

BEACHED SEABIRD AND MARINE MAMMAL CARCASS MONITORING 2010 Annual Report



January 2011

Title page photographs, clockwise from top left: great blue heron entangled in fish net on Mussel Beach – September 2010; subadult green sturgeon on south Gold Bluffs Beach – June 2010; surf scoter on north Gold Bluffs Beach – July 2010; harbor porpoise on north Gold Bluffs Beach – June 2010.

INTRODUCTION

Beached carcass monitoring surveys are conducted to ascertain baseline information about seabird and marine mammal mortality that occurs along portions of the Redwood National and State Parks (RNSP) coastline. The main objectives are to gather trend data on mortalities and determine whether the mortalities resulted from natural or anthropogenic events. Documenting natural mortalities can help biologists monitor events such as the expected deaths of post-fledging and adult breeding seabirds, fatal injuries from predation and other natural hazards and diseases in a population. Also, population effects of natural climatic events (e.g. El Nino) can be monitored more effectively.

The north coast of California receives traffic from container vessels and tug pulled barges carrying petroleum products, and while these ships are not visible from the coastline, they are a constant presence. Consequently, the cumulative impact of any small, unpublicized leaks, spills or accidents could contribute directly to seabird and marine mammal mortality along the RNSP coastline. The presence of petroleum products on carcasses can provide information on “background” levels of these contaminants in the marine environment. In addition, baseline data on the presence (or absence) of petroleum products on wildlife can be valuable for comparison when a large scale spill does occur. Entanglement in fishing gear and human trash, such as plastic bags and six-pack rings, has been documented as a cause of death for some marine fauna, and is also monitored for frequency of occurrence within RNSP.

METHODS

The first surveys to monitor seabird and marine mammal mortalities were performed by RNSP staff during 1997. These surveys continued during 1998 and 1999, with 2 surveys typically performed in the winter (January and December) and three surveys performed in the summer (May, June, July). These surveys were typically done in conjunction with ongoing western snowy plover (*Charadrius alexandrinus nivosus*) surveys, since they took place in the same locations. Surveyors would walk one direction in the back-beach dune areas surveying for snowy plovers, and then return along the rack line of the beach looking for any marine mammal or seabird carcasses.

Beginning in 2000, the beached marine mammal and seabird carcass surveys were expanded in an attempt to include all months of the year. Winter surveys (Jan.-Feb. and Nov.-Dec. of the same calendar year) were typically only conducted on Gold Bluffs Beach (north and south sections) and Freshwater Spit, whereas surveys from March-October were conducted on all the beach stretches during all years. Since 2005, regular winter surveys have been occasionally cancelled due to the low presence and persistence of carcasses and staff safety concerns (e.g. dangerous surf). There are currently six beach stretches surveyed within RNSP for carcasses, from south to north they are: Freshwater Spit, Mussel Beach, Gold Bluffs Beach (divided into 3

sections), and Crescent Beach (for maps, see Holm 2008 – Appendix A). The total distance of the six beaches is 25.8 km. Beach stretches were surveyed in accordance with the RNSP beached carcass survey protocol (see Holm 2008 - Appendix B), and all data was collected on beached carcass data sheets (see Holm 2008 - Appendix C) and entered into the RNSP Fish and Wildlife Branch carcass database.

In 2002 and 2003 all bird carcasses found along surveyed beaches were individually tagged and numbered. Approximately 40% of the bird carcasses were re-sighted on subsequent carcass surveys (Holm 2003). Thus, approximately 60%, on average, of the bird carcasses found were new. A 60% raw bird carcass count correction factor is used throughout this report in conjunction with the actual raw counts.

Most of the marine mammal carcasses recorded are detected during regular beached carcass surveys on the six index beach stretches. Some marine mammal carcass records, however, are from incidental sightings of beached carcasses from non survey beach stretches. The information presented for marine mammals is therefore representative of the entire RNSP coastline. All marine mammal counts are actual numbers. Marine mammal carcass locations are noted when first recorded and not counted during subsequent surveys or incidental reports.

