Polk County Parks

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Introduction

- Sand Skinks
  - The Polk County Environmental Lands Program has been recording observations of Sand Skinks
  - They are a fossorial lizard that leaves distinct S-shaped patterns in the sand

- Water Quality
  - Long-term goal is to quantify benefits of the wetlands in the Circle B Bar Reserve
  - How is water quality improved through the wetland system?

Research Questions

Sand Skinks

- What is sand skink presence or absence at each site for each year? What is the long term trend in sand skink presence for each site?
- Has there been a decline in the presence of sand skinks for three years or more at any of the sites?
- Are there differences in sand skink presence between sites and years?
- Is there a relationship between sand skink presence/absence and prescribed fire? Is there a decline in sand skink presence due to prescribed fire?

Water Quality

- How much of the total nitrogen and total phosphorous is removed as water travels through the system?

Why the questions are important

Sand Skinks

- Sand Skinks are a vulnerable species that are actively managed and monitored
- Sand Skinks are extremely hard to observe
- Management and conservation efforts need to be quantified to measure success
    - Successful programs mean a positive outcome for the Sand Skinks

Water Quality

- Nitrogen and phosphorous are essential for animal and plant life, but an overabundance in the water supply has negative outcomes
- Levels of both can be used to track levels of local fertilizers as well as the natural rate of absorption in the ecosystem

Who should care

- Sand Skinks are neat lizards with a unique ecosystem that is victim to human expansion and encroachment in its habitat
- More effective management results in better outcomes for the Sand Skinks and efficient spending of conservation funds
- Water is a fundamental biological need and better understanding its contents in a particular location helps manage local health, agricultural, and environmental outcomes

The Data

Where does it come from?

- Our team received the data from researchers at Polk County
- The data was collected by the parks initiative – The Environmental Lands Program

How we used it?

- Sand Skink
  -- Sand Skinks found and not found over the years
  -- Burn History Data

- Water Quality
  -- Individual parameter data collected during the flow of water
  -- Collected every month from November 2017 to July 2018

Limitations of the data

Water Quality Data Set:

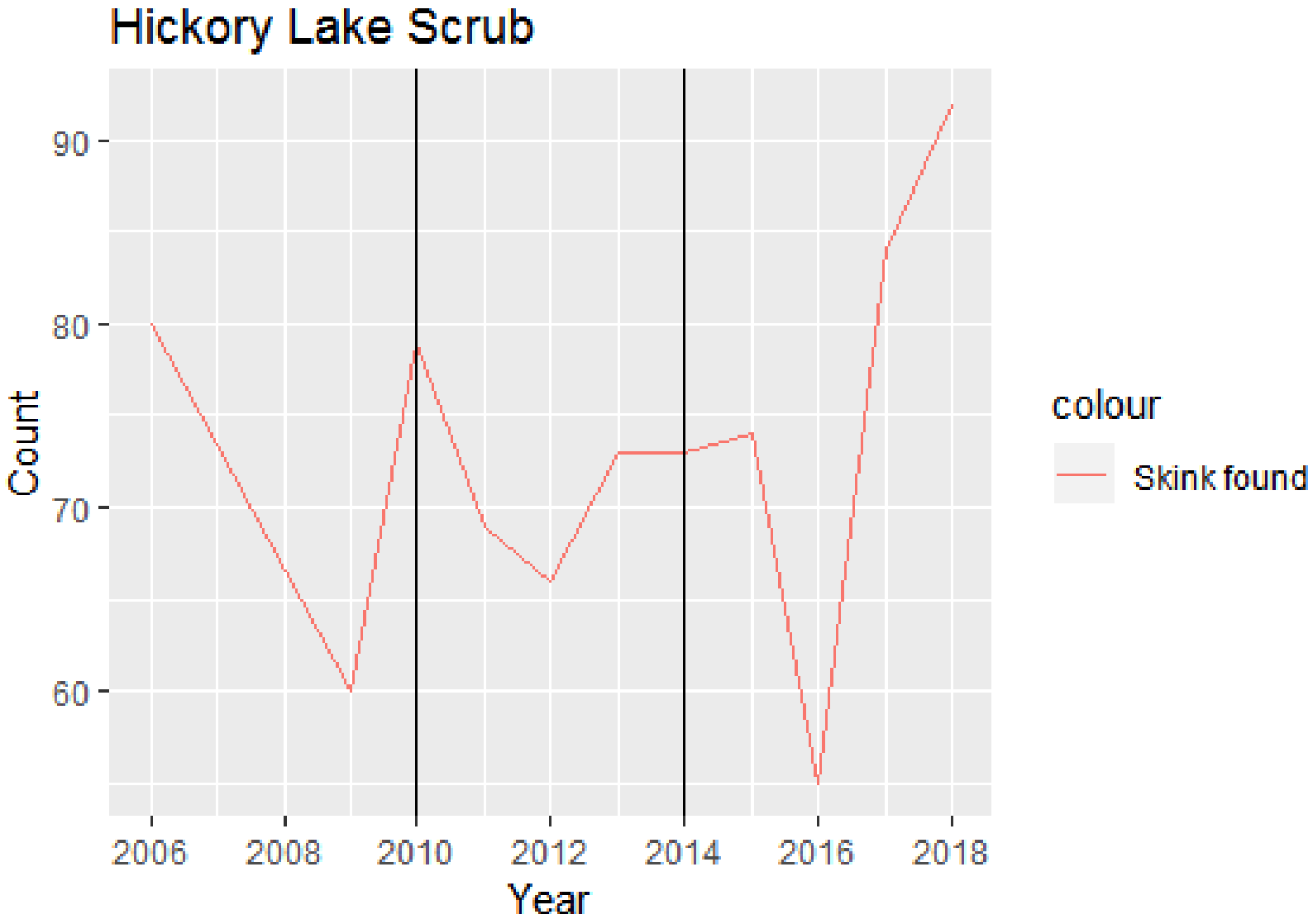
- Available data did not provide insight on the sequence of the sites
- Information on the topography of the land and rainfall would help us make a more conclusive interpretation.

