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# Adaptive Management Working Group Meeting 26 January 2021

Platte River Recovery Implementation Program

# What don't we know about Whooping Cranes that we need to know to contribute to their survival?

This question is outside the purpose of the Program. All the Program can do is provide habitat, which is pretty well defined other than the ongoing debate over the value of wet meadows for whooping cranes.

Whether flows at the time of decision to stop or not impact WC use of Platte. Also need to investigate what base flows are preferential to maintenance of fish guilds.

Why is fall WC use consistently lower than spring. Importance of early spring WC use (younger birds, stay longer periods of time, etc.) WC stay length affected by what factors?

Are the individuals that stop along the Central Platte actually more "fit" than those birds that do not?

Is summer germination suppression possible with the amount of water available to the Program?

Is a mechanical/chemical approach more effective at controlling summer vegetation germination?

Are there certain scenarios where Program water could be added to existing base flows to achieve desired management goals and other scenarios where it is neither efficient or effective to use water to achieve these goals?

How to maximize existing Program water for WC use.

How much does habitat selection preference equate to habitat need? What are the minimum habitat requirements that are adequate to survival/recovery, even if more would be better/preferred?

Identify existing knowledge gaps (Johnson 1994, 1997). Summer flow impacts on seedling germination (>2,500 cfs) and fisheries health (>1,000 cfs). Do hydrological conditions impact WHCR use of wet meadow (seasonal wetland) or rivine habitats, etc.?

# Whooping Cranes – Identifying existing knowledge gaps



## HABITAT SELECTION

- **What are the conditions associated with stopovers vs. flyovers?**
- **Effect of flow on decision to stopover?**
- **Effect of unobstructed channel width (UOCW) on decision to stopover?**
- **Relationship between flow and proportion of population that uses CPR?**
  - **What are the ranges over which WC stopovers are more common? Are there high and low flow cutoffs?**
  - **Does hydrocycling affect WC use of the CPR?**
- **Relationship between flow, UOCW and proportion of population that uses CPR?**
- **Effect of hydrology on WC use of wet meadows and riverine habitats?**
- **What is the value of wetland meadows for WC?**

## MINIMUM HABITAT REQUIREMENTS

- **What are the minimum habitat requirements necessary for survival/recovery?**

# Whooping Cranes – Identifying existing knowledge gaps



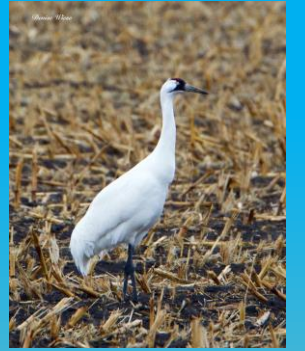
## USE OF WATER TO CREATE HABITAT

- **Summer flow impacts on seedling germination (>2500 cfs)?**
- **Availability of flows sufficient to suppress summer germination?**
- **Flow vs. mechanical/chemical germination suppression to maintain UOCW?**

## SETTING WATER OPERATIONS PRIORITIES

- **How to maximize existing Program water for WC use?**
- **Scenarios when Program water plus base flows meet management objectives vs Scenarios when not effective or efficient to use water?**
- **Base flows for maintenance of fish guilds?**
- **Summer flow impacts on fisheries health (>1000 cfs)?**
- **How much do WC forage while on-channel?**

# Whooping Cranes – Identifying existing knowledge gaps



## CONTRIBUTE TO WC SURVIVAL

- **Are WC that stop along CPR more fit?**
  - **Do WC that use the CPR have lower migratory mortality than those that do not?**
  - **Are WC that use the CPR more likely to reach their destination?**
  - **Are WC that use the CPR more likely to reproduce successfully upon arrival (following spring migration)?**

