Effects of Landscape-Scale Environmental Variation on Greater Sage-Grouse Chick Survival

Guttery et al. 2013 PLOS ONE

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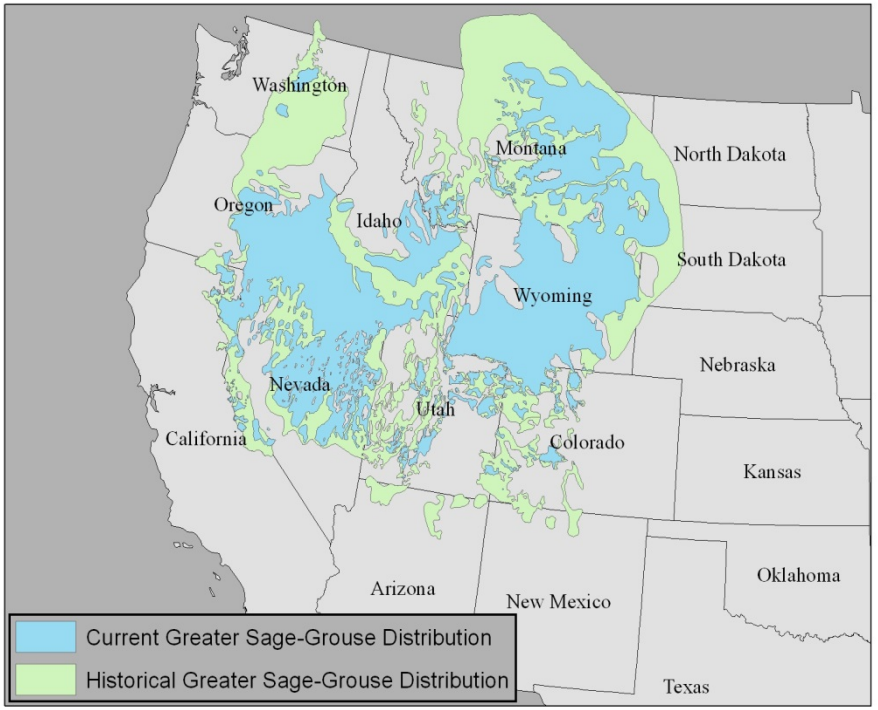
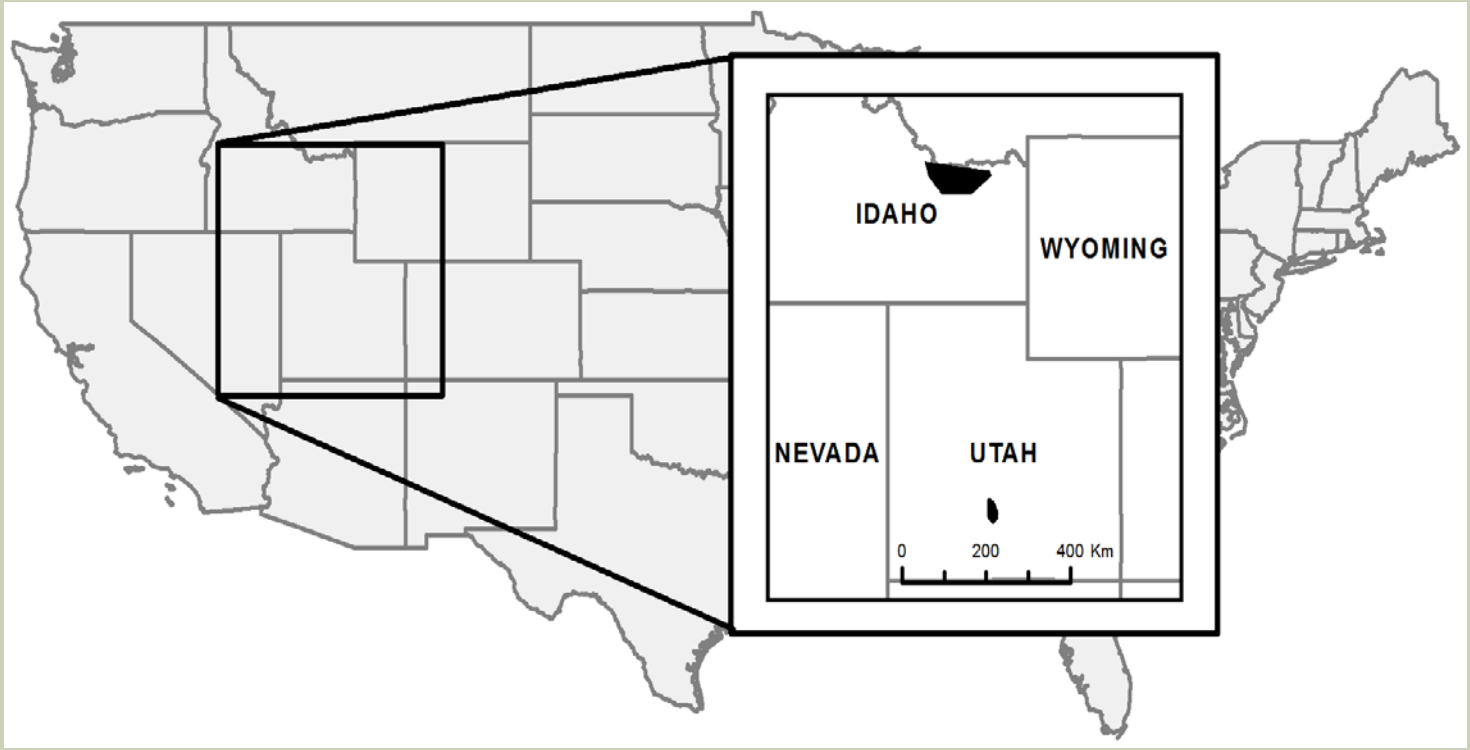
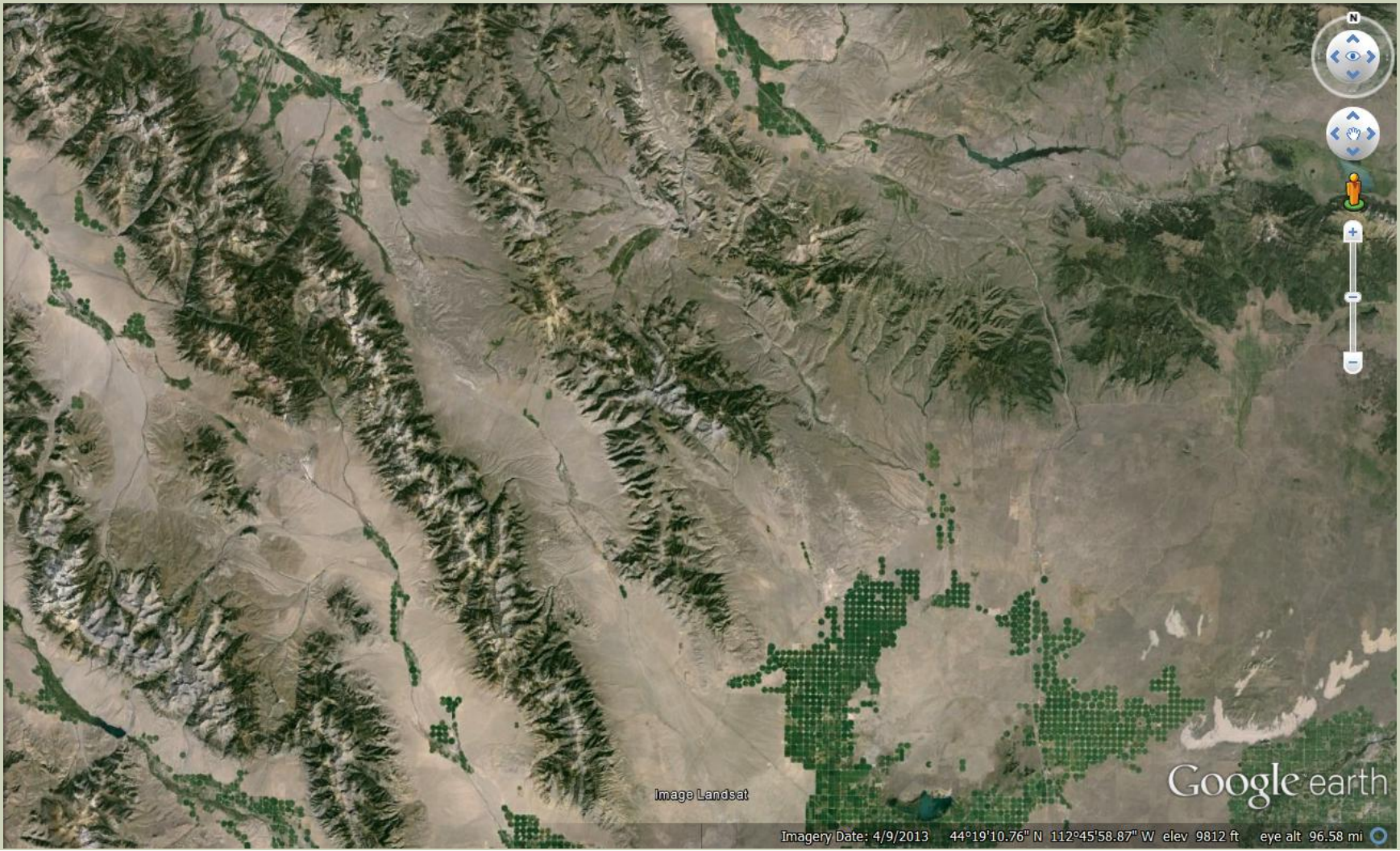
INTRODUCTION