Sank Skink Data Set:

- Data set organized to facilitate collection and not analysis
- Observation dates did not align for the different sites. It would have been interesting to observe how the sand skinks at the different sites fared when compared to each other.
- The observation dates for each site were not uniformly distributed

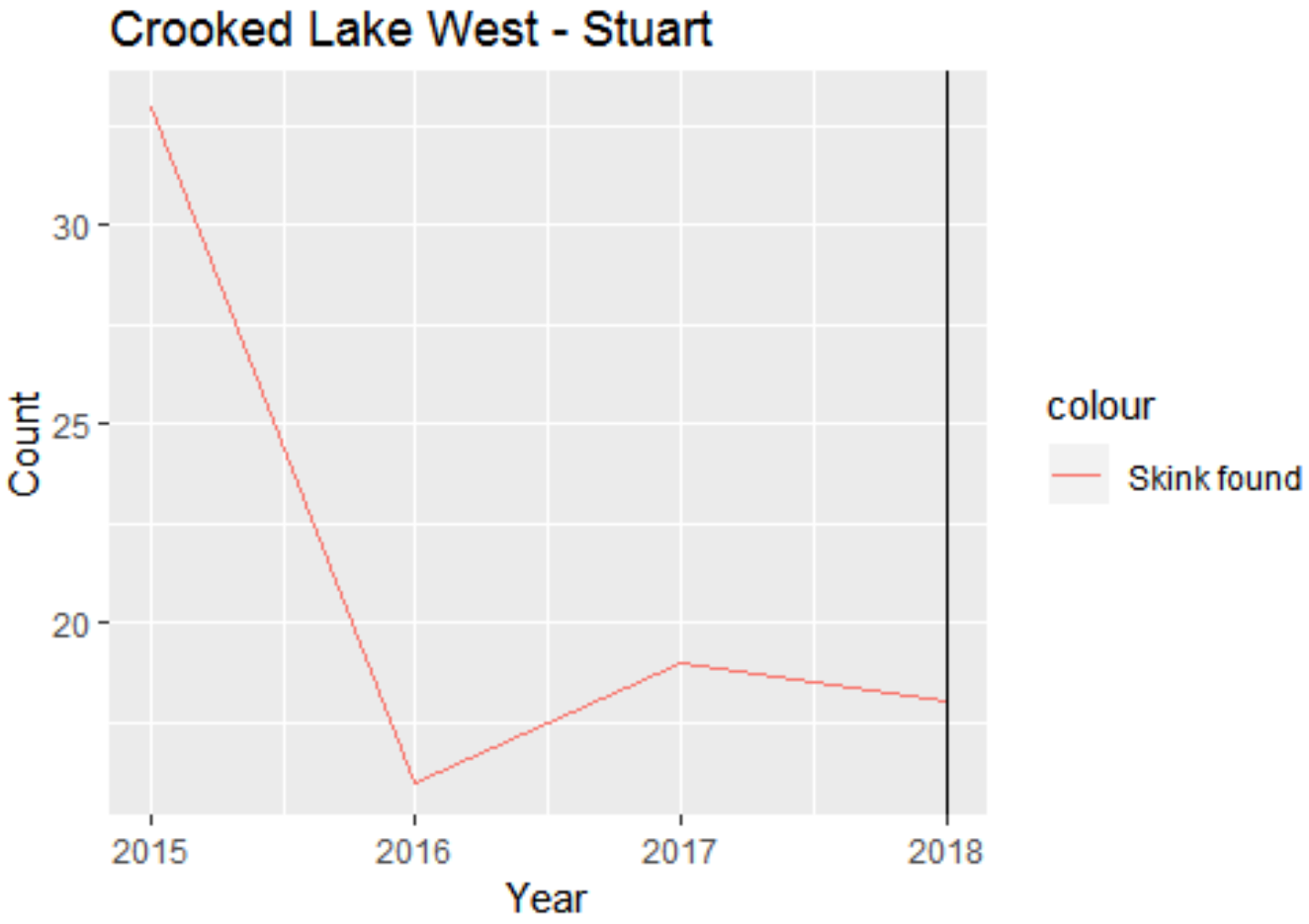
Hickory Lake

- Skink presence has peaked in 2018
- Sand skink presence shows a decline following the burn incidents