RESULTS

Survey Effort

All Redwood National and State Parks beaches were surveyed once per month during March through October 2010. Gold Bluffs Beach and Freshwater Spit were surveyed once in November and December 2010 (winter months) but were not surveyed in January or February due to weather constraints. Surveyors spent a total of 244 person hours looking for beached carcasses (Fig. 1). Surveyors covered 25.8 km of beach each month during non-winter months. A total of 14.2 km of beach was surveyed each month during the winter.

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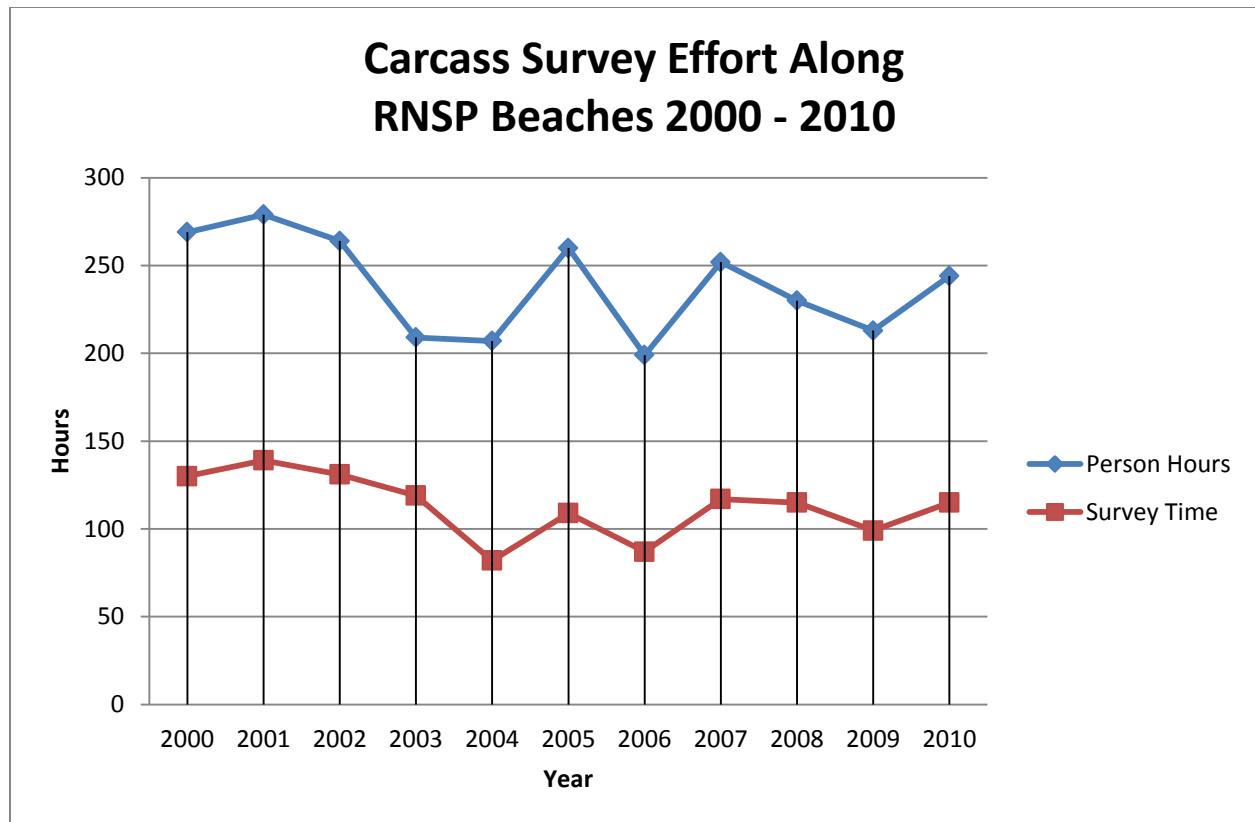


Figure 1. Beached carcass survey effort along RNSP beaches from 2000 - 2009.

