

Beached Bird Survey at Puale Bay, Alaska Peninsula/Becharof NWR, Alaska 2010

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Introduction

In 1989, an oil tanker ran aground in Prince William Sound, Alaska. The spill resulting from this accident, known as the Exxon-Valdez Oil Spill (EVOS), released 43.9 million liters of crude oil into the Gulf of Alaska (Piatt and Anderson 1996). This spill was spread by wind and current from Prince William Sound to the southwest, contaminating a distance of approximately 750 km (Piatt et al. 1990). The common murre (*Uria aalge*) was the most affected seabird of the spill. Over 100,000 oiled carcasses washed onto the beaches of Puale Bay alone (Nysewander and Dippel 1990, unpubl; Piatt et al. 1990). Due to the natural history of the murre, living mostly in open seas but nesting along cliffs, accurate population estimates are limited (Piatt and Anderson 1996). Productivity and population studies were quickly established so that data on the colonies could be documented more efficiently. Additionally, a beached bird survey consisting of six different transects, within Puale Bay, was established in 1989 along with the murre productivity and population study as a result of EVOS (Dewhurst et al. 1990). Now that the seabird colonies show similar reproductive parameters to un-oiled colonies, the project's objectives have evolved to focus on the natural mortality within Puale Bay (Kaler et al. 2003, unpubl).

Beached bird surveys in general have been used as tools to establish baseline data on the mortality of seabirds and the overall health of ecosystems, especially in regards to human causes like oiling and entanglement (Harris et al. 2006, Seys et al. 2002, Camphuysen and Haubeck 2001). The most straightforward way of estimating mortality as a result of EVOS was by extrapolating information based on the number of carcasses that were stranded on the beaches according to ocean currents and drifting (Piatt and Anderson 1996). As a result, the beached bird survey was added as a supplemental project to the seabird colony monitoring to document normal mortality (Dewhurst et al. 1990).

Study Area

Puale Bay is located on the southeast coast of the Alaska Peninsula, along Shelikof Strait. The bay is adjacent to the Alaska Peninsula/Becharof National Wildlife Refuge (Refuge) and the Becharof Wilderness. The first transect was 3.61 km long and the second was 1.29 km long (Figure 1). Beaches were mostly covered in sand, with some bedrock and boulders toward the end of the second transect. Typical vegetation seen along the surf line and lower wrack line were bullwhip kelp (*Nereocystis luetkeana*), *Fucus sp.*, and ribbon kelp (*Alaria marginata*). Seabeach sandwort (*Honckenya peploides*) and beach rye grass (*Elymus arenaris mollis*) were commonly seen at the higher wrack lines amongst the deposits of driftwood. Many animals such as the glaucous-winged gull (*Larus glaucescens*), black-legged kittiwake (*Rissa tridactyla*), least sandpiper (*Calidris minutilla*), semipalmated plovers (*Charadrius semipalmatus*), brown bears (*Ursus arctos*), and red fox (*Vulpes vulpes*) were seen while surveying. Rainfall averaged 6.4 cm per month. Average temperature was 10.4° Celsius; wind speed averaged 12.1 mph from 13 June 2010 to 12 September 2010.

Methods

The surveys were conducted following methods from the previous field season in 2003. This year, however, the data was collected using the Coastal Observations And Seabird Survey Team (COASST; Parrish 2006) protocols. COASST, a large volunteer-based organization, surveys many beaches along the Northwest coast and in Alaska. Surveys were done along two transects, Section 1 and Section 2, located south of the mouth of Teresa Creek. GPS coordinates were taken for each end of section transects this year to provide more accurate relocation of survey start and end points for surveys in the future. In previous years, transects were established based on the location of the creeks, but the creek outlets have changed between years so as to make replication difficult without GPS coordinates. Surveys for Section 1 were completed approximately every two weeks, and every four weeks for Section 2. Each section was registered with the COASST program as a Beach (the survey unit).

