Understanding breeding populations of Rusty Blackbirds Reproductive success

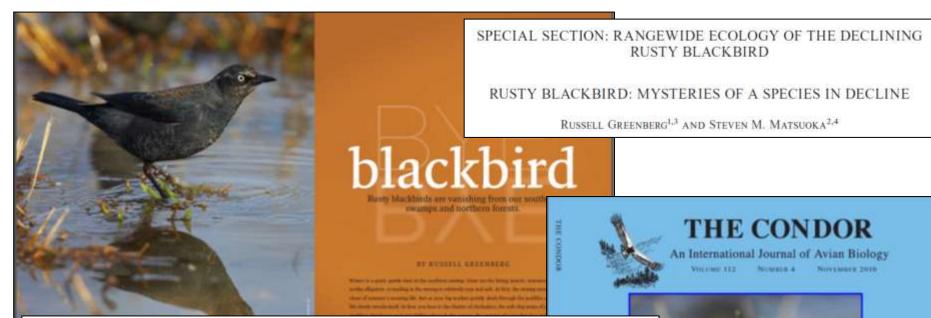
Steve Matsuoka U.S. Fish & Wildlife Service

David Tessler Alaska Department of Fish and Game

Russ Greenberg Smithsonian Migratory Bird Center

A. Harding-Scurr, D. Shaw, R. Corcoran, P. Meyers, N. Rojek Rusty Blackbird Working Group

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MIGRATORY CONNECTIVITY IN THE RUSTY BLACKBIRD: ISOTOPIC EVIDENCE FROM FEATHERS OF HISTORICAL AND CONTEMPORARY SPECIMENS

Keith A. Hobson^{1,4}, Russell Greenberg², Steven L. Van Wilgenburg³, and Claudia Mettke-Hofmann^{2,5}

Understanding Declines in Rusty Blackbirds

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An enormously abundant migrant.... The thousands of Grackles have been increased to tens of thousands. They blacken the fields and cloud the air. The trees on which they alight are foliated by them. Their incessant jingling song drown the music of the Meadow Larks and produce, dreamy, far-away-effect, of myriads of distant sleigh bells.

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IMPLICATIONS OF PREBASIC AND A PREVIOUSLY UNDESCRIBED PREALTERNATE MOLT FOR AGING RUSTY BLACKBIRDS

Claudia Mettke-Hofmann^{1,2,5}, Pamela H. Sinclair³, Paul B. Hamel⁴, and Russell Greenberg²

On the Decline of the Rusty Blackbird and the Use of Ornithological Literature to Document Long-Term Population Trends

RUSSELL GREENBERG* AND SAM DROEGE†

Conservation Biology 1999



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90% decline since 1960s

Chronic decline since 1850

Identified potential causes

"...little quantitative work has been done on the life history of the Rusty Blackbird...except by anecdote (e.g. **reproductive success**)."



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"The species now breeds only sparingly in most regions ... with reports of dense **populations from Alaska**." "...little quantitative work has been done on the life history the Rusty Blackbird...except by anecdote (e.g. reproductive success)."



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"reproductive success of populations from Alaska" Greenberg & Droege 1999

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Is reproductive success chronically low?

• Is reproductive success highly variable?

Fecundity *F* ~ *NS* * *CS* * *V*

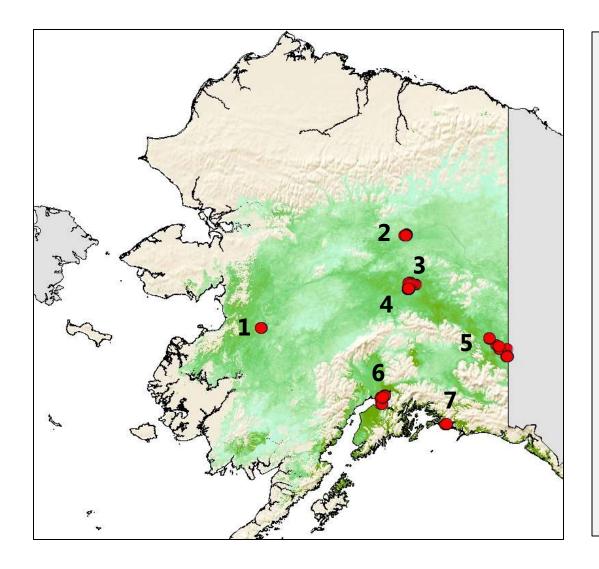
Nest Success % nests with ≥1 fledgling

- **Clutch size** (*CS*) number of eggs laid
- **Viability of young** (*V*) % eggs that fledge per successful nest

