

Are sex, year, and banding station predictors of Oregon Junco wing length?

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INTRODUCTION

In 2012, the Juneau Audubon Society and the University of Alaska Southeast began the Sitka Winter Bird Observation Project to determine annual movements, year-to-year site fidelity, dispersal patterns, population structure, and body composition of wintering birds. Most frequently, Oregon Juncos, a subspecies of Dark Eyed Juncos, *Junco hyemalis*, were caught, banded, and their wings were measured. Oregon Juncos are a common backyard bird during the winter, feeding on a mix of seeds and insects¹. Measuring body size gives information about health of the bird, food availability earlier in the year, and also helps determine sex. **The objective of this analysis was to determine whether capture station, capture year, or sex of the bird predict wing length.**

METHODS

All birds were captured in November beginning in 2012 until 2018. Birds were also caught in 2019 but the data wasn't available. Stations were selected based on known congregations of feeder birds and volunteers who could easily monitor and report sightings of banded birds. The birds were captured using mist nets. Wing length (measuring cord length between the end of two wing feathers), amount of fat, sex, year, and station were recorded prior to banding and release. An analysis of variance (ANOVA) was used to determine whether sex and year impacted wing length. A Box-Cox transformation was performed to approximate normality. A separate ANOVA was done on year 2014 data only to see if station had as significant impact, since this year had the most measurements across sites (Figure 1).

