max No.
	05:30 to 06:30	08:00 to 09:00	10:30 to 11:30	13:00 to 14:00	
01	9	8	-	-	9
02	-	5	8	-	8
03	8	-	-	-	8
04	9	-	11	1	11
05	6	10	3	-	10
06	-	-	3	-	3
07	-	-	-	4	4
08	1	-	-	-	1
09	4	-	3	-	7
10	4	-	-	-	4
11	-	2	5	4	5
12	10	2	3	2	10
No. of Observations	8	5	7	4	
Average	6.38	5.40	5.14	2.75	6.67

Adaptations to Monitoring Protocols for Consideration in 2008

1. Detecting any eventual responses of harbor seals to fireworks displays will require greater monitoring frequency during the census period. We propose that monitoring for harbor seals take place at greater frequency each day during the census period. Monitoring only at low tides may miss larger populations of harbor seals on Gualala Point Island. The seals may be responding to diurnal cues in addition to tidal schedules when they haul out on Gualala Point Island.

2. Exact times of maximum counts of harbor seals during a census visit or census shift should be recorded on future field sheets to the nearest minute.

3. If harbor seal pups and their mothers in 2008 are in areas close to the Gualala Fireworks Festival site, the Task Force and the Bureau of Land Management should seek to establish in advance of the Festival a Memorandum of Understanding for Collaborative Monitoring with the Sonoma County Department of Parks and Recreation to undertake harbor seal monitoring in the Gualala Point Regional Park.

4. The observation period of harbor seals ought to be extended longer, both before and after the 12-day census period, to get better data regarding how harbor seal populations fluctuate before an anticipated fireworks event and subsequently “recover”.

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SECTION 3: PROTOCOL DOCUMENTATION

The longer-term significance of this pilot project is to lay the groundwork for a robust and easily conducted seabird and marine mammal monitoring protocol that replicates systematic observational methods for the rocks and islands of the California Coastal National Monument over many years. Creating a multiyear database of observations provides data about patterns and trends of seabird and marine mammal species that use the National Monument for nesting, birthing, rearing, resting and roosting. Additionally, the project imparts invaluable knowledge to the volunteers regarding Monument islands, their animal inhabitants and fosters learning and appreciation of these nationally important resources.

3.1 Overview of Protocol Elements

Seabird Censuses from Mainland Vantage Points

When first planning a protocol to monitor seabirds in the Gualala area, the Bureau of Land Management (BLM) originally envisaged a modest, low-cost protocol to monitor seabird colonies entailing pre-fireworks observations, observations during the nighttime fireworks display and post-fireworks observations to determine any eventual effects of the Gualala fireworks display on diverse nesting seabird species. Refer to page 49 for documentation.

Seabird Nest Tracking from Mainland Vantage Points

The protocol established by McChesney (2007) for monitoring Brandt's cormorants at nesting colonies in coastal California was adapted. It was modified to include observations of nests of the other nesting species on Gualala Point Island and Castle Rock (refer to page 60).

Disturbance Monitoring

Task Force member Marge Anthony proposed that the monitoring program include monitoring disturbances, both natural and human-mediated, to seabirds during the monitoring period. The protocol to monitor disturbances follows a pre-established protocol from the Point Reyes Bird Observatory (PRBO) Conservation Science (2007) and Jaques and Strong (2002). Refer to page 64 below.

Marine Mammal Monitoring

The Task Force adopted the census form for monitoring harbor seals established by Dr. Sarah Allen for long-term monitoring at the Point Reyes National Seashore (PRNS) and the Sonoma County coast in place at other sites along the shoreline of The Sea Ranch. The most recent report from the ongoing PRNS study can be found at
http://www1.nature.nps.gov/im/units/sfan/vital_signs/Harbor%20Seals/docs/HSealReport-12-31-06.pdf
Refer to page 69 below.

Daytime Land Photography from Vantage Points

BLM biologist Paul Roush provided an initial photographic survey of Gualala Point Island at the onset of the census period. Photographs taken with a Canon 20D digital single lens reflex (DSLR) camera with a 300mm lens and a 2x teleconverter (magnification = 12x) provided the initial nest site locations for both the western gulls and the Brandt's cormorants as well as the other species of interest. These photographs served as the basis for the subsequent monitoring observations.

Professional photographer Rozanne Rapozo, also a member of the Task Force team, donated her time to photograph Gualala Point Island throughout the census period from each of the vantage

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points. In addition, several sets of photographs were made of Robinson Point Island and Castle Rock (Colony 2), and Fish Rocks (Colony 3). Details of the photographic equipment and the photography logs for these observations begin on page 72 below.

Nighttime Photo Monitoring from the South Vantage Point
Two Task Force members, Craig Tooley and Brian Hichwa, both professional photographers, provided nighttime photographic images of the Brandt's cormorants observed from the south vantage point of Gualala Point Island. Two digital photographic methods were used: visible light digiscoping and infrared photography. In both cases observations of bird activity was possible for 90 minutes after sunset. Refer to page 73 below

Acoustic Monitoring
Sound monitoring took place at the time of the Gualala Festivals Committee's fireworks display on the evening of 06 July 2007. Monitoring consisted of a sound recording of the entire fireworks display taken by George Bush from the north vantage point for Gualala Point Island and of sound meter readings filmed in real time alongside a GPS unit with satellite clock time.

The initial protocol to measure sound from the fireworks display developed by Christopher Real was modified to include only one sound meter because only one meter was obtained. Use of OHV sound meters, normally used for testing sound from motor vehicles, was proposed initially but considered insufficient for useful information. Refer to page 78 for details.

Video Recording from the Gualala Point South Vantage Point
Task Force volunteer Phyllis Schmitt made a continuous video recording of the visual and sound activity of Gualala Point Island from the south vantage point on 06 July 2007. A Sony 20x optical Handycam (DCR-HC26) was used to capture the video and sound during the time prior to and during the fireworks. The time mark on the video corresponds within one minute of the time recorded on the nighttime DSLR images.

Video/Sound Recording from the Gualala Point North Vantage Point
Task Force volunteer Rita Peck made a continuous video recording of the visual and sound activity of Gualala Point Island from the north vantage point on 06 July 2007. She used a Sony Handycam DCR-DVD308 on a tripod to capture the video and sound during the time prior to and during the fireworks.

Aerial Photography
Gerry McChesney of the US Fish and Wildlife Service conducted his annual overflights of Gualala Point Island and Fish Rocks on 30 May 2007. Subsequently, pilot Jerry Rench flew photographer Craig Tooley on noon-time flights over the islands on 4 June 2007; 5, 7, and 12 July 2007; and 30 August 2007. A planned flight for 06 July 2007 was cancelled because of low visibility due to fog conditions. Refer to page 76 for details.

3.2 Field Equipment Checklist for Seabird Censuses, Seabird Nest Tracking and Seabird Disturbance Records

1. Stocks of 5 Field Sheets
    - i. Seabird Survey Sheet
    - ii. Seabird Nest Survey Sheet
    - iii. Seabird Disturbance Log Sheet
    - iv. Harbor Seal Survey and Disturbance Sheet (2-sided)

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v. Camera Log Sheet

2. Mechanical pencils for recording data.
3. Clipboard
4. Thermometer
5. Compass
6. Clothing to accommodate changeable weather conditions
7. Spotting scope
8. Binoculars
9. Water and snacks
10. Cellular telephone
11. First-aid supplies
12. GPS unit
13. Camera
14. Flashlight
15. Tote bags were supplied with the basic equipment (numbers 1-5) current nest photographs and photocopies of the bird species of interest from The Sibley Guide to Birds (2000).

3.3 Optical Equipment

The Bureau of Land Management provided three spotting scopes for use by monitors at vantage points. BLM provided the following models: Two Swarovski ATS80HD with a 45º-angled eyepiece with 20-60x variable and 30x magnification. Additional spotting scopes of similar caliber were offered by Task Force members (Leica APO 62mm straight Televid with 20-60 variable eyepiece, Swarovski ATS 80HD with 45 degree angled eyepiece with 20-60x variable , Swarovski ATS 65 with 45 degree angled eyepiece with 20-60x variable, Swarovski STS 65HD with eyepiece 20-60x variable and a Kowa TSN 824 with a 20-60x variable eyepiece).

3.4 Camera Equipment

Refer to Sections 6 and 7 for a description of camera equipment used.

3.5 Safety and Security

Safety is the most important concern for The Sea Ranch Association and for the Bureau of Land Management. Care is needed to avoid site hazards along trails and at vantage points near ocean bluffs and cliffs. Ocean bluffs often consist of soils that are unstable and prone to erosion. Frequent rain, mist and fog makes the ground slippery.

The Task Force recommended (1) monitoring in teams of two as much as possible due to safety hazards, the early hour and nighttime monitoring; (2) carrying a cell phone; and (3) memorizing some of the emergency phone numbers included in team “tote bags”. Most shifts checked in and out with Connie Schimbor, the Site Coordinator, to pass on the scopes, the tote bag containing essential field equipment and supplies to the next shift of volunteers.

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SEABIRD CENSUSES FROM MAINLAND VANTAGE POINTS

Goal: To provide daytime counts of populations of seabird species from the mainland at different times of day.

This survey covers full-grown birds and mobile chicks that are outside the nests. Chicks may also be aggregated in crèches, i.e. groups of mobile chicks gathered outside of nests and away from adult birds.

Monitoring Teams

A two-member monitoring team monitored seabirds and their nests during the day at Gualala Point Island. A single monitor or a two-member monitoring team monitored seabirds from Robinson Reef islands to Castle Rock and the single western gull nest on Castle Rock that was visible from the Robinson Point vantage point.

Monitoring Schedule

The term of monitoring was six days before the planned fireworks display in the town of Gualala (including the morning of the day of the planned display) (01 through 06 July 2007) and six days after the fireworks display (07 through 12 July 2007).

There were four daytime monitoring shifts starting at the following times:

05:30 First Shift: All Bird, Nest and Disturbance Monitoring

08:00 Second Shift: All Bird, Nest and Disturbance Monitoring

10:30 Third Shift: All Bird, Nest and Disturbance Monitoring

13:00 Fourth Shift: All Bird, Nest and Disturbance Monitoring

The two-person team generally took about 1-2 hours to complete all counts. If fog reduced visibility, the monitors attempted to make counts during breaks in the fog. Occasionally there were days with very heavy fog until afternoon. On those days, only one or two monitoring shifts were completed. Usually no monitoring took place after mid-afternoon because of the difficulty of viewing with stronger afternoon winds and into bright afternoon sun.

At the 05:30 shift, volunteer monitors originally planned to just count brown pelicans roosting overnight on Gualala Point Island. The volunteers expanded the count to a full shift of counting All Bird, Nest and Disturbance Monitoring because early morning was also a peak time for seeing pigeon guillemots outside their nests and because wind and lighting conditions were better for viewing seabirds.

The Site Coordinator scheduled The Sea Ranch CCNM Stewardship Task Force members, volunteers and BLM biologists.

Volunteer efforts were focused more heavily on the much higher nesting concentration on Gualala Point Island. At the Robinson Point site, when one western gull nest was observed and several possible pigeon guillemot nest crevices were located, a less intense monitoring schedule was used. There was a daily count in the early morning and in the early evening to capture

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nesting and roosting data. On several days before and after the scheduled fireworks (03, 05, 06, 07 and 08 July) additional shifts were done at 8:00, 10:30 and 13:00.

SEABIRD SURVEY Data Sheet
The data sheet SEABIRD SURVEY was used for all four daily shifts of seabird counts. Refer to Appendix 4 to view a copy of the data sheet.

