ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF WILDLIFE CONSERVATION
PO Box 25526
Juneau, AK 99802-5526

COOPERATIVE ENDANGERED SPECIES CONSERVATION FUND

PROJECT TITLE: Delineating non-breeding habitat of Steller's eiders

PRINCIPAL INVESTIGATORS: Dan Rosenberg

COOPERATORS: none

GRANT AND SEGMENT NR: E-13

PROJECT NUMBER: 1

WORK LOCATIONS: Bering Sea with emphasis on Togiak Bay and southern Kuskokwim Bay

REPORT PERIOD: 1 June 2007 – 31 May 2008

I. PROBLEM OR NEED THAT PROMPTED THIS RESEARCH

Three breeding populations of Steller's eiders are recognized, two in Arctic Russia (Atlantic and Pacific) and one in Alaska (U.S. Fish and Wildlife Service 2002). The Alaska breeding population of Steller's eiders was listed as threatened in 1997 (Federal Register 62(112): 31748-31757). The cause(s) for the decline is unknown. The majority of the Pacific population (eastern Russia and Alaska breeders) molts and winters in Alaska where the listed population integrates with the Arctic Russian population.

Identifying and protecting important non-breeding habitats and the relationship of birds using these habitats to the listed population, were identified as high priority recovery tasks by the Steller's eider Recovery Team in January 2007. In addition, resource managers need more information on eider distribution, abundance, and habitat affiliations for endangered species consultation and to adequately prepare and review NEPA documents.

Recovering a threatened species depends upon determining its rate of population change and identifying factors limiting population growth. Estimates of annual survival of known-age cohorts can help identify mechanisms affecting population change and guide recovery efforts. Second-year (subadult) birds do not migrate to the breeding grounds and their summer distribution and habitat use has not been well documented. In spite of extensive banding efforts on the Alaska Peninsula, few known age birds have been banded (Dau et al. 1999).

At-sea surveys conducted before second-year (SY) and adult birds begin to molt will allow researchers to classify birds by plumage before they become difficult to distinguish and identify habitat use for SY birds. Capture and marking known-age

birds will aid in the development of a demographic model and future recoveries of these birds will identify habitat linkages and help delineate the distribution of the listed population.

This information becomes increasingly important as oil and gas leasing is scheduled for Bristol Bay (North Aleutian Basin) and Bristol Bay waters may be affected by activities of the proposed Pebble Mine.

II. REVIEW OF PRIOR RESEARCH AND STUDIES IN PROGRESS ON THE PROBLEM OR NEED

OBJECTIVE 1: Develop a better knowledge of the distribution and abundance of non-breeding Steller's eiders in western Alaska and evaluate threats to sustainability of non-breeding habitat.

Sporadic summer surveys have been conducted in the region from northern Bristol Bay to southern Kuskokwim Bay since the early 1970's (Bailey 1983, Petersen et al. 1991, Seppi 1997, Shaw et al. 2004). Larned (2002) and Dau and Mallek (2005, 2007) fly aerial surveys for Steller's eiders and other waterbirds in northern Bristol Bay and southern Kuskokwim Bay during spring migration.

Steller's eiders commonly pass through the area during spring and fall migration (Petersen et al. 1999, Larned 2002, Dau and Mallek (2005, 2007). Togiak, Chagvan, Nanvak, Goodnews, and Carter Bays are all used as staging areas by Steller's eiders during spring migration (Larned 2002, Dau and Mallek 2005, 2007); from one hundred to several hundred molting (flightless) birds have been reported for Cape Pierce, Chagvan, Nanvak, and Goodnews Bay in mid- to late-summer (Petersen et al. 1991, Shaw et al. 2004, HDR 2007); and Steller's eiders have been observed at Carter Bay and Hagemeister Island in late-summer (Bailey 1983, Seppi 1997) but not reported as flightless.

When identified, all birds were thought to be males except for HDR (2007) who identified a few second-year or female birds in Goodnews Bay (HDR surveys were conducted in June and July 2007, after our surveys). Changes in abundance or distribution may have occurred since summer surveys were conducted in the 1970's and 80's and additional molting sites may exist. Most areas in western Alaska have not been thoroughly surveyed during late-spring and summer.

In 2005, a marked second-year (SY) female Steller's eider, satellite tagged in Kodiak, remained in Togiak Bay following the northward migration of breeding birds, and appeared to molt on the north side of Hagemeister Island near Hagemeister spit (D. Rosenberg, unpubl. data). This bird may be indicative of a region where other SY birds spend the summer and molt. In 2005, using satellite telemetry, we discovered a new molting location in lower Cook Inlet where subsequent surveys identified over 2,500 molting birds (D. Rosenberg, unpubl. data).