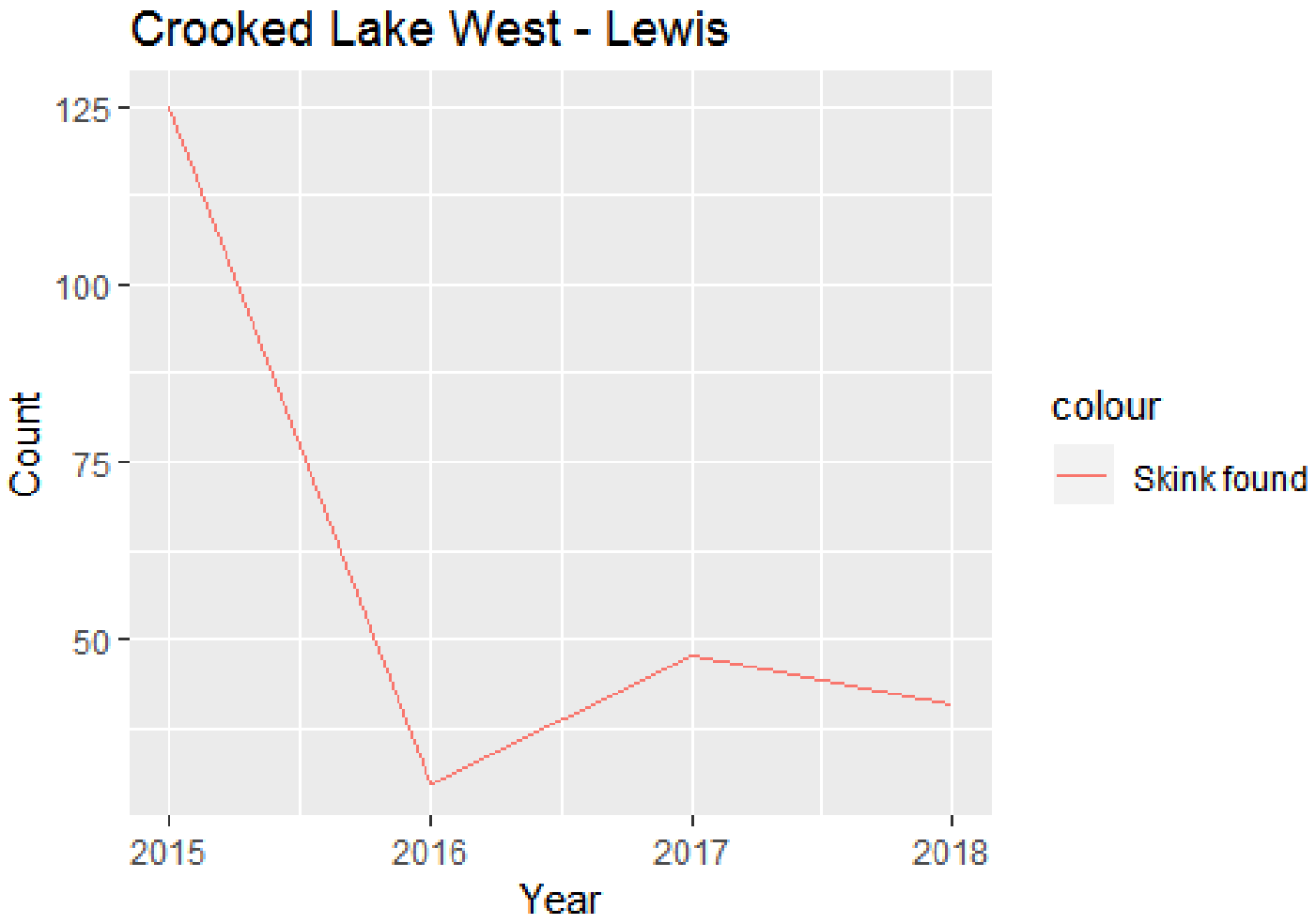
Crooked Lake West Stuart

- Sand skink presence has declined over the last three years
- It remains to see if the burn in 2018 will affect the skink population