Ambient Variables Recorded on the SEABIRD SURVEY Data Sheet

1 Colony
Use the California Colony Number for which the vantage point is designated. Refer to Section 1.5 for the colony locations. For the present pilot study, the following codes apply:

Robinson Point	ME-384-11 (= Collins Landings to Gualala River)
Gualala Point Island	SO-384-01

No data were taken under this protocol from Fish Rocks.

2 Vantage Point
Refer to Section 1.6 for the vantage point number for the monitoring location. Allowable values for this pilot protocol are **N** for the north vantage point or **S** for the south vantage point.

3 Date
Use the Federal Information Processing Standard form: YYYYMMDD,
where YYYY is the numeric year
MM is the numeric month and
DD is the numeric day of the month.

Thus, 04 July 2007 is recorded as **20070704**.

4 Start Time
Use the 24-hr clock format, so-called "military time" where, for example, **13:00** = 1:00pm.

Start Time is the time when the observers begin monitoring the shift. Valid values, therefore, are: **05:30**, **08:00, 10:30** and **13:00**.

5 Stop Time
Use the 24-hr clock format, so-called "military time" where, for example, **15:00** = 3:00pm.

Stop Time is the time when the observers conclude monitoring for total seabird populations and nests. This time coincides with the end of the monitoring shift.

6 Level of Low Tide Closest
This variable is interpolated from published tide tables for the areas close to the site being monitored. It does not need to be completed in the field. The tide level recorded is for the low tide closest in time to the **Start Time**.

Rozanne Rapozo obtained low tide times for Gualala as reported in the Independent Coast Observer, a newspaper published in Gualala.

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7 Cloud Cover Percent

This is a visual estimate, to the closest 10%, of cloud cover as viewed directly above the monitoring point at the **Start Time**.

If the **Cloud Cover Percent** changes during the monitoring shift, make a note of the new percent and the time, in 24-hour clock format, of the change in the **Additional Notes and Observations** section of the field sheet.

8 Wind Speed Class

Record the **Wind Speed Class**. Initially the Beaufort Wind Scale was used as per the following table for the appropriate class:

Wind Speed Class	Description
0	Smoke rises vertically
1	Wind direction shown by smoke drift
2	Wind felt on face; leaves rustle
3	Leaves, twigs in constant motion; light flag extended
4	Raises dust and loose paper; small branches moved
5	Small trees in sway
6	Wind whistling, large branches moving.

Subsequently, Rich Kuehn obtained wind readings for the census period from anemometer readings maintained by the Anderson Window Company. The company was recording wind speeds to test the function of a novel window design being installed in a new house at The Sea Ranch, approximately 100 m from the south vantage point. These data are added to the database as **8a Wind Speed**. Wind speeds were obtained for 05:30, 08:00, 10:30 and 13:00 from 01 July through 12 July 2007. Wind data came from a WeatherHawk Model 916 wireless weather station recorded on a Campbell Scientific data logger at a home site near Gualala Point Island.

9 Air Temperature

Record the air temperature at the monitoring site in degrees Celsius at the **Start Time**.

10 Precipitation Code

Use the precipitation code as follows:

Precipitation Code	Description
0	No precipitation
1	Mist or fog
2	Light drizzle
3	Light rain
4	Heavy rain

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11 Data Recorder
Enter here the full name of the person who is the data recorder. The data recorder should remain the same person for each 2-hour shift of monitoring.

12 Observers
Enter the full names of the people who are observing the Colony during the shift of monitoring.

Species Variables Recorded on the SEABIRD SURVEY Data Sheet

Species Codes
The codes for the most likely bird species to be seen are abbreviations used by the USGS Patuxent Wildlife Research Center, Bird Banding Laboratory.

Species Code	Species Common Name
BRPE	Brown Pelican
BRAC	Brandt's Cormorant
PECO	Pelagic Cormorant
ABOY	American Black Oystercatcher
BOGU	Bonaparte's Gull
HEEG	Heermann's Gull
RBGU	Ring-billed Gull
CAGU	California Gull

Species Code	Species Common Name
WEGU	Western Gull
GWGU	Glaucous-winged Gull
GWGU X WEGU	Glaucous-winged Gull / Western Gull hybrid
UNGU	Unknown Gull Species
PIGU	Pigeon Guillemot
CORA	Common Raven

Six spaces are left blank to fill in names of other species noted physically **ON** the islands during the time of observation. Birds not seen actually landing on islands were not tallied as part of the census, including birds that likely did land on the island but out of view from the vantage points. Unusual birds flying by the island might be listed in the notes accompanying the data sheet (refer to **20 Additional Notes and Observations** below).

Species Data
The following species are the focal species in the vicinity of The Sea Ranch and Gualala and are tallied by age class group, health status and mortality:

BRPE, BRAC, PECO, ABOY, WEGU and PIGU

13 BRPE (Brown Pelican)
Counts of brown pelicans are divided among three age classes defined by plumage features.

13a BRPE Brown Heads / White Bellies
Counts of this, the youngest, age cohort of brown pelicans rely on noting the fully brown or dusky coloration of the entire head plus the white belly of the individual bird.

Count injured birds if present but do not count dead birds if present.

13b BRPE White Heads / Light Bellies
Counts of this, the intermediate, age cohort of brown pelicans rely on noting the light crown and nape (sometimes with residual dusky feathers) plus the white to light dusky (but not dark brown) belly of the individual bird.

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Count injured birds if present but do not count dead birds if present.

13c BRPE Dark Brown Bellies
Counts of the adult cohort of brown pelicans rely on noting the dark brown belly of the individual bird. Depending on the time of year, the crown and nape are whitish and white respective (non-breeding) or yellow and dark brown (breeding).

Count injured birds if present but do not count dead birds if present.

13d BRPE Unknown
Total the number of birds whose plumage are not visible clearly enough to classify as one of the previous three age cohorts or whose plumage appears to be outside the range of the classification. Take notes about unusual or confusing plumages.

Count injured birds if present but do not count dead birds if present.

13e BRPE Injured
Total here all the injured brown pelicans noted during the current census. These birds will also be counted in one of the previous four categories of plumage characterization (**13a** through **13d**).

13f BRPE Dead
Total here all the dead brown pelicans noted during the current census. These birds will not be counted in one of the previous four categories of plumage characterization (**13a** through **13d**).

Make a note of the plumage under **13g BRPE Notes** if the plumage type of the dead bird is not discernible.

13g BRPE Notes
Make notes of significant information or observations in regard to brown pelicans counted here.

NOTE: Refer to the following websites for more information on plumages of brown pelicans:

http://www.oceanlight.com/lightbox.php?sp=Pelecanus_occidentalis
http://homepage.mac.com/rstacy/pelicans02.html

to view a large collection of photographs of brown pelicans in diverse plumages, in flight and on land.

14 BRAC (Brandt's Cormorant)
Counts of Brandt's cormorants are divided among three age classes defined by body size and plumage features.

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14a BRAC Mobile Chicks
Counts of this, the youngest, age cohort of Brandt's cormorants rely on noting uniformly dark birds less than fully grown, mobile on foot but not fledged and appearing outside the perimeter of a Brandt's cormorant nest.

Count injured birds if present but do not count dead birds if present.

14b BRAC Juveniles
Counts of the first-year age cohort of Brandt's cormorants rely on noting the light brown or tan-colored breast and the dull, mostly non-iridescent plumage on the back.

Count injured birds if present but do not count dead birds if present.

14c BRAC Adults
Counts of the adult cohort of Brandt's cormorants rely on noting the black breast and neck of the individual bird.

Count injured birds if present but do not count dead birds if present.

14d BRAC Unknown
Total the number of birds whose plumage is not clearly visible enough to classify as one of the previous three age cohorts or whose plumage appears to be outside the range of the classification. Take notes about unusual or confusing plumages.

Count injured birds if present but do not count dead birds if present.

14e BRAC Injured
Total here all the injured Brandt's cormorants noted during the current census. These birds will also be counted in one of the previous four categories of plumage characterization (**14a** through **14d**).

14f BRAC Dead
Total here all the dead Brandt's cormorants noted during the current census. These birds will not be counted in one of the previous four categories of plumage characterization (**14a** through **14d**).

Make a note of the plumage under **14g BRAC Notes** if the plumage type of the dead bird is not discernible.

14g BRAC Notes
Make notes of significant information or observations in regard to Brandt's cormorants counted here.

15 PECO (Pelagic Cormorant)
Counts of pelagic cormorants are divided among three age classes defined by body size, age and plumage features.

15a PECO Mobile Chicks

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Counts of this, the youngest, age cohort of pelagic cormorants rely on noting uniformly dark birds less than fully grown, mobile on foot but not fledged appearing outside the perimeter of a pelagic cormorant nest.

Few mobile chicks of pelagic cormorants are expected because their nesting habitat on ledges does not afford much opportunity to be mobile by foot away from the nest.

Count injured birds if present but do not count dead birds if present.

15b PECO Juveniles

Counts of the first-year age cohort of pelagic cormorants rely on the following features: (1) facial skin ashy flesh with a pink gular patch; (2) gray head and gray and black neck; (3) upperparts blackish, somewhat glossed with dull green, turning brown with exposure to sun; and (4) underparts slightly paler gray.

Count injured birds if present but do not count dead birds if present.

15c PECO Adults

Counts of the adult cohort of pelagic cormorants rely the following feature in the non-breeding season: all feathering black with metallic gloss that may reflect different colors (green, bronze, violet), becoming worn and dull brown by breeding season.

Birds in breeding plumage are easier to discern because they have (1) white flank patches; (2) white neck plumes; (3) two small crests – one on the forehead and one at the top of the nape; and (4) a small but noticeable red chin patch at the base of the bill.

Count injured birds if present but do not count dead birds if present.

15d PECO Unknown

Total the number of birds whose plumage is not clearly visible enough to classify as one of the previous three age cohorts or whose plumage appears to be outside the range of the classification. Discerning juvenile and adult birds may not be possible under some viewing conditions. Take notes about unusual or confusing plumages.

Count injured birds if present but do not count dead birds if present.

15e PECO Injured

Total here all the injured pelagic cormorants noted during the current census. These birds will also be counted in one of the previous four categories of plumage characterization (**15a** through **15d**).

15f PECO Dead

Total here all the dead pelagic cormorants noted during the current census. These birds will not be counted in one of the previous four categories of plumage characterization (**15a** through **15d**).

Make a note of the plumage under **15g PECO Notes** if the plumage type of the dead bird is not discernible.

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15g PECO Notes

Make notes of significant information or observations in regard to pelagic cormorants counted here.

16 ABOY (American Black Oystercatcher)

Counts of American black oystercatchers are divided among two age classes defined by plumage features.

16a ABOY Juveniles

Counts of the first-year age cohort of American black oystercatchers rely on the following features: (1) dull brown feathering on the back, back of the neck and wings; and (2) the dull red often tipped with sepia (dark brown).

Count injured birds if present but do not count dead birds if present.

16b ABOY Adults

Counts of the adult cohort of American black oystercatchers rely the following features: (1) uniformly black to glossy black plumage; and (2) bright red bill, often tipped with orange-red.

Count injured birds if present but do not count dead birds if present.

16c ABOY Unknown

Total the number of birds whose plumage is not clearly visible enough to classify as one of the previous two age cohorts or whose plumage appears to be outside the range of the classification. Discerning juvenile and adult birds may not be possible under some viewing conditions. Take notes about unusual or confusing plumages.

Count injured birds if present but do not count dead birds if present.

16d ABOY Injured

Total here all the injured American black oystercatchers noted during the current census. These birds will also be counted in one of the previous four categories of plumage characterization (**16a** through **16d**).