# Whooping Cranes – Identifying existing knowledge gaps



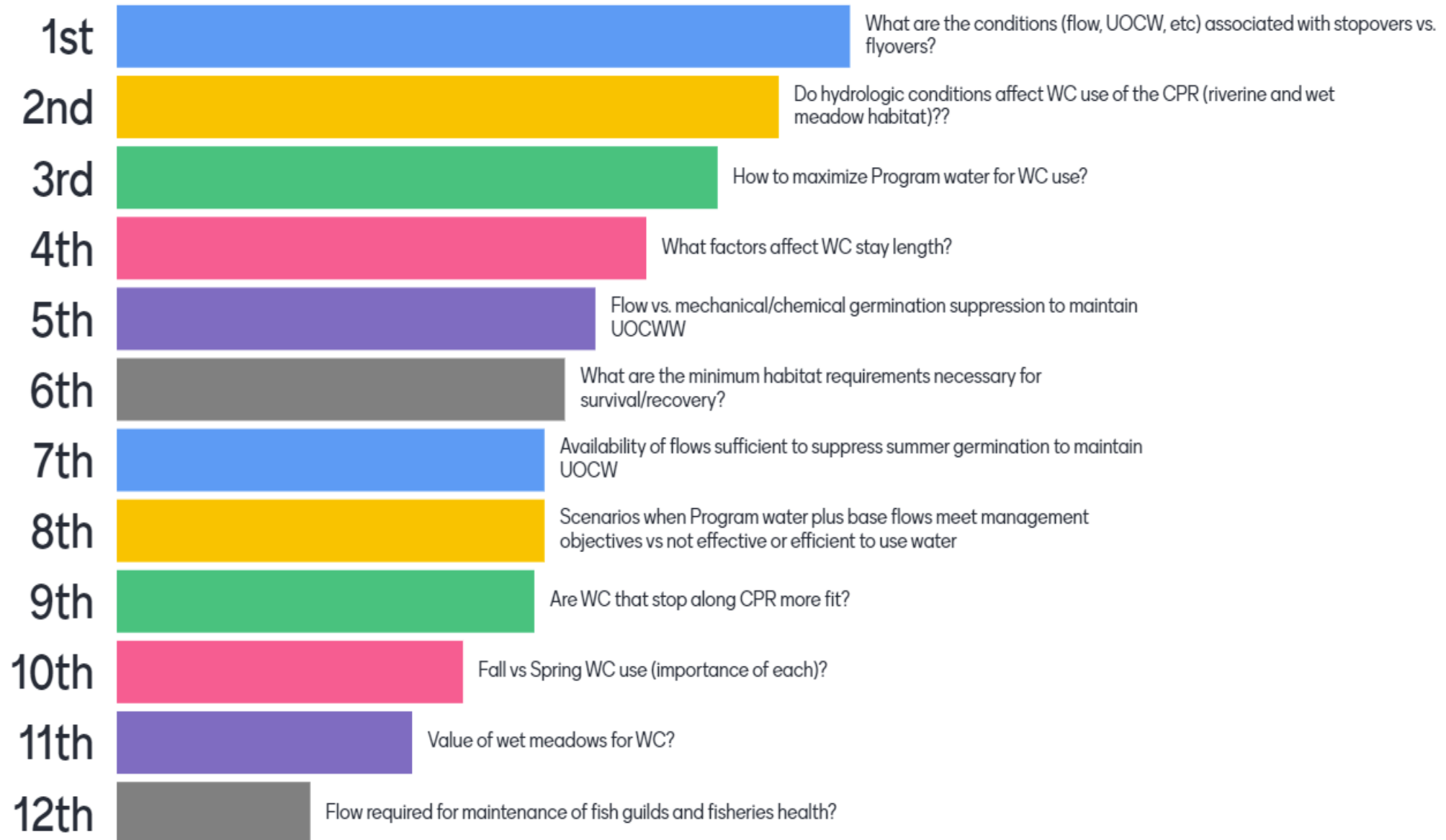
## LENGTH OF STAY

- **What factors affect WC stay length?**

## SEASONAL PATTERNS IN WC USE

- **Why is fall WC use lower than spring?**
- **Importance of early spring WC use?**

# How would you rank these in terms of importance to WC survival?



# **Whooping Cranes – Potential BIG QUESTIONS**

**Q1: What are the conditions that influence whether a WC will stop or flyover the CPR?**

**Q2: Can we use water to make UOCW for WC use?**

**a) Can we use SDHF (Fall) to maintain UOCW?**

Does anyone still want to test SDHF? If so, need to pose the specific question.

**b) Can we use germination suppression flows (Spring/Summer) to maintain UOCW?**

**Q3: What are the conditions that influence length of stay on the CPR?**

**Q4: Are WC that stop on the CPR more fit?**

# Whooping Cranes – Potential BIG QUESTIONS

**Q1: What are the conditions that influence whether a WC will stop or flyover the CPR?**

- **What do we already know?**
- What else could be important?
- What hypotheses to test?
- How to test these hypotheses?
- What information from the EDO will help formulate hypotheses and develop management options for testing hypotheses?
- How likely is it that we can reduce uncertainty around these Big Questions?
- Will answering these Big Questions influence our management?

