

Sea Duck Joint Venture
Annual Project Summary
FY 2016 – (October 1, 2015 to Sept 30, 2016)

Project Title: PR146: Point Barrow, Alaska, Migration Counts for King and Common Eiders

Principal Investigators:

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Partners: North Slope Borough, USFWS Alaska Region

Project Description: Most of the king (*Somateria spectabilis*) and common eiders (*S. mollissima v-nigra*) nesting in northern Alaska and western Canada migrate past Point Barrow, Alaska twice annually — during their northward spring migration and their southward molt and fall migration. At Point Barrow, Alaska this spectacular concentration of migrating birds passes very close to shore, allowing for migration counts, which have been intermittently conducted under varied protocols since the early 1950s. Woodby and Divoky (1982) estimated 113,000 eiders passed in 30 minutes in the spring of 1976. Murdoch (1885), Bailey (1948), Brueggeman (1980), and others have commented on the spring passage of eiders, but the magnitude of the spring migration has been estimated only on a few occasions (Woodby and Divoky 1982, Suydam et al. 1997, Quakenbush et al. 2009).

This project will repeat the spring migration counts in 2015-2016. Counts were conducted from approximately late April, 2015 to early June near the edge of the shore-fast sea ice. Four observers counted eiders for up to 24 hours per day (at least two hours out of every four); there are 24 hours of daylight. Counts conducted at the same location and using the same methods as in 1996 and 2002-2004 will allow us to acquire new population indices directly comparable to the earlier indices to determine the status of the population and further explore population trends. Collecting detailed spring and fall migration data will also allow us to address timing, behavior, molt, and weather conditions related to migration.

Objectives:

- Obtain estimates of king and common eider populations that can be compared with those from 1996 and the early 2000s in order to evaluate current trends.
- Use high-resolution photography to calculate a correction factor for the visual counts. This may result in a correction factor (simple ratio) that can be applied to past estimates.
- Determine the sex and age ratios of king and common eiders passing by Point Barrow through visual and photographic methods. This will allow us to determine the timing of migration by the different ages and species and compare it to previous timing and use of this area.

Preliminary Results:

Eider migration peaked May 7-8 in both years and most birds passed Point Barrow between April 30 and May 13 (Figure 1.)

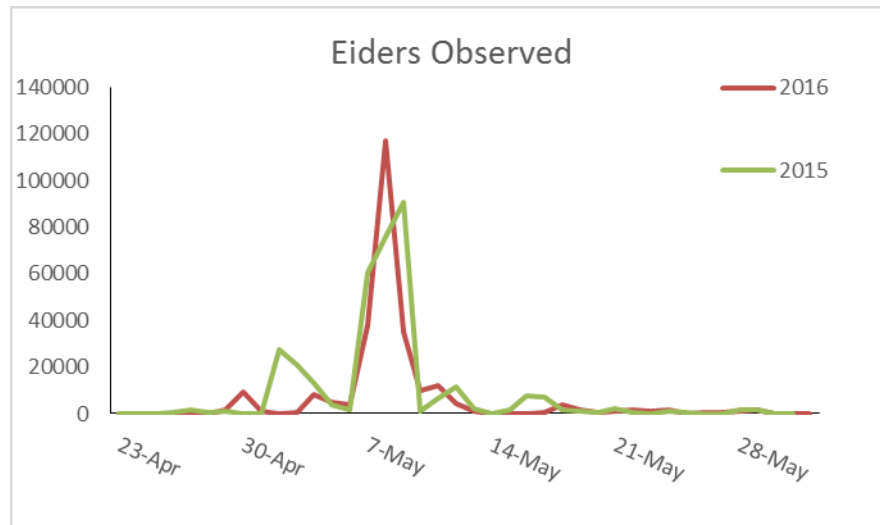


Figure 1. Numbers of King and Common Eiders observed passing Pt. Barrow, AK, on spring migration, 2015-2016.

