An introduction to the Rusty Blackbird symposium: Building on the foundation built by Russ Greenberg

Luke L. Powell
Smithsonian Migratory Bird Center
International Rusty Blackbird Technical Group

Bill Glanz

w/ Rusty Blackbird nest, ME

w/ Kia, New Zealand

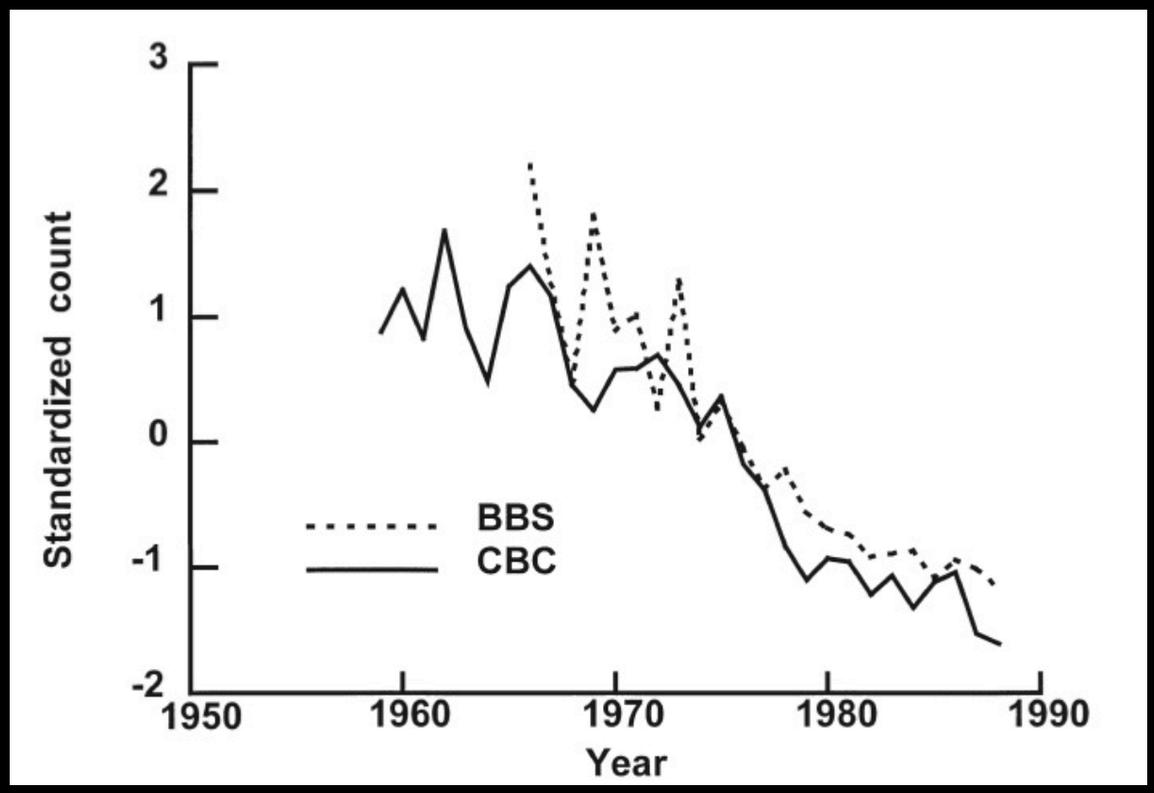
Evil Eye: 2¢ each

Wholesale 300PCs Pale Yellow Evil Eye Flat Round R...

US $0.02 / piece

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

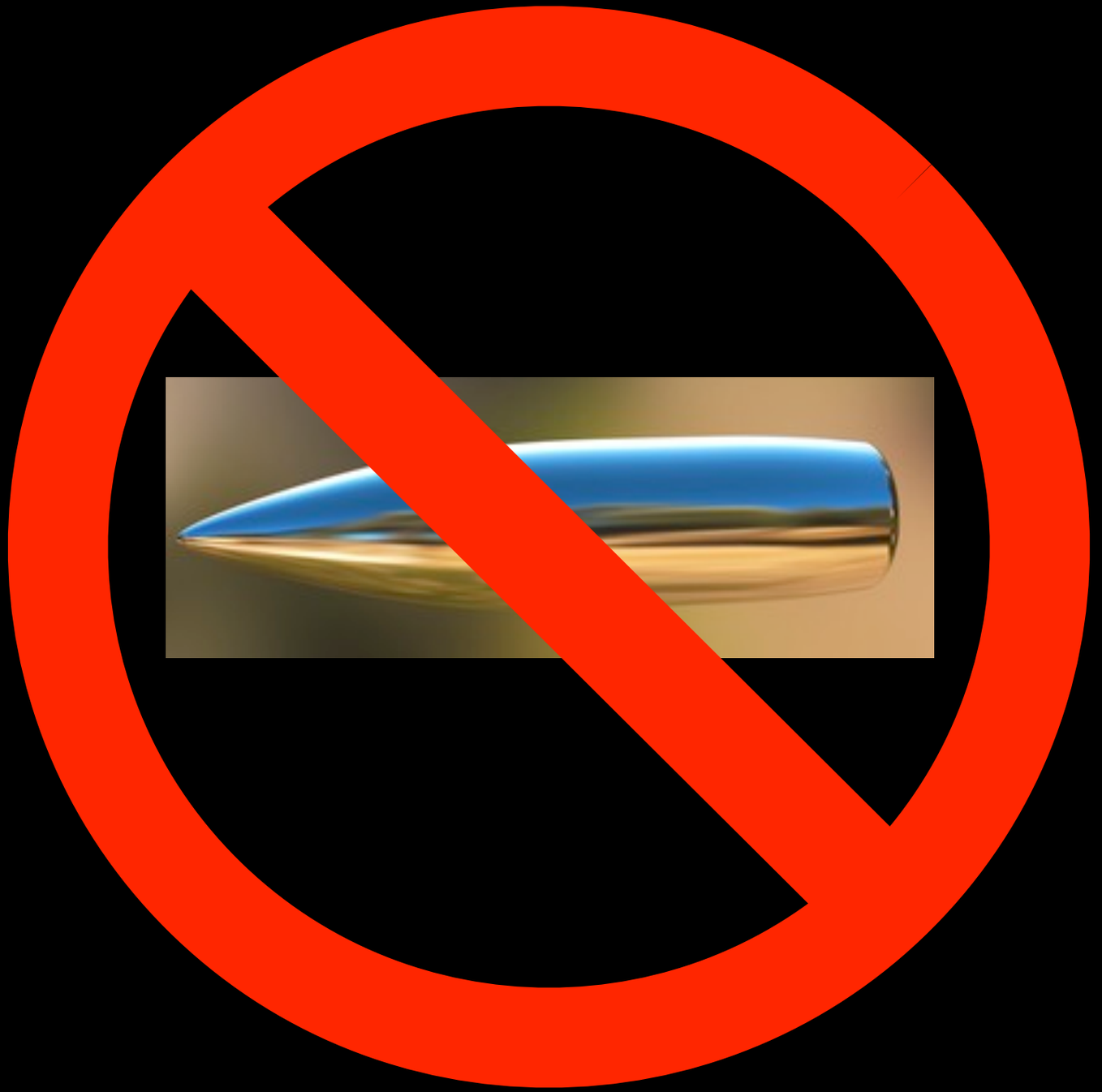
What caused declines?