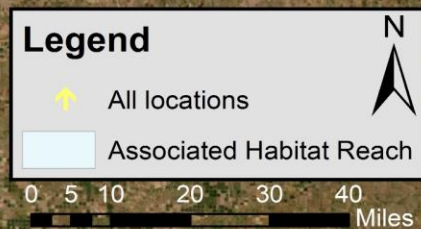
# Preliminary Analysis: AHR flyovers and stopovers

- Cellular data telemetry tracking partnership
- Objectives:
  - Identify factors associated with stopovers vs. flyovers:
    - Time of day
    - Maximum Unobstructed Channel Width (MUCW)
    - Instantaneous flow (flow)
    - Others?



# All Locations within 60 miles of AHR

- ~35,000 Locations
- 51 Individual birds
- Fall 2017-Spring 2020

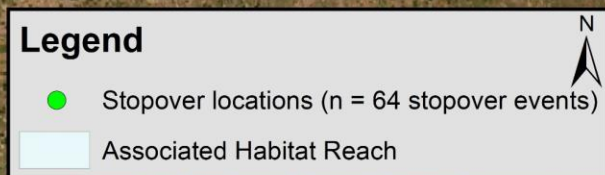


Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



# All Stopover Locations within 60 miles of AHR

- 64 Stopover Events (~16,000 stopover locations)
- ~ 19,000 flight locations
- 51 Individual birds
- Fall 2017-Spring 2020



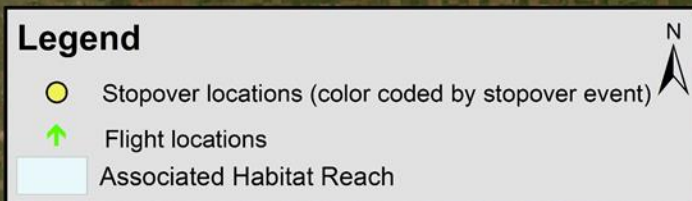
0 5 10 20 30 40 Miles

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



# All Locations in AHR

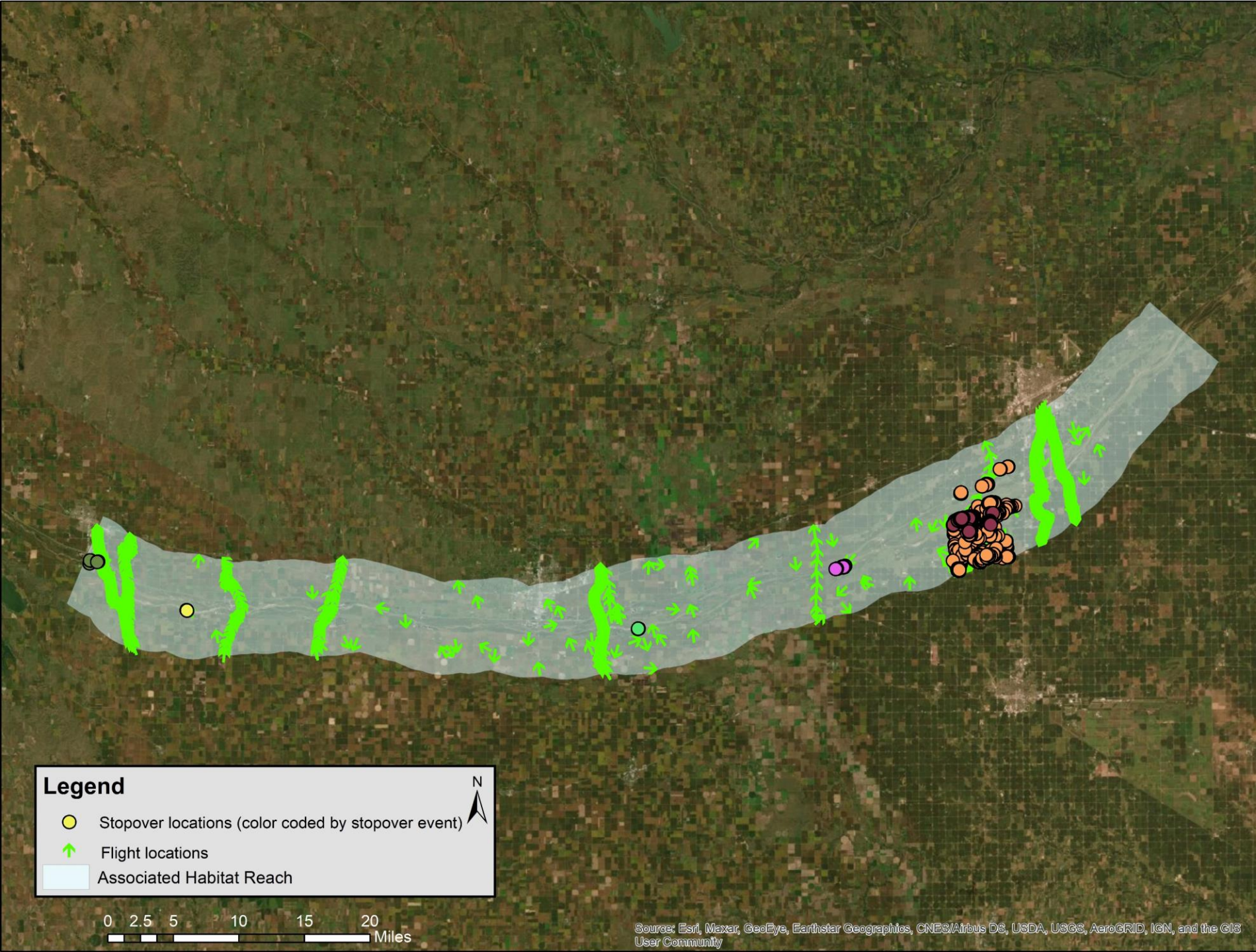
- 8 Stopover Events  
(2,892 stopover locations)
- 89 Flyovers
- 49 Individual birds
- 0.082 (8/97)  
Stopped in AHR