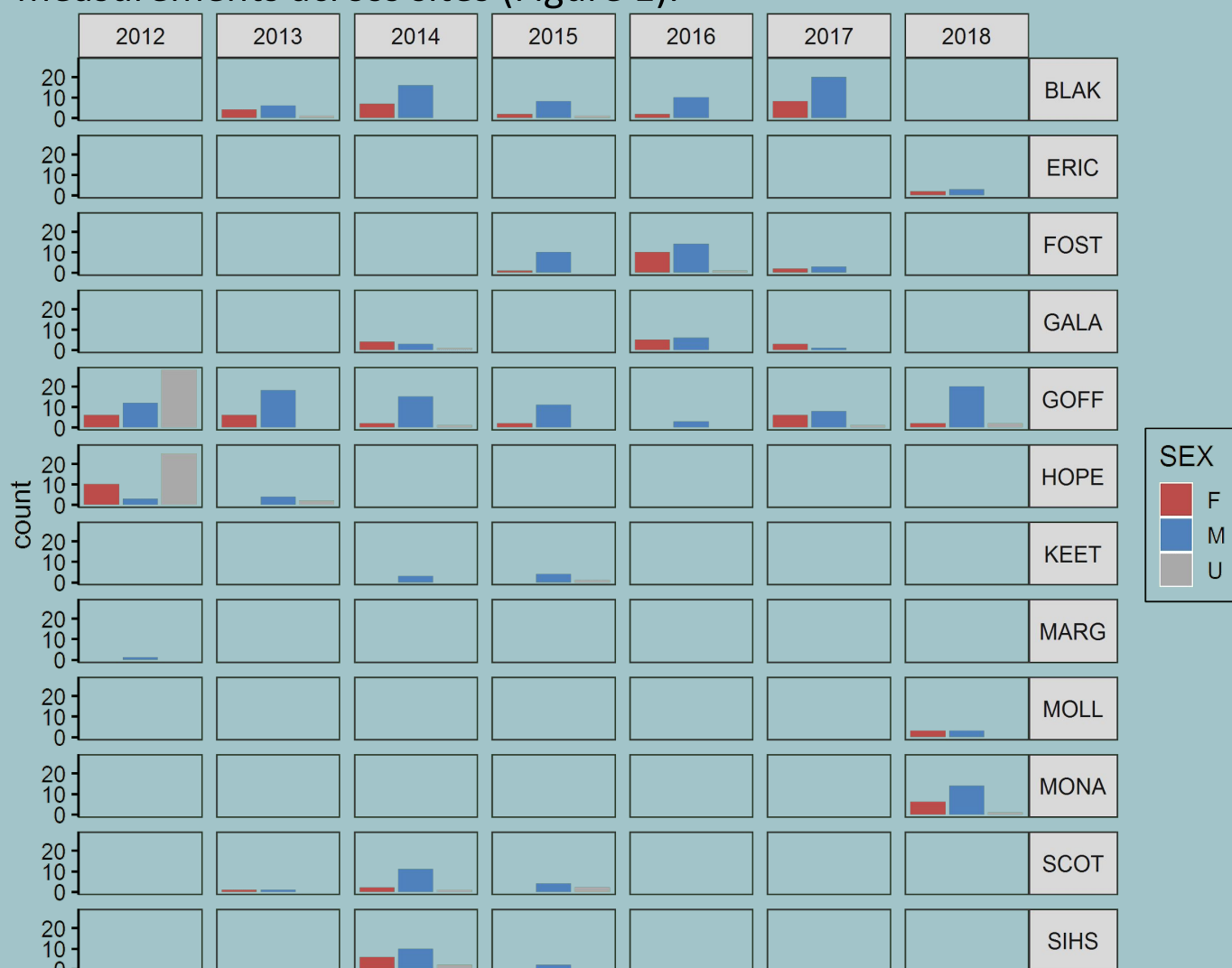


Figure 1: Summary of all measured birds by sex, year, and station.

RESULTS

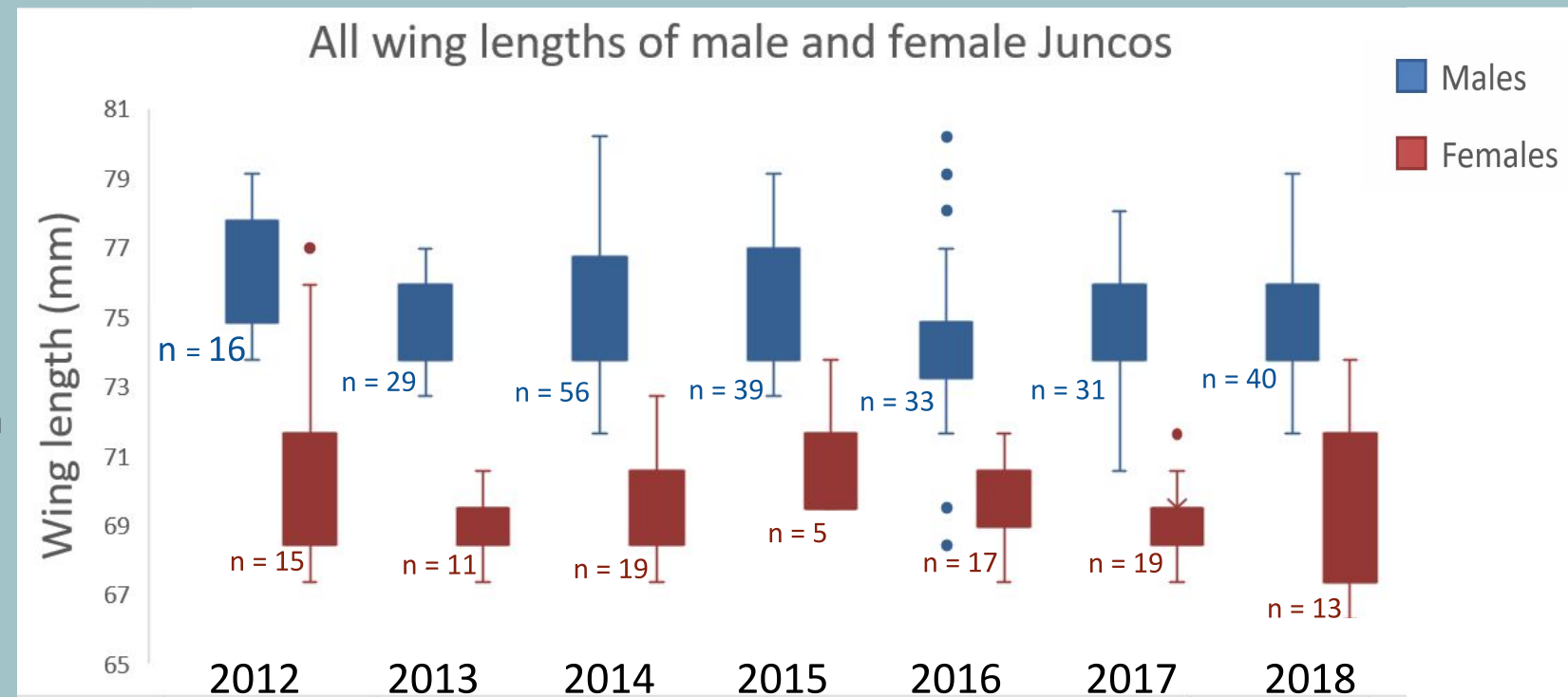
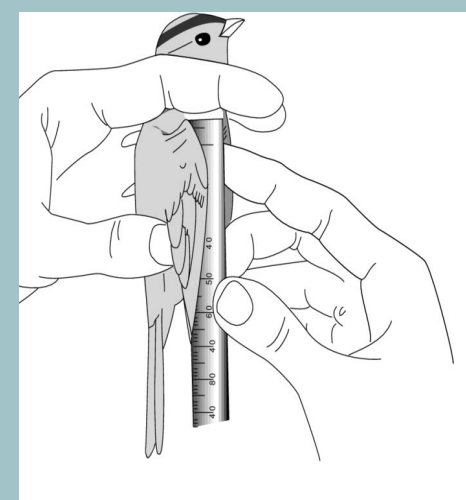