Bird Carcasses

2010 Non-winter Surveys (March – October)

There were 284 bird carcasses (raw count) recorded from March to October in 2010. The total raw number of carcasses recorded was much lower than the average recorded from 2000 to 2010 (mean = 694, SD = 245) (Fig. 2). Seventy percent of the 2010 carcasses were detected during the peak months of July – October, similar to the pattern seen in 2008 and 2009, but the peak was much flatter this year and there was a noticeable increase in carcasses in December (Fig. 3). Seventy-one percent of all carcasses were detected on the three Gold Bluffs Beach stretches, while 9% were found on Crescent Beach, 10% on Mussel Beach and 10% on Freshwater Spit.

2010 Winter Surveys (November – December)

Surveys were not conducted on north and south Gold Bluffs Beach during January and February of 2010. North and south Gold Bluffs Beach and Freshwater Spit were all surveyed during November and December. There were 42 bird carcasses found. Only “fresh and fresh - scavenged” carcasses were counted so as not to double count carcasses from October and earlier.

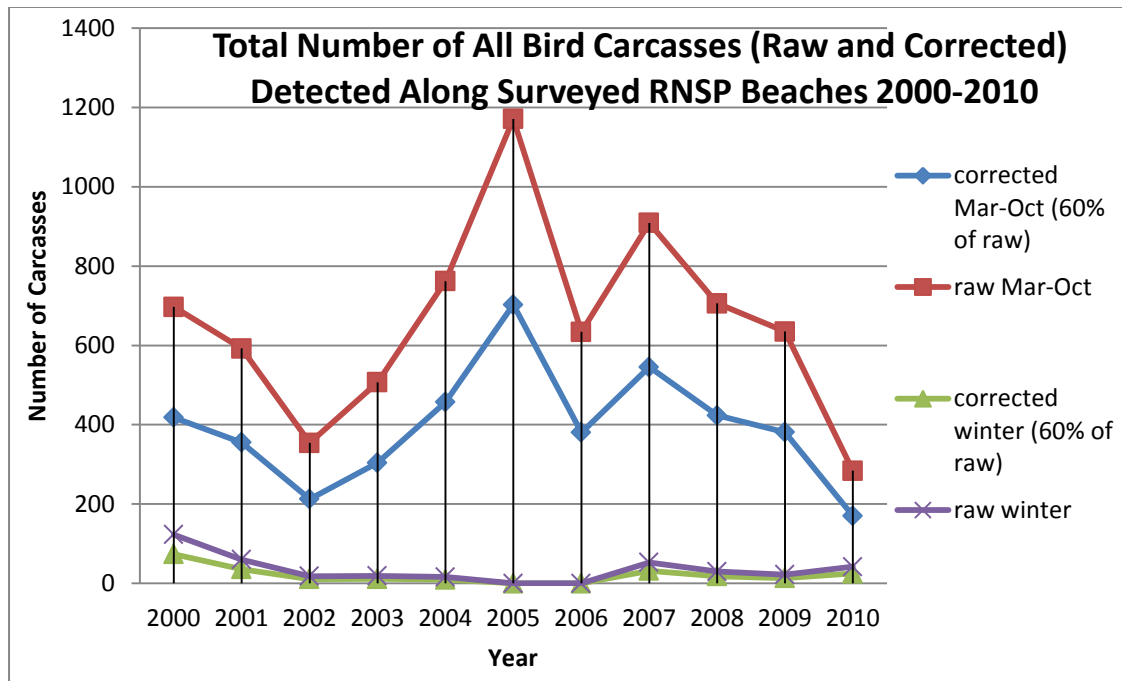


Figure 2. Total number of bird carcasses detected (raw and corrected) along surveyed RNSP beaches, winter and March through October 2000-2010.