0 2.5 5 10 15 20  
Miles

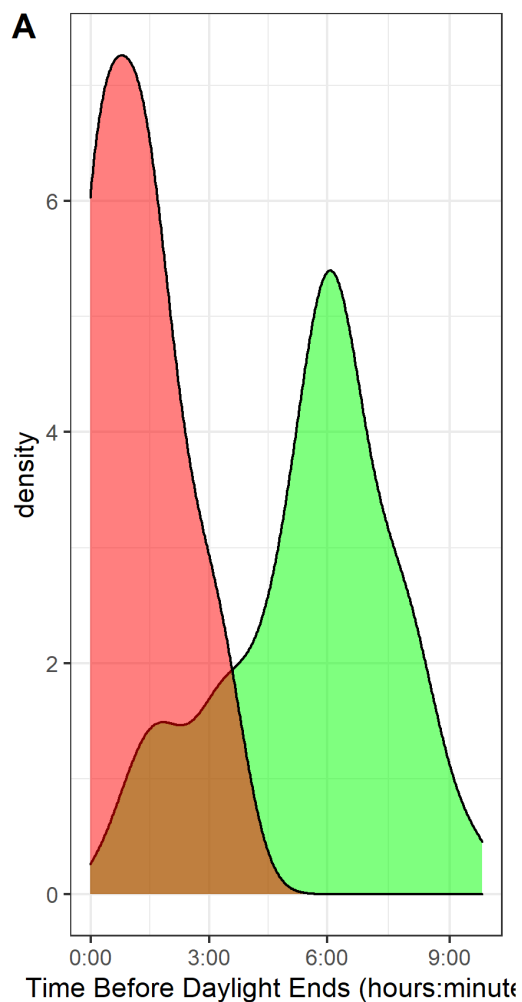
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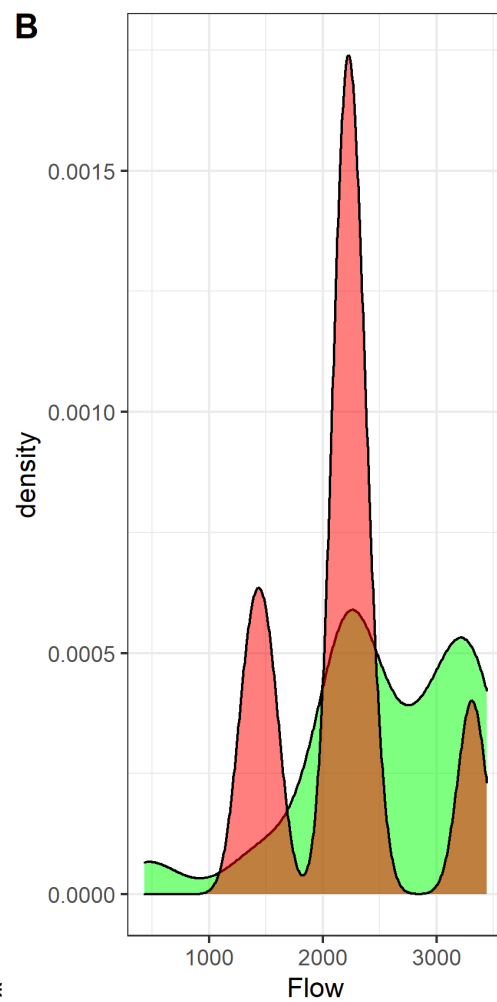