16e ABOY Dead

Total here all the dead American black oystercatchers noted during the current census. These birds will not be counted in one of the previous four categories of plumage characterization (**16a** through **16d**).

Make a note of the plumage under **16f ABOY Notes** if the plumage type of the dead bird is not discernible.

16f ABOY Notes

Make notes of significant information or observations in regard to American black oystercatchers counted here.

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17 WEGU (Western Gull)

Counts of western gulls are divided among three age classes defined by plumage features and body size.

17a WEGU Mobile Chicks

Counts of this, the youngest, age cohort of western gulls rely on noting the fully brown or dusky coloration of birds less than fully grown, mobile on foot but not fledged and appearing outside the perimeter of a western gull nest.

Count injured birds if present but do not count dead birds if present.

17b WEGU Brown Full-Grown

Counts of this, the intermediate, age cohort of western gulls rely on noting the overall brownish appearance, with having brown or black tips. First summer birds may have whitish wings.

Count injured birds if present but do not count dead birds if present.

17c WEGU Grayish Back Brownish Head

Counts of the second-year cohort of western gulls rely on (1) the mostly dark gray back; (2) wings with mixed with brown and gray feathers, (3) the head with a brownish cast: and (4) white rump.

Count injured birds if present but do not count dead birds if present.

17d WEGU Gray Back White Head

Counts of this cohort are for birds three years or older and rely on the following traits: (1) white or nearly entirely white head; and (2) gray to dark gray back and wings with distinct black wing tips.

Count injured birds if present but do not count dead birds if present.

17e WEGU Unknown

Total the number of birds whose plumage is not clearly visible enough to classify as one of the previous four age cohorts or whose plumage appears to be outside the range of the classification. Take notes about unusual or confusing plumages.

Count injured birds if present but do not count dead birds if present.

17f WEGU Injured

Total here all the injured western gulls noted during the current census. These birds will also be counted in one of the previous five categories of plumage characterization (**17a** through **17e**).

17g WEGU Dead

Total here all the dead western gulls noted during the current census. These birds will not be counted in one of the previous five categories of plumage characterization (**17a** through **17e**).

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Make a note of the plumage under **17h WEGU Notes** if the plumage type of the dead bird is not discernible.

17h WEGU Notes
Make notes of significant information or observations in regard to western gulls counted here.

NOTE: Refer to the website

http://www.geocities.com/RainForest/Canopy/6181/occi_d.htm

to view a large collection of photographs of western gulls.

18 PIGU (Pigeon Guillemot)

Counts of pigeon guillemots are divided among three age classes defined by body size and plumage features.

18a PIGU Mobile Chicks
Counts of this, the youngest, age cohort of pigeon guillemots rely on noting uniformly blackish-brown birds less than fully grown, mobile on foot, but not fledged, appearing and outside the burrow containing a pigeon guillemot nest.

Few **PIGU Mobile Chicks** are expected because their nesting habitat in burrows and crevices does not afford much opportunity for chicks to be mobile on foot away from the nest, where they would become prey.

Count injured birds if present but do not count dead birds if present.

18b PIGU Juveniles
Counts of the first-year age cohort of pigeon guillemots rely on the following features: (1) head mostly mottled brown, with a white throat; (2) lack of a large white wing patch – instead matt brown or stripes of black and white while at rest or visible in flight; and (3) underparts with barred brown pattern.

NOTE: Juveniles generally appear identical to Adults during their first winter. The duration of juvenile plumage is brief.

Count injured birds if present but do not count dead birds if present.

18c PIGU Adults
Counts of the adult cohort of pigeon guillemots rely the following feature in the non-breeding season: white chest; face with dark stripe behind the eye; white wing patch is conspicuous; back barred or mottled with black.

Birds in breeding plumage are easier to discern because they have all black plumage apart from a prominent white wing patch with a black bar across the base of the greater coverts.

Count injured birds if present but do not count dead birds if present.

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18d PIGU Unknown
Total the number of birds whose plumage is not clearly visible enough to classify as one of the previous three age cohorts or whose plumage appears to be outside the range of the classification. Discerning juvenile and adult birds may not be possible under some viewing conditions. Take notes about unusual or confusing plumages.

Count injured birds if present but do not count dead birds if present.

18e PIGU Injured
Total here all the injured pigeon guillemots noted during the current census. These birds will also be counted in one of the previous four categories of plumage characterization (**18a** through **18d**).

18f PIGU Dead
Total here all the dead pigeon guillemots noted during the current census. These birds will not be counted in one of the previous four categories of plumage characterization (**18a** through **18d**).

Make a note of the plumage under **18g PIGU Notes** if the plumage type of the dead bird is not discernible.

18g PIGU Notes
Make notes of significant information or observations in regard to pigeon guillemots counted here.

19 Other Seabird Species
The following species are non-breeding gull species. Live birds are tallied as the total individuals of the species, without regard to age class or health status.

BOGU, HEEG, RBGU, CAGU, WEGU, GWGU, GWGU X WEGU and UNGU

Refer to the species list in **1.7 Species of Interest and Basis for Interest** for the full common names of these species.

A list of the other seabird species recorded on Gualala Point Island during the count period from 01 July through 12 July 2007 appears on page 17.

20 Additional Notes and Observations
Field observers recorded data about the significant disturbances that they observed or unusual behavior of the species of interest. The back of the field sheet is available to continue field notes as needed.

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SEABIRD NEST TRACKING FROM MAINLAND VANTAGE POINTS

Goal: To survey nests of breeding seabirds in colonies from predetermined vantage points at several times each day to intensively monitor changes in nests and chicks during the pilot period.

Pre-Monitoring Reconnaissance
Initial site reconnaissance took place between 25 June and 30 June. At this time, BLM wildlife biologists worked with the volunteer monitors to hone protocol practices and bird identification skills as needed. BLM wildlife biologists photographed the nests visible from the vantage points and numbered the nests selected for tracking.

Observers at the designated viewing points relocated seabirds and their nests using color photographs. Nests were referenced by numbered locations annotated on a copy of a high-resolution digital photograph on a large format (8.5" x 14") sheet for each island at each vantage point (= photo point). Observers also monitored disturbances to seabird colonies and marine mammals as they occurred.

To document changes over the monitoring period, a team member took a series of digital photos (at the high-resolution setting) of the island once daily at about 10:30 from each vantage point. All daily photographs had the center of the camera lens level with the ground surface and at 1.5 m height from the ground.

Annotation and Update of Nest Locations
During the reconnaissance period in advance of monitoring, whenever a new pair on territory or a new nest location was found, volunteers annotated the site on the large-format photograph. In this way, other monitors could find and observe pairs and nests at any location more easily.

Nest sites and even the birds themselves were cryptic and difficult to see from a distance, even with good optical equipment. Care was necessary for accurate observations. Therefore, team members consulted with each other, the Site Coordinator or the BLM wildlife biologists wherever there was a question.

SEABIRD NEST SURVEY Data Sheet
The data sheet SEABIRD NEST SURVEY is used for all four daily shifts of seabird counts. Refer to Appendix 4 to view a copy of the data sheet.

Ambient Variables are the same as on SEABIRD SURVEY (see page 50)

<u>Nest Data Variables</u>

1 Nest Number
A unique number is attributed sequentially to a nest site observed from the vantage point, the number being added as each new nest is recorded

2 Species
The following bird species are part of this data set:

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BRAC, PECO, ABOY, WEGU and PIGU

Note: Variable values with a light blue background in the following tables apply only to Brandt's cormorants and are optional. They are used if observers are skilled at discerning stages of nest construction and stages of chick development; otherwise observers use the "umbrella" code in white.

3 Nest Condition

Nest Code		Description
BT		Birds are present, have a territory and are displaying.
NM		Nest material is present in loose clumps or stringy bunches of marine or terrestrial vegetation forming at most a disorganized mat.
N	PN	Poorly-Built-Nest: A disorganized mound or a flat pile of nesting material.
	FN	Fairly-Built-Nest: A well-defined, roughly circular pile of nesting material up to approximately 6" in height, with some evidence of a nest bowl depression at its center.
	WN	Well-Built-Nest: Substantial (>6" vertical height) amount of nesting material, forming a clearly-defined circular nest structure with a well-developed nest bowl, often plastered with much guano.
NV		Nesting birds are present but the actual nest site is not visible from the vantage point.
AB		Abandoned nest from the current year. Abandoned nests are nests that do not have adults in attendance for two or more consecutive days during the monitoring period.

4 Number of Adults

Record the number of adults at the territory or nest site at the time of observation.

5 Adult Behavior

Record the code for adult behavior seen at the nest at the time of the nest survey.

Behavior Code		Description	
∅		Adult(s) not present at the site	
S		Adult(s) standing next to or near nest	
N	I	Adult(s) on nest	Adult(s) in incubating posture on nest
	B		Adult(s) in brooding posture on nest
U		Adult(s) in other posture – Describe in field notes	

6 Eggs

Record the number of eggs in the respective nest.

Expected Values:
Brandt's cormorants usually have 1 to 5 eggs in a nest.
Pelagic cormorants usually have 1 to 4 eggs in a nest.
American black oystercatchers have 1 to 3 eggs in a nest.
Western gulls nests have up to 3 eggs; if 4 eggs appear, it is likely that two females are using the same nest.

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Pigeon guillemot pairs lay 1 or 2 eggs; if 3 or 4 eggs appear, more than one pair is using the same nest.
NV – use this entry when no eggs are visible

If observers believe that only some of the eggs are visible from the vantage point, they enters the number of egg visible and a "+" sign, i.e., 3+. That designation means that 3 eggs are in view, but that one or more additional eggs are likely to be present. The designation "0+" means that one or more eggs are not visible from the vantage point, but the observers believe that eggs are present because of the way that the pair of birds is behaving.

7 Number of Chicks

Record the number of eggs in the respective nest.

NV – use this entry when no chicks are visible
If the team believes that only some of the chicks are visible from the vantage point, the team enters the number of chicks visible and a "+" sign, i.e., 2+. That designation means that 2 chicks are clearly in view, but that one or more additional chicks are likely to be present.

8 Largest Chick Size

Record the size class of the largest chick at the nest.

NOTE: Volunteer monitors do not need to use the classes for Brandt's cormorant chick size if they are uncertain about how to classify the chicks.

Chick Size Class		Description	
C	1	Chick	Tiny, naked chick (1-8 days old). Completely helpless, struggles to raise head for short periods.
	2		Small Downy Chick (8-15 days old). Completely downy. Can sit up to feed, but no other mobility.
	3		Large Downy Chick (15-25 days old). Mostly to entirely downy. Flight feather sheaths may be visible in older chicks. Can stand up, moves about in nest, begs aggressively and may begin wandering out of nest. May begin to crèche.
	4		Gawky Chick (25-40 days old). Most flight feathers well established and body contour feathers largely replacing downy fluff. Head and neck remain mostly down. Very mobile, crèching heavily.
J		Juvenile (40+ days old). Flight and contour feathers >95% established, very mobile and completely independent of nest site. May be capable of flight.	

9 Field Notes

Enter remarks here about observations of significance that are outside the range of variables listed or that appear to affect observations significantly. Include here the abbreviations for the

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species of gulls present at the site, other than western gull, if the team is able to identify other gull species. Refer to the following table for abbreviations for the species names.

NOTE: Brandt's cormorants undergo fierce competition for nesting space and materials early in the season, so restraint is needed during the first four weeks when designating new nesting sites; i.e., follow the progress of paired birds and wait until they are tending a well-established nest.

