Alaska Department of Fish and Game
State Wildlife Grant
ANNUAL INTERIM PERFORMANCE REPORT

Grant Number: T-1 **Segment Number:** 6
Project Number: 14
Project Title: Current population and decadal trends of Kittlitz's and marbled murrelets in Kachemak Bay, Alaska
Project Duration: July 1, 2004 – June 30, 2007
Report Period: July 1, 2005 – June 30, 2006
Report Due Date: September 30, 2006
Partner: U. S. Fish & Wildlife Service

Objectives

1. Obtain population estimates for Kittlitz's and marbled murrelets in Kachemak Bay.
2. Determine decadal trends of Kittlitz's and marbled murrelets in Kachemak Bay.
3. Track annual and seasonal patterns of abundance and distribution of adult and juvenile Kittlitz's and marbled murrelets in Kachemak Bay.
4. Identify critical habitats for Kittlitz's and marbled murrelets within Kachemak Bay.

Summary of Accomplishments

The following accomplishments are related to Objectives 1-3:

1. At-sea surveys were conducted from 18 to 23 July, 2005 for a comprehensive survey of Kachemak Bay. These were not historic transects, but were the first effort to obtain complete coverage of the bay during a period of peak murrelet at-sea attendance (mid to late July). Transects were systematically spaced, north-south lines approximately 4 km apart (Fig. 1). Transects totaled 188 km in length, and 37.6 km^2 (at a transect width of 0.2 km^2), over a total area of 634 km^2. Based on murrelets counted on transect (558 marbled and 93 Kittlitz's), the preliminary population estimates were 9,400 (± 3,478 95% CI) marbled murrelets and 1,567 (± 1,910) Kittlitz's murrelets. Population estimates and distribution maps will also be available for other marine birds and marine mammals observed and recorded during this survey.

2. We conducted at-sea surveys over a period of 19 days from 3 - 22 August 2005. During the August 2005 surveys, we recorded a total of 2,291 murrelets, of which 85% were marbled murrelets, 7% were Kittlitz's murrelets, and 8% were unidentified Brachyramphus murrelets. The data will be incorporated into the decadal trends analyses for the final report. These surveys repeated historic transects (1988, 1989, 1993-1996) during the murrelet fledging period. As in 2004, we observed juveniles of both murrelet species during the August surveys (Fig. 2), indicating local breeding of both species. However, juvenile densities and ratios of both murrelet species were lower in 2005.

3. We conducted at-sea surveys from 16 to 20 June 2006, to repeat surveys conducted by U.S. Fish and Wildlife Service (USFWS) during the same period in June 1993 and 2005. This survey covered 46 transects for a total of 166 km (33.3 km^2). During the June 2006 survey, 8 Kittlitz's murrelets were observed on transect, as well as 146 marbled murrelets (Fig. 3). No Kittlitz's had been observed on transect during the June 2005 surveys.

Marbled murrelet densities in June 2006 were also higher than in June 2005. We were assisted during June surveys by URS biologists and by Cook Inlet Keeper.

The following accomplishments are related to Objective 4:

4. Environmental variables were collected at the start of each transect, including sea surface temperature and salinity (with digital meter), water clarity (with sechi disk), wind speed and direction (Kestrel wind gauge), air temperature, and sea state. Continuous plotting by GPS provided track lines and location data for every recorded observation. In addition, we collected data on water column structure using a CTD sampler (Fig. 4; see below).
5. We used a CTD (Conductivity-Temperature-Depth) probe (Seabird Electronics Inc., SBE 19 SEACAT), fitted with an additional sensor to measure turbidity, to determine the vertical profile of the water column. A series of 11 CTD sites was sampled immediately following the June survey (21 June 2006). A larger grid of 22 sites was sampled on 22 - 23 July 2005 (Fig. 4). These will provide information on water column characteristics (temperature, salinity, density), which will be used to describe marine habitats associated with each murrelet species. We will be assisted in analysis of the CTD data by Dr. Scott Pegau, of the Kachemak Bay Research Reserve. The CTD (a $10,000 instrument) was donated by Auke Bay Laboratory, Juneau, Alaska, which was not in the original proposal as part of the federal contribution.