The beach transects were surveyed systematically with distance between surveyors varying depending on number of surveyors, beach width (due to tidal level), and detection difficulty (due to

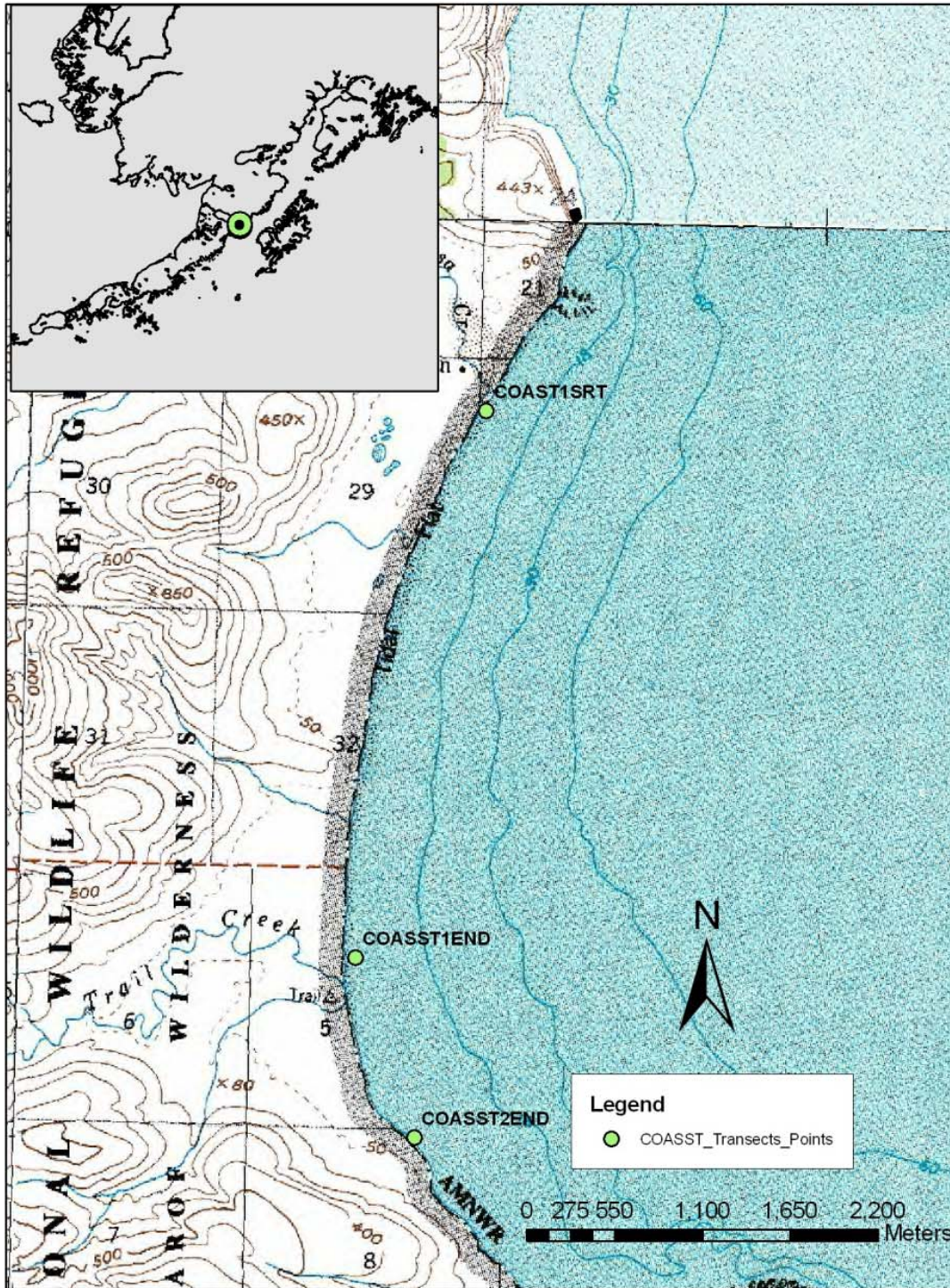


Figure 1. Start and end points for Section 1 and Section 2 COASST transects in Puale Bay, Alaska Peninsula/Becharof NWR, Alaska 2010.