- Loss of wooded wetlands in Southeast?
- Timber management in Northeast?
- Climate change - Boreal wetlands drying?

- Mercury in Northeast?

No silver bullet

photo: Ted Swem



Progress since Greenberg & Droege 1999

- 7 MS theses
- 2 PhD dissertations
  - J. Luscier, P. Newell
- 16 papers
  - Special Issue: The Condor

Matsuoka
&Tessler et al.

Westwood
et al.

Hodgman, Luepold
& Powell et al.

Foss & Wohner
et al.

Luscier et al.

Wohner et al.

Mettke-Hoffman. et al.

Stouffer & Borchert
et al.

Map by
Terry Sohl

Matsuoka
&Tessler et al.

Westwood
et al.

Hodgman, Luepold
& Powell et al.

Foss & Wohner
et al.

Luscier et al.

Wohner et al.

Mettke-Hoffman. et al.

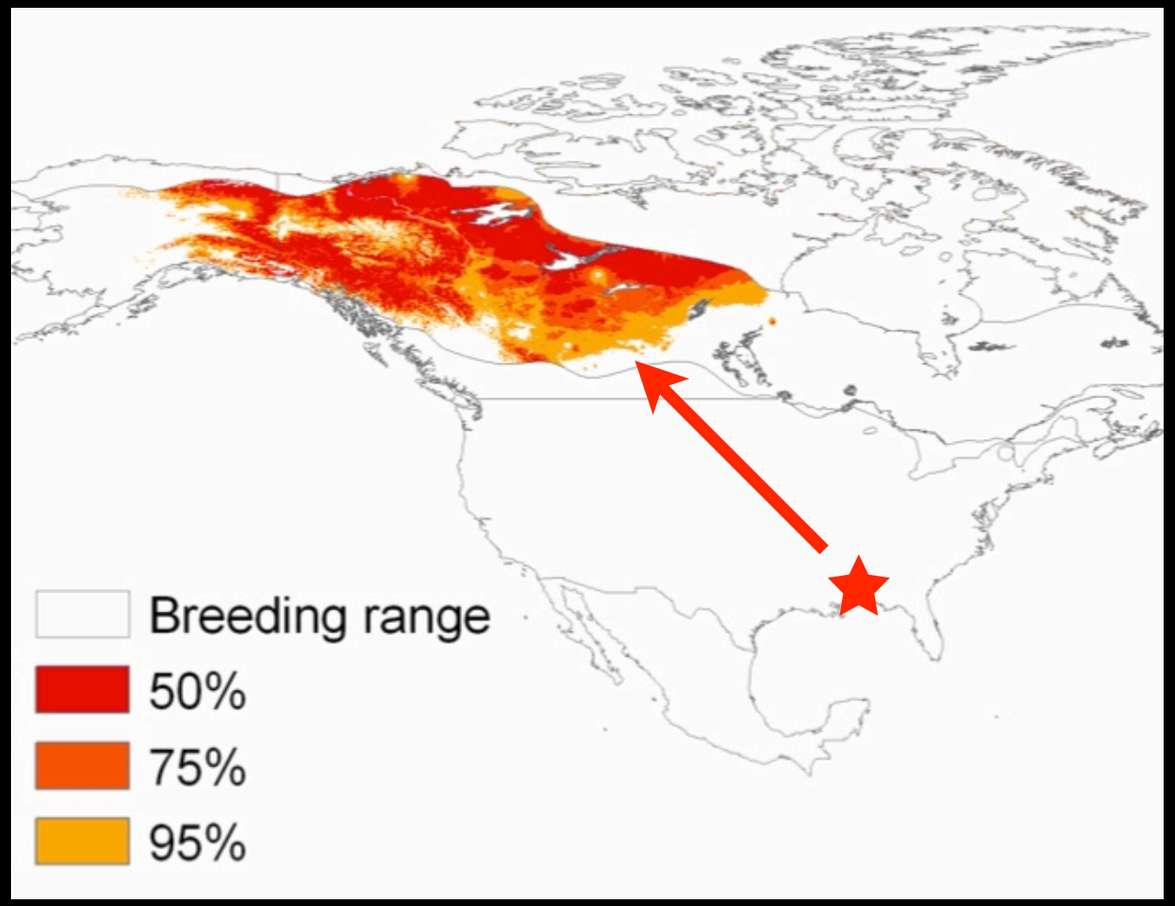
Stouffer & Borchert
et al.