Significant Deviations*:*
None

Actual Costs during this Report Period *(personnel plus all operating expense totals)*:
(Reported costs included ADF&G indirect calculated at 13.5%)

Federal (from ADF&G):	Partner (nonfederal share):
$37,013	$12,338

Project Leader *(or Report Contact Person)*: Kathy Kuletz

Additional Information: *See attached figures. Data tables and figures showing distribution of other species recorded during at-sea surveys of Kachemak Bay can be provided on request.*

1. During July 25-26, 2005, we conducted a recognizance survey of Grewingk Glacier Lake, 4 km above the Grewingk Glacier outflow into Kachemak Bay. The waters adjoining the glacier outflow are where most of the Kittlitz's murrelet are typically found in Kachemak Bay (Fig. 1). Because Russian scientists have indicated that newly fledged Kittlitz's murrelets spend time in the upland glacial lakes, we hiked to the most likely and accessible lake in Kachemak Bay during a time when fledging should have occurred. We were delivered and picked up at the drop-off site on Glacier Spit by our partner, Cook Inlet Keeper, and spent two days canvassing the area with spotting scopes and binoculars. We did not observe any Kittlitz's murrelets in the lake, but estimated there were approximately 2,000 – 3,000 glaucous-winged gulls on rocky islands in the lake. There were also small numbers of arctic terns nesting along the lake edges.

2. We submitted a request for, and received, additional funding ($6,000) from ADF&G. This allowed us to conduct the June 2006 surveys, which had not been originally scheduled. It will also allow us to increase survey effort during the fledging period, when we attempt to locate newly fledged murrelets of both species.
3. Upon request, we provided Angela Doroff (USFWS/Marine Mammals Management) with our historic and recent data sets for sea otters. She will analyze the Kachemak data to determine if there have been population changes in this area, and will compare population trends in Kachemak to other areas of Alaska.
4. Upon request, we provided Ellen Lance (USFWS/Ecological Services) with data on the distribution and abundance of Kittlitz's murrelets, marbled murrelets, pigeon guillemots, and sea otters. This was to assist an assessment of a local proposed development.
5. We have been collaborating with Dr. Scott Pegau (ADF&G) of the Kachemak Bay Research Reserve by providing our CTD data to assist in his analyses of currents in lower Cook Inlet. In addition, Dr. Pegau will be co-authoring a paper with us on murrelet use of marine habitats relative to water column structure. On two of Dr. Pegau's oceanographic surveys of lower Cook Inlet, we were able to collect seabird data. These additional surveys (personnel costs covered by USFWS) will add to our understanding of murrelet distribution in the outer regions of Kachemak Bay and lower Cook Inlet.
6. During this reporting period (July 2005 – June 2006), results from this study were presented at the Alaska Marine Science Symposium, the Alaska Bird Conference, the Pacific Seabird Group meeting, and at a special presentation for the Audubon Society in Cordova. We also submitted an abstract that was accepted for presentation in September 2006 at The Wildlife Society National Conference.

