Lower Colorado River Valley Population of Sandhill Crane (*Grus canadensis tabida*) Breeding and Wintering Ecology

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Introduction

- Seasonal movement patterns and habitat requirements during annual life cycles are critical information needed to formulate regional and national conservation strategies
    - Band recoveries
    - Surveys
    - Observation of Marked Individuals

- 6 subspecies of sandhill cranes are found in North America
    - 3 non-migratory groups
    - 3 migratory groups

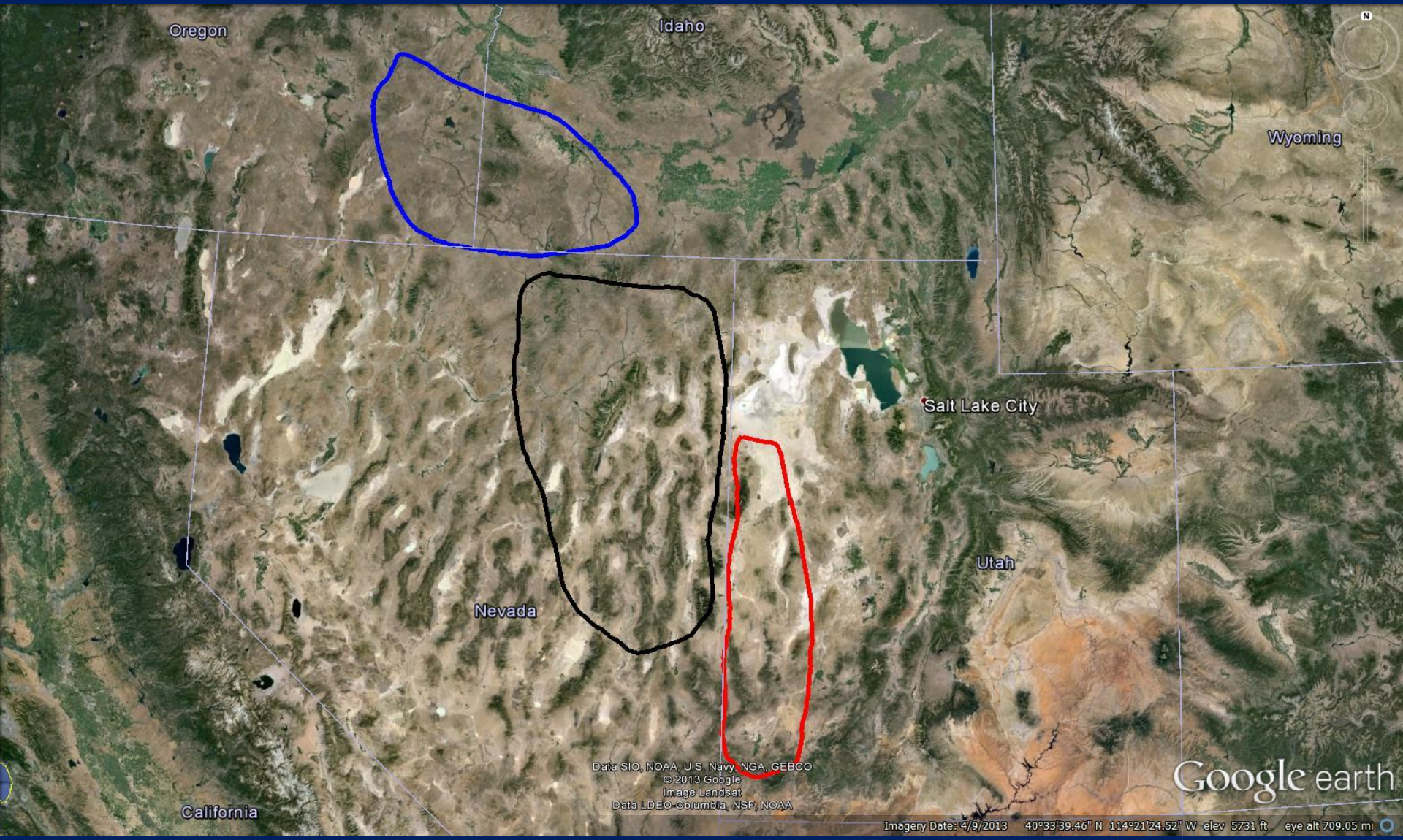
Introduction

- LCRV is the smallest of the migratory populations
  - Identified management challenges
    - Uncertainty of breeding origin