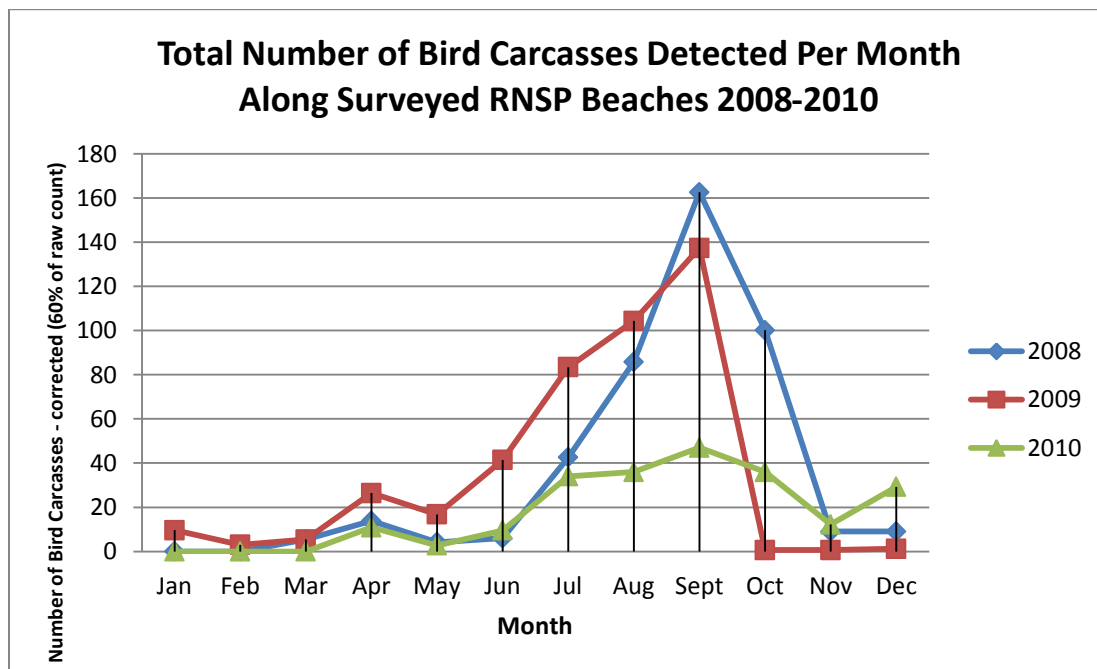


Figure 3. Total number of bird carcasses detected (corrected – 60% of raw count) per month along surveyed RNSP beaches in 2008 - 2010.

Bird Species Detected

Unlike all previous years, by far the most common species or species group detected were gulls. In all previous years, the most commonly detected bird species was common murre (*Uria aalge*), which came in third (Figure 4). The second most common group of bird carcasses found were unknown species and the fourth most common species found were grebes. The rest of the carcasses found were spread over a wide variety other species or groups (Table 1).

Table 1. Raw and corrected (60% of raw) number of bird carcasses by species or group found along RNSP survey beaches in 2010.

Species or Group	Raw #	Corrected #	Species or Group	Raw #	Corrected #
Gull (unk species)	118	71	Common raven	2	1
Unknown species	53	32	Glaucous winged gull	2	1
Common murre	36	22	Heerman's gull	2	1
Grebe (unk species)	21	13	Common merganser	1	1
Cormorant (unk species)	16	10	Double crested cormorant	1	1
Western gull	12	8	Great blue heron	1	1
Northern fulmar	7	5	Greater white fronted goose	1	1
Surf scoter	6	4	Laysan albatross	1	1
Brown pelican	5	4	Pacific loon	1	1
Green wing teal	4	3	Petrel (unk species)	1	1
Western grebe	4	2	Red throated loon	1	1
Loon (unk species)	3	2	Sooty shearwater	1	1
Shearwater (unk species)	3	2	Turkey vulture	1	1
Pigeon guillemot	3	2			

Over the last eleven years, the three most commonly detected species (common murre) or groups of species (gulls and cormorants) have roughly tracked each other up until this year. Common murre carcasses were detected at by far the lowest rate since regularized surveys began (Fig. 4). Common murres were far below the eleven year average in 2010 for the corrected (60% of raw) number of carcasses detected per kilometer of surveyed beach (2010 = 0.84; 2000 – 2010 mean = 8.47, SD = 4.91). Gulls were slightly below the eleven year average (2010 = 3.07; 2000 – 2010 mean = 3.94, SD = 1.32) while cormorants were below the eleven year average (2010 = 0.40; 2000 - 2010 mean = 0.86, SD = 0.67). The large number of unknown species most likely was distributed across many taxonomic groups because comments made about the unidentifiable carcasses indicated field marks of the the Alcidae, Procellariidae and Laridae families as well as other groups.