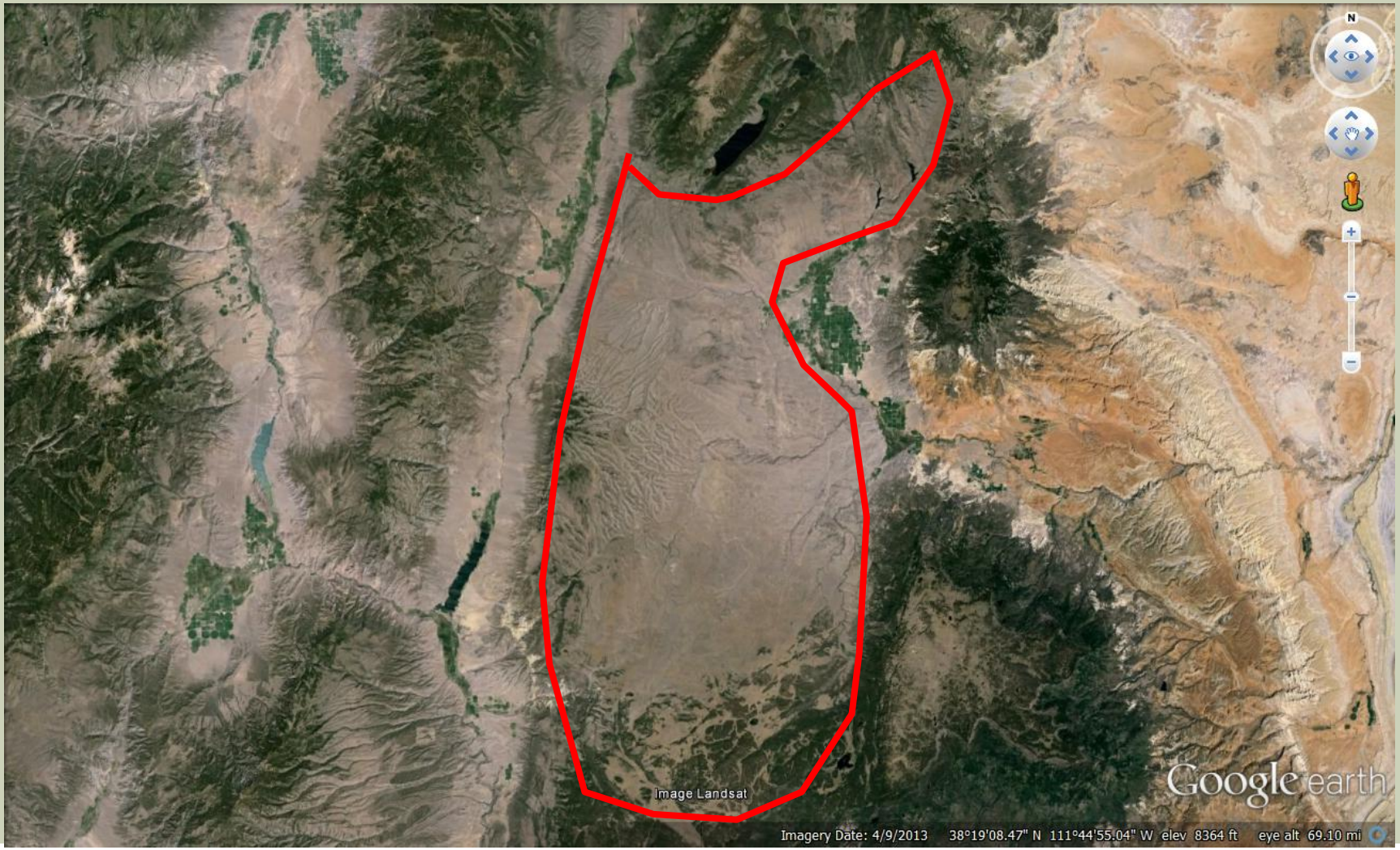
STUDY AREAS



UPPER SNAKE RIVER PLAIN, ID



PARKER MOUNTAIN, UT



METHODS


NATURAL RESOURCES
Wildlife Resources


Braunamid white
USP: 2/0
Metric: 3
Length: 100m
Art.-Nr: F1185055

PREVIOUS RESEARCH (PARKER 2005-2006)

- 0.50 Survival to 42 days
- One study area
- 2 years

LARGE SCALE - MULTIPLE SITES

Analysis and Modeling:

- Monitored Survival (Telemetry-based)
- Model: Known-Fate MLE (R; Manly and Schmutz 2001)
- Covariate Data:
  - Palmer drought Severity Index (PDSI)
  - Palmer Z-Index
    - Winter Nov 1- Apr 30
    - Summer May 1 – July 31
  - Parameter-Elevation Regressions on Independent Slopes Model (PRISM)
  - NDVI (Phenological “Greeness”)

RESULTS

Table 1. Capture statistics for greater sage-grouse chicks marked in Idaho (1999–2002) and Utah (2005–2009).

Year	Broods[1]	Chicks[2]	Hen Ages[3]	Marked[4]
1999	13	30	SY = 3, ASY = 10	2.31
2000	15	42	SY = 4, ASY = 11	2.80
2001	14	40	SY = 1, ASY = 13	2.86
2002	24	71	SY = 5, ASY = 19	2.96
2005	21	89	SY = 11, ASY = 10	4.24
2006	21	61	SY = 0, ASY = 21	2.90
2007	12	55	SY = 4, ASY = 8	4.58
2008	11	66	SY = 2, ASY = 9	6.00
2009	11	64	SY = 1, ASY = 10	5.82
Total	142	518	SY = 31, ASY = 111	3.65