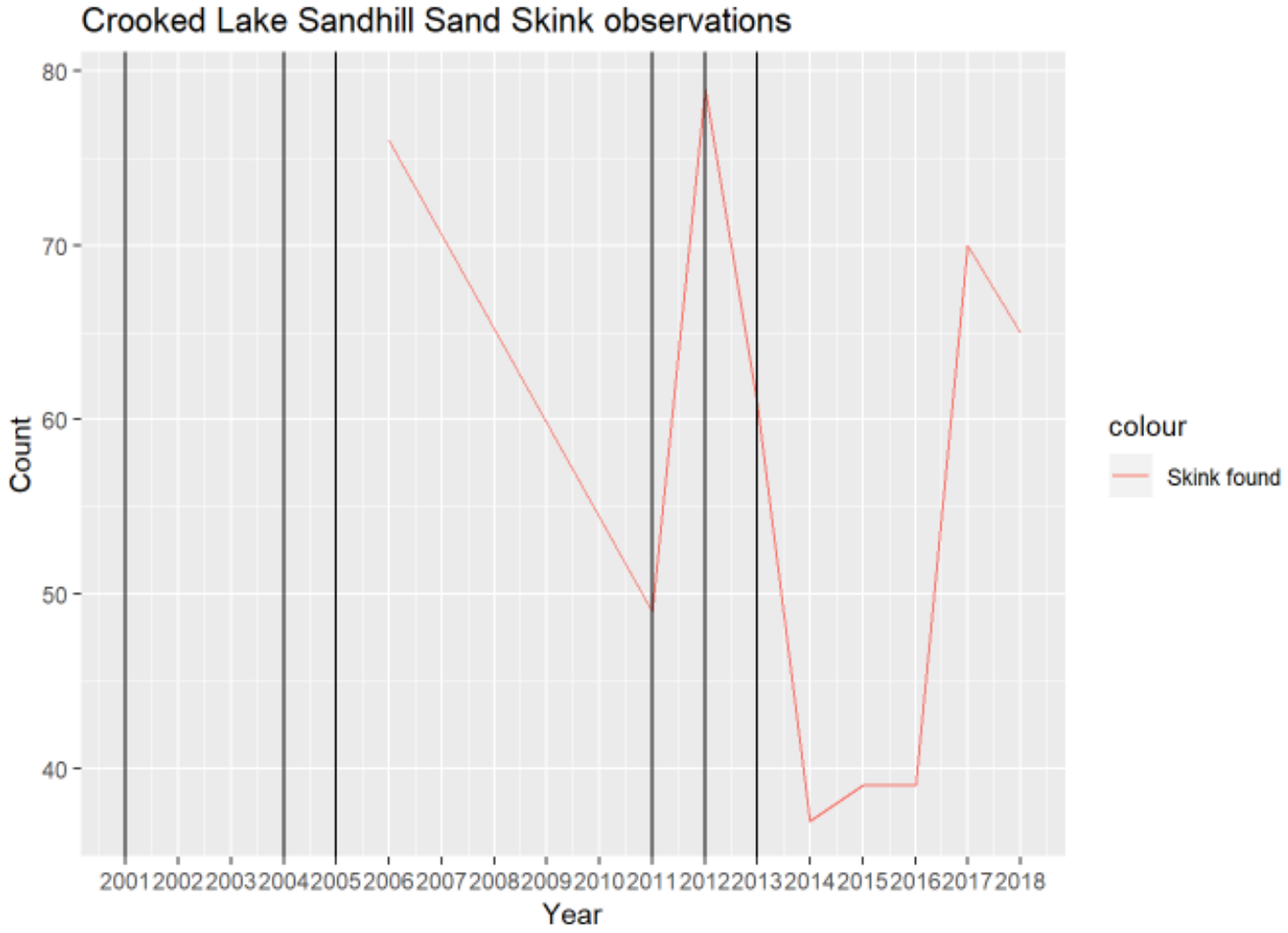
Crooked Lake West Lewis

- Sand skink presence has declined over the last three years
- We do not have any data on burn history at this site