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DISTURBANCE MONITORING

Goal: To document the circumstances when human factors disturb and do not disturb seabird colonies and to document the frequency of natural (non-human) sources of disturbance on seabird colonies during the census period.

The corresponding data sheet SEABIRD DISTURBANCE LOG is used as needed during a monitoring shift.

Originally, volunteers had planned to monitor disturbances to the seabird colony at Gualala Point Island in the latter part of each monitoring shift. However, on the islands being monitored the incidence of human or other disturbance agent was infrequent and any disturbance needed to be recorded as it occurred.

Refer to Appendix 4 to see the SEABIRD DISTURBANCE LOG data sheet.

Ambient Variables

1 Colony
Use the California Colony Number that covers each vantage point. Refer to Section 1.5 for the colony locations. For the present pilot study, the following codes apply:

Robinson Point	ME-384-11 (= Collins Landings to Gualala River)
Gualala Point Island	SO-384-01

No data were taken under this protocol from Fish Rocks.

2 Vantage Point
Refer to Section 1.4 for the point number for the monitoring location. Allowable values for this pilot protocol are **N** or **S**.

3 Date
Use the Federal Information Processing Standard form: YYYYMMDD,
where YYYY is the numeric year
MM is the numeric month and
DD is the numeric day of the month.

Thus, 04 July 2007 is recorded as **20070704**.

4 Start Time

Use the 24-hr clock format, so-called "military time" where, for example, **15:00** = 3:00pm.
Start Time is the time when the observers begin the monitoring shift. Valid values, therefore, are: **05:30**, **08:00, 10:30** and **13:00**.

5 Stop Time
Use the 24-hr clock format, so-called "military time" where, for example, **15:00** = 3:00pm.
Stop Time coincides with the end of the monitoring shift.

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NOTE: The difference between **Stop Time** and **Start Time** is the duration of the observation period. The number of actual disturbances divided by the duration of the observation period gives a standard frequency of disturbances per unit of time.

6 Observers

Enter the complete first and last names of each observer present during the monitoring shift. Avoid abbreviations entirely.

<u>Disturbance Variables</u>

7 Time

Use the 24-hr clock format, so-called "military time" where, for example, **15:00** = 3:00pm.

Time (the variable) is the record of when the **Agent** of disturbance appears, i.e., an attack by a raptor or gull, a firearms shot, landing of people on an island, etc. If aircraft, boats, individual people, dogs, etc., approach within 330 m (1000 ft) of the island in any of the three dimensions, these human-aided **Agents** of disturbance are recorded.

NOTE: The **Agent** of disturbance does not have to cause a disturbance. For example, if a boat, with its motor turned off, drifts to within less than 1000 ft of an island, it is an **Agent** of disturbance. The presence and duration of the presence of the boat is recorded in the Disturbance Log. However, the boat may generate no disturbance for seabirds whatsoever. **Action**(s) and **Effect**(s) would be **NONE**.

Enter an asterisk (*) in the **Time** column for the disturbance if **Time** of the start of the disturbance is unknown or unavailable.

8 Human?

This variable requires a check in its column when the first **Agent** of the disturbance is anthropogenic, i.e., stemming from a human action or an action facilitated by a person, such as allowing a dog to run on a beach.

NOTE: If an airplane flies low over an island (below 1000 ft) and causes a peregrine falcon to take flight and fly over a group of nesting western gulls so that the western gulls also take flight, the Agent is still the airplane. The airplane (**Human?** = YES) is the original source of the disturbance; the Falcon is a subsidiary source of disturbance.

9 Agent(s)

Use the category or specific descriptor for the first **Agent** of disturbance. Use **Additional Notes and Observations** if more space is needed to describe the new **Agent**.

Note:

If two boats are traveling together and initiate a disturbance in the seabird colony, for example, record the number "**2**" in the column **Agent(s)** just as well. Likewise, if four common ravens are teaming together, record "**4**" in addition to the species abbreviation (CORA).

4.10 Action(s)

Action(s) by the **Agent(s)** in the area may cause **Effect(s)** in seabird colonies. **Action(s)** differ according to whether the **Action(s)** have a human or a non-human **Agent**.

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Human **Action(s)** are:

1. Invasion of nest or roost sites
2. Approach toward nest or roost sites
3. A sound event
4. A light event

There are three **Actions** by a seabird or marine mammal species that are **Agents** of disturbance:

1. Predation (e.g., attacking to steal chicks, eggs, or the adult seabird)
2. Competition (e.g., squabbling over territory or food)
3. Agitation (e.g., alarm for no other apparent reason)

11 Effect(s)

The **Effect(s)** are the reactions by adults (PRBO 2007) and results for young birds and eggs (McChesney et al. 2005) of the **Action(s)** of the **Agent(s)** of disturbance. Thus far, the following Effect(s) are included:

Reactions by Adults	**Results for Young Birds or Eggs**
None	None
Bird(s) looked upward	Chicks scatter by running (Exposure)
Growling or alarm calls	Chicks and eggs displaced from nest
Threatening gestures such as neck stretching and head shaking	Chicks and eggs depredated
Standing erect or standing on guard above the nest	Food delivery to chicks from parents prevented
Flushing, flying away	

12 Duration

Record the time in nearest whole minutes during which the **Action(s)** of the **Agent(s)** of disturbance occur.

Special Cases:

For human-originated disturbances (**Human?**=Yes), record the time that the Agent of Disturbance is within 1000 ft distance in any dimension of the seabird island or colony.

For repeated attacks from a predator over a brief period, consider a single disturbance event to be the total of the time of repeated attacks plus the time intervals between the attacks such that the disturbance event ends when there is no further attack for the amount of time between the first and last attack.

For example, a peregrine falcon attacked a pelagic cormorant six times within five minutes and then flies away for ten minutes and attacks twice again over two minutes and before departing for the remainder of the monitoring period. This series of events constitutes two disturbances, one disturbance lasting five minutes, the other lasting two minutes.

13 Egg Loss

If one of the Effect(s) of the disturbance Action(s) was the displacement or loss of one or more eggs from one or more nests in the area of the disturbance, circle "**Y**". Displacement or loss may

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include cracked or smashed eggs, eggs rolling off into the ocean, eggs eaten, etc. If no Egg Loss occurred, circle "**N**". If it is not clear whether eggs were lost because of poor visibility or commotion during the disturbance, circle "**?**".

14 Chick Loss

If one of the **Effect(s)** of the disturbance was the loss of one or more chicks from one or more nests or crèches in the area of the disturbance, circle "**Y**". Loss may be come from direct predation, falling into the ocean, crippling injury, etc. If it is not clear whether chicks were lost because of poor visibility or commotion during the disturbance, circle "**?**".

15 Distance

Estimate in feet the closest distance of the disturbance **Agent** to the central point of the bird group affected by the disturbance.

16 Direction

Give the general compass direction toward which the disturbance Agent is moving:

N NE E SE S SW W NW

A compass will help in determining bearing, especially if people are not familiar with the area.

If there are multiple Agents, i.e. several boats or a loose flock of common ravens and these leave the area in multiple directions, enter "**Multiple**"

17 Species Affected
Species Individuals Affected
Percent of Species Individuals Affected

For each bird or marine mammal species affected by the disturbance Action(s), whether directly or indirectly, record accurately the species abbreviation of this protocol, the number of individual full-grown (adults and juveniles, but not chicks) birds affected by the **Action(s)** and the percent of the total number of full-grown birds within view affected by the disturbance **Action(s)**.

If there is insufficient space to enter all your data on individual species affected, continue entering data on reverse side of the DISTURBANCE LOG form. Use the same disturbance **Time**. Use multiple lines if needed to record all information conveniently.

18 Additional Notes and Observations

Include the following kinds of information and observations here:

1. Supplemental information for vessels, vehicles, or aircraft that are disturbance Agents – manufacturers, make or model, identification marks such as license plates or vessel or aircraft identification markings.

2. Additional species, species counts and percentages of totals of adults disturbed by a disturbance Agent, for which there is no space under **Species Affected**.

3. Other observations deemed significant or informative by the observers.

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Use the same disturbance **Time** as in variable 7 for **Time** in variable 18 **Additional Notes** so that the text linked to the correct disturbance event on the front side of the DISTURBANCE LOG.

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MARINE MAMMAL MONITORING

For this pilot monitoring effort, the Task Force incorporated the existing protocol established by Dr. Sarah Allen at Point Reyes National Seashore. Area residents have been using this protocol already to census harbor seals and to document disturbances to harbor seals from March through July. The existing census activity is for locations other than Gualala Point Island.

The Task Force extended the monitoring to the two seabird colony sites covered in this pilot protocol.

Monitoring Teams

A single monitor monitored harbor seals from the two vantage points at Gualala Point Island.

Monitoring Schedule

The term of monitoring was six days before the planned fireworks display in the town of Gualala (including the morning of the day of the planned display) (01 through 06 July 2007) and six days after the fireworks display (07 through 12 July 2007).

Monitoring of harbor seals was scheduled for once per day, within an hour of low tide. Monitoring must be scheduled based on the tides rather than fixed times of day because the seals only haul out when the low rocks around Gualala Point Island are exposed by the low tide.

Goal: To provide daily count of the maximum, usual number of seals hauling out to rest during low tide.

The data sheets used currently to census harbor seals for Dr. Sarah Allen's long-term study for Point Reyes National Seashore were used, without change. Appendix 4 contains copies of the forms used for monitoring.

Ambient Variables

1 Date

Use the Federal Information Processing Standard form: YYYYMMDD, where
YYYY is the numeric year
MM is the numeric month and
DD is the numeric day of the month.

Thus, 04 July 2007 is recorded as **20070704**.

2 Day of Week

Use the day of the week spelled out (Monday, Tuesday…).

3 Year

Use 4-digit year (e.g. "2007").

4 Location

Use "Gualala Point Island"

5 Start Time

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Use the 24-hr clock format, so-called "military time" where, for example, **13:00** = 1:00pm.

Start Time is the time when the observers begin monitoring at the first vantage point (on this form, "Sub-Site").

6 End Time
Use the 24-hr clock format, so-called "military time" where, for example, **15:00** = 3:00pm.

End Time is the time when the observers conclude monitoring at the last vantage point (on this form, "Sub-Site").

7 Observers
Use full name of the observer(s).

8 Weather Visibility
1=clear, 2=slightly obscured but still able to count, 3=unable to conduct an accurate or full count.

9 Rain (Y/N)
Use Y for any significant precipitation, N otherwise.

10 Low Tide Level closest to survey time
This variable can be taken from a tide table for the area being monitored. It does not need to be completed in the field. The tide level recorded is for the low tide closest in time to the **Start Time**. List both the level of the low tide and the time of the low tide, in military time.

11 All sub-sites surveyed? (Y or N)
Use Y if both Gualala Point Island sites were surveyed, N otherwise.

Species Count Data
Only harbor seals are to be counted in the grid. Other pinnipeds should be noted in the "Comments, Note Other Pinnipeds" column.

12 Time
Enter start and end time of monitoring at a particular vantage point, e.g. 08:25-08:35.

13 Sub-Site
Enter "GPI – North" or "GPI – South".

14 # of Adults and Imm Seals
Enter total number of harbor seals seen, except for pups.

15 # of Live and Dead Pups
Enter total number of harbor seal pups seen. If it is not possible to determine if a seal is a pup or just an immature adult, include it in the "Adult and Imm Seals" count, not the pup count.

16 # of Dead Pups
Enter total number of dead pups seen.

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17 # of Red Seals
Enter total number of seals that have red or rust color on any part of their body.

18 # of Shark Bite
Enter total number of seals showing visible shark bites.