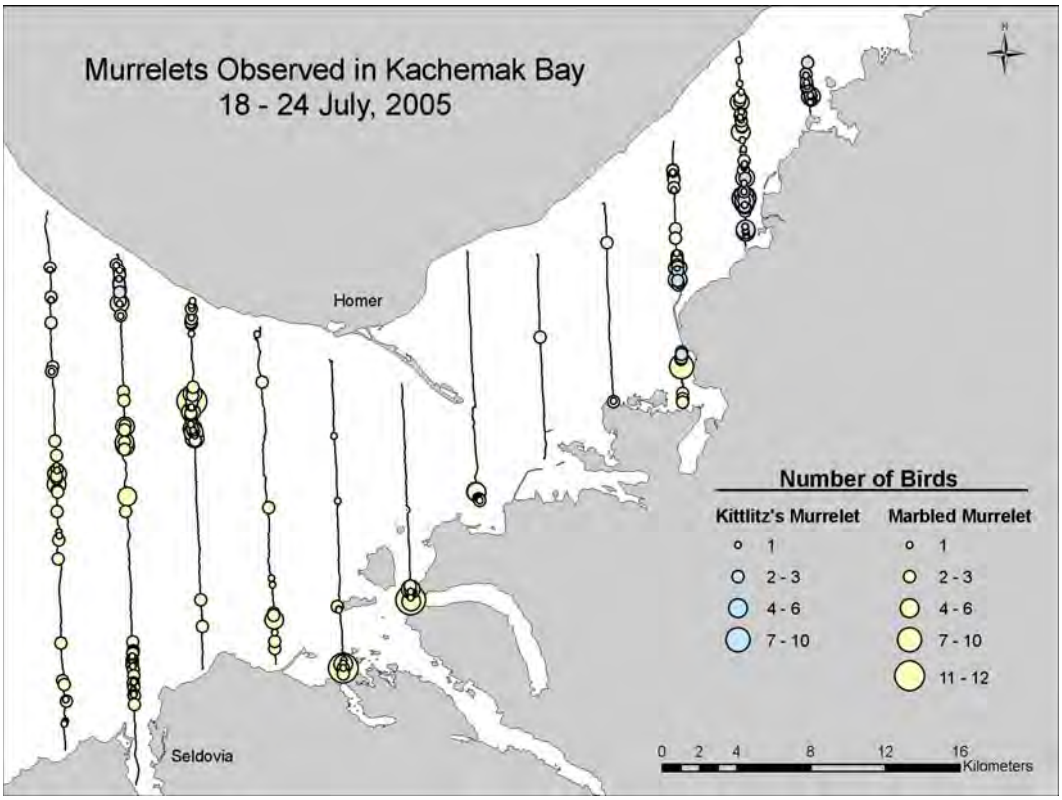

Figure 1. Distribution of marbled and Kittlitz's murrelets during July 2005

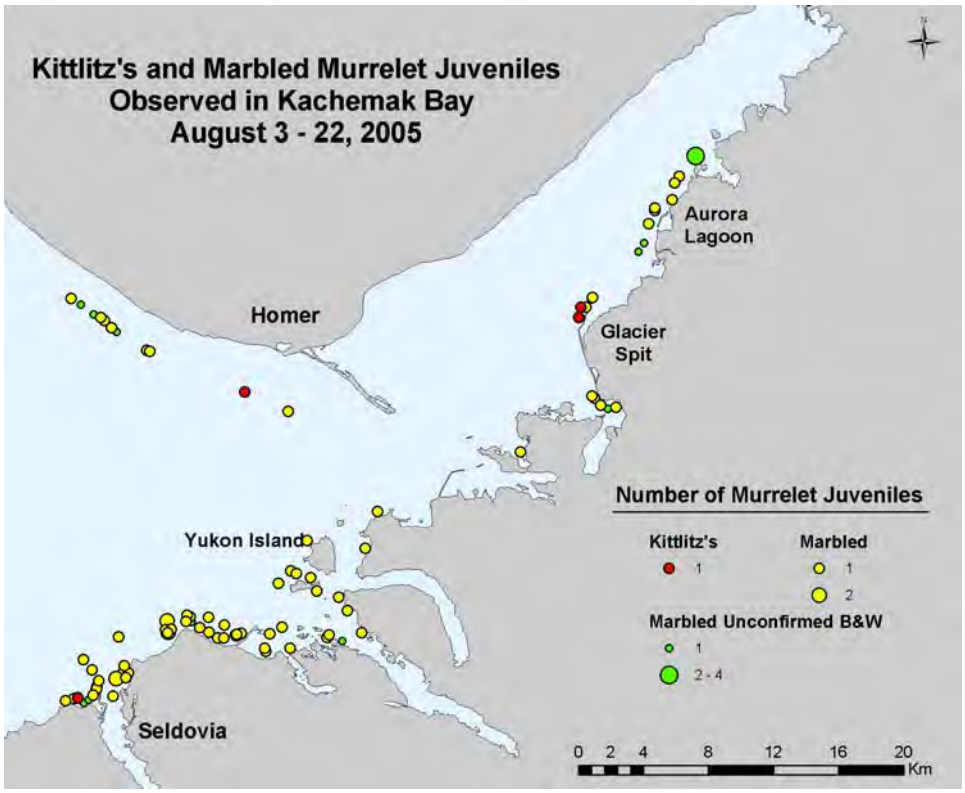

Figure 2. Distribution of juvenile murrelets in August 2005. 'Unconfirmed B&W' refers to black-and-white plumaged birds not identified to age class.