During the 2015 spring migration, we estimated (estimates + 95% confidence intervals) that 787,277 (737,527- 837,026) King and 98,121 (91,136 - 105,107) Common Eiders passed Point Barrow. We estimated that 322,292 (298,635-345,950) King and 130,027 (124,425-135,628) Common Eiders passed Point Barrow during the 2016 spring migration. (Figures 2, 3, and 4).

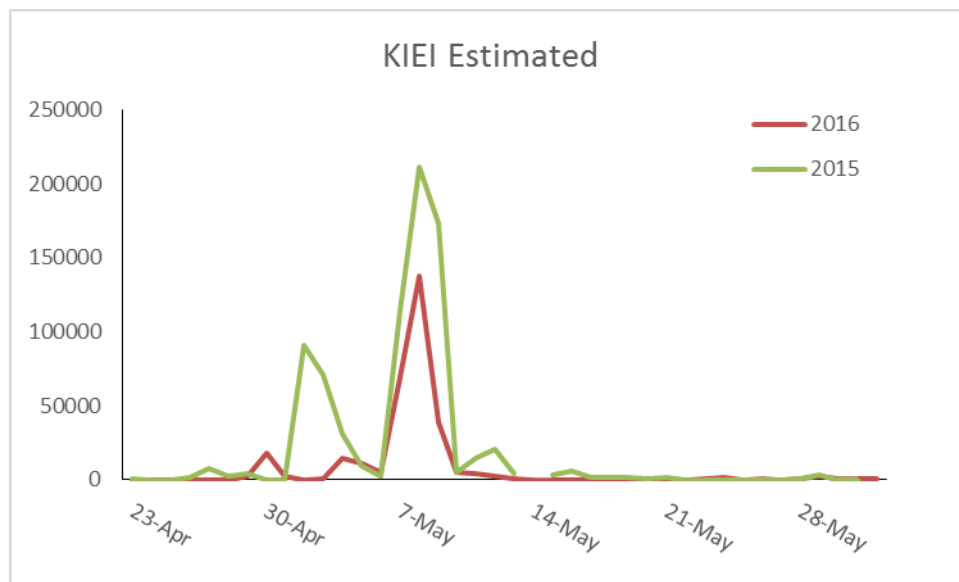


Figure 2. Estimated numbers of King Eiders migrating past Pt. Barrow, AK, 2015-2016.

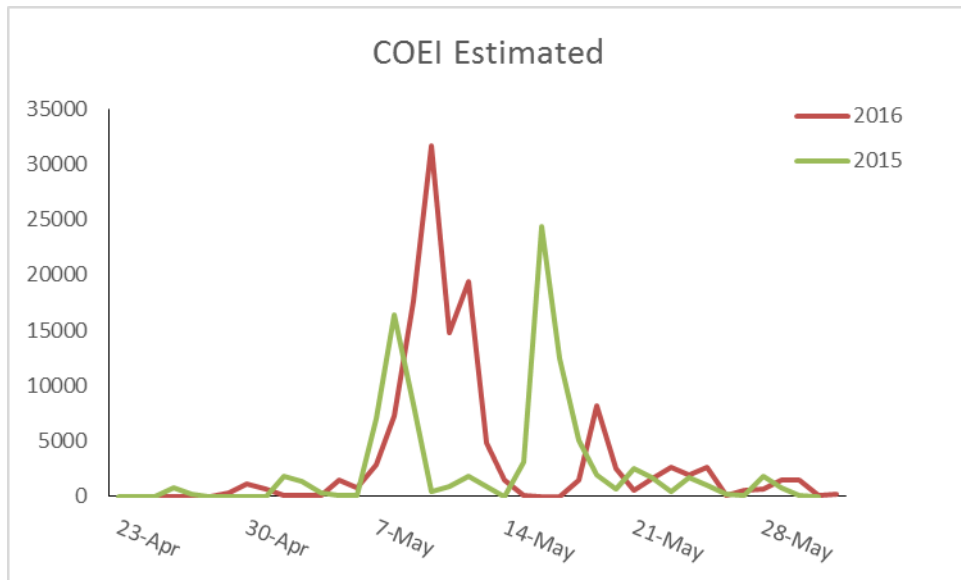


Figure 3. Estimated numbers of Common Eiders migrating past Pt. Barrow, AK, 2015-2016.