Map by
Terry Sohl

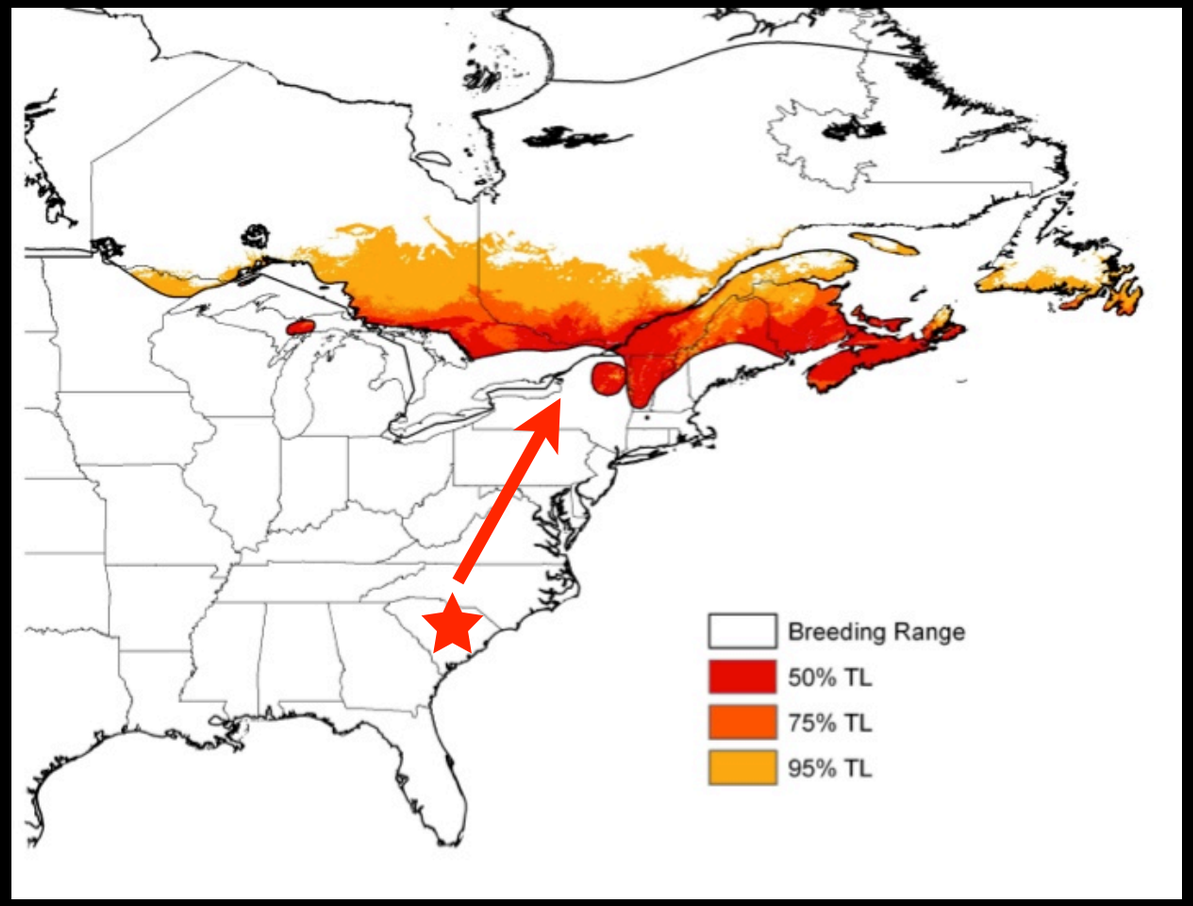
Rusty Blackbird

- Citizen Science; looks for Rusty "hotspots"
- Three winters (2009-2011; Brian Evans & Greenberg)
- Spring Migration (2014-2016; Jude Scarl et al.)
- Fall migration (penciled-in for 2017-2019)

Connectivity w/ Isotopes



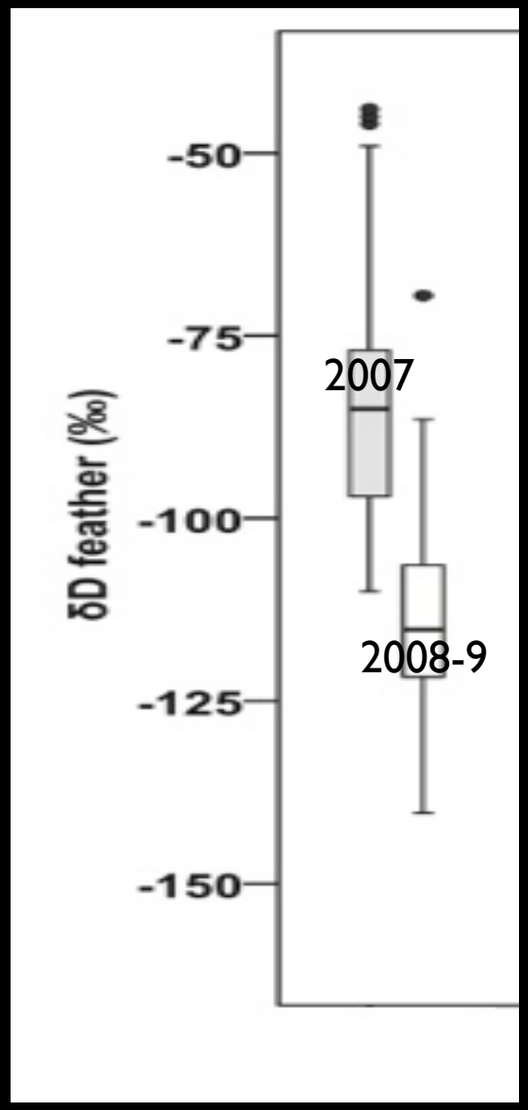
Mississippi samples

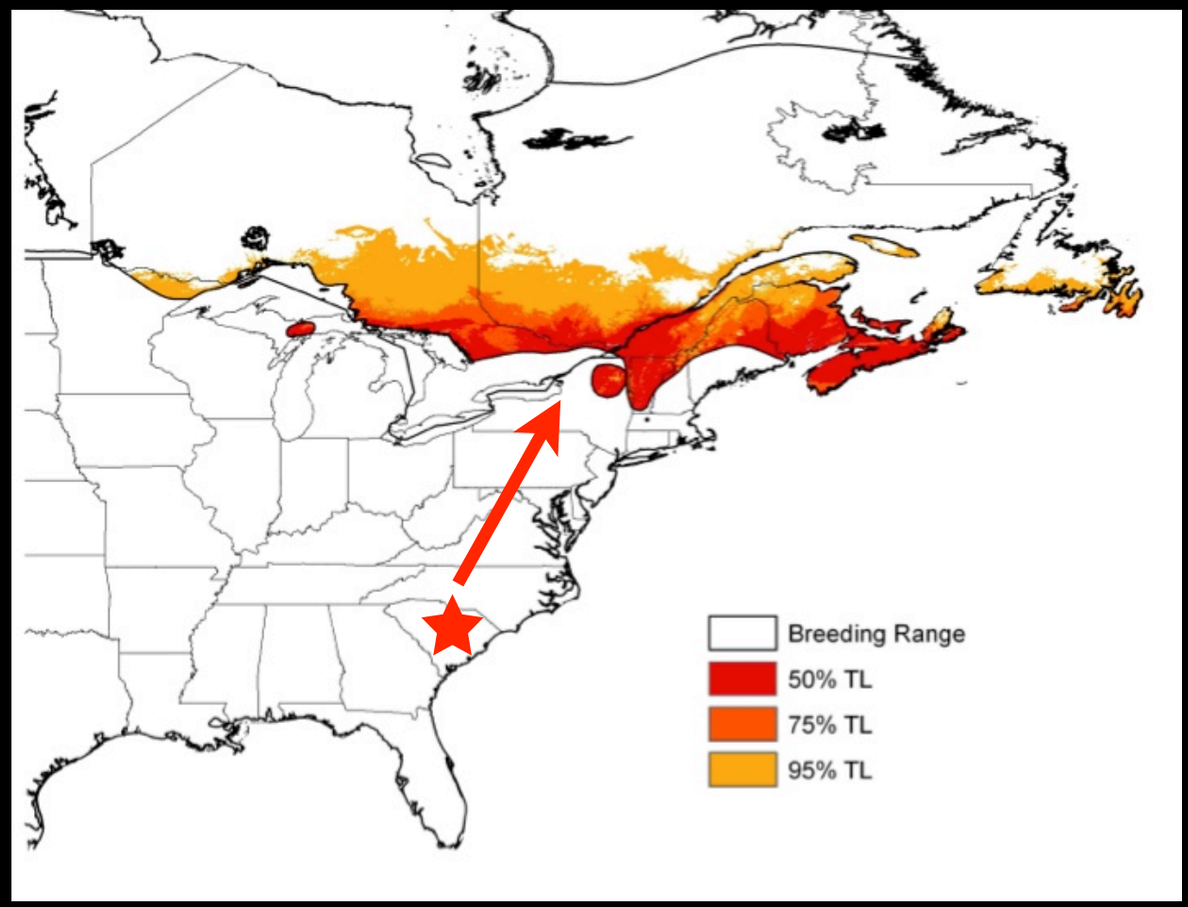


South Carolina samples

Hobson, Greenberg et al. 2010, Condor

Little winter fidelity!





