Investigating mortality in the Blue-grey Tanager (*Thraupis episcopus*) SSP® following transfer events

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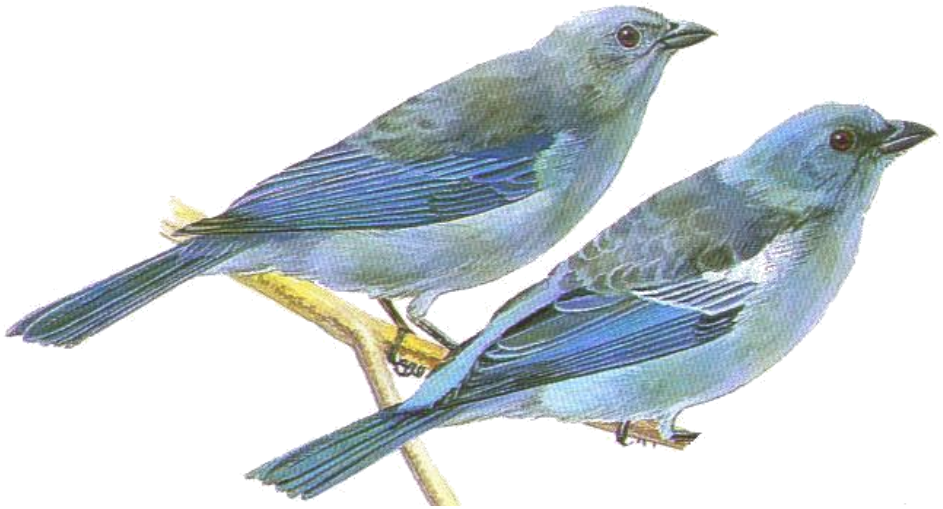

Photo credit: Whitefield, 1998

speaker notes in italics

abstract:

Managing avian populations in a sustainable manner is a continuous challenge. Small numbers and low or declining growth rates suggest that breeding individuals, rearing young and keeping them alive after transfers is still quite challenging for many species. We used data from the AZA North American Regional Blue-grey Tanager (Thraupis episcopus) Studbook, to investigate mortality rates following transfer events specifically. We assumed that specific periods of time following a transfer event correlated to a standard sequence of events birds experience at a new facility (e.g. transfer, quarantine, introduction to new exhibits). We hypothesized that mortality trends in a specific time period following transfer may reflect a need for more focused management efforts in an effort to increase survival. We will discuss our results as well as discuss some future directions of our research.

Outline

Why?

- Avian population *sustainability*
- Previous work with Blue-grey Tanagers

Questions asked

- Hypotheses
- Methods
- Results

Discussion

- Conclusions
- Future Directions

Passerines and Husbandry Challenges

- The goal of many SSPs is to cooperatively create, maintain and manage populations for demographic stability and high gene diversity.

- Avian population sustainability is a challenge *(Lynch & Snyder, 2014)*
  - **Quantitative studies are rare – But becoming more common**
  - Declining average growth rates of almost half of programs in 2014
  - Legislation Changes
  - Breadth of life history (short vs. long lived)

- Passerines as an example

Blue-grey Tanager SSP® - Management Strategy

- The SSP outlined a new management strategy to address sustainability and logistical challenges.

Core Breeding	Non-Core Breeding	Non-Breeding Exhibit only
• 4 or more breeding pairs • Source for non-breeding flocks • Group transfers	• <4 breeding pairs • Source for non-breeding flocks	• Exhibit single sex flocks only • Supplied from breeding facilities

(Lynch & Snyder, 2014; Snyder & Andrews, 2015)

Model Program
The group transfer portion of core-breeders was included to make it more logistically easy to transfer animals and thought to reduce loss?

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Why investigate post-transfer mortality?

- Dedicated breeding facilities to coordinate transfers
  - Ease logistics and financial costs
  - Ease quarantine concerns

- Anecdotal experience suggested losses occurring after transfer.
  - Information on mortality rates following transfer events may be informative?
  - *Future application to improve populations.*

- Model Program to test methods.

Also having a quantifiable study produced will better address questions where only anecdotal evidence was available previously.

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What are the rates of mortality following a transfer event?

- Restricted to 90 days after a transfer event
  - Assumptions
    - 3 days –Transfer/shipping related mortality
    - 30 days – Quarantine period
    - 90 days – Exiting quarantine/introduction to new exhibit.