- Current winter aerial surveys and ground counts are believed to encompass ~90% of the LCRV population
  - Cibola NWR
  - Colorado River Indian Tribes wetland areas
  - Sonny Bono Salton Sea NWR
  - Gila River
- Current summer aerial surveys only account for ~ 30% of the LCRV population
  - NE Nevada

Introduction

- Speculation regarding other breeding areas:



Introduction

- Current Pacific Flyway population management is driven by abundance

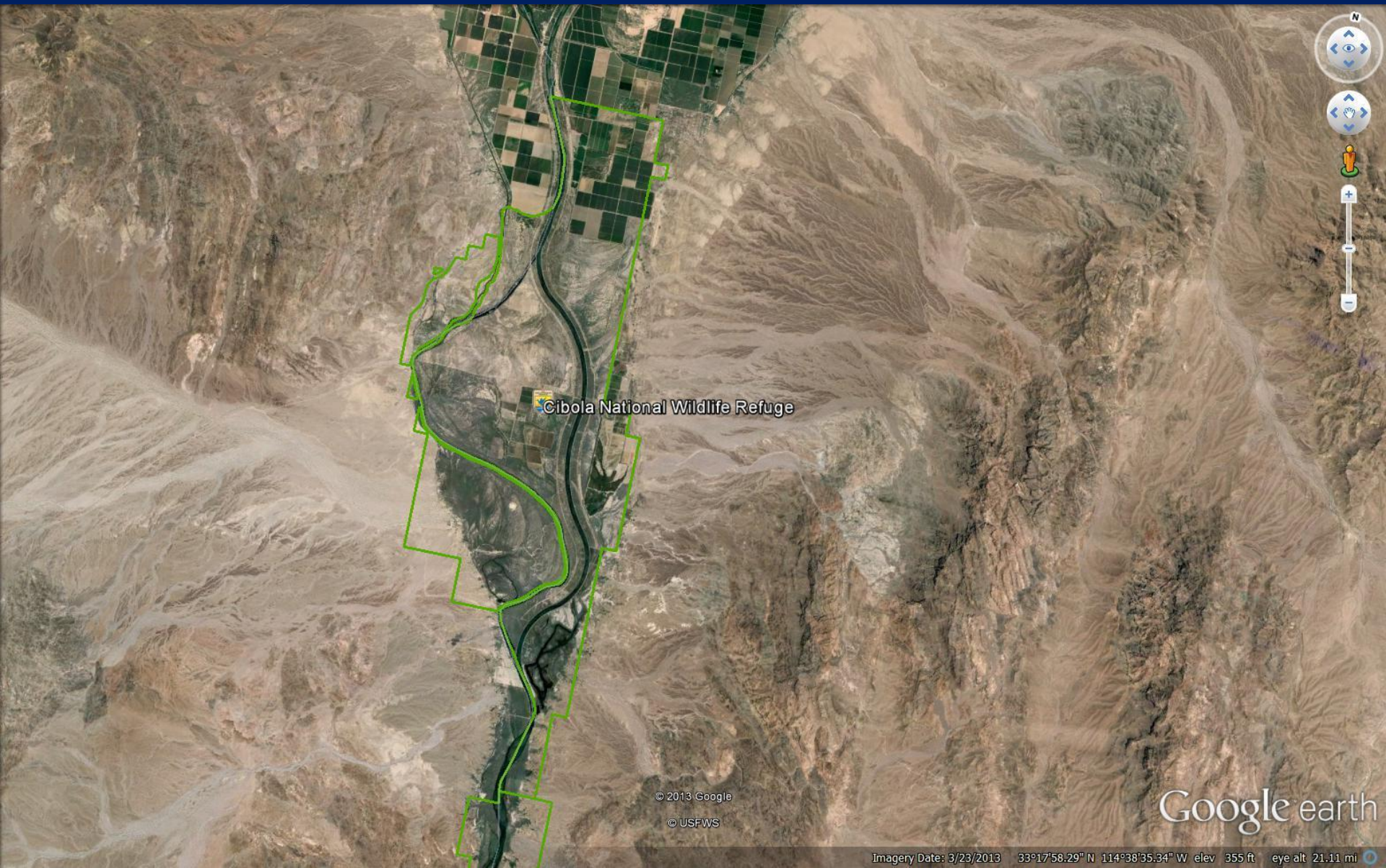
- Abundance and low numbers of known nesting areas resulted in information needs identified
    - Migratory Shore and Upland Game Bird Support Task Force