South Carolina samples

Hobson, Greenberg et al. 2010, Condor

What caused the declines?

Next step: What's limiting the population?

Full annual cycle pop'l model:

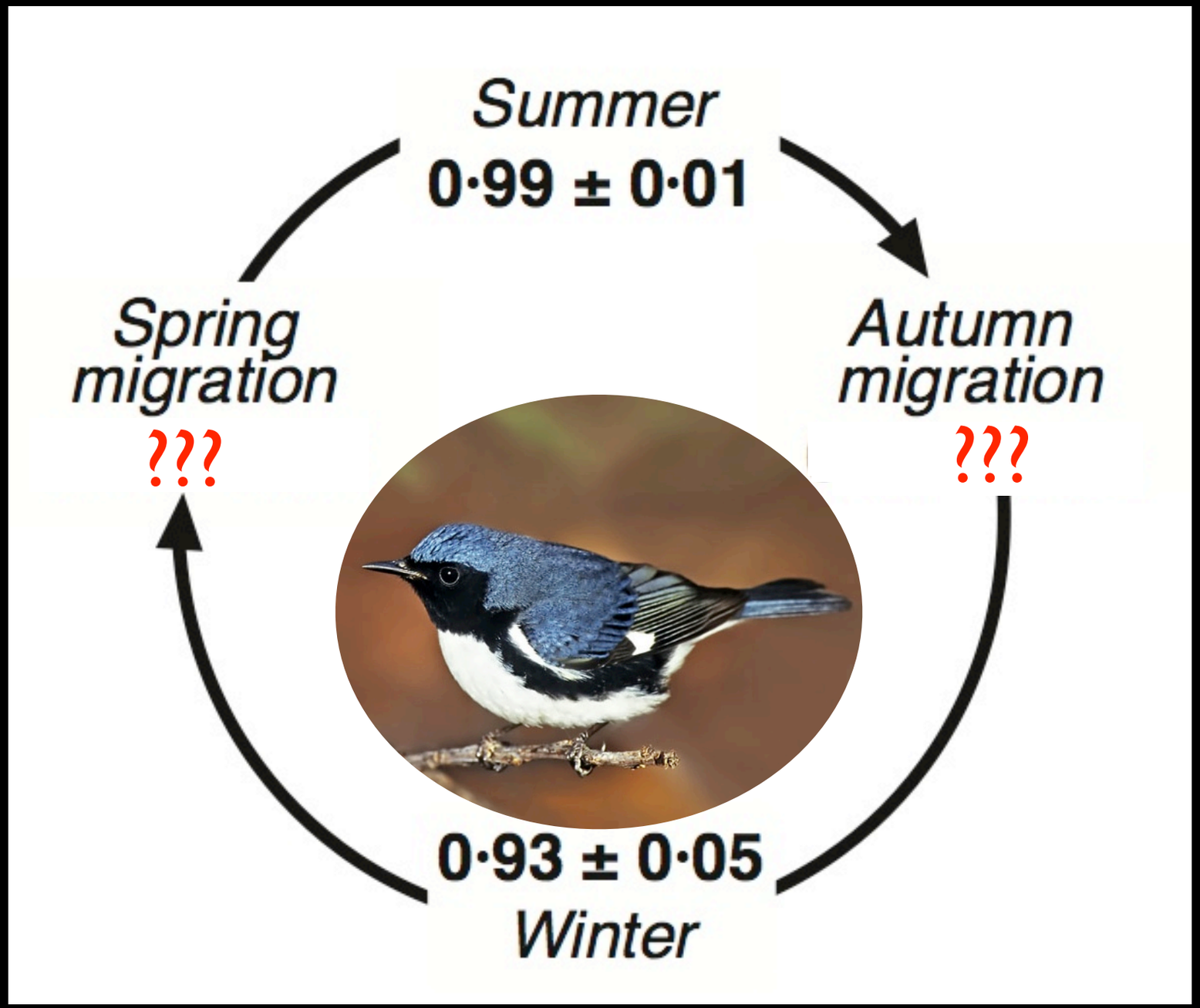
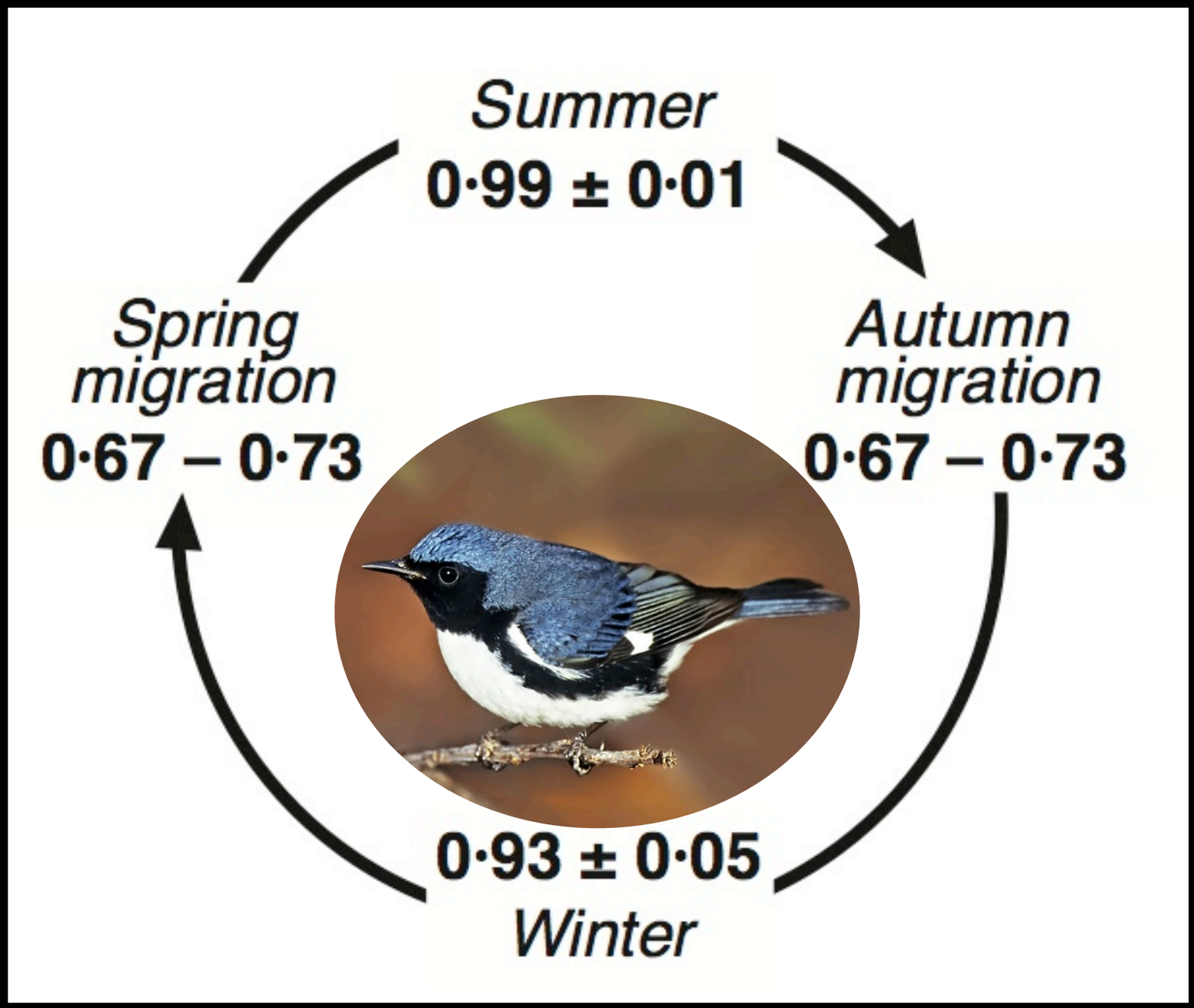