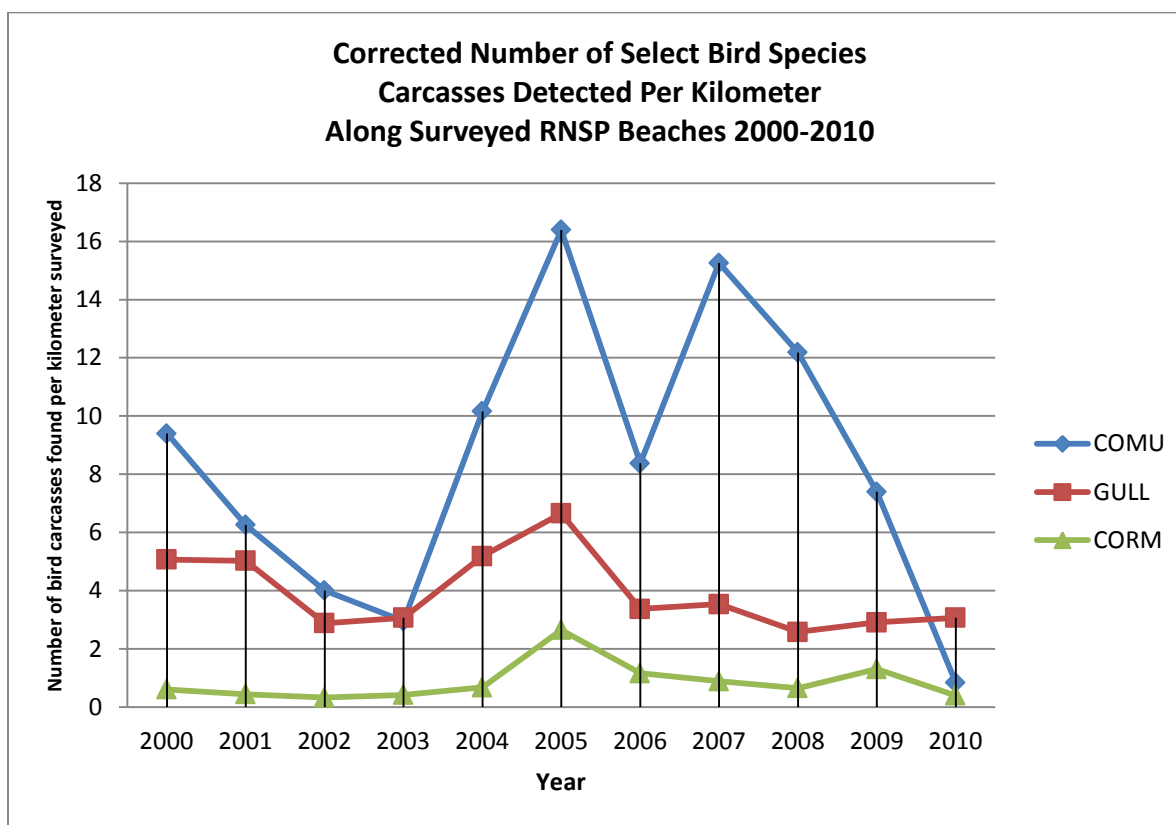


Figure 4. Corrected (60% of raw) number of common murre, gull and cormorant carcasses detected per kilometer of surveyed RNSP beaches from 2000 to 2010. COMU = common murre, GULL = all gull species, CORM = all cormorant species.

Marine Mammal Carcasses

The carcasses of 22 California sea lions (*Zalophus californianus*), one harbor seal (*Phoca vitulina*), two harbor porpoise (*Phocoena phocoena*) and one sub adult (approximately eight meters long) gray whale (*Eschrichtius robustus*) were recorded on the RNSP coastline during

2010. This was the second highest number of California sea lion carcasses detected, and higher than all previous years but 2009, while all other marine mammal species were below typical numbers found in previous years (Fig. 5). Like last year, many of the California sea lions appeared to have suffered from starvation as evidenced by slim profiles, slack skin and protuberant hip bones, but their ultimate cause of death was deemed as undermined. Three apparently “sick” or “weak”, but alive, subadult California sea lions were also reported on RNSP beaches this past year, again, similar to 2009. All of the other marine mammals were categorized as undetermined deaths. Marine mammal carcasses were found along all RNSP beaches.