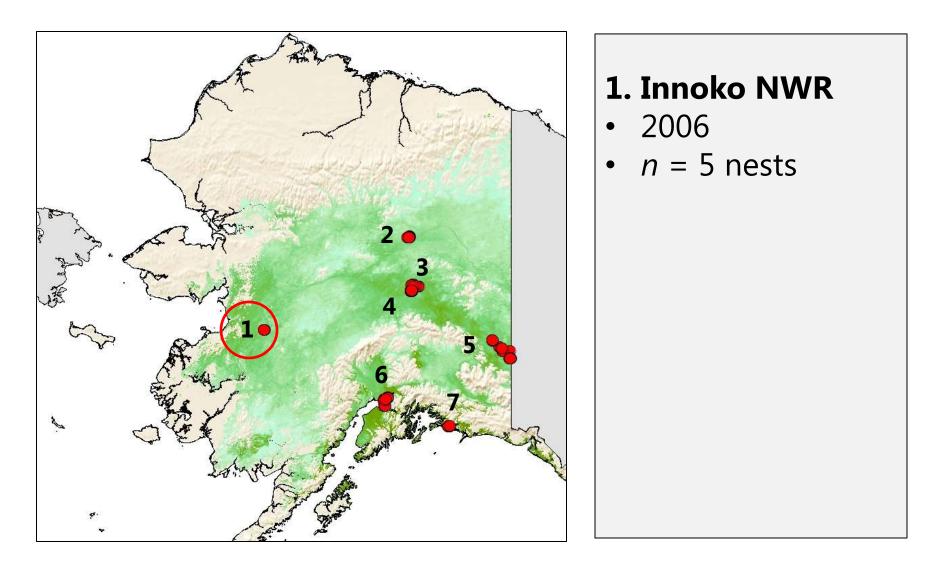


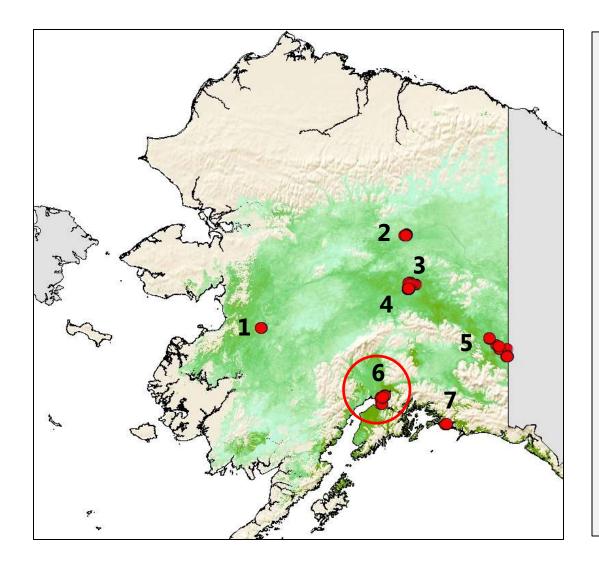




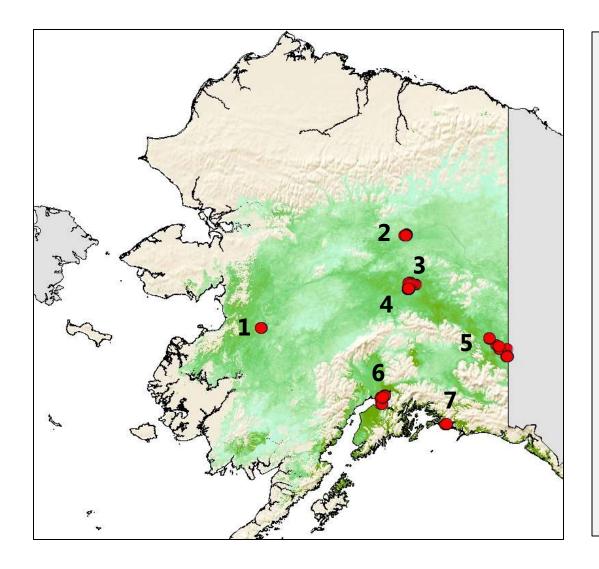


- 1. Innoko NWR
- 2. Yukon Flats NWR
- 3. Fairbanks
- 4. Tanana Flats
- 5. Tetlin NWR
- 6. Anchorage
- 7. Copper River





- 1. Innoko NWR
- 2. Yukon Flats NWR
- 3. Fairbanks
- 4. Tanana Flats
- 5. Tetlin NWR
- 6. Anchorage
- 2007-2013
- *n* = 113 nests



- 1. Innoko NWR
- 2. Yukon Flats NWR
- 3. Fairbanks
- 4. Tanana Flats
- 5. Tetlin NWR
- 6. Anchorage
- 7. Copper River
 - *n* = 460 nests

Fecundity *F* ~ *NS* * *CS* * *V*

Nest Success % nests with ≥1 fledgling

Clutch size (*CS*) number of eggs laid

Viability of young (*V*) % eggs that fledge per successful nest







Daily survival rate $F \sim dsr^{28} \times CS \times V$

Covariates Study area Habitat (NWI) Date Nest age Year (trend) year (factor) year (2006 vs. others) All univariate and bivariate