Figure from Sillett & Holmes 2002, J. Animal Ecology

BTBW: K.T. Karlson 2008

Full annual cycle pop'l model:

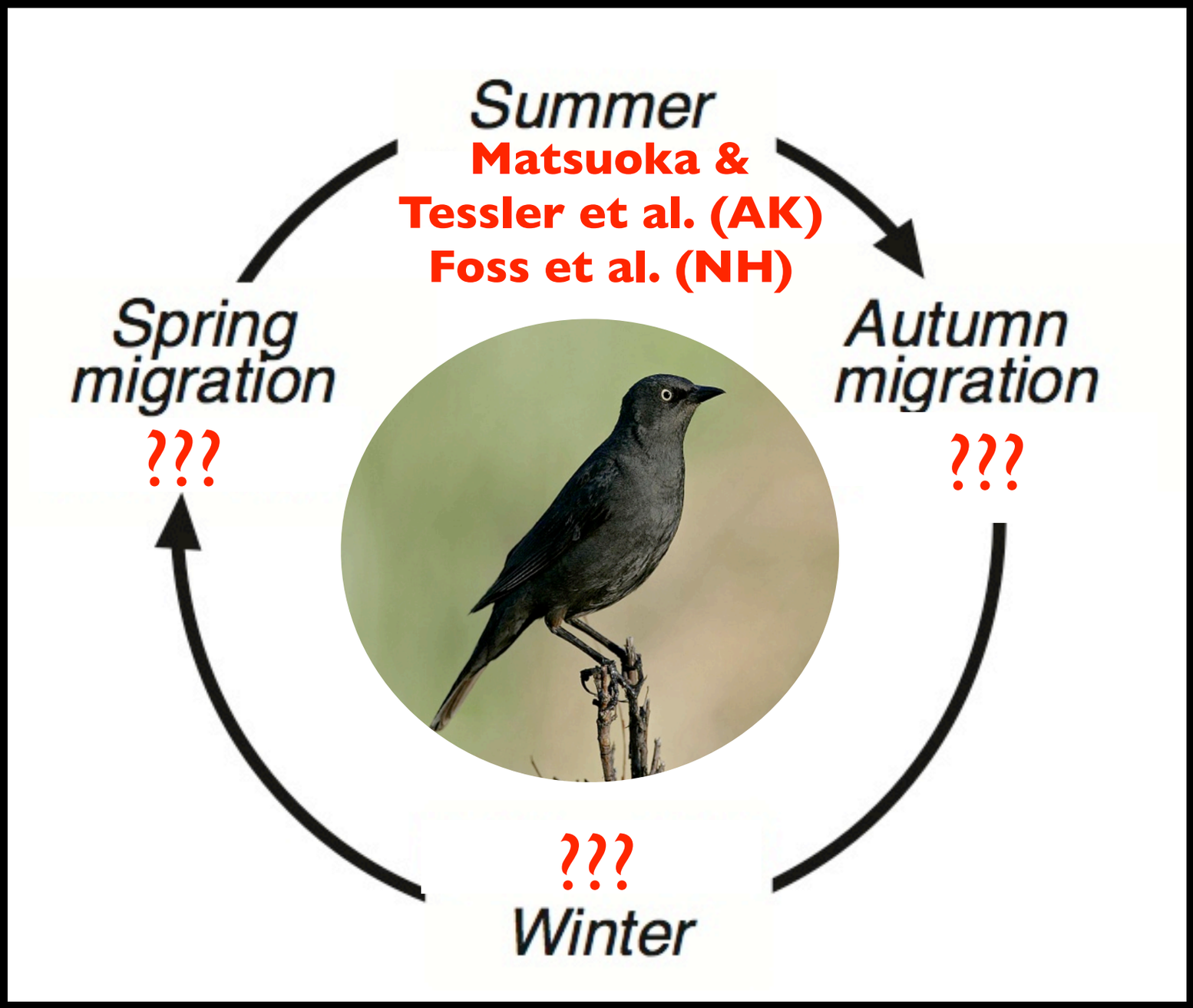


$$\Phi_{annual} = \Phi_{breeding} * \Phi_{winter} * \Phi_{migration}$$

Figure from Sillett & Holmes 2002, J. Animal Ecology

BTBW: K.T. Karlson 2008

Full annual cycle pop'l model:



$$\Phi_{annual} = \Phi_{breeding} * \Phi_{winter} * \Phi_{migration}$$

Figure modified from Sillett & Holmes 2002, J. Animal

Full annual cycle pop'l model:

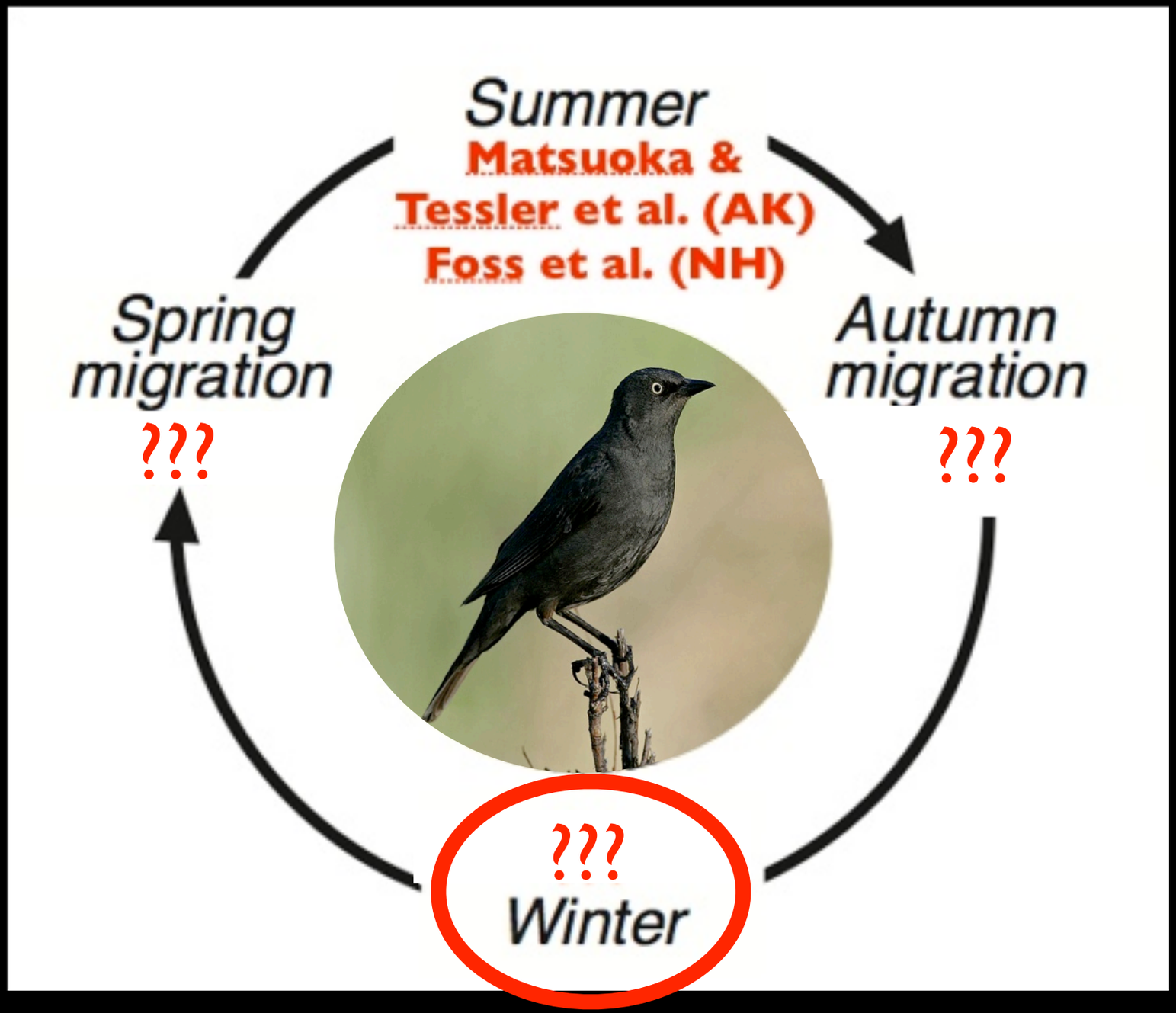


Figure modified from Sillett & Holmes 2002, J. Animal

$$\Phi_{annual} = \Phi_{breeding} * \Phi_{winter} * \Phi_{migration}$$

BREEDING SEASON

8. ASY Summer

5. SY Autumn

$\phi_{sum,a}$

$m_a\phi_{sum,j}$

$\phi_{sum,a}$

4. SY Summer

START.
$m_j\phi_{sum,j}$

1. HY Autumn

AUTUMN MIGRATION

$\phi_{mig,j}$ $\phi_{mig,a}$

$\phi_{mig,a}$ $\phi_{mig,j}$

SPRING MIGRATION

WINTER SEASON

3. HY Spring

$\phi_{win,i}$

2. HY Winter

7. SY Spring

$\phi_{win,a}$

6. SY Winter

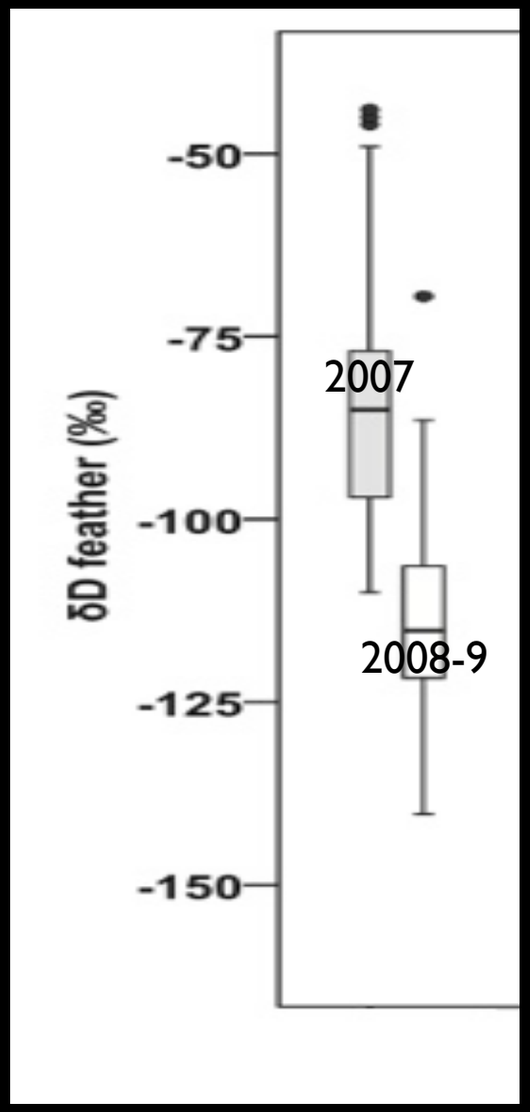
Figure modified from Hostetler et al. *in review*