Do the rates of mortality after transfer differ depending on age and number of transfers experienced?

- Predictor variables for this were:
  - Age at transfer – used (≤10months or >10 months)
    - Based partly on sample size restrictions.
  - # of transfers per individuals (1 or >1)
    - Several individuals had 2 and 3 transfers in life span.
    - Used 1 transfer or >1 transfer for predictor variables.

Data and Analysis

- Data were extracted from the North American Regional Blue-grey Tanager Studbook *(Snyder, 2018)*
  - 1990 – 2015 = 535 transfers

- For each event – recorded:
  - Studbook ID
  - Date of transfer, death, LTF, and Hatch
  - Status (Living, Dead, LTF)

    **LTF only included if status changed after the time periods being evaluated.

- Bayesian Logistic regression used to analyze the data

Rates of Mortality Following Transfer Event

3 Days = 3.5%

30 Days = 7.6%

90 Days = 13.4%

Based on the raw data, the rate of mortality was 3.5%, 7.6%, and 13.4% at 3, 30, and 90 days after transfer, respectively.

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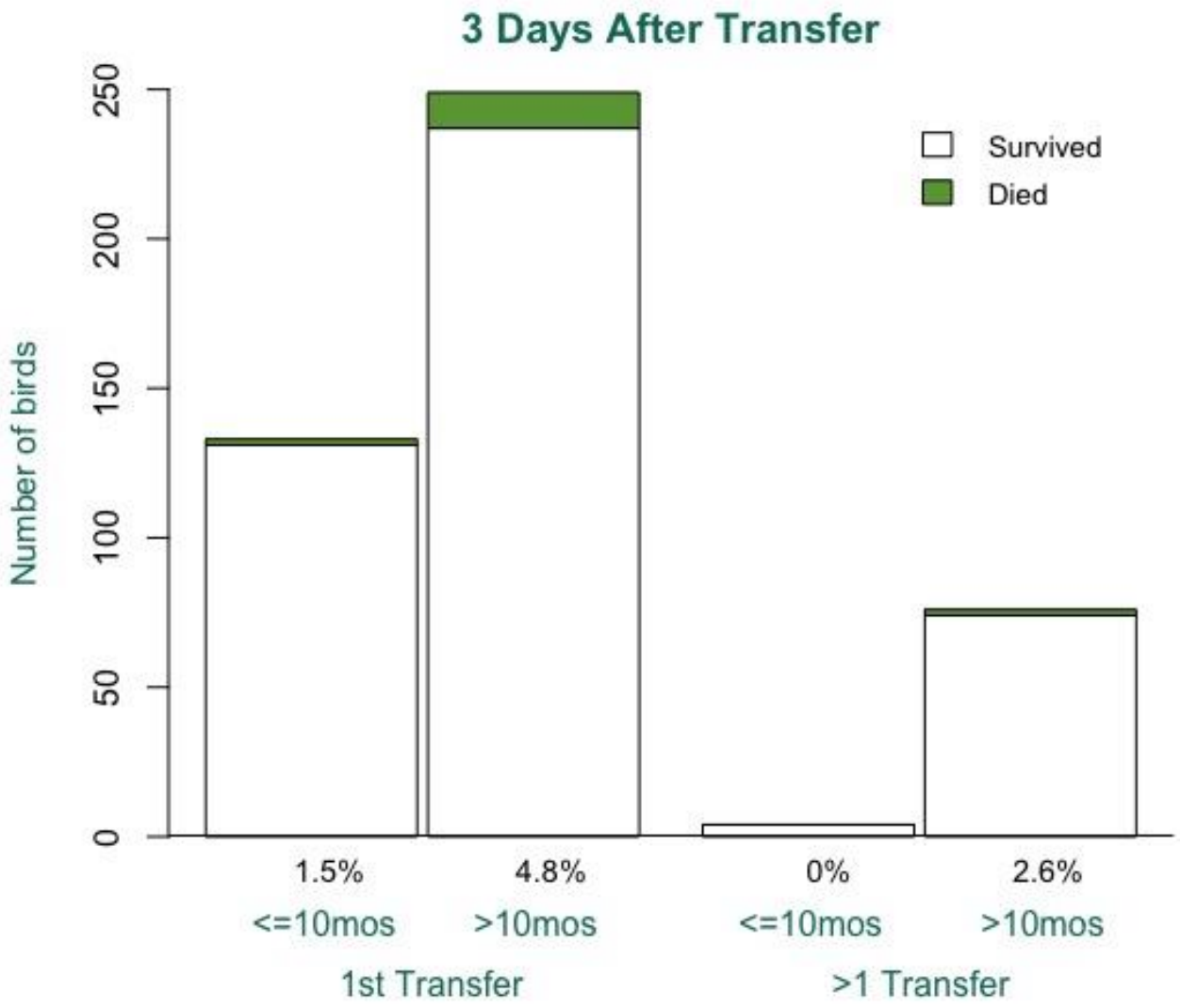
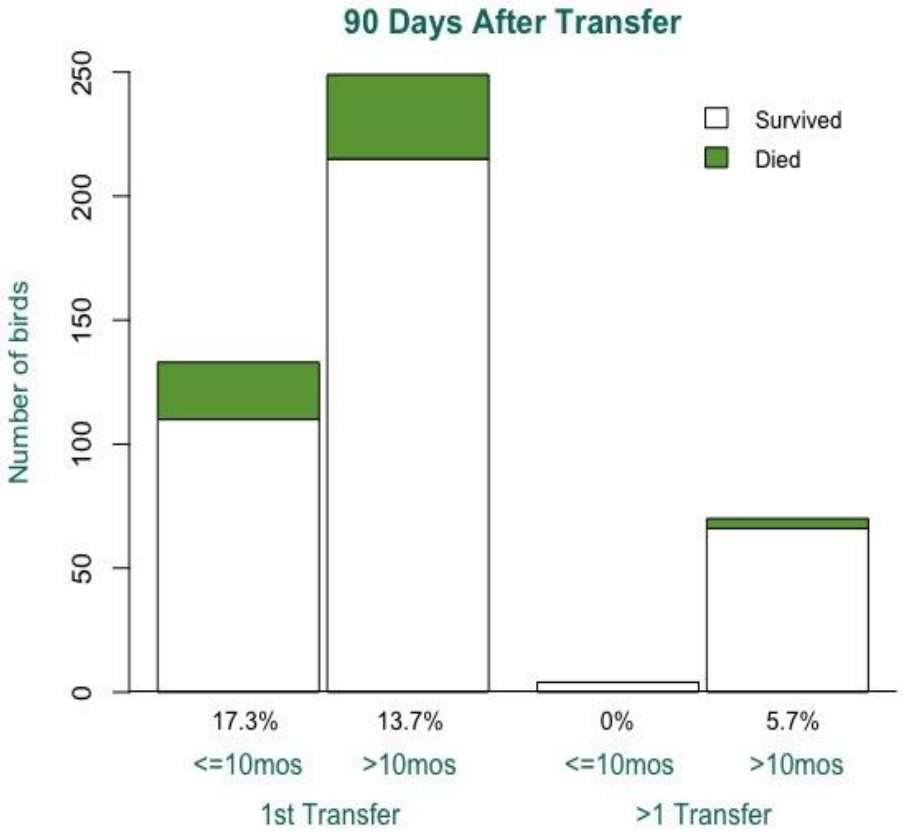
- Age affected mortality at **3 days** after transfer: Birds >10 months were **6.3 times** as likely to suffer mortality compared to younger birds.





- Number of transfers affected mortality at both **30 and 90 days** after transfer:
- Multiple transfers were **0.29 and 0.37 times** as likely to result in mortality compared to 1st transfers at 30 and 90 days, respectively.

Conclusions

- Mortality rates initially are low after transfer and gradually increases through time.
- older birds are 6.3 times more likely to die within the first three days of a transfer.
- Although fewer birds experience multiple transfers, birds are less likely to suffer mortality after their second and third transfers regardless of age.
- Analysis of post-transfer survival suggests that age and number of transfers do lead to differences in tanager mortality after transfer events.

Our results alone will not determine whether the BGT population is sustainable, but should be viewed as important additional knowledge that can help to maintain a sustainable population.

Future questions

- Continue to develop this with the SSP/TAG.
- Investigate chick mortality using similar methods in other tanagers?
  - Do other tanager SSPs show similar trends in post-transfer mortality?



  - Potentially apply methods to similar questions on mortality after hatch?

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