Daily survival rate $F \sim dsr^{28} * CS * V$

Covariates

Study area Habitat

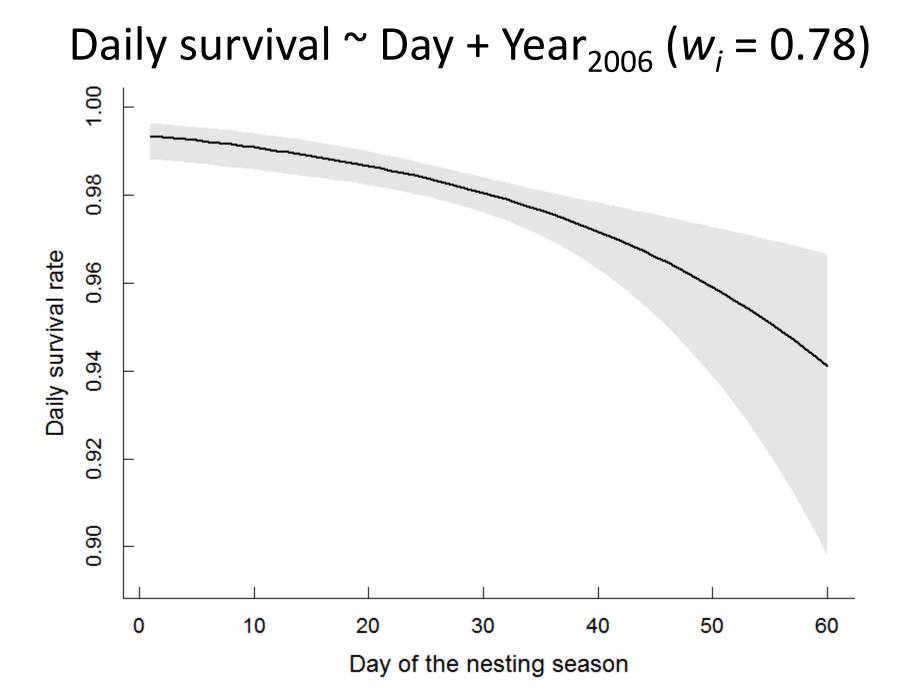
Date

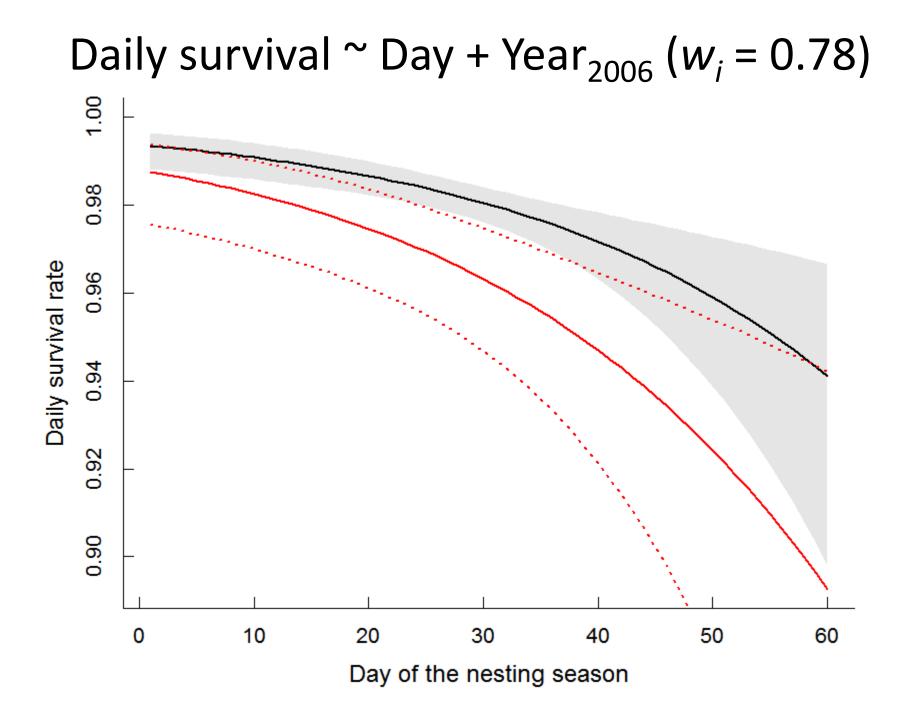
Nest age Year (trend) year (factor) **year (2006)** Null $\sum W_i$ 0.01 0.01 1.00 0.03 0.12 0.01 0.78 0.00