Figure 2



Wing chord length²

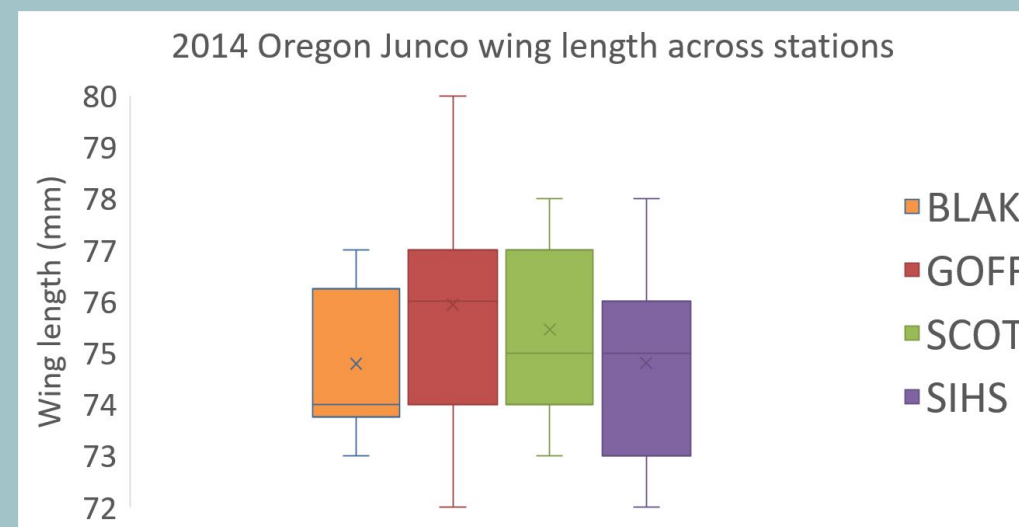


Figure 3

$$WING_{jk}^{-4/3} \sim SEX_j + YEAR_k + \epsilon_{jk}$$

Table 1: Year Station and Sex were all significant predictors of Wing Length, although only Year (as a factor) and Sex were retained in the final model after AIC analysis. No factor interactions were retained.

Predictors of wing length	Df	F value	P value
Year	6	4.3	<0.001
Sex	2	207	<0.001

RESULTS SUMMARY

- Wing length was significantly different among years (Figure 2).
- Females were smaller than males (Figure 2).
- Differences by station were not retained in the 2014 only model (Figure 3, equation not shown).



DISCUSSION

No significant differences among stations in any given year were shown. This finding indicates that researchers may choose capture station based on convenience. None of our findings were surprising. Differences in size between males and females was as expected, and food availability differing year to year could provide a possible explanation for why year was one of the biggest impacting factors on wing length across sites. This study is a positive proof of concept for winter bird capture and measurement in Sitka. The next steps for the Sitka Winter Bird Observation Project is to expand the study to common species also found in Sitka, notably Song Sparrows. By studying Song Sparrows as well, it can be determined if they are residential to Sitka or migratory.

References:

1. J.S. Gashwiler & A.L. Ward (1968) Oregon Junco Foods in Coniferous Forests. The Murrelet. 49 (3) pp. 29-36.
2. Ralph CJ, Geupel GR, Pyle P, Martin TE & DeSante DF (1993) Handbook of Field Methods for Monitoring Landbirds. Director 144:1-41.
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