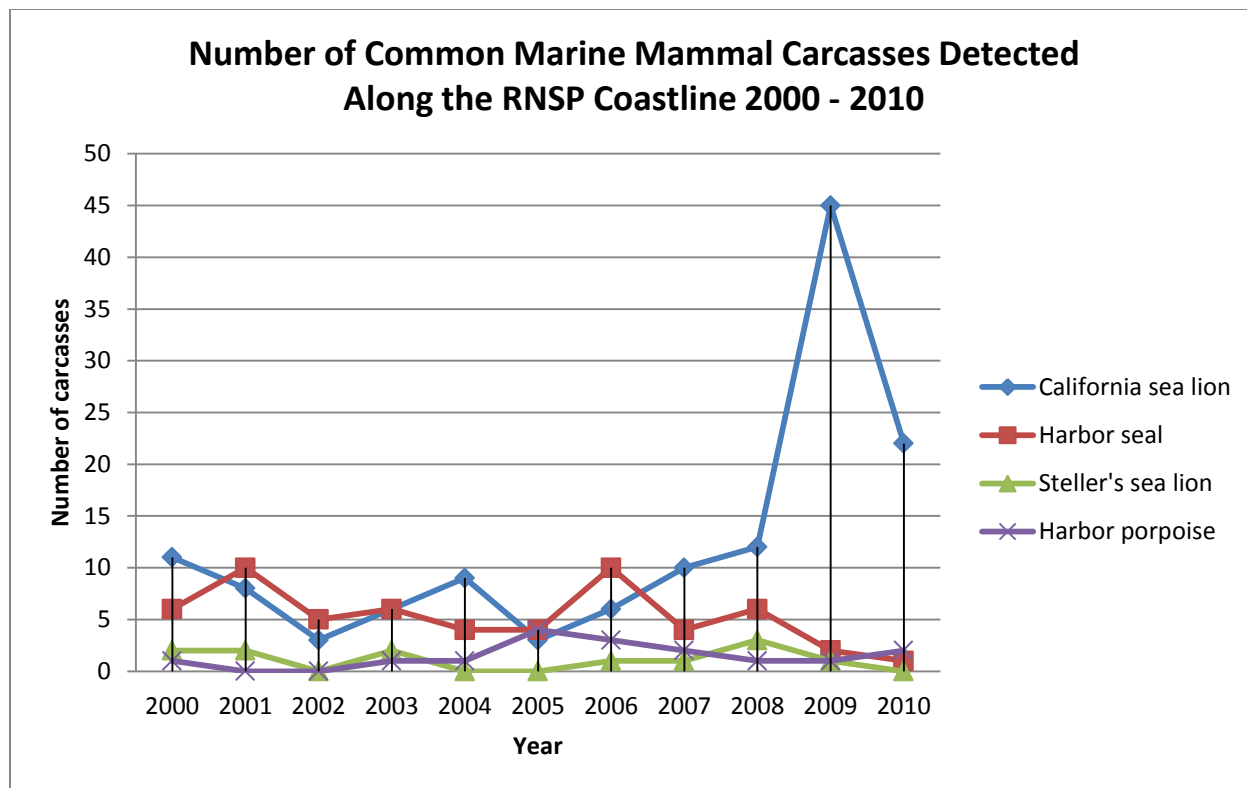


Figure 5. Number of common marine mammal carcasses recorded along the entire RNSP coastline from 2000 – 2010.