[1]Number of broods captured.
[2]Total number of chicks marked with radio-transmitters.
[3]SY = second year hen (hatched the previous year), ASY = after second year hen (hatched ≥2 years earlier).
[4]Average number of chicks marked per brood.
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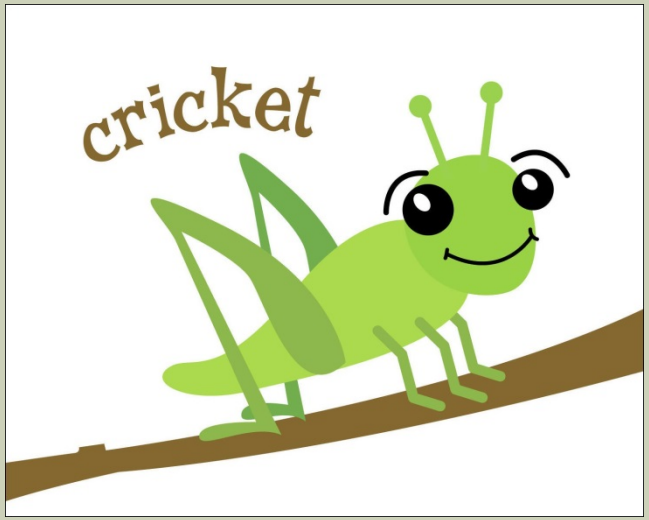
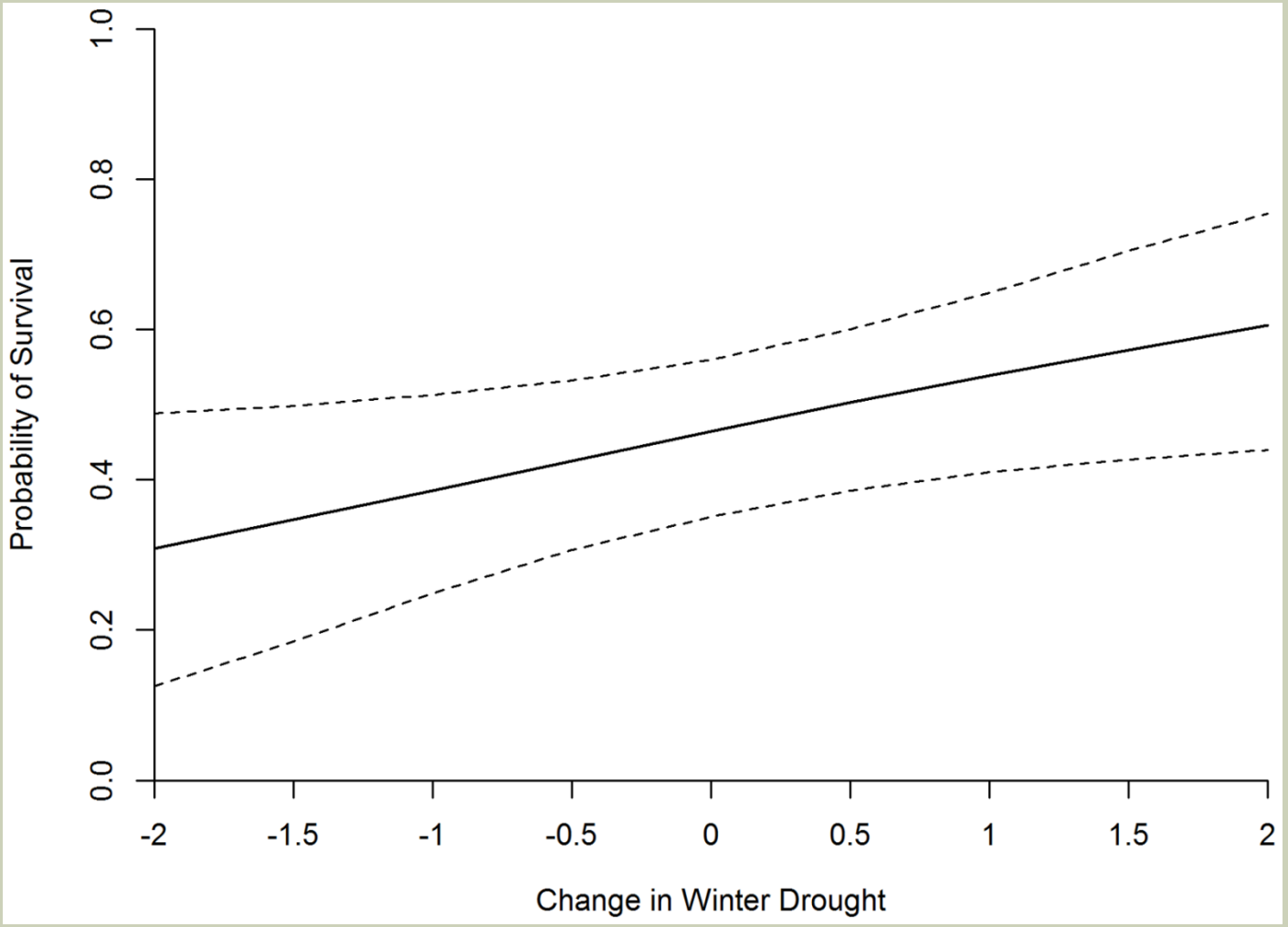
> 11,000 Exposure Days