We began surveys in Togiak Bay on June 9, 2007 (See Job/Activity 1 A below). We chose this time period because it was after breeding birds departed the area on their northern migration but prior to molt (Rosenberg, unpubl. data). Remaining birds would likely be non-breeders that would potentially molt in the region. As adults would still be in nuptial plumage we would be able to identify birds to age and sex. This would indicate the potential for second-year birds to molt in the area, a prerequisite to further activities.

OBJECTIVE 2: Investigate opportunities for capturing and marking molting flocks that we identify.

Molting Steller's eiders are usually captured by using small boats to drive or herd them into traps placed on nearby beaches (Dau et al. 1999). To our knowledge, no one has attempted to capture molting birds in these areas. Opportunities for capturing and marking molting flocks depended primarily upon their abundance and distribution, their distance to shore, shoreline bathymetry and geomorphology, the presence of a nearby (within 1-2km) shallow sloped beach and the magnitude of tidal currents. As we were only identifying pre-molting flocks we based our predictions on areas where historical molting locations and extant observations coincide. We also investigated the potential to capture flighted birds in these same areas prior to molt.

OBJECTIVE 3: Identify the annual distribution, habitat use, survival rates, and relationship of these birds to the listed population.

Following reconnaissance (if we observed sufficient numbers of second-year birds molting in the areas identified above) our plan was to return in subsequent years and capture and mark known age birds.

III. MANAGEMENT IMPLICATIONS

Managers cannot delineate the listed population from the non-listed population throughout the molting and wintering range nor have we adequately delineated the distribution of non-breeding birds during spring and summer.

Documenting the full extent of non-breeding habitat for Steller's eiders will guide resource managers in assessing and if necessary mitigating for the affects of development activity within their range and potentially improve population surveys and modeling. Documenting annual changes in the number of second-year birds may provide as an index of annual productivity. Knowledge of habitat conditions at summer staging areas for SY birds may help identify the causes of population declines in the listed population.

IV. SUMMARY OF WORK COMPLETED ON JOBS FOR LAST SEGMENT PERIOD ONLY (1 June 2007 – 31 May 2008)

JOB/ACTIVITY 1A: Survey areas where we previously located satellite transmitted birds and nearby areas that may provide suitable molting habitat including Togiak Bay and Hagemeister Island, Chagvan, Nanvak, Goodnews and Carter Bays.

This survey was undertaken to determine the extent of Steller's eider use of the region between Togiak Bay and Hagemeister Island on the south to Carter Bay on the north during June 2007 (Fig. 1). This is a period when non-breeding birds remain in the area following the northward departure of the breeding population. During this time of year birds are flight capable and males are in breeding plumage and easy to separate from females and subadult birds.

Surveys were conducted from 9–15 June 2007. Surveys were conducted by 2 observers from the flying bridge of a 47' shallow draft seiner using 10x binoculars and if necessary 12x image stabilized binoculars or a 60x spotting scope when conditions allowed. Survey speed was a maximum of 7 knots but often slower.

We began our survey from the village of Togiak and proceeded west along the north shore of Togiak Bay. In addition to the north shore of Togiak Bay we surveyed portions of Carter Bay, Goodnews Bay, Chagvan Bay, outside the mouth of Nanvak Bay, and the northwest coast of Hagemeister Island (Fig. 1).

Surveys were conducted opportunistically as tides allowed. Not all portions of bays were surveyed because water depths were often less than the 1 meter draft of the survey vessel and scheduling conflicts with the charter vessel restricted survey time. This did not allow us to wait for more favorable tide cycles. Surveys were conducted opportunistically when traveling between bays. If weather allowed we followed the coast within 200 meters but time constraints precluded a complete shoreline survey.

We observed Steller's eiders in Hagemeister Strait (Mid-Air Reef, Asigyukpak Spit), Chagvan Bay, Goodnews Bay, and Carter Bay (Table 1). The majority of birds were adult males (after-second year) in nuptial plumage. Brown birds (females and SY birds) comprised 7.5% of our observations. These birds were in mixed flocks with adult males. Based on the width of white in the anterior and trailing edge of the speculum, we identified all brown birds as SY. Our identifications were not positive on all birds due to the variation in white feathering on the speculum but we were confident that at minimum a large majority of brown birds were SY birds. Thus, the percentage of SY birds identified in Table 1 represents a maximum estimate and may be slightly less.