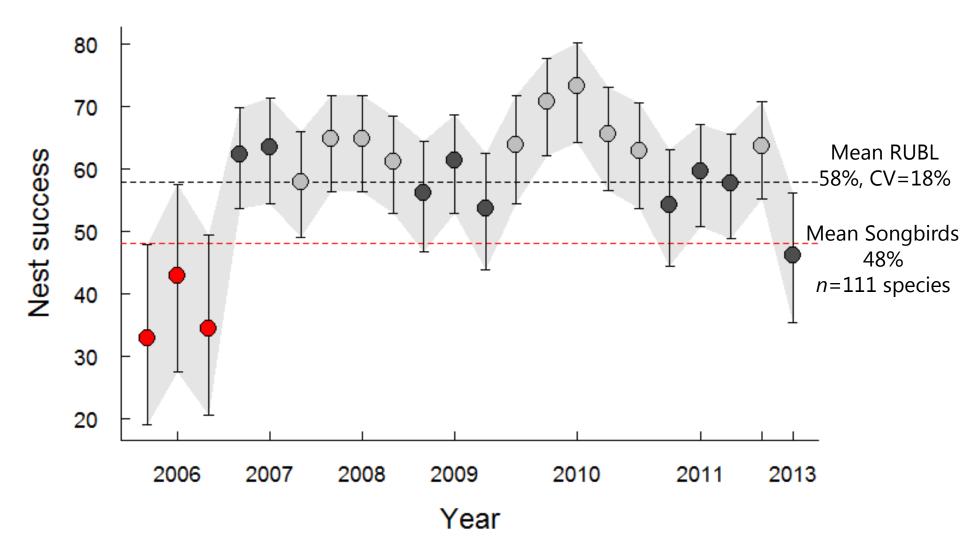




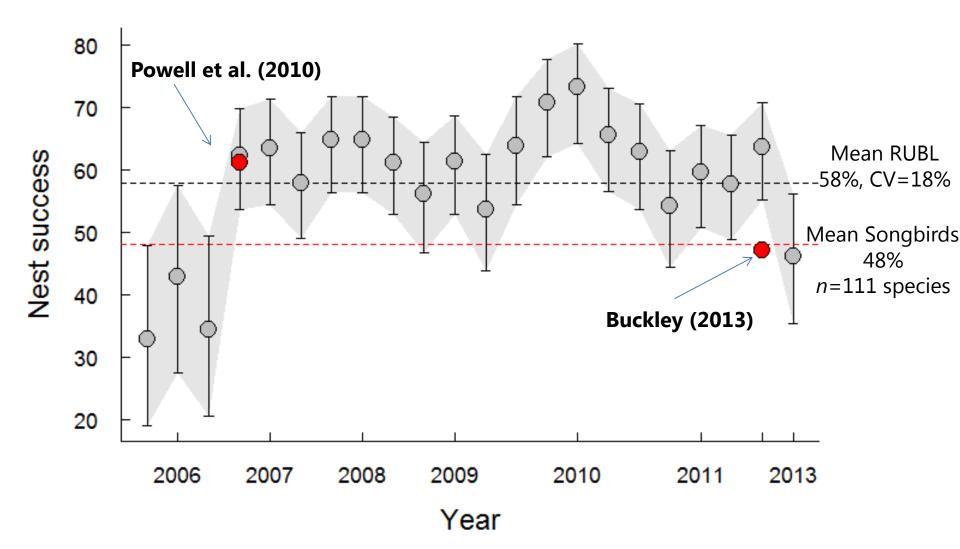




Nest success by site & year



Nest success by site & year



Clutch size $F \sim dsr^{28} * CS * V$

Covariates Study area 1st egg date Year (trend) year (factor) year (2006 vs. other) Null model