19 Disturbance Sources Y/N
If a disturbance is seen during the monitoring period, enter "Y" here and give details on the second page (Disturbance survey). Otherwise, enter "N".

20 Comments, Note Other Pinnipeds
Note type and number of any other pinnipeds, or marine mammals, that are seen. A list of the pinnipeds that may be seen in the area and the codes that may be used to refer to them is given below:

Species Code	Species Common Name	Species Scientific Name
ES	Northern Elephant Seal	*Mirounga augustirostris*
HS	Harbor Seal	*Phoca vitulina*
CSL	California Sea Lion	*Zalophus californianus*
SSL	Stellar Sea Lion	*Eumetopias jubatus*
NFS	Northern Fur Seal	*Callorhinus ursinus*

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DAYTIME LAND PHOTOGRAPHY FROM VANTAGE POINTS

Photography Variables

The data variables for photography consist of the metadata for each photograph along with a description of the photograph. Variable includes the date and time when each photograph was taken, camera make and model, lens used, settings, etc. The CAMERA LOG as originally designed was not used by the photographers. Instead, photographers have established archives of their photographs, provided archival CDs or DVDs containing the digital files of selected photographs, and labeled such with date, name of photographer, subject matter, location and vantage point.

Photographs are at a designated source with the The Sea Ranch CCNM Stewardship Task Force, The Sea Ranch, CA. Copies of selected photographs have been sent to the Bureau of Land Management, California State Office, in Sacramento, CA to the US Fish & Wildlife Service, Don Edwards San Francisco Bay National Wildlife Refuge, in Newark, CA.

Videos and sound recordings are archived at The Sea Ranch Association with duplicate copies deposited with the BLM California State Office.

For the land-based, day photography, a Nikon D2x camera was used for the photo series taken during the monitoring period. The camera was mounted on a Gitzo carbon-fiber tripod using a Wimberly gimble-style tripod head with the lens center at approximately 54 inches height from the ground. In some instances, a weighted bean bag was placed over the camera and lens in an attempt to mitigate high winds. Photography, at times, was impossible due to heavy fog.

A Nikon image stabilized f4.0, 200-400 mm zoom telephoto lens, combined with a 1.4x teleconverter was used to complete the imaging system. The maximum magnification of this system resulted in a telephoto lens equivalency of 840 mm. In addition, wide angle lenses were used to photograph the sites in their entirety.

Depending on favorable weather conditions, photographers took sequential pictures of Gualala Point Island from each vantage point panning from one end of the island to the opposite end of the island, segmenting the top, middle and bottom levels of each pan. Then additional photos were taken to record details of certain areas of interest (nests, species, behavior etc.).

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NIGHTTIME PHOTO MONITORING FROM THE SOUTH VANTAGE POINT

BLM wildlife biologists did not know how feasible it would be to observe bird populations at night when the birds might be 0.25 km or more from the observation point, as is the case with Gualala Point Island. Weather conditions are not predictable and visibility might be limited by cloud and/or fog cover and the distance from shore. Nighttime reconnaissance was necessary to determine what features of birds and bird movement could be identified, filmed or sound recorded in a setting similar to the conditions during the fireworks display.

Preparation and Reconnaissance

A team of 9 volunteers went out on two nights, 30 June 2007 and 04 July 2007, before the expected fireworks to determine what camera and film equipment would be useful. This team tested: binoculars and spotting scopes, night-vision goggles, digital camera, infrared camera, digiscopes, a sound monitor and night video between 20:30 and 21:30 each evening. Cold and windy conditions were expected. Volunteers prepared for a range of conditions, some of which might be challenging for data collection. During the evenings of reconnaissance the equipment was tested, but no birds were observed in flight after dark. The volunteers decided to take photos on a timed sequence to catch as much action as possible.

Nighttime Photographic Methods

The results from the initial reconnaissance demonstrated that it would be possible to image the birds on Gualala Point Island from sunset to approximately 90 minutes after sunset with the photographic imaging systems tested. These systems were positioned close to the ground on extremely stable carbon fiber tripods to minimize motion during long exposures. These systems have the flexibility with high ISO speeds (800 to 1600) and long exposure times (one to 30 seconds) to successfully image in almost total darkness.

Two different photographic methods were used to accomplish the nighttime monitoring of Gualala Point Island:

- Digital Infrared Imaging (DIR)
- "DigiScoping" Visible Imaging (DSV)

All images were taken from the Gualala Point Island south vantage point. Both imaging set-ups were located 305 m from Gualala Point Island at an angle of 0° and at a distance of 0.5m from the ground. The south vantage point is at approximately the same height as Gualala Point Island. Therefore, the elevation angle = 0°.

Images were taken on three separate nights, 30 June 2007, 04 July 2007 and 06 July 2007 ranging in time from 20:30 to 21:56. Typically images were taken at 1 to 2 minute intervals on the pre-fireworks nights and prior to the beginning of the fireworks on 06 July 2007. The fireworks were initiated at 20:35:20. DSV images were taken every 15 to 20 seconds subsequent to the onset of the fireworks. Exposure times varied from 6 seconds at 21:32:56, 10 seconds at 21:35:49, 13 seconds at 21:36:52, 20 seconds at 21:38:52 and 30 seconds at 21:46:25. DIR images were taken typically once a minute after the fireworks started.

In addition to images of the south view of Gualala Point Island, the sunset was photographed in both the DIR and DSV systems. Because of this, an absolute time mark was captured which allowed the synchronization of the camera clocks with real time. It was determined that the

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Nikon 200 used for the DSV images required a camera metadata time correction of -30 seconds. The Nikon D70 used for the DIR images required a camera metadata time correction -90 seconds.

The DIR system consisted of a Nikon D70 Digital Single Lens Reflex (DSLR) camera modified to image in the Near Infrared (NIR). The specific wavelength range is 700-1700 nm. The camera was professionally modified such that the NIR blocking filter on the Nikon image sensor was removed and replaced by a visible light (400-700nm) blocking filter. The modification allows the camera to image NIR light (700-1700 nm) while rejecting visible light.

A Nikon image stabilized f2.8, 300mm telephoto lens combined with a 1.7 teleconverter was used to complete the imaging system. The overall magnification of the system was

$$m = \frac{300}{50} * 1.7 * 1.5 = 15.3x.$$

Other DIR photographic imaging parameters were:

ISO	=	800
f#	=	2.8
Exposure time	=	6-30 sec; typically 30 sec.
File type	=	raw (Nikon NEF)

The digiscoping (DSV) system consisted of a Nikon D200 DSLR camera coupled to a Leica APO Televid 77mm spotting scope with a Leica 1:10:4/800 Adapter. The magnification of this system was

$$m = \frac{800}{50} * 1.5 = 24x$$

Other DSV photographic imaging parameters were:

ISO	=	1600
f#	=	10.4
Exposure Time	=	6-30 sec typical
File type	=	raw (Nikon NEF)

Picture File Contents:

Twenty (20) DSV images from 06 July 2007 were selected as representative images of the nesting birds on Gualala Point Island. These images document seabird behavior both before and during the fireworks from 21:32:00 to 21:46:25 on 06 July 2007. These images can be seen in the accompanying Powerpoint presentation. In addition, the images from 06 July 2007 were synchronized with the sound recording from the north vantage point on the night of the fireworks. The synchronization is presented as an iMovie. The entire sequence of both the DIR and DSV images are available to interested parties. The frequency of images is shown in the graph below.

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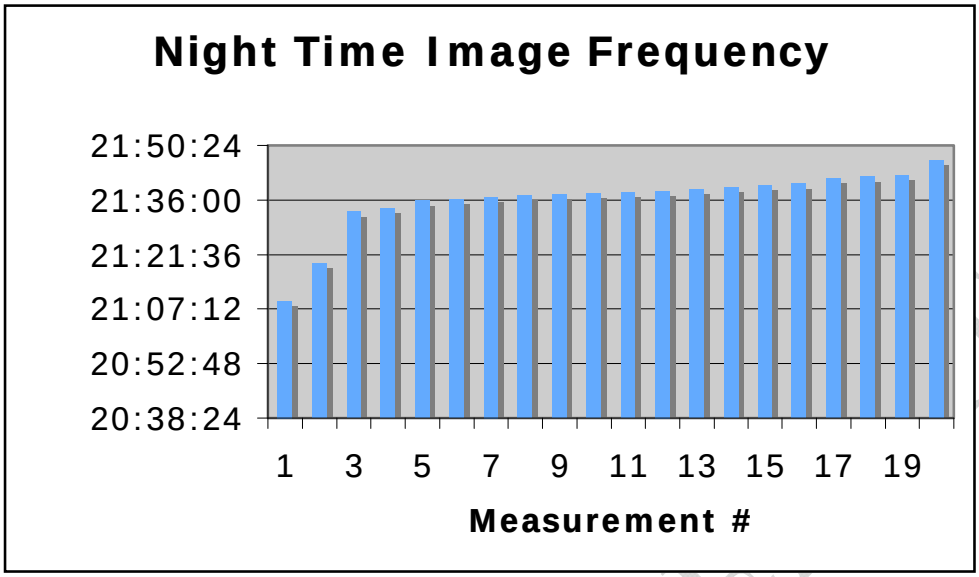
Figure 10 Night image frequency, Gualala Point Island, 06 July 2007, 21:00 to 22:00



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AERIAL PHOTOGRAPHY

Aerial photography has proven to be one of the most effective and important parts of the monitoring of the Sonoma and Mendocino coasts for Brandt's cormorants as well as other nesting seabirds and marine mammals. Many times land-based observers have restricted views of offshore islands. Therefore the Task Force decided that aerial photography would be a valuable tool to make thorough observations.

The protocol for the flyover follows the limits established in Carter et al. (1992) for flights to photograph seabird colonies along the entire coast of California. Refer to pp I-13 through I-14 in Carter et al.

In addition, at the request of Gerry McChesney, wildlife biologist at the US Fish and Wildlife Service, the flyovers took place at 1000 ft elevation to avoid flushing and otherwise disturbing the breeding seabirds on Gualala Point Island, Castle Rock and Fish Rocks.

An overflight to photograph the Brandt's cormorant nesting colonies on Gualala Point Island and Fish Rocks took place on 30 May 2007 by the US Fish and Wildlife Service. To fulfill the mission as The Sea Ranch CCNM Stewardship Task Force, the first aerial overflights took place on 04 June 2007. These photos were used as a baseline for the subsequent flights on 05 July 2007, 07 July 2007, 12 July 2007 and 30 August 2007. Aerial photographs provide time-series data on the fate of individual Brandt's cormorant nests for the study period, before and after the fireworks display in the town of Gualala.

In accordance with FAA regulations, flights were undertaken when there was one-mile of shoreline visibility. The Task Force cancelled an overflight on 06 July 2007 because of the low cloud cover and dense fog at midday. Each photographic session was completed under similar conditions. The same pilot, a former flight instructor Jerry Rench, flew the same plane, a 160-hp Cessna 172-M with Horton Stall Kit installed, with photographer, Craig Tooley, for all Task Force flights.

Photographs were taken from ≥ 1000 ft., at an air speed between 40 and 60 knots and between 11:00 and 12:00. The plane was banked left at approximately 25°, circling each individual island two to three times counterclockwise. Photographs were taken out of the open left window with the photographer in the pilot's seat and the pilot flying the plane in the co-pilot's seat because the pilot's side of the airplane had a window that opened to allow photography.

The photographic sequence of offshore islands was from south to north: Gualala Point, Gualala Point Island, Robinson Reef and Robinson Point, Fish Rocks and Havens Neck.