- Logistic regression
  - ▣ Time
  - ▣ MUCW
  - ▣ Flow

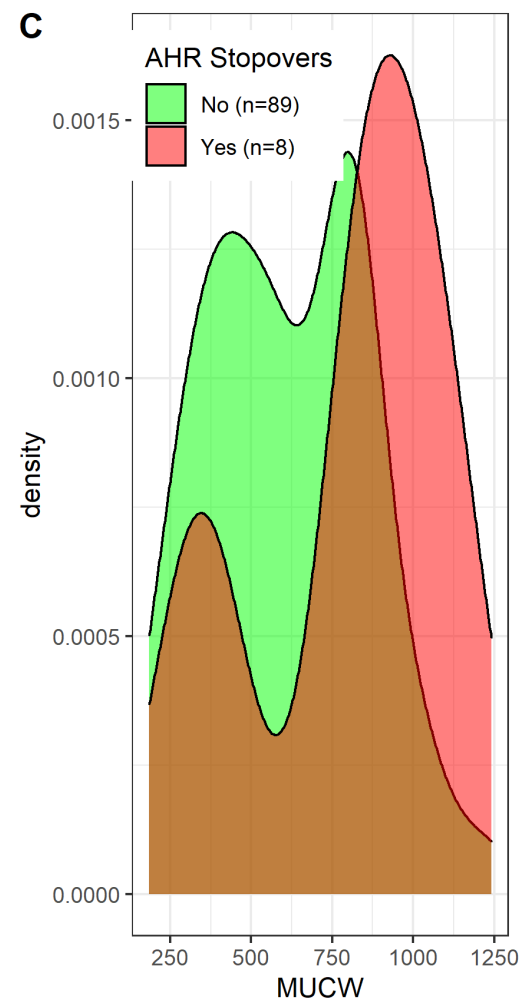
A



B



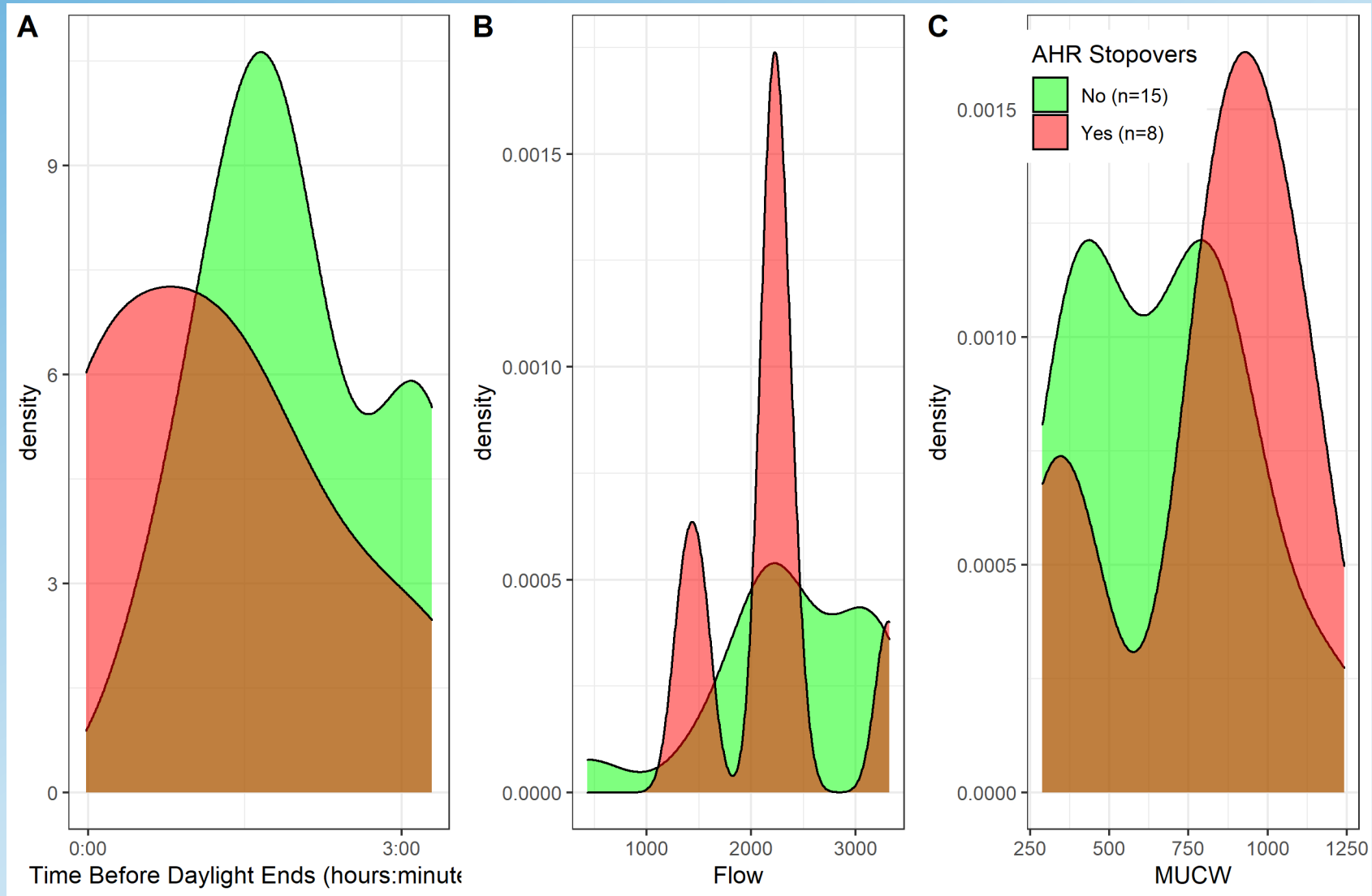
C



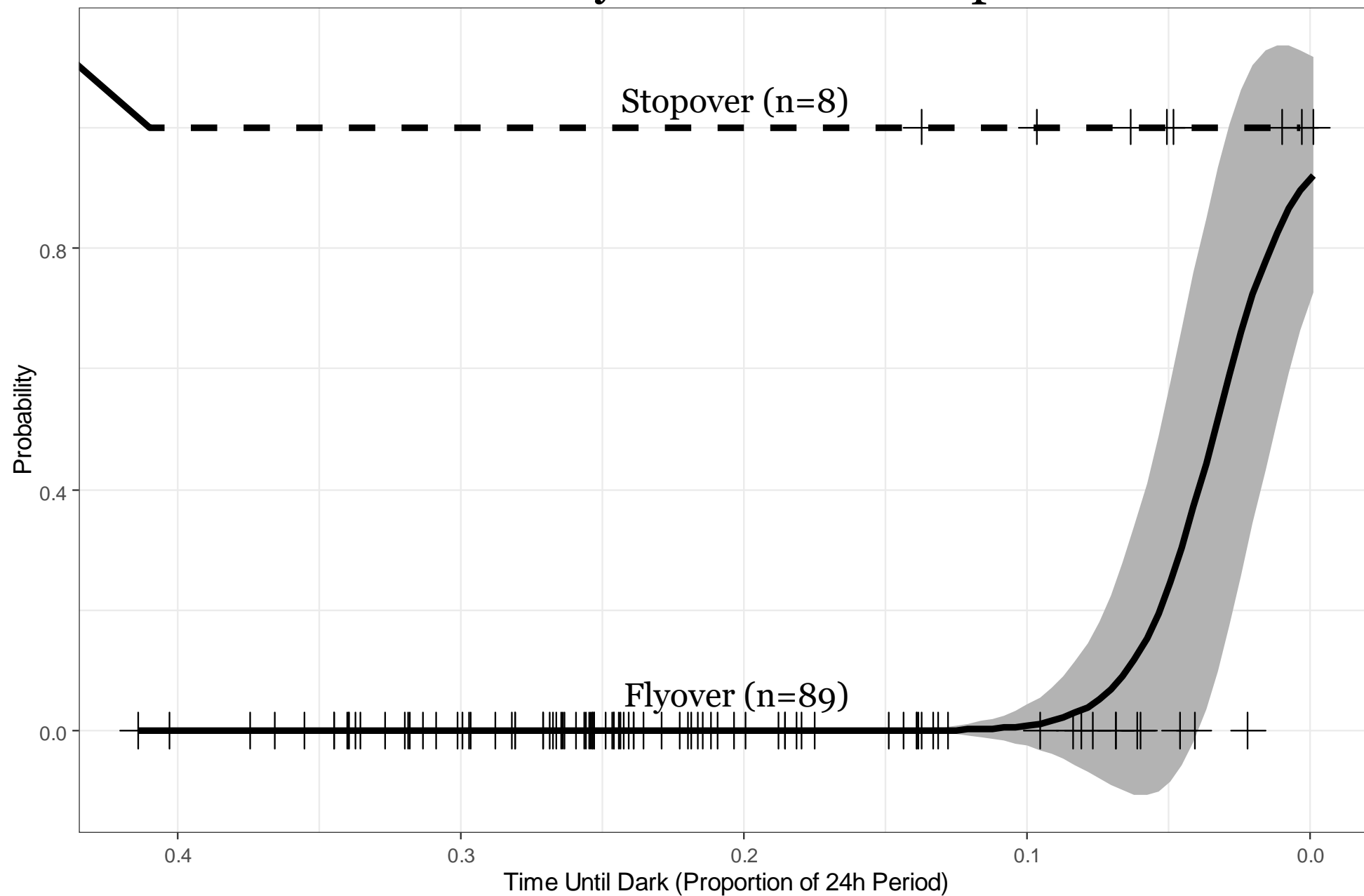
Model Rank	Variables	AUC	Pseudo R2
1	Time of Day * MUCW	0.96	0.58
2	Time of Day * MUCW + Flow	0.96	0.64
3	Time of Day	0.95	0.49
4	Time of Day + Flow	0.95	0.51
5	MUCW	0.7	0.07
6	Flow	0.67	0.03