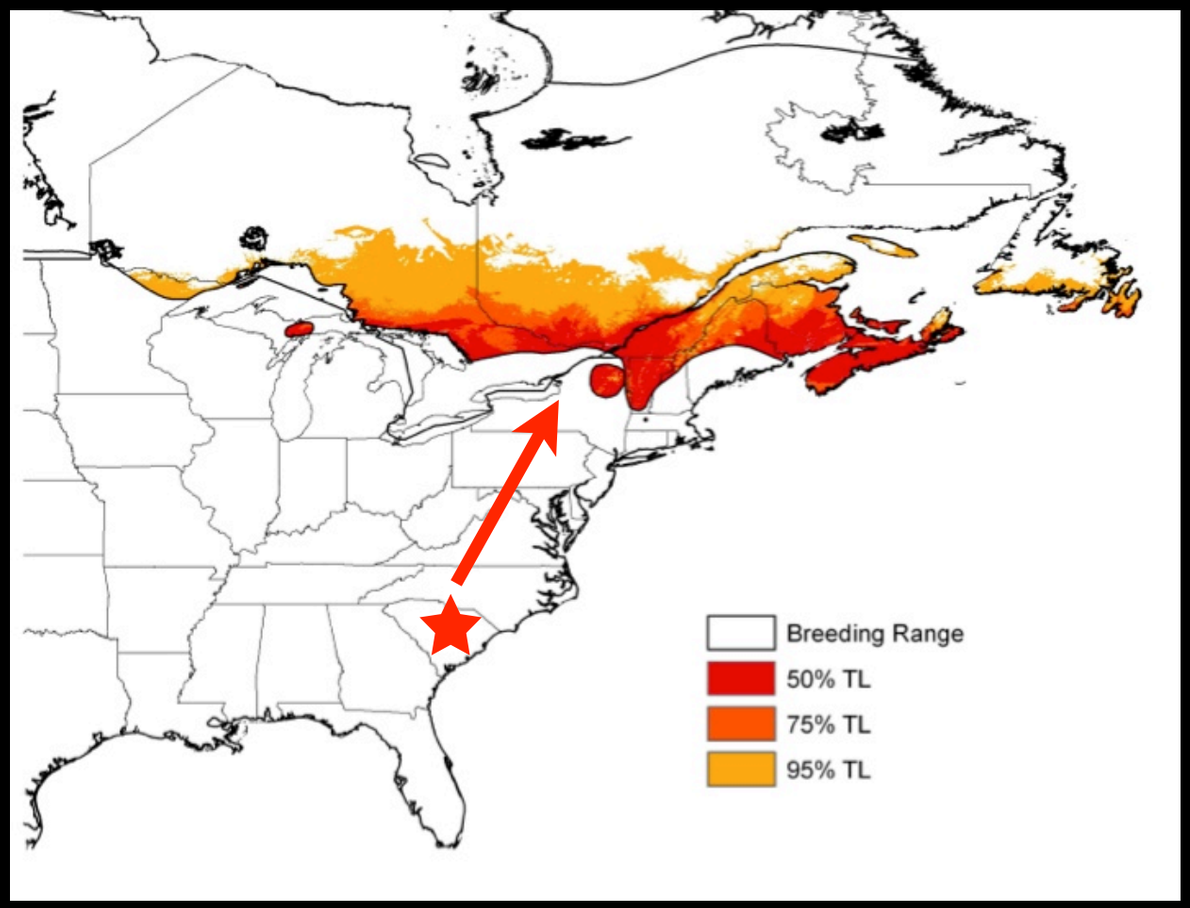
Missing piece: Fall Migration

Q: Is November an additional stationary period of life cycle?

Johnson, Matsuoka, Tessler, Greenberg & Fox, 2012, WJO

Missing piece: Spatiotemporal variability in migratory connectivity

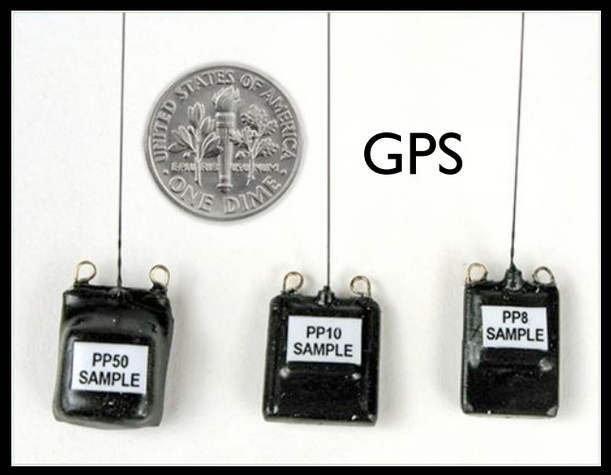




South Carolina samples

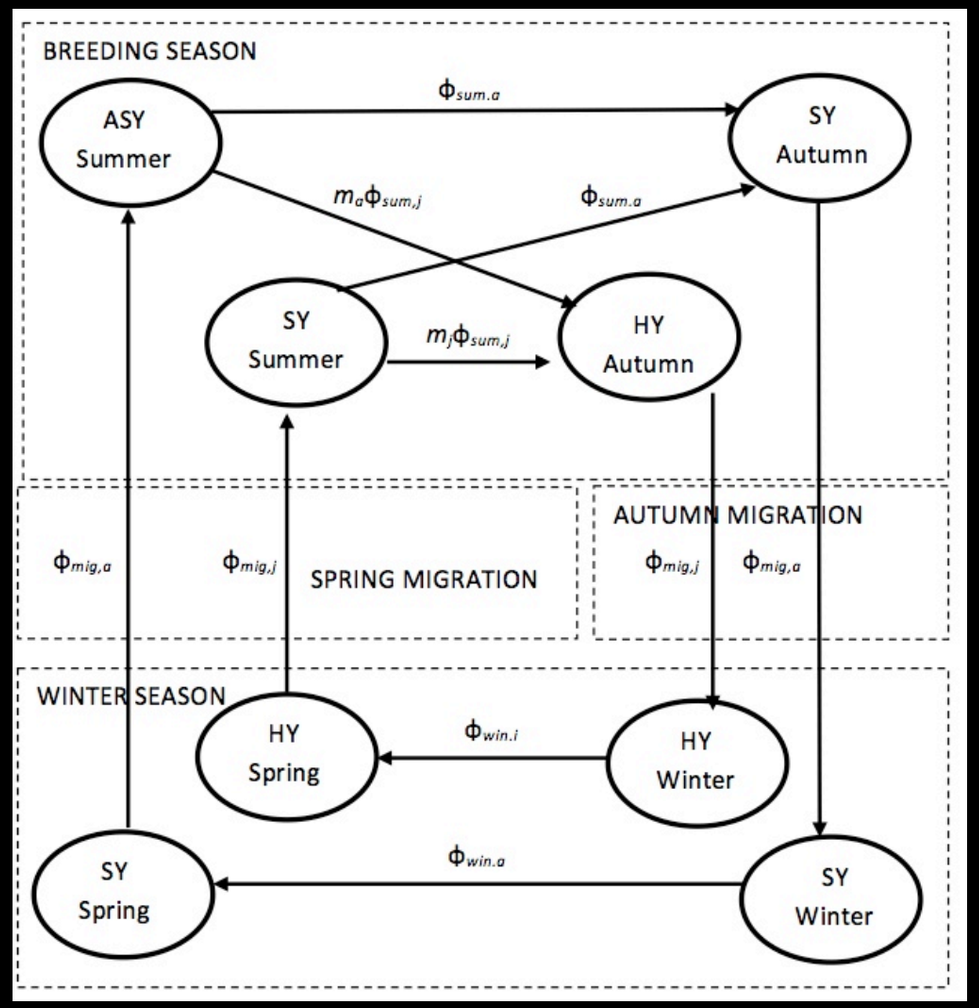
Smithsonian Migratory Bird Center's Migratory Connectivity Project

- Rusty Blackbird: a focal species
  - Light level geolocators
    - 100s of low-res fixes
  - GPS geolocators
    - 50+ high-res fixes