All univariate and bivariate models

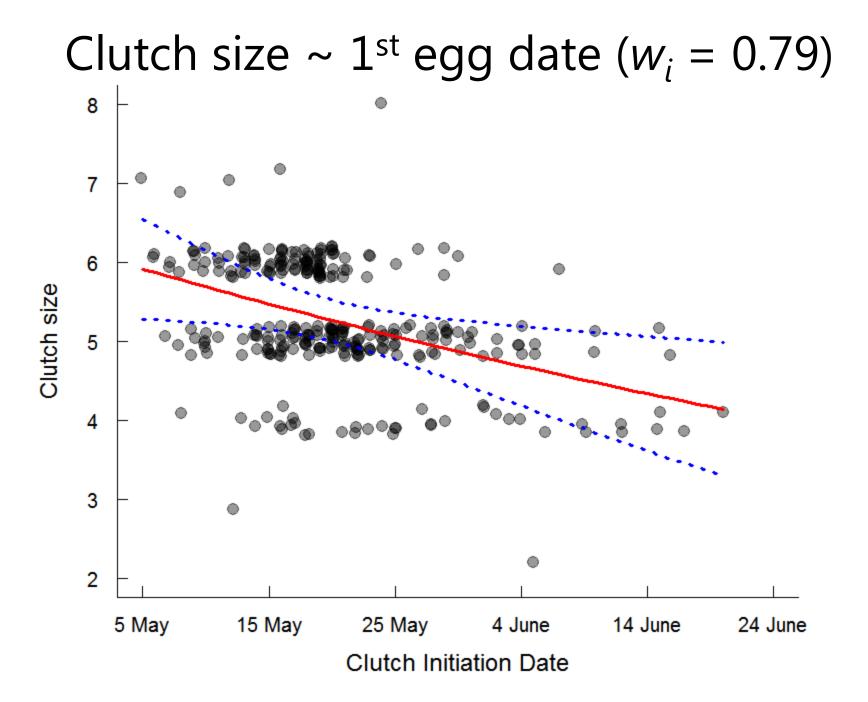


Clutch size F ~ CS

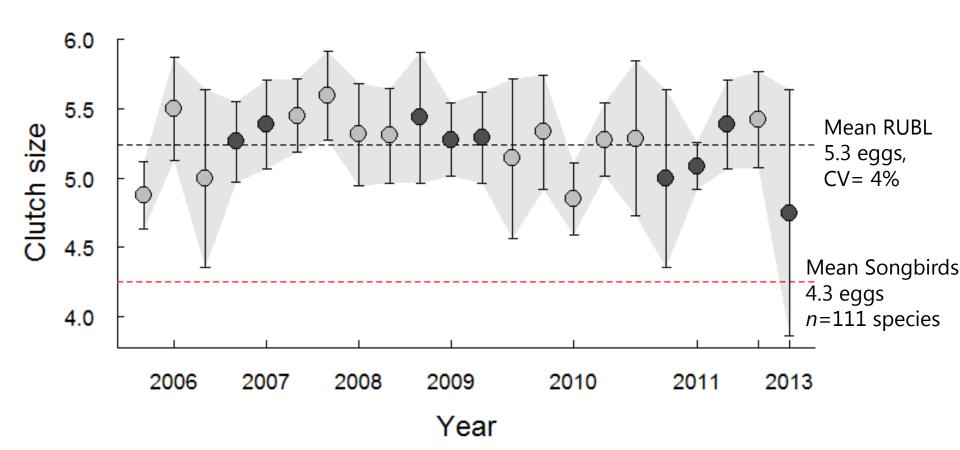
Covariates Study area 1st egg date Year (trend) Year (factor) year (2006) Null

 $\sum W_i$ 0.00 0.79 0.12 0.05 0.00 0.12

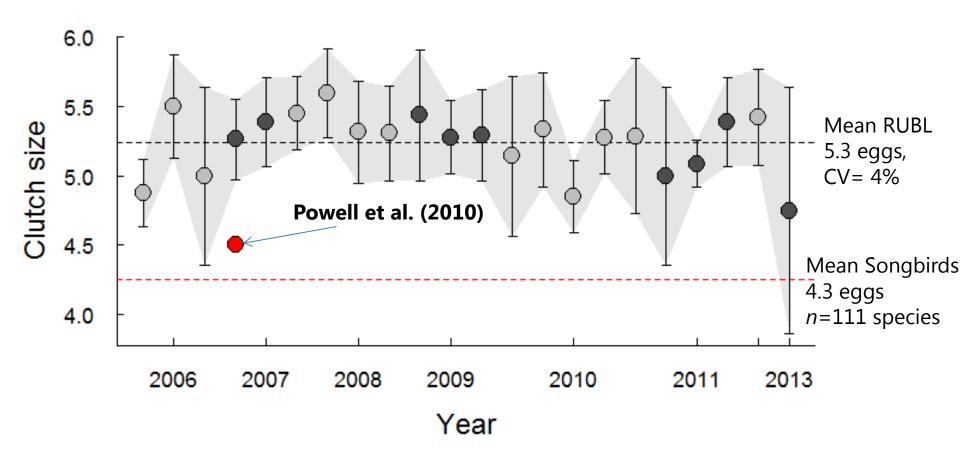




Clutch size by site & year



Clutch size by site & year





Covariates Study area Clutch size Year (trend) year (factor) year (2006 vs. other) Null model

All univariate and bivariate models

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Covariates Study area **Clutch size** Year (trend) Year (factor) year (2006) Null

 $\sum W_i$ 0.02 0.56 0.10 0.02 0.06 0.16

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Clutch size% eggs fledge3-5 eggs93 (91-95)6-7 eggs87 (83-92)



Nest Success (*NS*)

Clutch size (CS)