The aerial photographs obtained provide excellent views of each of these offshore islands. Using the photographs, the wildlife biologists Gerry McChesney, Paul Roush, and Jim Weigand were able to accurately document the nesting of the Brandt's cormorants from initial nesting sites on 30 May 2007 and the subsequent disruption of the nesting in the 07 July, 12 July, and 30 August photographs.

Specific details of the camera equipment and the image data are given in the table below. ISO settings between 400 and 1600, along with shutter speeds of 1/400 s – 1/1650 s at full open

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aperture settings, allowed the volunteers to obtain sharp, clear pictures of the nesting bird colonies as well as several pinniped sites.

Resolution was such that the wildlife biologists were able to easily distinguish individual nest sites. Further details of these sites are given in Section 2: Findings and Results.

Photo 12 The survey aircraft used to take aerial photographs of CCNM islands, June through August 2007

Photo by Rich Kuehn

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ACOUSTIC MONITORING

The BLM currently does not have the ideal equipment for measuring the sound of fireworks, but a borrowed unit is available and suitable.

The steps for measuring sound with the Tenma unit on the night of 06 July 2007 were as follows:

1. Designate a set-up position for the equipment on the mainland at the north vantage point for Gualala Point Island used for daytime seabird monitoring in advance of the evening of 06 July.

2. Keep talk and movement to a minimum during data collection during the fireworks display.

3. Assemble a monitoring station that consisted of one sound measuring unit (IEC651 Type 2 instrument): capable of recording fast response (0.125 seconds), slow response (0.5 seconds) and peak response from fireworks rockets, but (unfortunately) not all at the same time; and a digital clock set to Pacific Daylight Time on a GPS unit, with both units attached to a tripod at 5-ft height.

4. Point the microphone of the sound measuring unit at a 45º angle in the direction of the sound source (the fireworks display).

5. Train a video camera or cameras with a light source for each camera (a flash light is OK) on the instruments to provide real-time information on data for the sound variables.

6. Turn on the unit 30 minutes prior to the scheduled fireworks and set to the HI measurement range (65 to130dB) and the C-weighting (IEC651 Type 2 specification for uniform frequency range (30 to 10,00Hz). After the instrument has been on for 10 minutes, the calibration will be done.

7. Calibrate sound instrument, after it has operated for ten minutes, with a self-calibration procedure before and after each session.

8. Record ambient sound before the fireworks, with readings of the fast response, the slow response and the peak response, to establish a background baseline.

9. Switch the unit at the scheduled time of the fireworks to the peak response setting and record the peak sound at the start of the fireworks.

10. Then switch the instrument to the fast-response setting to document the remaining fireworks sounds.

Siegfried Linkwitz, an instrumentation designer for high-end audio equipment (http://www.linkwitzlab.com), loaned the Task Force a Tenma™ (405 Pioneer Blvd., Springboro, Ohio 45066). Model 72-860 Sound level Meter, Serial # 970520023, to record and measure sound. George Bush, a retired Systems Physicist who worked at Lawrence Livermore Laboratory, operated the instrument.

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As a point of reference, 90 dBa is thought to disturb nesting pairs of Northern Spotted Owls. Ambient sound level is 65 dBa for normal conversation.

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SECTION 4: QUALITY ASSURANCE AND DATABASE MANAGEMENT

Training

Quality Assurance attempts to make sure **in advance** that data resulting from this protocol attains the expected level of data quality. The expected level of data quality for this monitoring protocol is accurate depiction of case study events sufficient as evidence in a court of law. This standard does not mean that the data are to be used for legal purposes but that the data could be used for legal purposes.

People are the most valuable resource of this monitoring protocol. BLM and The Sea Ranch CCNM Stewardship Task Force worked jointly in a short time to assure that the quality of the data collected met the expected standards for quality.

Harbor Seal Surveys

Volunteer monitors from The Sea Ranch Harbor Seal Docent Program were already familiar with harbor seal monitoring using the procedures established by the Point Reyes Bird Observatory Conservation Science and Point Reyes National Seashore. They assumed responsibility for the entire data collection effort for harbor seal population counts at low-tide. They were assisted in additional counts by seabird census monitors who took incidental counts of harbor seals during their shifts at vantage points.

Seabird and Nest Observers

BLM wildlife biologists first surveyed the islands in the study beginning on 25 June. This reconnaissance afforded the biologists an opportunity to review the protocol and make adjustments to correspond to local conditions and to the number of area residents able to participate in seabird monitoring.

On each day, 26 and 27 June, BLM wildlife biologists held a workshop to cover seabird identification, field methods and equipment use for the seabird and nest observation. The contribution of expertise from area residents was extremely important here as well. At that time, biologists scheduled an individualized two-hour training session in the field for one or two people at a time. In this way, volunteers received instructions and practice in the protocol and had questions and concerns addressed. The goal was to make volunteers with the Task Force comfortable and at ease with conducting the protocol.

The BLM had at least one wildlife biologist present in The Sea Ranch or Gualala between 30 June and 12 July to facilitate monitoring undertaken by volunteers and help with any questions or changes that came up.

Photographers

None of the photographers required training as they were experienced or professional photographers used to working in the coastal conditions of the region. Discussion of methods to use arose from conversations and field testing of equipment and suites of apparatus to determine in advance of the night of the fireworks display which methods available to the Task Force would best accomplish the documentation of birds under daytime, nighttime and aerial conditions.

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The photographers made photographs immediately available to the Task Force so that information from photographs could be gathered, summarized and interpreted in an efficient manner.

Sound Technicians
The Task Force relied on sound engineers for advice and equipment to accomplish results for documenting decibel levels from the fireworks display.

Data Entry and Quality Control

At the end of each monitoring shift, Task Force members returned the completed data sheets to Connie Schimbor, monitoring site coordinator, who looked over the data sheets for completeness and accuracy. Ideally, each day, data sheets from all shifts at each vantage point were entered into an EXCEL workbook. Each data sheet form had its own worksheet in the EXCEL workbook. One person was designated the data base manager for the authoritative data file so that duplicate, different databases were not concurrent. Often, a data entry backlog occurred because the database manager was also doing monitoring and documenting tasks.

Variables that had no data recorded for them on a data sheet had values of <Null>, not zero (0) to distinguish between no data available and no birds/seals present, for example.

Jim Weigand input the first five days of data so that Task Force volunteers who were subsequently entering and proofing the accuracy of data would have a full complement of data to refer back to for formatting into the Excel workbook. Rozanne Rapozo and Julie Gibson took the lead for subsequent data management and proof reading.

Data transfer to electronic form and review of data entry consisted of the following five steps:

1. Reviewing data sheets at the end of a completed shift
2. Entering the data into the EXCEL workbook directly from data sheets
3. Highlighting discrepancies as items needing attention or clarification
4. Correcting transcription errors and annotating changes made after original entry
5. Reviewing with the recorder of a datasheet any discrepancies identified during the proof reading process and making adjustments, if necessary.

The steps are described in more detail in the following paragraphs.

Data Sheet Review
Task Force volunteers returned field data sheets to the monitoring coordinator who then checked the data sheets for completeness and correctness before volunteers left the monitoring site. At the end of the fourth shift, the coordinator conveyed the days' datasheets to the designated data entry person, who was also the database manager and keeper of the official database during his/her tenure.

Data Entry
The designated database manager entered data from field data sheets into the electronic spreadsheets. Each type of field data sheet had its own spreadsheet inside the EXCEL workbook file. (EXCEL allows the data to be transferred eventually into a relational database for querying analyses.)

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The form of the spreadsheet has columns for each variable on a field data sheet in the order that the variable appears on the field data sheet. This order was necessary for ease of data entry. Additionally, notes or comments written by Task Force volunteers were transcribed verbatim into corresponding cells on the spreadsheet. Occasionally notes from one sheet actually pertained to data on a different field data sheet being completed during the same shift. In such cases, the designated database manager entered the notes on the appropriate field data sheet and made an additional annotation identifying the source field data sheet from which the notes were transcribed.

Highlighting Items for Attention
If the data entry person found data to be unclear or questionable, she/he would enter the data as closely as possible to the data as it appeared on the datasheet and flag the data by filling the Excel cell with a yellow background.

Correcting Transcription Error and Items for Attention
The data checker functioned as a proofreader and communicator on behalf of the database integrity. All data checking began with printing out, in full, the latest batch of newly entered data from the respective EXCEL spreadsheet. Printed data was cross-checked with field sheet data to confirm equivalency or to correct a typo. Any transcription errors were corrected on the printout. Subsequently, the data checker (database manager) used the corrections made on the printout to type the correct data element in red typeface into the previously incorrect data cell. Also, the database manager adds an annotation to the cell so that the history of the data correction was documented.

Correcting Highlighted Items for Attention
To resolve uncertainties, the data entry person and/or data checker contacted the respective Task Force volunteers for clarification about items highlighted for attention by the data entry person. A correction was made to the printout of the current data batch. Subsequently, the data entry person transcribed the correction on the printout to the data cell with the previously uncertain data and added an annotation to the cell so that the history of the resolution of the uncertainty about the data was documented. In the event that the paper copies of field sheets begin to deteriorate, the data sheets will be scanned to create an electronic archive.

The Sea Ranch Association archive is the repository for the original field data sheets. The data sheets will be scanned as well as an electronic archive in the event that the paper copies of field sheets begin to deteriorate. Printed data batches used for comparing data entered to data on field sheets are also kept in an accompanying notebook as a permanent record of data.

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SECTION 5: PRELIMINARY ESTIMATE OF MONITORING CONTRIBUTIONS OF THE SEA RANCH CCNM STEWARDSHIP TASK FORCE

Accounting for the Value of Volunteers Contributions of Labor and Materials

Before data collection took place, BLM provided an estimate to The Sea Ranch CCNM Stewardship Task Force for labor hours anticipated for monitoring seabirds and marine mammals for the July 1 through 12 census period. Task Force member Rozanne Rapozo designed forms to track the hours of volunteer work, travel mileage and contributions of equipment and funds to the monitoring effort. Each volunteer was asked to complete a form. Appendix 4 contains blank copies of those forms. This attention to detail helped BLM and the Task Force to track the value of volunteers' time and resources that the Task Force contributed to monitor the effects of fireworks on the behavior of the seabirds and marine mammals in this part of the CCNM for which The Sea Ranch Association serves as Stewards. This record keeping allows the BLM and the Task Force to plan more accurately for labor and equipment needs in subsequent BLM efforts with stewardship partners elsewhere in coastal California. When seeking additional funds that require a non-Federal match in value, these carefully compiled data assist federal agencies and non-profit groups to submit eligible grants.

Initial Scenario

Assumption: There will be ample volunteers and available equipment to execute all elements of this protocol at four vantage points.

		Total Person Hours in the Field
1.	2 BLM Wildlife Biologists – each spending 10.5 days (Reconnaissance, training, monitoring, quality control)	168 hr
2.	Daytime Volunteer Monitoring from 2 vantage points each at 2 CCNM islands (4 2-member teams x 6 hours / day x 13 days + 4hrs training *8)	656 hr
3.	Nighttime Volunteer Reconnaissance with Area Residents (2 2-member teams x 2 hours x 3 nights)	24 hr
4.	Nighttime Volunteer Monitoring from 2 vantage points each at 2 CCNM islands (4 5-member teams x 3 hours x 1 night)	60 hr
5.	Mainland-based Sound Level Measurements (4 people x 1.5 hr)	6 hr

ESTIMATED TOTAL LABOR REQUIREMENT: 914 hours (=168 BLM hours + 746 Volunteer hours)

ESTIMATED VALUE OF VOLUNTEER LABOR @ $18.04 / hr = $13,457.84

Actual Time and Expenses for Monitoring

Careful documentation and accounting of the volunteer hours have provided a record of the total contribution of The Sea Ranch CCNF Stewardship Task Force to accomplish the intensive monitoring that took place between 1 and 12 July 2007. These figures assume a per-hour value of volunteer contribution at a standard Federal rate of $18.04 and an IRS mileage rate for travel at $0.17 a mile. The actual value and hours exceeded the initial budget estimate by half again as much as the original estimate. Members of the Task Force and other volunteers contributed more volunteer time than was originally estimated. Additionally, the original scenario did not allocate time for training and data entry and verification.