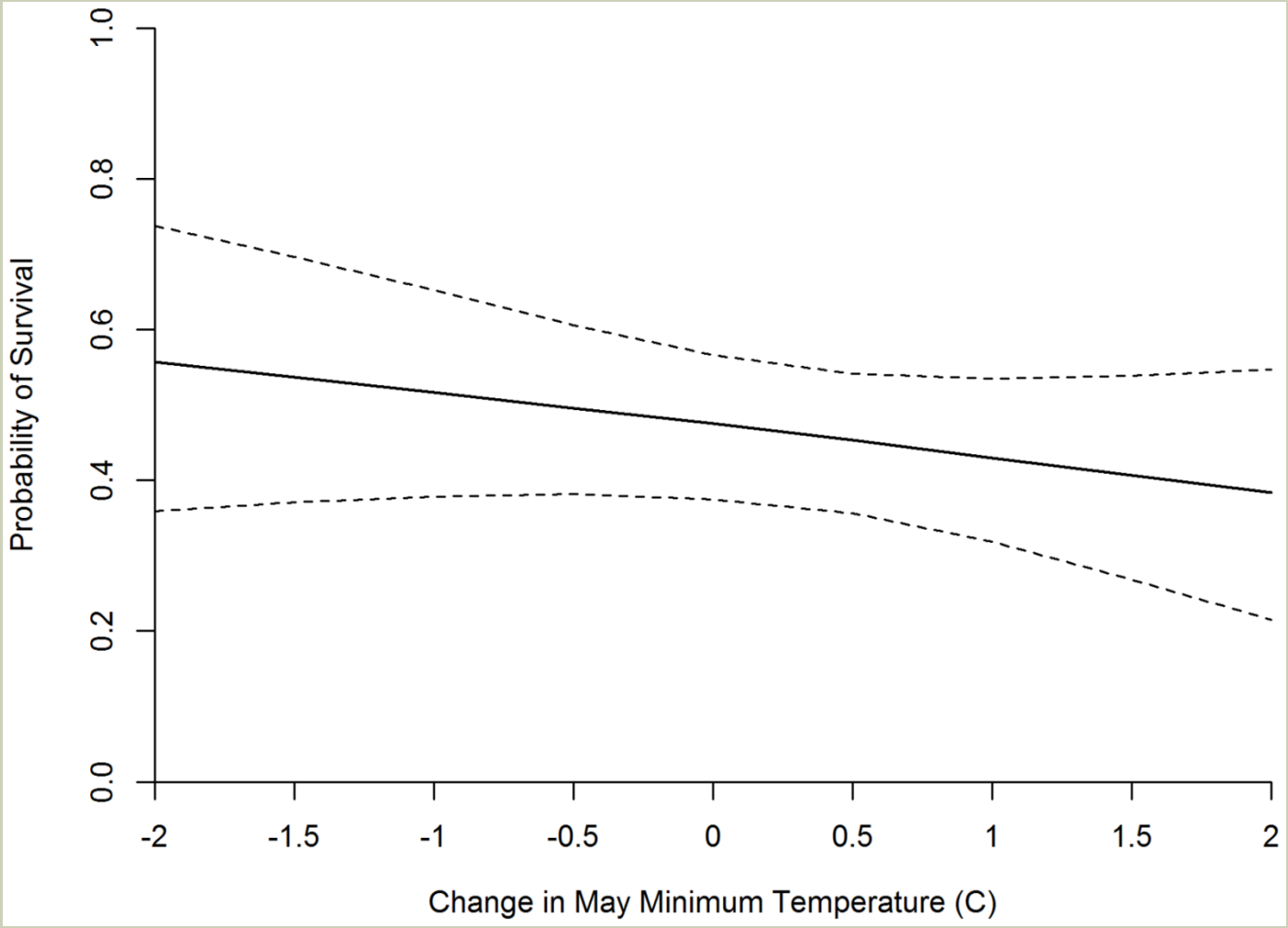
NDVI – NOTHING!!!