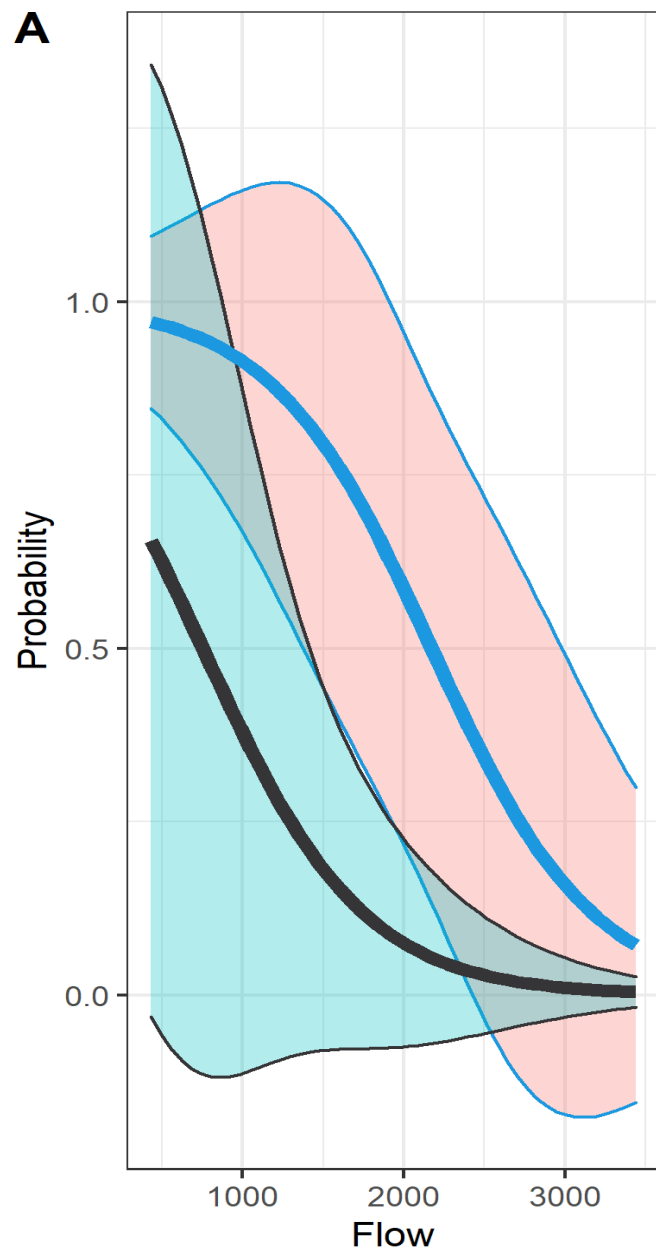


# Stopovers vs. Flyovers 3 Hours Before Dark



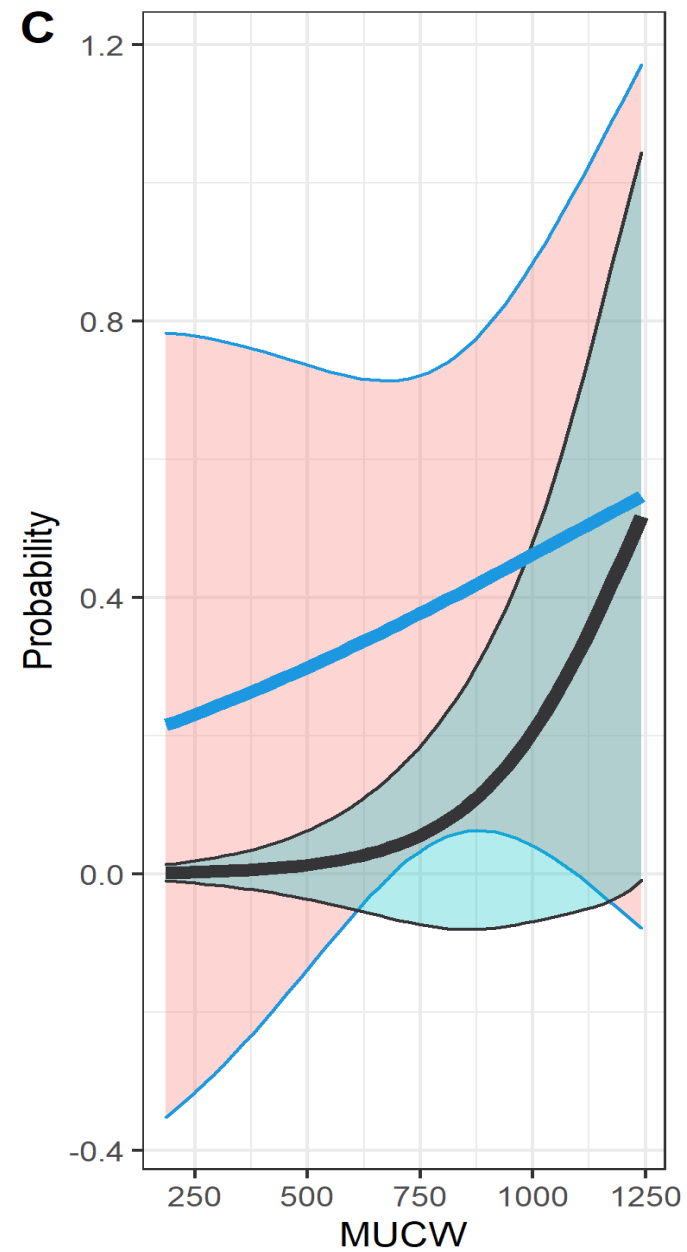
# Time of Day is HIGHLY Important





Group1

- 1 hour Before Dark
- 2 hours Before Dark



Group1

- 1 hour Before Dark
- 2 hours Before Dark

# Preliminary Conclusions and Cautions

- Highest Order: Time of day (maybe others?)
- Secondary Order: MUCW, flow, other variables
- Preview of types of analyses possible for answering the question.
- Acquiring more migration events will allow for increased certainty of both types of relationships and introduction of other variables



# Whooping Cranes – Potential BIG QUESTIONS

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# Meeting Review and Wrap-Up

- Agenda suggestions for next meeting
- Action Items
- Meeting Feedback
- Key Insights