When conducting surveys we may have also counted birds more than once as they were flight capable and moved around during the survey. This was primarily a factor in Goodnews Bay where estimates ranged from a minimum of 95 to a

maximum of 199 Steller's eiders. We believe the lower estimate is probably more accurate and is consistent with other recent estimates (Shaw et al. 2004, HDR 2007). Age ratios were similar for both our higher and lower estimates.

We identified several locations where non-breeding birds stage prior to the annual wing molt and have recorded the ratio of adult to SY birds at these locations. However, the number of SY birds at these locations does not warrant the cost to attempt to capture and mark birds. As the number of second-year birds is dependent upon prior year productivity and overwintering conditions it will vary annually and we may propose additional surveys in future years.

JOB/ACTIVITY 1B: Evaluate habitat conditions and potential habitat changes in areas where populations are currently found. Map distribution of non-breeding birds.

We did not have time to evaluate habitat conditions. Birds were generally observed in shallow nearshore waters or hauled-out near the mouths of bays or along spits. Eel grass beds were often in the vicinity. We observed non-breeding birds in nearshore areas of Hagemeister Strait, Chagvan Bay, Goodnews Bay, and Carter Bay (Carter Spit) (Fig. 1).

A gravel staging and loading operation is next to eider staging areas on the south spit of Goodnews Bay and construction of a seafood processing plant is scheduled for the same area. Barge traffic, fuel storage, set net fishing activity, subsistence hunting, and 4-wheeler and skiff traffic occur in this area. No signs of human disturbance were observed (HDR 2007).

JOB/ACTIVITY 2A: Assess site conditions (tidal currents, beach topography, use areas), and logistics to determine future possibility of capturing molting birds for purposes of banding and marking known-age cohorts.

Birds were generally observed in shallow nearshore waters or hauled-out near the mouths of bays or along spits. The mouths of bays are often narrow, amplifying tidal currents. Shallow sloped beaches were present nearby in al areas. All bays we surveyed were very shallow with navigation restricted at low tide. Strong tidal currents and shallow water depths may restrict capture operations to periods around slack high tide. Capturing flighted birds is also restricted by strong tidal currents and may be limited to periods around slack tides.

JOB/ACTIVITY 3A: Capture and mark (band, transmitters) molting birds.

This activity was not conducted as the number of second-year birds did not warrant the cost to attempt capture and mark them (see above). In other years more SY birds may be present making it cost effective.

LITERATURE CITED

Bailey, E.P. 1983. Reindeer and seabird survey of Hagemeister Island, Alaska. Unpubl. Rept., U.S. Fish and Wildlife Service, Alaska Maritime National Wildlife Refuge, Homer. 20pp.

Dau, C.P., P.L. Flint, and M.R. Petersen. 1999. Distribution of recoveries of Steller's eiders banded on the lower Alaska Peninsula, Alaska. J. Field Ornithol. 71(3):541-548.

Dau, C. and E.J. Mallek. 2005. Aerial survey of emperor geese and other waterbirds in southwestern Alaska, spring 2005. U. S. Fish and Wildlife Service, Migratory Bird Management. Anchorage. 18pp.

Dau, C. and E.J. Mallek. 2007. Aerial survey of emperor geese and other waterbirds in southwestern Alaska, spring 2007. U. S. Fish and Wildlife Service, Migratory Bird Management. Anchorage. 19pp.

HDR. 2007. Steller's eider molting surveys Platinum, Alaska. HDR Alaska, Inc., Anchorage. 13pp.

Larned, W.W. 2002. Steller's eider spring migration surveys southwest Alaska, 2002. U.S. Fish and Wildlife Service, Migratory Bird Management, Anchorage. 21pp.

Petersen, M.R., D.N. Weir, and M.H. Dick. 1991. Birds of the Kilbuck and Ahklun Mountain Region, Alaska. No. Amer. Fauna 76. U.S. Dept. of Interior, Fish and Wildlife Service.

Seppi, B.E. 1997. Fall migration of shorebirds and waterfowl at Carter Spit, Alaska. U.S. Dept. of Interior, Bureau of Land Management. BLM Alaska Open File Report 65. 36pp.

Shaw, D.W., J.M. Maley, and D.D. Gibson. 2004. UAM-BLM Bird survey: Goodnews Bay, June and July 2004. Unpubl. Rept. University of Alaska Museum, Fairbanks. 9pp.

U.S. Fish and Wildlife Service. 2002. Steller's eider recovery plan. U. S. Fish and Wildlife Service, Ecological Services, Fairbanks. 25pp.

V. PUBLICATIONS

None at this time.

VI. APPENDIX

Table 1. Number of Steller's eiders classified by plumage characteristics and percent composition of second-year males and females by location.

Figure 1. Survey route and location of flocks of Steller's eiders observed from boat surveys conducted from 9–15 June 2007.

