If Climate Change is Taking Place, then the Migration Routes of the Lesser Snow Goose and the Northern Pintail is Changing

Colin Atti and Charlie Evon

Department of Natural Sciences, ENVS 110-Introduction to ArcGIS,
University Alaska Southeast, Juneau, Alaska 99801

Introduction

Our project studies how birds are affected by the climate. It shows how much the Northern Pintail Ducks and the Lesser Snow Goose are affected by the changing climate and the affects of the migration routes of the two birds. We chose those two birds because we noticed the Northern Pintail Ducks have been declining in population and have heard older generations saying that this place used to be filled with many species of birds including the Northern Pintail Ducks and the Lesser Snow Geese during their migration in the Fall. Also, the Lesser Snow Geese have vanished in the early to mid 1960's so we decided to study them.

Fig. 1. Northern Pintail Ducks

Fig. 2. Lesser Snow Geese staging.

Materials and Methods

The materials needed for this project were: GPS, laptop computer, ARCGIS software, various USGS maps, National Weather Service (NWS) data from 1970-2007, field notebook, digital camera, and a four-wheeler to travel.

First we determined our hypothesis and the study area based on personal and local knowledge of bird migrations through the Yukon-Kuskokwim Delta Wildlife Refuge. Next, we determined where the Northern Pintail Ducks and the Lesser Snow Geese might be seen. Then, we had to go out onto the tundra and collect the data ourselves regarding the population of each of the two birds. Included in our data collected was information about the terrain including if there were any lakes, high grounds, etc. After we collected the data we downloaded the obtained data into the ARCGIS maps and Google Earth maps and continued this process for every place we went. Also, we determined which lakes have emptied out on the maps and found how much area of water has been emptied out from that lake. Finally, we compiled the information leading to our conclusion.

Fig. 3. Study area.

Fig. 4. Charlie and brother out for a survey.

Results

During our three month research, we only saw one flock of Lesser Snow Geese, of about 50, within our area of study. This was during their migration while they passed through. These geese suddenly vanished during the early to mid 1960's and have only been seen by a small amount of people during their time of migration since then.

However, we constantly saw small groupings of Northern Pintail Ducks, totaling about 20 ducks per sighting. They usually nest here, but the population of these ducks have also seem to be decreasing. During our interview with Peter Jimmie, the local Yup'ik elder, he stated that he's noticing the difference in their population over the past 20 years. And he is correct - supported by the information we found on the National Audubon Society website. The population has gone down 77% over the last 40 years and the Northern Pintail Ducks are third on the list of the most population declines on birds in the U.S.

Fig. 5a. Photograph taken in December 1931. In the far distance you can see that there were once high grounds.

Fig. 5b. Photograph taken in Spring of late 1970's. In this photograph you can see that the land is slowly sinking to less than 5' as shown by the height of the man in the photograph.

Fig. 5c. Photograph taken in September 2007. In this photograph you can see that the hills are now completely gone.

Fig. 5(a-c). The three photographs shown above show how much the land has changed between 1931 and 2007. The sinking of the land changed the vegetation by lower the land to sea level. This allowed the flood waters from the Bering Sea along with its salt water to change the vegetation from non-salt tolerate to salt tolerate.

Fig. 6. Map area of our study area during with GPS points.

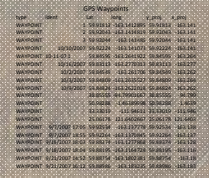

Fig. 7. GPS waypoints taken during study.

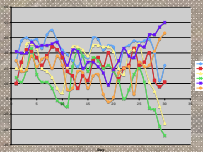

Fig. 8a. September Temperatures from 1970, 1980 and 2007.

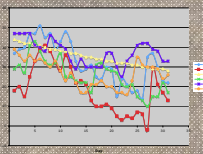

Fig. 8b. October Temperatures from 1970, 1980 and 2007.

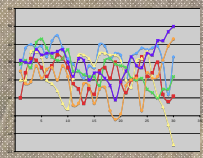

Fig. 8c. November Temperatures from 1970, 1980 and 2007.

Conclusion

In conclusion, the project we did shows how the extreme weather changes are affecting the two species of waterfowl during the fall migration. The change in vegetation from non-salt tolerate to one of salt tolerate affect the waterfowl by decreasing its fall diet of berries that grow only in fresh water conditions . Our data showed a decrease in population of the Northern Pintail Ducks and the disappearance of the Lesser Snow Geese in the last fifty years.

The waterfowl we depend on are very important to our community and the elders. Will the birds still be around in 20 years? We hope this will not be the effect to the community. If the birds have gone further north, will we have to move somewhere more north to be able to hunt birds? If the climate continues to change this way, things here will be a lot different for our community in the future.

Bibliography

"Bethel Temperature History." 2007. February 13, 2008. http://climate.gi.alaska.edu/history/WestCoast/Bethel.html

"Bird Fact Sheets: Lesser Snow Goose." Hinterland Who's Who, 2008. March 27, 2008. http://www.hww.ca/hww2.asp?id=51.

"Common Bird in Decline Northern Pintail (*Anas acuta*)." National Audubon Society, 2007. December 18, 2007. http://stateofthebirds.audubon.org/cbid/profile.php?id=3.

Connor, Dr. Cathy. UAS Consultant. August 2007.

Ely, C.R.; "Distribution, Abundance and Age Ratios of Wrangell Island Lesser Snow Geese (*Anser caerulescens*) During Autumn Migration on the Yukon-Kuskokwim Delta, Alaska;". Wildfowl, Vol. 44. (1993) 24-32.

Jimmie, Peter, Personal Interview. February 21, 2008. Kwigillingok, Alaska

McCaffery, Brian. Personal Interview. February 26, 2008. Kwigillingok, Alaska

Mills, Tamara. Fish and Wildlife Services. Migratory Bird Study. Advisor. Prakash, Dr. Anupma. UAS Consultant. August 2007.

"Snow Goose." Cornell Lab of Ornithology, 2007. December 18, 2007. www.birds.cornell.edu/AllAboutBirds/BirdGuide/Snow_Goose.html

Stevens, Dr. Eric. National Weather Services. Personal email. February 20, 2008.

"Topographic Map Symbols." United States Geogical Survey, 2007. February 21, 2007. http://erg.usgs.gov/isb/pubs/booklets/symbols/#2

Acknowledgments

We thank Brian McCaffery for the information he provided on the Lesser Snow Goose and the Northern Pintail Ducks and Dr. Eric Stevens for the temperature history of Y-K Delta dating back to the 1970's. Also, we'd like to thank elder Peter Jimmie for sharing his knowledge of the history of the local wildlife for our study area.

For further information

Please contact *jennifer_bacus@lksd.org*. More information on this and related projects can be obtained at *www.uas.alaska.edu/envs*. PDF-version of the poster can be obtained at www.lksd.org/kwigillingok.