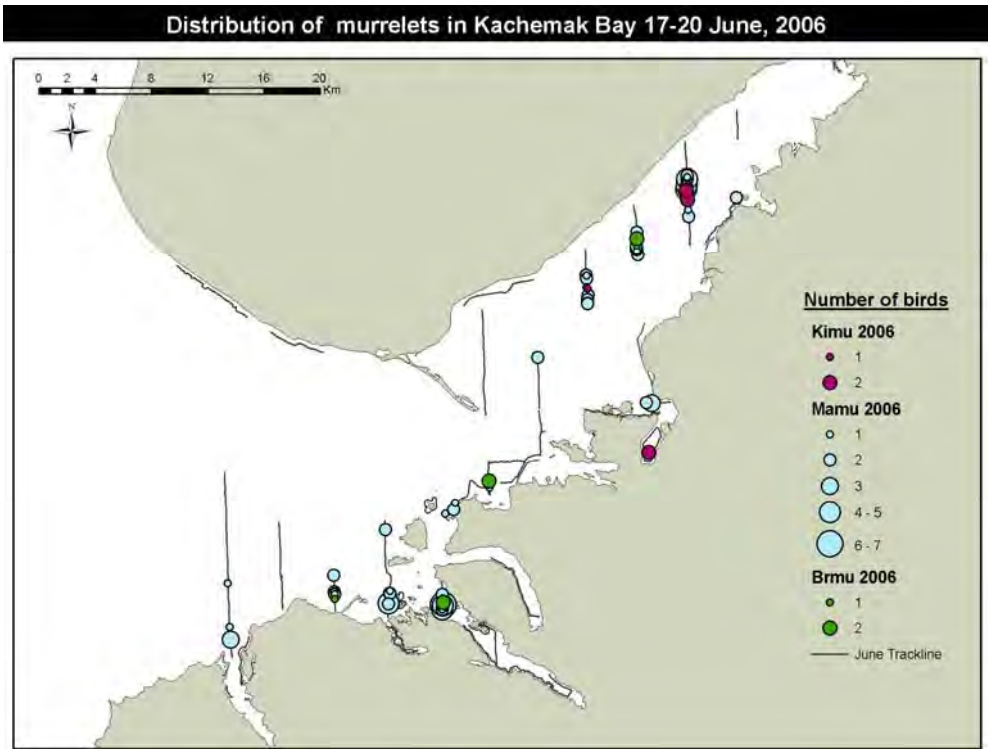

Figure 3. Distribution of Brachyramphus murrelets in Kachemak Bay in June 2006.

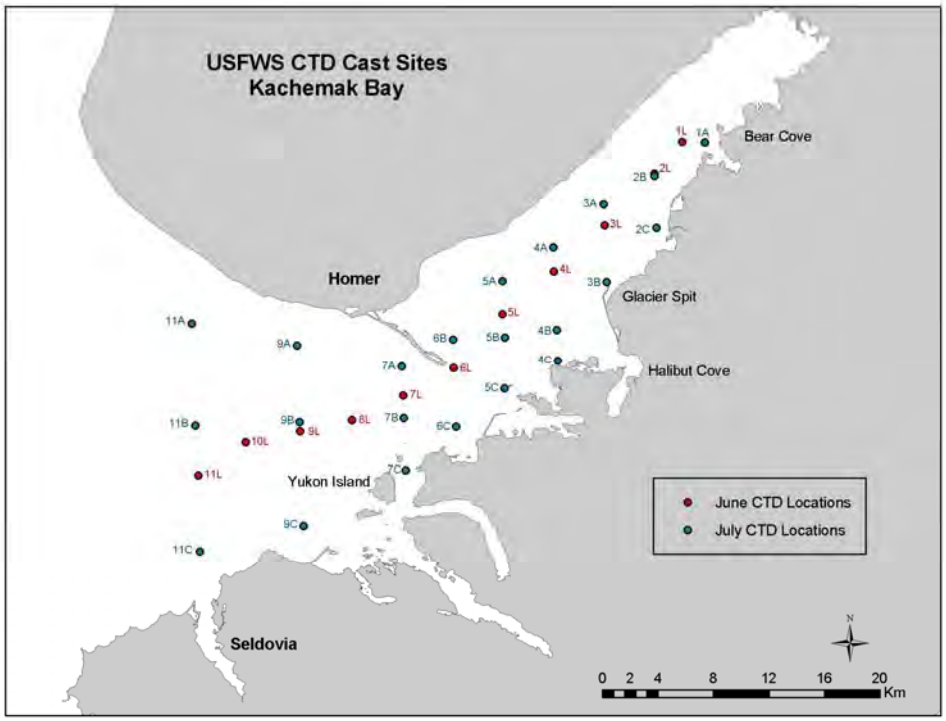

Figure 4. CTD locations in Kachemak Bay in July 2005 (blue dots) and June 2006 (red dots).