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The following itemizes the volunteer effort during the monitoring period:

Description of Effort	Hours	Value	Expenses
Planning and Organization	35.0	$ 631	$ 30
Training of Task Force volunteers	75.7	$ 1,366	$ 0
Monitoring and Data Recording	705.5	$12,726	$ 30
Photography (Land & Aerial)	146.0	$ 2,634	$ 618
Mileage and Lodging			$ 413
Total	**962.2**	**$17,357**	**$1,091**

Total Contribution (Labor value plus expenses)
$18,448.00

Equipment Used for Monitoring:
- Cameras
- Spotting Scopes
- Digital Camcorders
- Garmin GPS System
- Sound Level Meters
- Airplane for Aerial Photography

The Task Force did not calculate a use rental value for the specialized equipment that the Task Force volunteers provided..

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SECTION 6: RELATED LITERATURE

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SECTION 7: AUTHORS OF THIS DOCUMENT

The following organizations, agencies, and individuals participated in this writing this document:

The Sea Ranch CCNM Steward Task Force, The Sea Ranch, CA 95497
George Bush
Sandy Bush
Bryant Hichwa
Diane Hichwa
Rich Kuehn
Mike Lane
Bonnie Plakos
Rozanne Rapozo
Connie Schimbor
Craig Tooley,

USDI Bureau of Land Management, 2800 Cottage Way, Sacramento, CA 95825
Paul Roush
Jim Weigand

with technical advice from:
DPS Technical, Inc., 1160 Dewey Way, Suite D, Upland, CA 91736
Christopher Real

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SECTION 8: APPENDICES

Appendix 1: Narratives of Seabird Responses to Fireworks, 02 July 2006

-----Original Message-----
From: Linda Keir [mailto:lkeir@mcn.org]
Sent: Monday, July 03, 2006 10:13 PM
To: Richard Kuehn
Cc: marganth@mcn.org
Subject: What I saw and heard watching Gualala Point Island

Dear Rich, Plese feel free to use this account of my/our observations as you see fit. You can use my name or not--I leave that up to you. AS we were parking the car in your courtyard, Marge and Shatzan and I met the two women staying at your house, they were headed out to the estuary and possibly the park, did they report back to you, and can you share with us?

_____

At about 9:15 on the night of July 2, two loud booms (no fireworks as yet) sounded as i walked with
two friends toward the bluff trail, headed for an excellent view of Gualala Point Island and its bird rookery.
A few minutes later, the fireworks began with a few low sputtering bursts, then came louder explosions with brighter flashes of light. Between the Island and the rocky shorepoint to the south, across the bluff trail from Rich Kuehn's house, we could hear the agitated cries of many birds, but visibility to the south was not as good as that provided by a cloudbank at the horizon line extending just above the top of the island from my POV. A bright quarter moon hung above this cloud bank.
We stood with backs to the fireworks to best observe effects on the island's rookery and nearby coastal area, not knowing what to expect--if anything. We were amazed and troubled by how immediate and extensive the response was. The louder, brighter rockets continued, and the cloud of birds increased in numbers and rose higher; it was joined from the south end of the island by larger birds, which from their size and dark outline against the grey cloud behind, I took to be pelicans. We saw a third type of bird, possibly a guillimot, but it whizzed low by the SE shore of the island, and the visibility there was poor.
The louder, higher, brighter bursts came in more rapid succession and the the entire east slope of the island, hundreds of feet long and perhaps comprising a 100 feet of sloping land from water to ridgeline, was repeatedly illuminated by flashes of light from the exploding fireworks less than a mile distant.
In the air above the island, one could see an agitated cloud of many birds, which from the bluff trail looked like a cloud of flies buzzing above a carcass. The louder bursts reverberated and echoed off the east slope of the Island. In between rocket bursts and echoes, one could hear the increasingly agitated cacophony of hundreds of birds.
When the barrage finally stopped, we walked very slowly back to where we were parked near Rich's house, pausing to listen. It was too dark to see

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much by then, but from the sounds and directions of the continuing bird cries, some birds were still flying about between the island and the coastal point to the south. When we reached the car, cries from the island and the shore area could still be heard.
Surely these stressed birds with their sleep disrupted will not be as effective hunter for themselves and their young today, though their survival depends on finding food and catching food.
As those with me can attest, I kept my eyes on the island and not on the fireworks, except to glance in the direction of Gualala from time to time to see how high they were reaching in the sky over the estuary before exploding.
Saturday night, I attended the fireworks at Point Arena. There I saw at least 3 rockets actually enter the water of the cove, one of which exploded in glowing fragments after entering the surface of the water.
I wonder if any of the fireworks shot from Gualala, whether "duds" or actual explosions, entered the water of the Gualala Estuary? I couldn't see the river from where I was watching the CCNM's Gualala Point Island. I urge any observations be sent to Marge Anthony and Rich Kuehn.
sadly yours
Linda Keir

------- Forwarded message follows -------
From: marganth@mcn.org
To: news@mendonoma.com
Date sent: Mon, 03 Jul 2006 13:03:26 -0700
Subject: Sightingss - as of the seabirds of Gualala Point Island rookery during Sunday fireworks
Dear Editor
Several of us walked to the bluff next to Gualala Point Island rookery Sun. eve to monitor the fireworks' effect on rookery residents, not knowing WHAT to expect -IF anything. We were amazed and troubled by how immediate and extensive the effect was.
Alarm cries from the seabirds began right after the first few small flashes and booms and increased in number, volume and pitch with subsequent displays.
A large cloud of birds flew off the rookery, increasing in numbers and height with each explosion.. That cloud was joined from the south end of the island by larger birds, which despite the dark, from their size, looked like pelicans.
As the louder, higher, brighter bursts came in more rapid succession the entire east slope of the island, hundreds of feet long and perhaps 100 feet high, was repeatedly illuminated by flashes of light from the exploding fireworks less than a mile distant.
The louder bursts REVERBERATED and echoed back off the east slope of the Island.to us on shore.
In between rocket bursts and echoes, one could hear the increasing cacophony of what sounded like hundreds of birds
When the barrage finally stopped. and we walked back to the car , we could tell by the sounds and directions of the

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continuing bird cries, that some disoriented birds were STILL FLYING ABOUT between the island and the shore to the south
These exhausted birds, with their sleep disrupted, are not as effective hunters next day for themselves and their young as would otherwise be the case.
Their very survival depends on finding enough food daily, despite the second poor fishing year in a row for seabirds
There are wildlife consequences, folks, beyond the transient human thrill .
One just needs to have an open mind and find the right places to observe such.
marge anthony-
Sea Rancher and respecter of wildlife sanctuaries, such as our SHARED Wild/Scenic Estuary, County Park and CCNM.

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Appendix 2:

MEMORANDUM OF UNDERSTANDING
BETWEEN
THE SEA RANCH ASSOCIATION
AND THE
BUREAU OF LAND MANAGEMENT
REGARDING THE
CALIFORNIA COASTAL NATIONAL MONUMENT

PARTIES AND PURPOSE

This Memorandum of Understanding (MOU) is entered into by and between **The Sea Ranch Association** and the United States Department of the Interior's **Bureau of Land Management** (hereinafter referred to as the "**BLM**") to establish an agreement whereby The Sea Ranch Association will serve as a steward for a portion of the **California Coastal National Monument (CCNM)** offshore of The Sea Ranch properties in Sonoma County, California.

INTRODUCTION

A. BLM & the California Coastal National Monument. By Presidential Proclamation on January 11, 2000, all unappropriated or unreserved lands and interest in lands owned or controlled by the United States in the form of islands, rocks, and pinnacles above mean high tide within 12 nautical miles of the shoreline of the State of California were designated as the CCNM. The CCNM was nationally recognized in the Presidential Proclamation as a biological and geological treasure, rich in biodiversity, and providing essential habitat for many species of scientific interest. The CCNM designation mandates the protection of historic and scientific objects, particularly wildlife species which normally inhabit the CCNM area, and limits management discretion that the Federal managers otherwise have. The Secretary of the Interior manages the CCNM through the BLM and under the BLM's existing authorities, subject to the overriding purpose of protecting the resources described in the Presidential Proclamation, The BLM is directed by Congress to administer the public lands so that all various land and resource uses and values are managed in combinations that will best meet the needs of the American people.

B. Core-Managing Partners. BLM, the California Department of Fish and Game (CDFG), and the California Department of Parks and Recreation (CDPR) serve as the "Core-Managing Partners" of the CCNM. Through an interim MOU signed in the spring of 2000, BLM extended its partnership with CDFG and added CDPR, the State agency that administers more than 25% of the California coast.

Collectively, BLM, CDFG, arid CDPR are responsible for the oversight of the entire CCNM.

C. Stewardship. With a national monument as extensive and connected to so many varied jurisdictions as the CCNM, the opportunities for partnerships are not only enormous, but also necessary. The BLM is committed to continuing existing partnerships and establishing new ones

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in order to effectively administer the CCNM. Consistent with appropriate authorities, stewardship agreements will be developed with select entities with management interests and capabilities along the coast. "CCNM Stewards" will work in partnership with BLM to help in the management of a specific portion of the CCNM (**See Attachment A, CCNM Stewardship Program Fact Sheet**).

D. The Sea Ranch Association. The Sea Ranch Association, a non-profit corporation of property owners, was established in 1965 to serve as stewards for the conservation and enhancement of the environment and to administer The Sea Ranch affairs. The Sea Ranch Association is interested in serving as a "CCNM Steward" for the long-term protection and management of the portion of the CCNM adjacent to The Sea Ranch properties (See Attachment B, Map of The Sea Ranch Association Stewardship Area of the CCNM).

Ill. AUTHORITIES

A. BLM Authority. The Federal Land Policy and Management Act of 1976, Section 307(b) provides that the Secretary of the Interior may undertake programs of resource management through cooperative agreements.

B. The Sea Ranch Association Authority. The Sea Ranch Association is a private non-profit Internal Revenue Code Section 501(c)(4) organization (Federal Taxpayer identification Number 94-1 670171) and as such, is authorized to enter into cooperative agreements with other entitles to further the concerns of the organization.

IV. PRINCIPLES OF STEWARDSHIP AGREEMENT

A. The Sea Ranch Association Agrees To:

1. Serve as a CCNM Steward and work closely with The Core-Managing Partners of CCNM and other CCNM partners, as appropriate, to assist with the protection, monitoring, and oversight (i.e. watchful care) of the portion *of* the CCNM and is various resources and resource values within The Sea Ranch Association Stewardship Area (hereinafter referred to as the Stewardship Area) (See Attachment B).

2. Designate a contact person to serve as The Sea Ranch Association liaison with the CCNM.

3. Cooperate with the BLM on the protection, monitoring, and oversight needs for the CCNM in the Stewardship Area consistent with The Sea Ranch Association's authorities and capabilities.

4. Work with the BLM to develop community involvement regarding the awareness of the CCNM and The Sea Ranch Association's role in protection, monitoring, and oversight of the CCNM's physical, biological, and cultural resources and resource values within the Stewardship Area.