debris). Number of surveyors ranged from four to six. We began surveying at low water on incoming tide and at the wrack on outgoing tides to increase the area of beach covered. Each person walked in a zigzag pattern over the area of beach in front of them with the team covering half of the beach transect at a time, and then turned around to walk the second half not yet searched. When a bird was found, everyone stopped to process the carcass together. This protocol improved data collection about each carcass since it standardized the measurement of the birds and included a better guide for identification (Parrish 2009), photo documentation, and marking. The marking allowed for identification of birds that remained or returned to the beach and were found during future surveys. This provided information about carcass persistence on the beach and the likelihood of carcass relocation. This can be used to better estimate death rate in the event of a major mortality event. Weather data was collected using an automated weather station and information was downloaded daily. USFWS (Marine Mammal Division) and NOAA protocols were available if a petroleum deposit or marine mammal carcass was found. All carcass and survey data was entered into the digital COASST database; the original data forms and a disk with photos was forwarded to their office in Seattle. Copies of forms were kept in a file in the seabird files of the Refuge office, and digital photos will be stored with other Puale Bay 2010 photos.

Results

Ten surveys were completed during the summer from mid June until September. The first transect was done seven times, the second three times. Typically the surveys were completed on days when seabird productivity surveying could not be done, so the weather conditions were usually rainy, foggy, and windy (Table 1). A total of twelve bird carcasses were found on Section 1, and only one bird was found on Section 2 (Table 2). Neither petroleum contamination nor bird entanglements were found during the surveys. Four black-legged kittiwakes (*R. tridactyla*) were discovered. One of these was a recapture from a previous survey. We also found two storm-petrels (*Oceanodroma sp.*), three murre species (*Uria sp.*), a marbled murrelet (*Brachyramphus marmoratus*), one cormorant species (*Phalacrocorax sp.*), and two unidentifiable carcasses. The marbled murrelet was the first carcass that was

Table 1. Weather parameters data during time of COASST surveys as downloaded from weather station, Puale Bay, Alaska Peninsula/Becharof NWR 2010.

Date	Start Time	End Time	Total Rain (cm)	Avg. Wind (mph)	Wind Dir.	Temperature (C)
19-Jun	9:30	12:30	0	1.5	SSE, ESE	8.4
29-Jun	9:35	13:30	0.1	3.6	ESE, WNW	9.2
9-Jul	9:10	11:15	0.1	27.0	ENE	10.2
25-Jul	10:40	15:00	0.1	12.8	SE, ESE	9.3
8-Aug	13:30	15:50	0	21.3	E	11.5
24-Aug	9:40	13:09	0	19.2	WNW, NW	13.2
4-Sep	9:30	12:40	0.1	13.5	E	11.3

Table 2. Summary of beach watch surveys conducted at Puale Bay, Becharof NWR, Alaska, June-September 2010.

Date	Time Start	Time End	Section	# of Observ	Species Found	Oil/Tar Balls	Weather
19-Jun	9:30	12:30	1	5	Storm-Petrel sp.	none	clouds, sun
29-Jun	*9:30	13:50	1	4	none	none	rain
29-Jun	11:00	12:50	2	4	none	none	rain
9-Jul	9:10	11:15	1	4	none	none	rain, wind
25-Jul	**10:40	15:00	1	4	murre sp., BLKI, Storm-Petrel sp.	none	rain
25-Jul	11:30	13:10	2	4	murre sp.	none	rain
8-Aug	13:30	15:50	1	4	4-BLKI (one refound), corm sp.,	none	rain
24-Aug	***9:40	13:09	1	4	none	none	sun, wind
24-Aug	10:45	12:15	2	4	none	none	sun, wind
4-Sep	9:30	12:40	1	6	MAMU, murre sp., unknown, passerine unknown	none	fog, rain
*surveyed section 1 from 9:30-11:00, 12:50-13:50							
**surveyed section 1 from 10:40-11:30, 13:10-15:00							
***surveyed section 1 9:40-10:45, 12:15-13:09							