Table 1. Number of Steller's eiders classified by plumage characteristics and percent composition of second-year males and females by location. Total represents maximum number as some double counting may have occurred.

Location	Total	Adult Males	SYM[1] or Female	Percent SYM[1] / Female
Mid-Air Reef	29	27	2	6.9
Asigyukpak Spit	2	2	0	0.0
Goodnews Bay	199	183	16	8.0
Carter Bay	55	50	5	9.1
Chagvan Bay	130	122	8	6.2
Total	415	384	31	7.5

[1] Second-Year Male

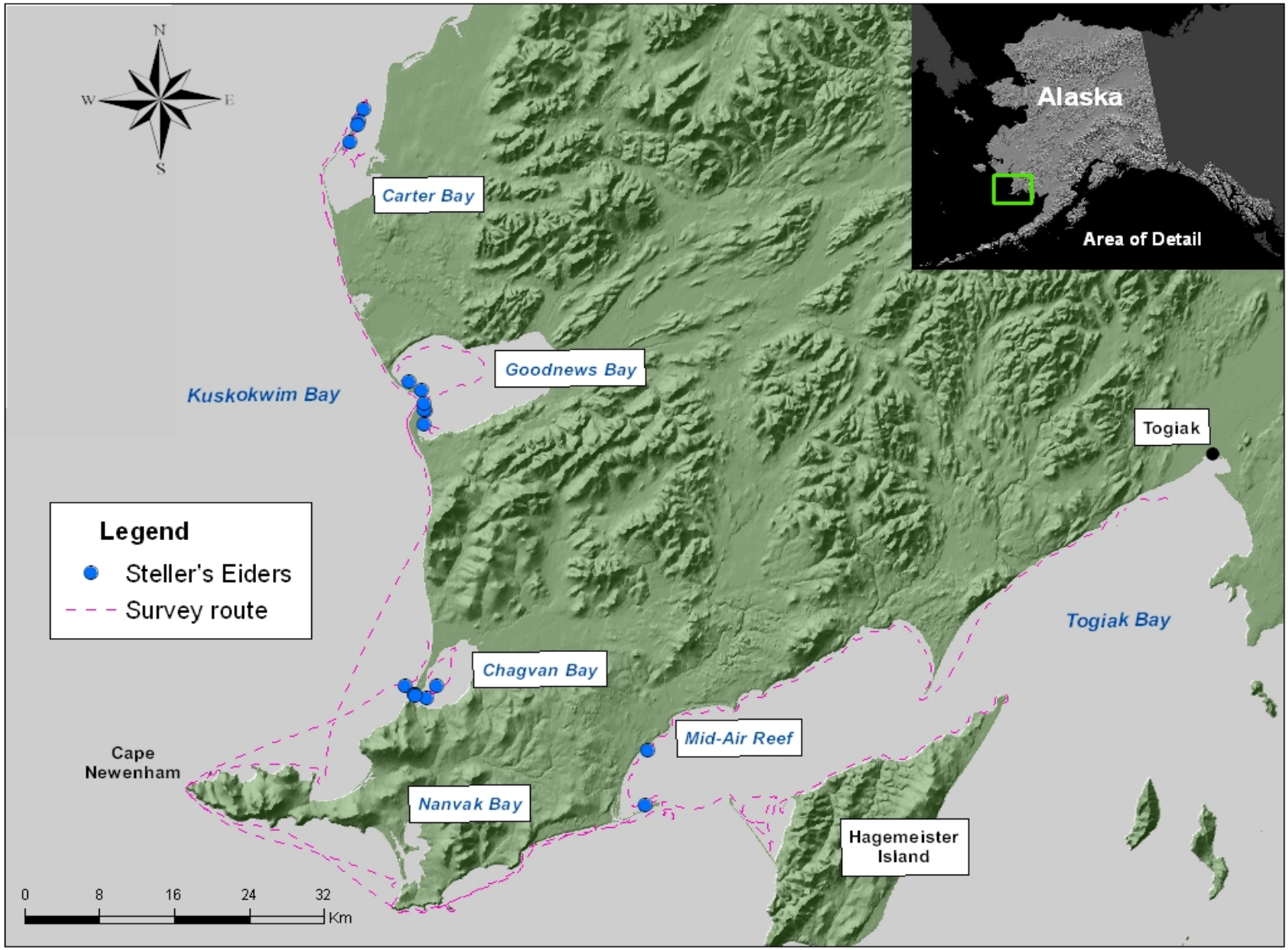

Figure 1. Survey route and location of flocks of Steller's eiders observed from boat surveys conducted from 9–15 June 2007.