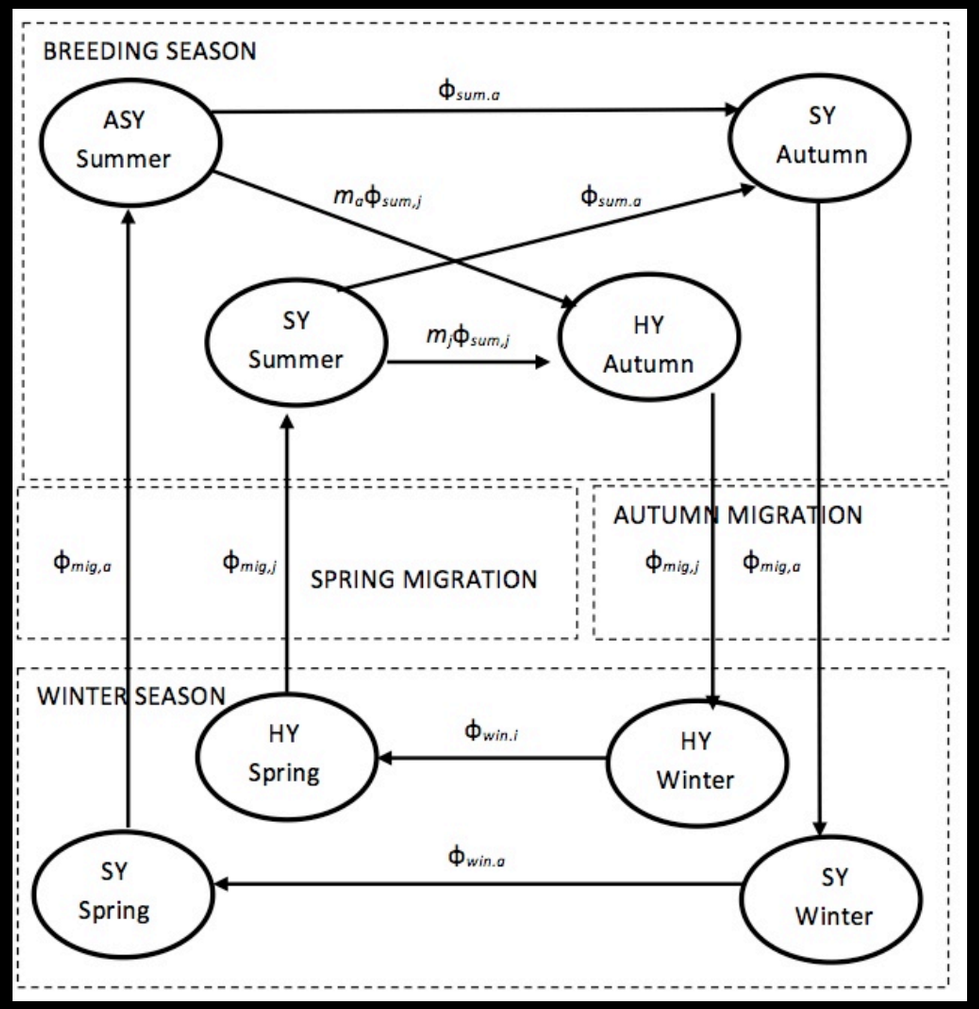
A full annual cycle pop'l model could incorporate:

- Survival
  - Age-specific
  - Habitat-specific
- Nest success



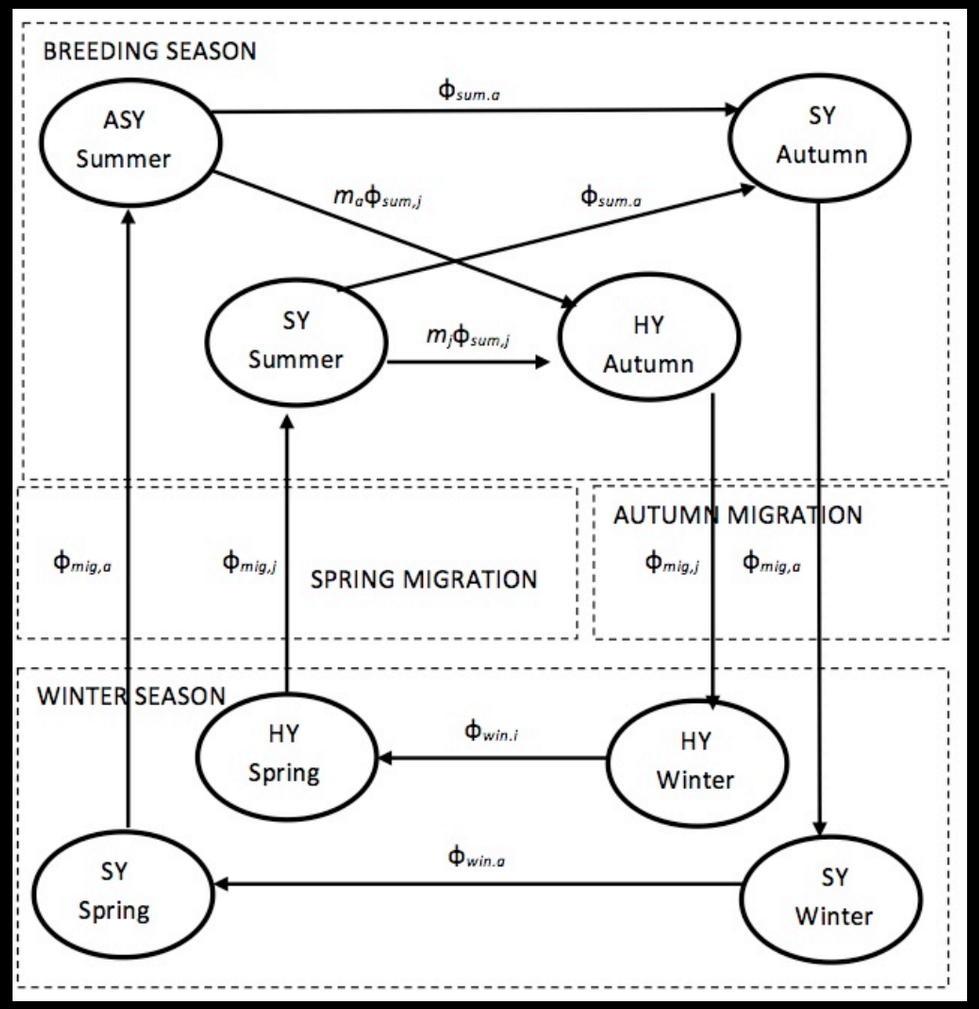
A Full annual cycle pop'l model could incorporate:

- Survival
  - Age-specific
  - Habitat-specific
  - Nest success
- Migratory connectivity
- Seasonal interactions



A Full annual cycle pop'l model could incorporate:

- Survival
  - Age-specific
  - Habitat-specific
  - Nest success
- Migratory connectivity
- Seasonal interactions
- Point count data
  - e.g. integrated population model



Priorities for the Russ-G Blackbird

- Rusty Blackbird **BLITZ**
  - Outreach and management

Priorities for the Russ-G Blackbird

- Rusty Blackbird **BLITZ**
  - Outreah and management
- **Full annual cycle model**
  - Within-winter survival
  - Breeding grounds: inter-annual survival
  - Geolocators for connectivity/migration info

Priorities for the Russ-G Blackbird

- Rusty Blackbird **BLITZ**
  - Outreach and management
- **Full annual cycle model**
  - Within-winter survival
  - Breeding grounds: inter-annual survival
  - Geolocators for connectivity/migration info
- **What is limiting Rusty Blackbird populations?**

Thank You!

Acknowledgements

- Carol Foss
  - Symposium organizer
- Jeff Hostetler
  - population model
- Steve Matsuoka & Sam Droege
  - Russ photos