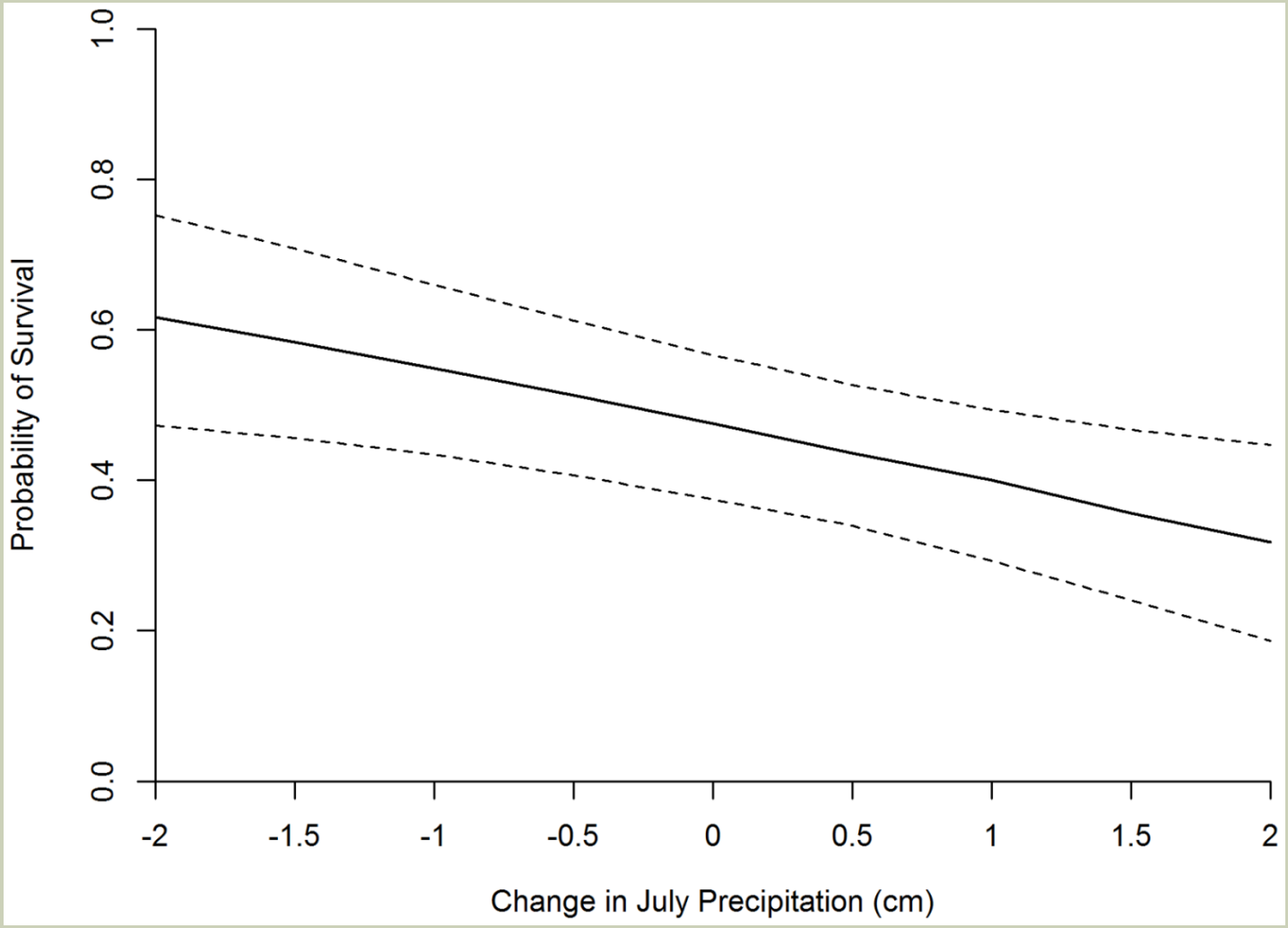
WINTER DROUGHT



MINIMUM MAY TEMPERATURE



JULY PRECIPITATION



TAKE HOME

- Climate Matters
- Periodic Production Hypothesis
- Moisture Facilitated Predation Hypothesis (Grouse?)
- High Levels of Chick Survival!!!!

QUESTIONS