Table 3. Summary of species found on beach watch conducted at Puale Bay, Becharof NWR, Alaska, June-September 2010.

ID number	Species	State of Deterioration
1	Storm-Petrel sp.	2 wings
100	Murre sp.	breast, wing
2	Murre sp.	1 wing
3	Black-legged Kittiwake	2 wings
4	Storm-Petrel sp.	2 wings
5	Black-legged Kittiwake	2 wings
6	Cormorant sp.	1 wing
7	Black-legged Kittiwake	2 wings
8	Black-legged Kittiwake	2 wings
9	Marbled Murrelet	fresh: eyes clear, feet pliable
10	Unknown species	2 wings
11	Passerine unknown	head, wing

fresh, based on the pliability of the feet and the clear eyes (Table 3). The other carcasses consisted only of pieces; usually the wings were found by themselves, much of the body having already been scavenged or decomposed. Further data recorded for each carcass can be found in Appendix 1. We also found a highly deteriorated caribou carcass and a whale skull, which belonged to a grey whale found beached in October 2009.

Conclusion

This year twelve bird carcasses were documented, an increase of eight carcasses over the previous high count (Kaler et al. 2003). A possible reason for this apparent increase in carcasses could be a result of the weather during the summer. There were many days with high winds, either washing more carcasses up from the water or else unburying birds previously covered up by the sand. Surveys were conducted with four to six people. With this number of people, transects were easy to search; and depending on beach width, only one pass was needed to fully search the exposed area. Deviation from normal survey was sometimes required due to fishing brown bears on or near the transect. In these cases

we either cut the transect short, if we were near the end, or else walked around above the wrack line, thereby giving the bear plenty of space. The use of the COASST protocol made processing the carcasses straightforward and thorough. It also allowed us to identify one carcass as a “recapture,” which was impossible under the previous protocols. The only problem we had was using the provided chalk and chalkboard in the weather. The chalk, if it worked, would quickly wash off the board, making pictures with the chalkboard almost impossible. Overall, the COASST surveys provide a thorough addition to the baseline data on mortality found on the beaches of Puale Bay and allow us to share the information with a national database.

Resources

- Camphuysen, C. J. and M. Haubeck. 2001. Marine oil pollution and beached bird surveys: the development of a sensitive monitoring instrument. *Environmental Pollution* 112: 443-461.
- Dewhurst, D. A, K.K. Hankins, and P. W. Opray. 1990. Exxon Valdez oil spill impact assessment on the Pacific Coast of the Alaska Peninsula and nearshore islands, Cape Kubugakli to American Bay, 26 April-13 August 1990. U.S. Fish and Wildlife Service, Administrative Report, King Salmon, AK (Unpubl.) 54pp.
- Harris, R. J., F. S. Tseng, M. A. Pokras, B. A. Suedmeyer, J. S. H. Bogart, R. L. Prescott, S. H. Newman. 2006. Beached bird surveys in Massachusetts: the Seabird Ecological Assessment Network (SEANET). *Marine Ornithology* 34: 115–122.
- Kaler, R, S. Savage, and A. Leppold. 2003. Populations and productivity of seabirds on the Pacific Coast of Becharof National Wildlife Refuge, Alaska Peninsula, Alaska Jun-September 2002. U.S. Fish and Wildlife Service, King Salmon, AK (Unpubl.). 61 pp.
- Nysewander, D and C. Dippel. 1990. Population surveys of seabird nesting colonies in Prince William Sound, the outside coast of the Kenai Peninsula, Barren Islands, and other nearby colonies, with emphasis on changes of numbers and reproduction of murre. Bird study number 3. U.S. Fish and Wildlife Service, King Salmon, AK (Unpubl.).48 pp.
- Parrish, J.K. (ed). 2006. COASST Protocol: A Guide for COASST Volunteers. University of Washington Creative Communications, Seattle, WA
- Parrish, Julia K. 2009. Beached Birds: A COASST Field Guide to Alaska. Waterfall Press, Seattle, Washington, USA.
- Piatt, J. F. and P. Anderson. 1996. Response of Common murre to the Exxon-Valdez Oil Spill and long-term changes in Gulf of Alaska marine ecosystem. *American Fisheries Society Symposium* 18: 720-737.
- Piatt, J.F., C. J. Lensink, W. Butler, M. Kendziorek, and D. R. Nyswander. 1990. Immediate impact of the 'Exxon Valdez' oil spill on marine birds. *The Auk*: 107: 387-397.