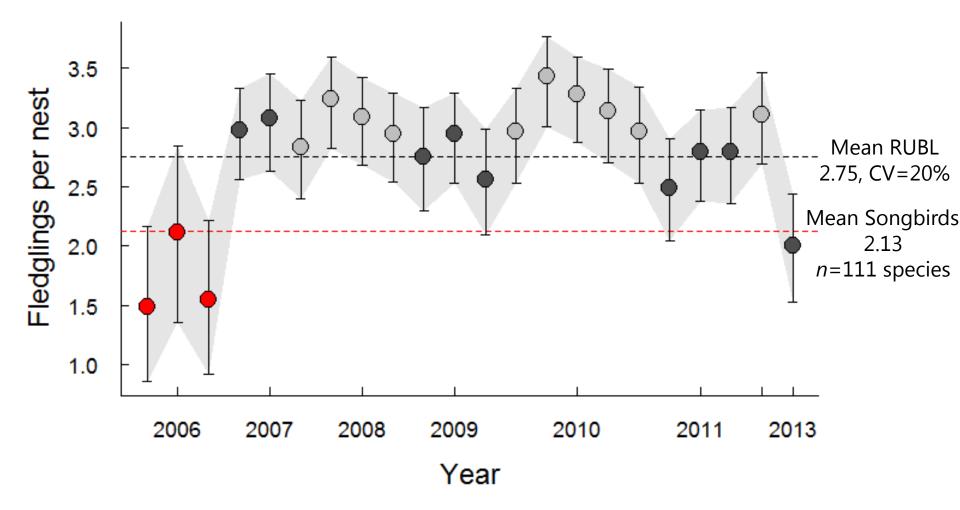
Viability of young (*V*)



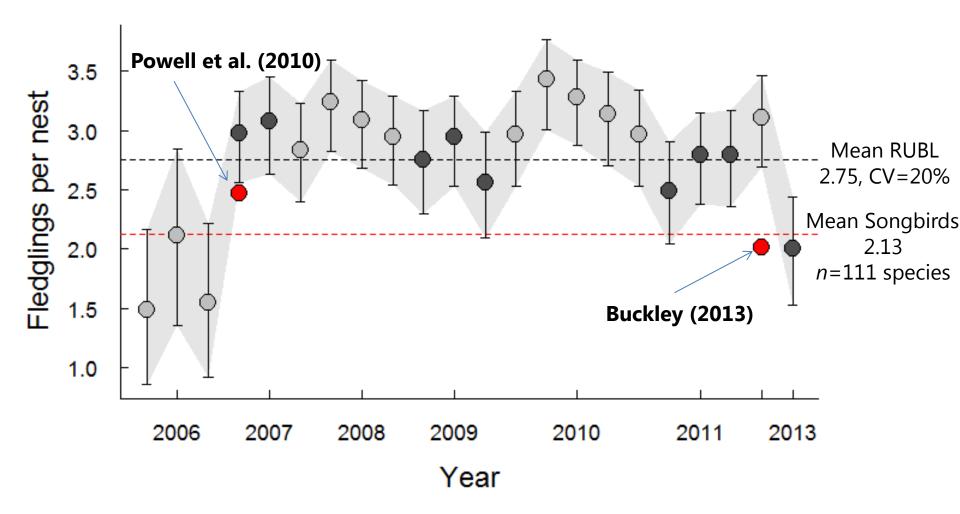




Fecundity by site & year



Fecundity by site & year



Conclusions

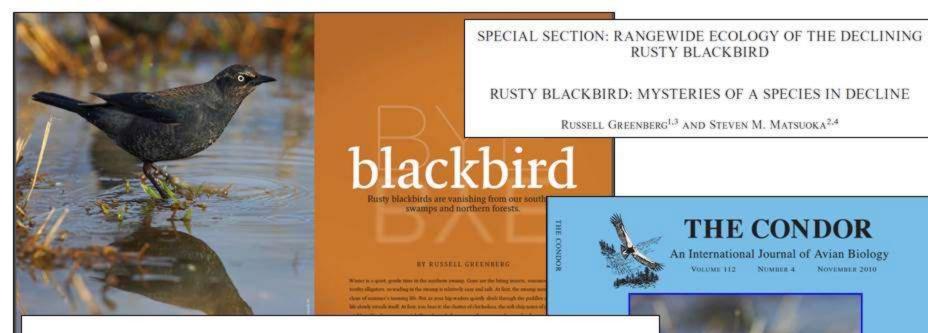
Is reproductive success chronically low?

- 2.75 fledged young per nest.
- 30% higher than most songbirds.
- 26% higher than in New England

Is reproductive success highly variable?Generally high, but low in 2 of 8 years

"ultimately what is needed is a model of annual population growth that connects demographic processes throughout the year so that the relative importance of various factors on fecundity, survival, and recruitment can be integrated into models of population dynamics."

Greenberg (2010)



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