TECHNICAL SUMMARY

STUDY TITLE: Monitoring marine birds of concern in the northeastern Chukchi Sea (loons)

REPORT TITLE: Monitoring marine birds of concern in the northeastern Chukchi Sea (loons)

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PROJECT MANAGER: J.A. Schmutz

AFFILIATION: U.S. Geological Survey, Alaska Science Center, Biological Resources Division

Address: 4210 University Dr, Anchorage, AK 99508

PRINCIPAL INVESTIGATOR: J.A. Schmutz

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BACKGROUND

Yellow-billed and Red-throated loons have been receiving increasing attention from federal and state wildlife agencies, as well as non-profit environmental groups due to low population numbers or decreasing population trends. The Yellow-billed Loon is a candidate species for listing under the Endangered Species Act (Federal Registrar 2009). Northern Alaska supports roughly 3,400 individuals of which approximately ≤1,000 nest there annually (Earnst 2004, Earnst et al. 2005). Nearly 91% of Yellow-billed Loons that breed in Alaska occur on the National Petroleum Reserve-AK (NPRA) (between Meade and Ikpikpuk Rivers) and thus, may be susceptible to habitat changes related to increased interest in development in the area (Earnst et al. 2005). Of the estimated 16,600 Red-throated Loons thought to occur in the U.S., roughly 3,000 breed on the Arctic Coastal Plain (ACP) of Alaska (Mallek and Groves 2009, Larned et al. 2010). The eider breeding population survey has been used to monitor Red-throated Loons on the ACP and there is some evidence to suggest declines (-4% per yr.) over the survey period (1992–2009) (Larned et al. 2005).

Due to the scale and remoteness of the Chukchi Sea, however, little is known about use of the area by these species and how they may be impacted by development of offshore

resources. Further, loons are particularly vulnerable to potential impacts from spilled oil (Piatt et al. 1990, Williams et al. 1995). King and Sanger (1979) assigned the Yellow-billed Loon an oil vulnerability index of 65, which was the highest of the loon species and higher than the average (51) assigned for the 128 avian species included. Though neither loon species considered for study is presently protected under the Endangered Species Act, the designation of the Yellow-billed Loon as a candidate species warrants agency attention, and the information obtained will be useful for analysis and preparation of the draft and final EIS's supporting activities related to the 2007 Chukchi Lease Sale and subsequent development.

OBJECTIVES

The primary goal is to quantify the pattern of use of coastal waters of the northeast Chukchi Sea by breeding, pre-breeding, and post-breeding Red-throated and Yellow-billed loons. Increasing sample sizes from previous work and sampling all age-reproductive classes will allow a more robust estimation of the relative importance, or at least use, of various non-breeding habitats throughout the year.

Specific objectives are as follows:

1) *Large-scale movements of adult and juvenile Red-throated Loons*. In each of 3 years (2008–2010), we will mark 7–10 Red-throated Loons (5–6 juveniles) near Kaseguluk Lagoon with long-lasting satellite transmitters to enable documentation of migration routes for up to 1 year from time of marking. By marking in this area, we can document use of the coastal marine waters of the eastern Chukchi Sea during summer.
2) *Large-scale movements of adult Yellow-billed Loons*. In each of 3 years (2008–2010), we will mark 7–10 Yellow-billed Loons southwest of Teshekpuk Lake with long-lasting satellite transmitters to enable documentation of migration routes for up to 3 years from the time of marking.

DESCRIPTION

We deployed satellite transmitters during 2008–2010 to delineate broad-scale migration routes, define the timing and duration of use of the Chukchi Sea, and identify areas of concentrated use along the Chukchi Sea coast by adult and juvenile Red-throated Loons, and adult Yellow-billed Loons. Data collected during 2008–2010 were added to data from loons from the Arctic Coastal Plain previously marked with satellite transmitters to compile the most complete data set of locations in the Chukchi Sea available. This information will be valuable to environmental risk assessments and other regulatory requirements associated with offshore oil and gas development in the Chukchi Sea.

SIGNIFICANT CONCLUSIONS

Red-throated and Yellow-billed loons used the Chukchi Sea as a migratory pathway between North American and Asian wintering grounds and breeding grounds on the Arctic Coastal Plain of Alaska. Red-throated and Yellow-billed loons were detected in

the Chukchi Sea throughout the open-water season. Most loon locations were within 25 km of the coastline, but Yellow-billed Loons had the tendency to be located farther offshore while crossing the Chukchi Sea from Alaska to Siberia north of the Bering Strait during post-breeding migration. Loons commonly used coastal habitat bordering the Lease Sale 193 boundary; however, no marked loons were detected within active lease areas. Breeding adults Red-throated Loons were present in the nearshore marine environment during summer to forage and some adult Yellow-billed Loons moved to the coastal after failing to breed. Juvenile Red-throated Loons had prolonged fall residency in the Chukchi Sea before departing on migration; however, no satellite tracked juvenile returned to Alaska as a non-breeding 1-year-old. These results confirm that loons are dependent on nearshore marine habitat. From a population perspective, red-throated loon breeding grounds are widely distributed throughout coastal tundra habitat in Alaska. In contrast, yellow-billed loon breeding habitat in the U.S. is concentrated in the central Arctic Coastal Plain; thus, the migration patterns of PTT-marked individuals indicate that the majority of breeding yellow-billed loons in the U.S. migrate through the northeast Chukchi Sea.

RESULTS

We found that marked Red-throated and Yellow-billed loons were located in nearshore marine habitat within 25 km of the coastline in the Chukchi Sea during the open water season. Pre-breeding migration in our sample of marked birds was more synchronous than post-breeding migration, likely due to variation in breeding success and the timing of departure from breeding lakes. Further, juvenile Red-throated Loons had longer fall residency periods than adults. Adult loon locations in nearshore marine habitat during summer were related to the foraging behavior of breeding adult Red-throated Loons and the abandonment of breeding habitat by some adult Yellow-billed Loons that did not successfully breed. Thus breeding adults of both species marked in this study were located in nearshore marine habitat from the 3rd week of May to the 4th week of October. Yellow-billed Loons migrating across the Chukchi Sea from Alaska to wintering sites in Asia during post-breeding migration came in closest proximity to active oil and gas leases in the northeast Chukchi Sea. Loons commonly used coastal habitat bordering the Lease Sale 193 boundary; however, no marked loons were detected within active lease areas. The Chukchi Sea was used by loons of both species tracked to wintering sites in Asia and North America and thus is an important migratory pathway.

STUDY PRODUCTS

RESEARCH PRESENTATIONS

2012. Rizzolo, D.J., and J.A. Schmutz. Non-breeding season distribution of satellite-tagged Red-throated and Yellow-billed loons from the Arctic Coastal Plain, Alaska (Presentation). Pacific Seabird Group Annual Meeting, Oahu, HI.

2011. Rizzolo, D.J. and J.A. Schmutz. Migratory movements and wintering sites of Red-throated and Yellow-billed loons from the Arctic Coastal Plain, Alaska (Poster). Alaska Marine Science Symposium, Anchorage, AK.