Seys, J., H. Offringa, J. Van Waeyenberge, P. Meire, E. Kuijken. 2002. An evaluation of beached bird monitoring approaches. *Marine Pollution Bulletin* 44 (2002) 322–333.

Appendix 1. Raw Data recorded for each carcass found during COASST Surveys June-September 2010, Puale Bay, Alaska Peninsula/Becharof NWR

Beach Name	Date	Carcass Count	Where Found	Refound	Foot Condition	Eyes	Body Parts	Entangled	Oil	Foot type	Bill (mm)	Wing (cm)	Tarsus (mm)	Species	Age	Plumage	Sex	ID #
PUBA 1	19-Jun	1	W	N	U	U	W2	N	N	-	-	15.5	-	Storm Petrel sp.	U	U	U	1
PUBA 1	29-Jun	0																
PUBA 2	29-Jun	0																
PUBA 1	9-Jul	0																
PUBA 2	25-Jul	1	W	N	U	U	B, 1/2 W	N	N	-	-	-	-	Murre sp.	U	U	U	100
PUBA 1	25-Jul	2	W	N	U	U	W	N	N	-	-	20.0	-	Murre sp.	U	U	U	2
PUBA 1	25-Jul	3	W	N	U	U	2W	N	N	-	-	30.0	-	BLKI	U	U	U	3
PUBA 1	25-Jul	4	W	N	U	U	2W	N	N	-	-	15.5	-	LESP	U	U	U	4
PUBA 1	8-Aug	1	W	Y														3
PUBA 1	8-Aug	2	W	N	U	U	2W	N	N	-	-	-	-	BLKI	U	U	U	5
PUBA 1	8-Aug	3	W	N	U	U	1W	N	N	-	-	42.0	-	CORM SP.	U	U	U	6
PUBA 1	8-Aug	4	S	N	U	U	2W	N	N	-	-	24.5	-	BLKI	U	U	U	7
PUBA 1	8-Aug	5	W	N	U	U	2W	N	N	-	-	26.5	-	BLKI	U	U	U	8
PUBA 1	24-Aug	0																
PUBA 2	24-Aug	0																
PUBA 1	4-Sep	1*	W	N	P	C	I	N	N	webbed, 3 toes	14	12.0	19	MAMU	U	U	U	9
PUBA 1	4-Sep	2**	W											probably murre				
PUBA 1	4-Sep	3	W	N	U	U	2W	N	N	-	-	11.7	-	unknown	U	U	U	10
PUBA 1	4-Sep	4***	W	N	U	G	H, LW	N	N	-	12	7.8	-	unknown	U	U	U	11
*very little fat, probably a juvenile, looked like some down feathers still on the back of the neck																		
**only 3 feathers attached to bone																		
***only 3 feathers attached to bone																		