5. Alert BLM to known and potential problems related to activities on the CCNM within the Stewardship Area.

6 Implement The Sea Ranch Association activities to avoid or minimize impacts to the CCNM

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7. Report to BLM on a quarterly basis, or more frequently, on any activity or action related to the CCNM.

B. The BLM Agrees To:

1. Respect any existing rights of The Sea Ranch Association and The Sea Ranch property owners to the use of or access to the CCNM and surrounding coastal waters.

2. Provide The Sea Ranch Association with a local contact for Items and actions related to the CCNM and provide guidance regarding the role of a CCNM Steward (See Attachment A).

3. Keep The Sea Ranch Association informed aid updated on matters related to the CCNM.

4. Identify potential funding opportunities for The Sea Ranch Association that might relate to the various aspects *of* the Implementation of this MOU.

B. The Sea Ranch Association and the BLM Mutually Agree To:

1. Seek opportunities to coordinate, share, and/or combine resources and data to carry out protection, monitoring, and oversight initiatives associated unique coastal habitats and resource values associated with this Stewardship Area of the CCNM.

2. Work together to ensure consistency and coordination in the protection, monitoring, and oversight of the CCNM.

V. OTHER PROVISIONS

A. Limits of Authority and Funding

1. Nothing in this MOU shall be construed as limiting or affecting in any way the authority or legal responsibility of the Parties.

2. Nothing in this MOU binds the Parties to perform beyond their respective authorities.

3. Nothing in this MOU requires the Parties to assume or expend any funds in excess of available appropriations.

4. The mission requirements, funding, personnel, and other priorities of either Party may affect that Party's ability to fully implement all the provisions identified in this MOU.

5. This MOU is neither a fiscal nor a funds obligation document. Specific activities that involve the transfer of money, services, or property between the Parties shall require execution of separate agreement or contract.

6. Nothing in this MOU restricts the Parties from participating in similar act or arrangements with other public or private agencies, organizations, or individuals.

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7. BLM retains the sole decision-making authority for public lands and resources it administers.

B. Amendment of Agreement. Amendments or supplements to this MOU may be proposed by either Party and shall become effective upon written approval of both Parties.

C. Dispute Resolution. The Parties shall attempt to resolve controversies through alternative dispute resolution methods that are mutually acceptable to both Parties. Methods may include, but are not limited to fact-finding, mediation, and non-binding arbitration.

D. Termination of Agreement. Either Party may terminate its participation in this MOU at any time through written notification to the other Party at least 90 days prior to termination.

E. Effective Date of Agreement. This MOU shall become effective upon signature by both Parties. This MOU may be executed in one or more counterparts, each of which will be considered an original document.

VI. APPROVALS

The Parties Hereto have executed this agreement as of the last date shown below.

S/ Mike Pool 1/31/06
Mike Pool Date -
State Director
Bureau of Land Management

S/ John R Fox 1/12/06
John R. Fox Date -

Community Manager
The Sea Ranch Association

2 ATTACHMENTS:
Attachment A - CCNM Stewardship Program Fact Sheet
Attachment B - Map of The Sea Ranch Association Stewardship Area of the CCNM

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Attachment A

CALIFORNA COASTAL NATIONAL MONUMENT STEWARDSHIP PROGRAM

FACT SHEET

PURPOSE:

To establish a series of California Coastal National Monument (CCNM) "Stewards" to work with the US, Department of the Interior's Bureau of Land Management (BLM), California Department of Fish and Game (CDFG), California Department of Parks and Recreation (CDPR), and other CCNM partners for long-tern, protection and management of CCNM and its various resources and resource values.

GOALS & OBJECTIVES:

- Increase protection arid monitoring of the CCNM.

- Involve adjacent landowners and/or resource managers of properties with various coastal and marine protection programs, initiatives, and/or interests associated with portions of the CCNM in the integrated, long-term management of the CCNM.

- Increase the knowledge and understanding of the various resources and resource values of the CCNM.

- Enhance the cooperative management of fragile ecosystems of California's coastline.

BACKGROUND & ORGANIZATION:

- CCNM was established by Presidential Proclamation of January 11, 2000, and BLM, under the Secretary of the Interior, was directed to provide long-term management.

- Through a memorandum of understanding (MOU), signed in the Summer of 2000, CDFG and CDPR were brought in as managing partners to assist BLM, who retains the ultimate legal responsibility for the CCNM, in "… preserving the [CCNM's] objects of historic and scientific interest, …mapping and understanding resources within the Monument, [and] …working with the public to explain the values of the Monument."

- In order to effectively deal with the wide array of partnership opportunities associated with the CCNM, three basic categories have been developed:

- Core-Managing Partner - Each of the three "core" agencies- -BLM, CDFG, and CDPR- -responsible for collaborating in the overall management of the entire CCNJM.

- Collaborative Partner - An organization, governmental or private, that is interested in collaborating with the core-managing partners in any of a variety of programs, actions, and management elements associated with the long-term management of the CCNM.

- Steward - A select entity with ownership and management responsibility for a portion of the coast that adjoins part of the CCNM and that is interested in serving as the "steward" for that portion of CCNM.

- Stewards will work with BLM and other partners to help in the management of their specific portion of the CCNM, a portion that is offshore of the Steward's onshore property.

METHODS:

- BLM will invite other governmental, tribal, or private organizations that own coastal lands and manage programs that provide for the protection and long-term management of portions of the California coast adjacent to parts of the

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CCNM, to be “Stewards” for that portion of the CCNM.

- A stewardship agreement will be developed with each approved Steward and each agreement will identify the specific portion of the CCNM for which the Steward will assist In the long-tern management, as well as outline the expected role and responsibilities in working with the BLM and its various CCNM partners.

- The Steward will serve as the local CCNM representative for the assigned portion of the CCNM by:

- Designating a contact person to serve as the CCNM liaison.

- Providing local contact point for items and actions related to the CCNM.

- Alerting BLM to known and potential problems.

- Identifying specific management needs, including protection, monitoring, and research.

- Integrating the management of its portion of the CCNM with its other resource management responsibilities.

- Reporting to BLM on a quarterly basis on any activity or action related to the CCNM.

- BLM will provide the Stewards with guidance and direction regarding the role of a CCNM Steward and keep the Stewards updated on the evolving protection and management needs and requirements related to the CCNM.

INTENDED OUTCOMES & BENEFITS:

- Increased monitoring and protection of the CCNM.

- Greater involvement of partners in the long-term management of the CCNM.

- Increased awareness arid knowledge of the specific resources and resource values of the CCNM.

- Regular reports on the condition of the CCNM resources and on the activities in and around the CCNM.

- Identification of actions needed related to enhance the long-term management of the CCNM.

- More effective use of limited funding and capabilities.

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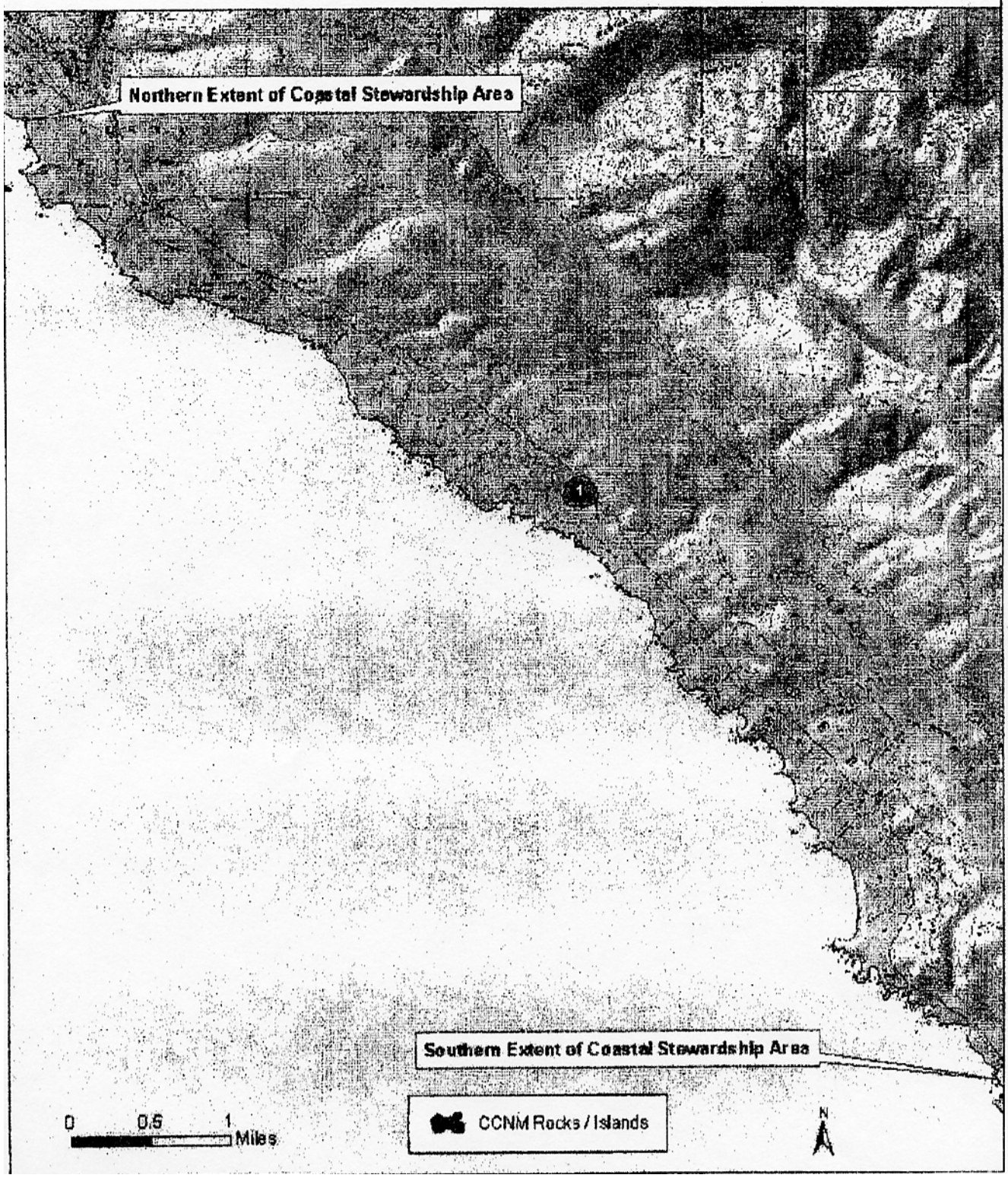
Attachment B

The Sea Ranch Association
Stewardship Area
of the
California Coastal National Monument



Appendix 3: Roster of Volunteers

The following volunteers participated in the monitoring effort:

Tom and Ginger Alexander
George Anderson
Marge Anthony
Sue Bechtel
Betty Burridge
George and Sandra Bush
Pauline Dakin
Jamie Edwards
Steve and Jeanne Gadol
Mel Gerst
Julie Gibson
Barbara Gomes
Dorothy Gregor
Diane and Bryant Hichwa
Ken Holmes
Mary Hunter
Linda Keir
Lee Kosso
Rich Kuehn
Mike Lane
Elaine Mahaffey
George and Michele Marshall
Bonnie Plakos
Rozanne Rapozo
Jerry Rench
Connie and Rich Schimbor
Phyllis Schmitt
Dean Schuler
Grace Steurer
Jim Tackett
Rita Peck and Craig Tooley
Julie Verran

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Appendix 4:

Refer to the accompanying EXCEL file labeled: Seabird and Mammal Data Sheets.xls

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