Our estimates of the population of King Eiders are very different (>50% difference) between the two years of the study leading to uncertain conclusions about how the population has changed in the last 12 years. Compared to our estimate of $787,277 \pm 49,750$ (estimates \pm 95% confidence intervals) King Eiders in 2015 and $322,292 \pm 23,657$ in 2016, Quakenbush et al. (2009) estimated the population size on spring migration at $304,966 \pm 76,254$ in 2003, and $591,961 \pm 172,011$ (Figure 4.), also highly variable between years.

The number of Common Eiders has remained fairly stable between the two years of the study and in the last 12 years since the previous population count. Compared to our estimate of $98,121 \pm 6,985$ Common Eiders in 2015 and $130,027 \pm 5,601$ in 2016, Quakenbush et al. (2009) estimated the population on spring migration at $114,998 \pm 28,566$ in 2003 and $110,561 \pm 32,087$ in 2004.

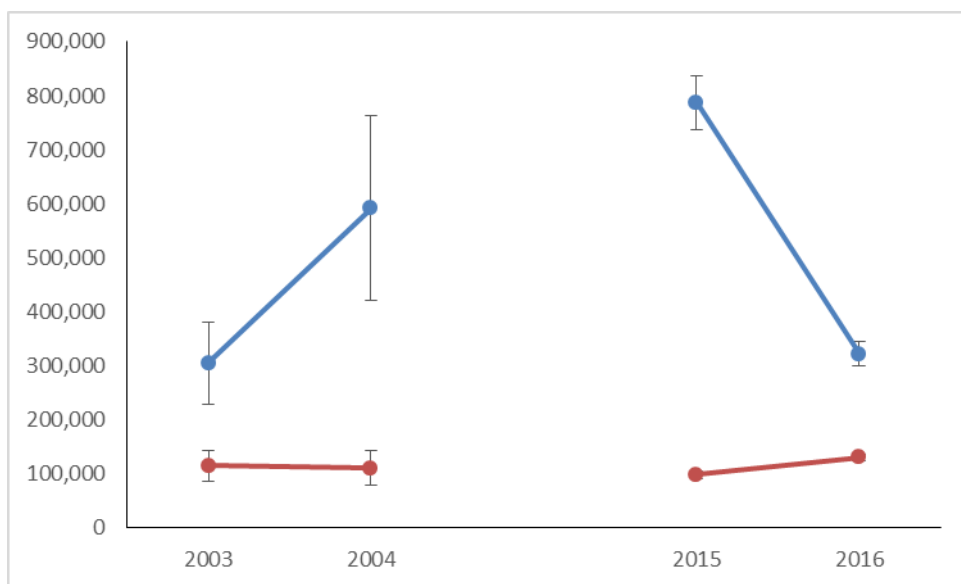


Figure 4. Estimated population size \pm 95% confidence intervals for King (blue) and Common (orange) Eiders in 2003-2004 (Quakenbush et al. 2009) and 2015-2016 (this study).

You will note that estimates of variability are quite different between 2003-2004 and 2015-2016; I am concerned about this and will see if Lori Quakenbush can meet with me. They don't report standard deviation, or variance which could help clarify the situation. I used the following

$$95\% \text{ CI} = 1.96 * \text{Standard Error},$$

$$\text{Standard Error} = (\text{the square root of total variance}/(\text{square root of total days}))$$

The peak of migration was only one day long in 2016, and the passage was very extreme with most birds passing between 11am and 7pm, it is possible this very short time period was not adequately sampled, artificially decreasing the population estimate in 2016.

Population estimates from migration counts are a minimum population estimate as observers are more likely to estimate low, especially on large flocks (personal observation based on photos, this data will be analyzed later), flocks that pass inland or far out to sea are not included, and years in which the peak of migration is very short may not be adequately sampled given our count schedule.

Project Status: *Next Steps are:*

- Analysis of photo data to evaluate observer bias of flock size, sex ratio and species ratios.
- Analysis of radar data.
- Establish need (if necessary) for an additional count in 2017.