Objectives

- Determine breeding and wintering distribution of LCRV Sandhill Cranes in order to establish the geographic area within which conservation measures can be undertaken to protect and enhance this population.
    - Delineate and identify breeding areas outside of NE NV
    - Describe winter movements and habitat needs
    - Determine habitat selection and use
    - Begin to investigate if comingling occurs with other western populations of SACR

Study Area

- Cibola NWR



Study Area

- Sonny Bono Salton Sea NWR

Experimental Design

- Trapping
  - Rocket nets and noose set ups
  - Adult cranes
  - GPS satellite transmitters
  - Standard size 9 USGS bands

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Experimental Design

- 20 PTTs
- 4 GPS locations a day
- Doppler locations and diagnostics every 72 hours for 8 hours
- Landsat Thematic Mapper imagery
- Manly et al. (1993) G-test measurement of habitat and dietery preferences

Experimental Design

- We will evaluate habitat selection using a Type III approach
  - use and availability are identified at the animal level.
  - Estimates derived from Type III assessments can be used to estimate parameters (and estimate variability) for the population of interest.
  - We will classify the measured resource units as available (random) or used and use a generalized mixed linear model with a binomial error distribution (PROC GLIMMIX) to assess habitat selection for both refuges and other priority areas.

Experimental Design

- Climate Change Forecasting:
  - We will use a geographic information system to extrapolate the most supported habitat covariates from the study to develop a predictive habitat selection model for cranes in the Lower Colorado River Valley.
  - We will follow the methodologies in Grisham et al. (2012) by extrapolating the predictive values from the equation produced in interpolated relationship between the dependent variable (selection) and independent (covariates from habitat selection assessment) variables.
  - We will then project all data in GIS to assist in identification of broad-scale environmental patterns to predict crane habitat selection in the Lower Colorado River Valley, given climate change forecasts. These data can be used as an index to identify areas of high conservation priority for cranes in the LCRV.

Results

- 40 captured and banded
  - 38 AHY
  - 2 SY
- 16 PTTs deployed
  - 10 Cibola NWR
  - 6 Imperial Valley

Results

- Locations

Results and Discussion

- Very preliminary at this point in time
  - Tied to Agroecosystems
  - Beginning to identify roost sites off NWR
- As changes occur how will this impact these cranes
  - Water availability
  - Impacts of climate change

Long Term Climate Goals

- Deployed 3 Wireless weather stations on each refuge
  - Records 15+ weather variables at 2.5 second intervals
  - Collect fine scale data (spatial and temporal) for each refuge
  - Data will be available for other assessments

- Ultimate goal is climate change impact assessment
  - Requires ecological, weather, and future climate data
  - We are collecting this data simultaneously and will do so for duration of study
  - Data intensive, but achievable

Management Implications

- Information gained from this study will enable agencies and land managers to target breeding and wintering landscapes for conservation of LCRVP sandhill cranes

- Directly addresses Priority 3 stated in the Information Needs for sandhill cranes, specifically information needs of sandhill cranes in the west

Time Table

Time	Activity
November 2013 –March 2014	Begin identifying trap sites and trapping
March 2014 – December 2016	Collect and analyze ARGOS data as well as produce initial maps
January – March 2016	Develop and submit draft report for review
May 2016	Submit final report

Acknowledgements

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Questions or Comments?