DISCUSSION AND RECOMMENDATIONS

The most significant event of 2010 was the unprecedented low number of common murre carcasses recorded this year. Only a tenth of the average number of murre carcasses found in the last eleven years was detected this year (Figure 4). In all other years, common murre were the most commonly detected carcass species. The normally high number of common murre found on RNSP beaches are a reflection of the large number of murre that breed within RNSP and immediately adjacent to it. Four of the five largest common murre breeding colonies in California occur between Trinidad and Crescent City and they represent over 60% of all the

breeding common murres in the state (Sowls et al. 1980). RNSP beaches are located directly between these two points. Approximately 250,000 murres breed at these four colonies (Capitolo et al. 2006). The small number of carcasses found could represent two events. First, there could have been extremely low numbers of breeding murres in 2010 which in turn would result in very low numbers of juveniles being produced and thus few dead young and adults washing up on RNSP beaches. This supposition is countermanded by the normal numbers of breeding common murres and their young observed in 2010 on False Klamath Cove Rock (RNSP unpub. data) which is located between survey beaches and where approximately 30,000 murres nest (Capitolo et al. 2006). Second, the low numbers could represent very high survivorship among the juvenile/subadult and adult murres that forage off of RNSP beaches. This supposition is supported by R. Golightly and team's observation (pers. comm.) of very high murre fledging success (97%) recorded in 2010 from a remote camera monitoring murre nesting on Castle Rock National Wildlife Refuge (the largest murre colony in California located approximately five miles north of RNSP). As demonstrated and discussed in previous years and seen starkly in 2010, the inter-annual variation in beached murre carcass numbers may be a reflection of the variation in breeding success of the nearby colonies. The 2005 spike in beached murre carcasses followed an extremely productive 2004 local murre colony breeding season. The four largest murre colonies all experienced large increases with Castle Rock increasing 36% over the previous nine year average, False Klamath Cove Rock (located within RNSP) increasing 8%, Green Rock increasing 24% and Flatiron Rock increasing 29% (Capitolo et al. 2006). Many of the subsequently increased population of returning adults in 2005 may have bred and then possibly overwhelmed local food resources, resulting in the larger die off seen in late summer and early fall of 2005 (Fig. 4). As stated, this past year saw an unprecedented drop in murre carcasses, possibly indicating a year very high juvenile survivorship. Next year's murre carcass deposition rate may be high, if the previous trend was indicative of post productive year mortality. There are also a large number of different gull species that reside or migrate along RNSP beaches as well as very large cormorant breeding colonies. Carcass deposition for both of these species groups was approximately average when compared to the previous ten years. The location of RNSP in this seabird breeding "hotspot" argues for continued beached carcass monitoring. If seabird carcass numbers continue to track breeding colony variation through the years, then carcass surveys may become an additional indirect method for monitoring regional seabird mortality, productivity *and* possibly survivorship.

The second significant event in 2010 was the large number of California sea lion carcasses again recorded along the RNSP coastline as compared to numbers seen in all years previous to 2009 (Figure 5). Last year's California sea lion carcass numbers in RNSP were extremely high and matched a large region wide die off that was thought to be caused by a combination of climatic changes and a large increase in the California sea lion population (see discussion Bensen 2009). The causes of this past year's elevated die off are not known nor were any significant events reported regionally. The overall increase in the California sea lion population may mean that elevated carcass deposition rates will become more common than in previous years simply because there are more sea lions in the local area that may die.

Mortality based on man-made events should be quite evident, immediate and causative. It appears that human caused mortality along RNSP beaches has been quite minor since surveys were expanded in 2000. Spacing surveys by approximately 4 weeks likely allows managers to

detect such trends, yet probably helps reduce double counting of carcasses to some extent. Because human caused mortality and other non-lethal impacts can occur at any time during the year, surveys for beached carcasses need to be conducted at regular intervals throughout the portion of the year that the species are present off of the RNSP coastline. Short-term trends in natural mortality are probably insignificant, and only after many years of data collection will any natural patterns become evident. The RNSP beached carcass dataset is becoming more and more valuable the longer that the information is systematically collected. Therefore, repeated surveys along the park beaches should continue.

Next year will be the twelfth year of consistent beached carcass surveys. RNSP's decade plus worth of results should be compared with beached carcass occurrences in other portions of the Pacific coast. Beached carcass data is currently being collected in other areas of Humboldt and Del Norte counties outside of RNSP and on much of the coasts of Oregon and Washington by the Coastal Observation and Seabird Survey Team (COASST) and along Marin county beaches by groups working with the Gulf of the Farallons National Marine Sanctuary. These organizations should be good sources of comparative data if standardized results can be obtained in a timely manner.

REPORT PREPARER

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