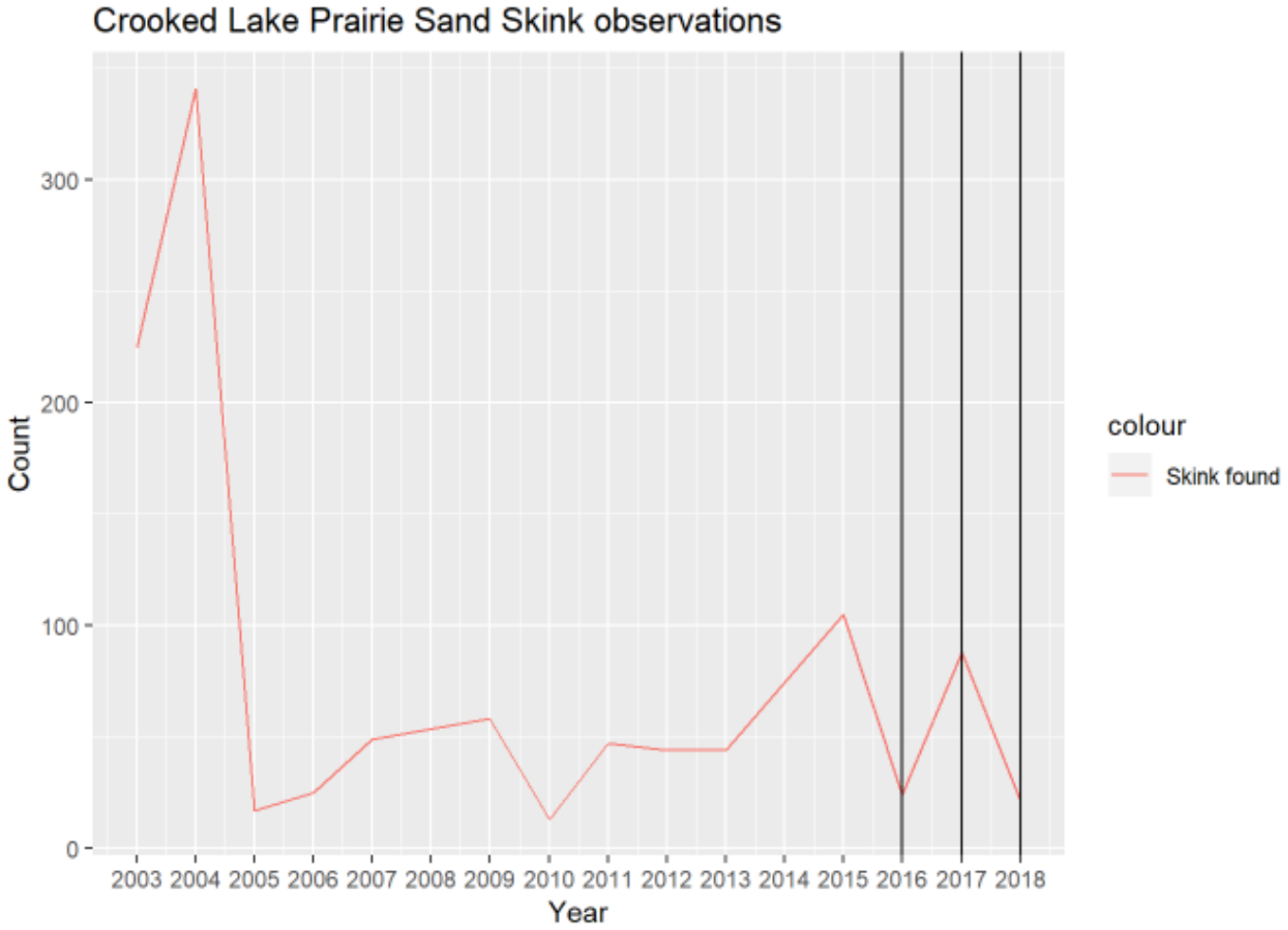
Crooked Lake Sandhill

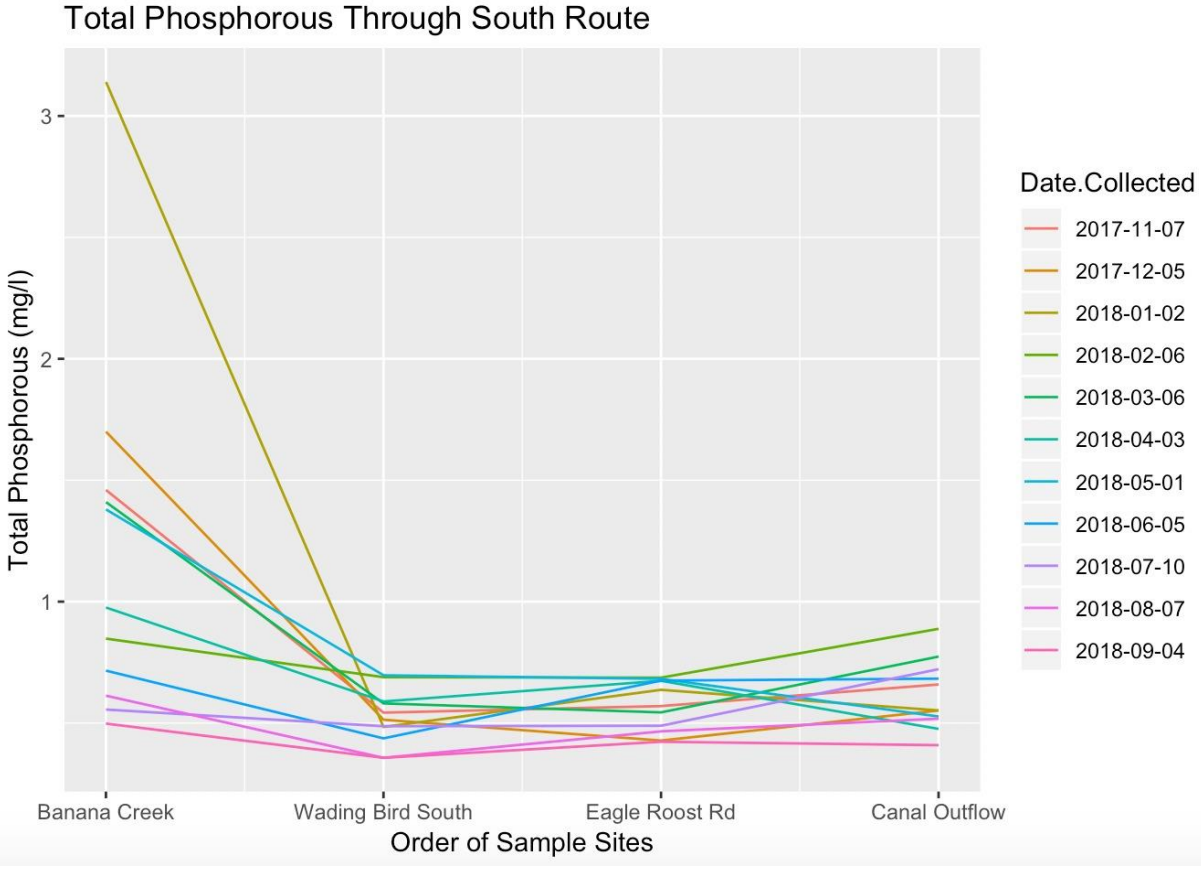
- Sand skink presence has not be consistent
- Even though there is an increase in sand skinks after the burn in 2011 there was a significant decrease in sand skinks after the burn in 2012

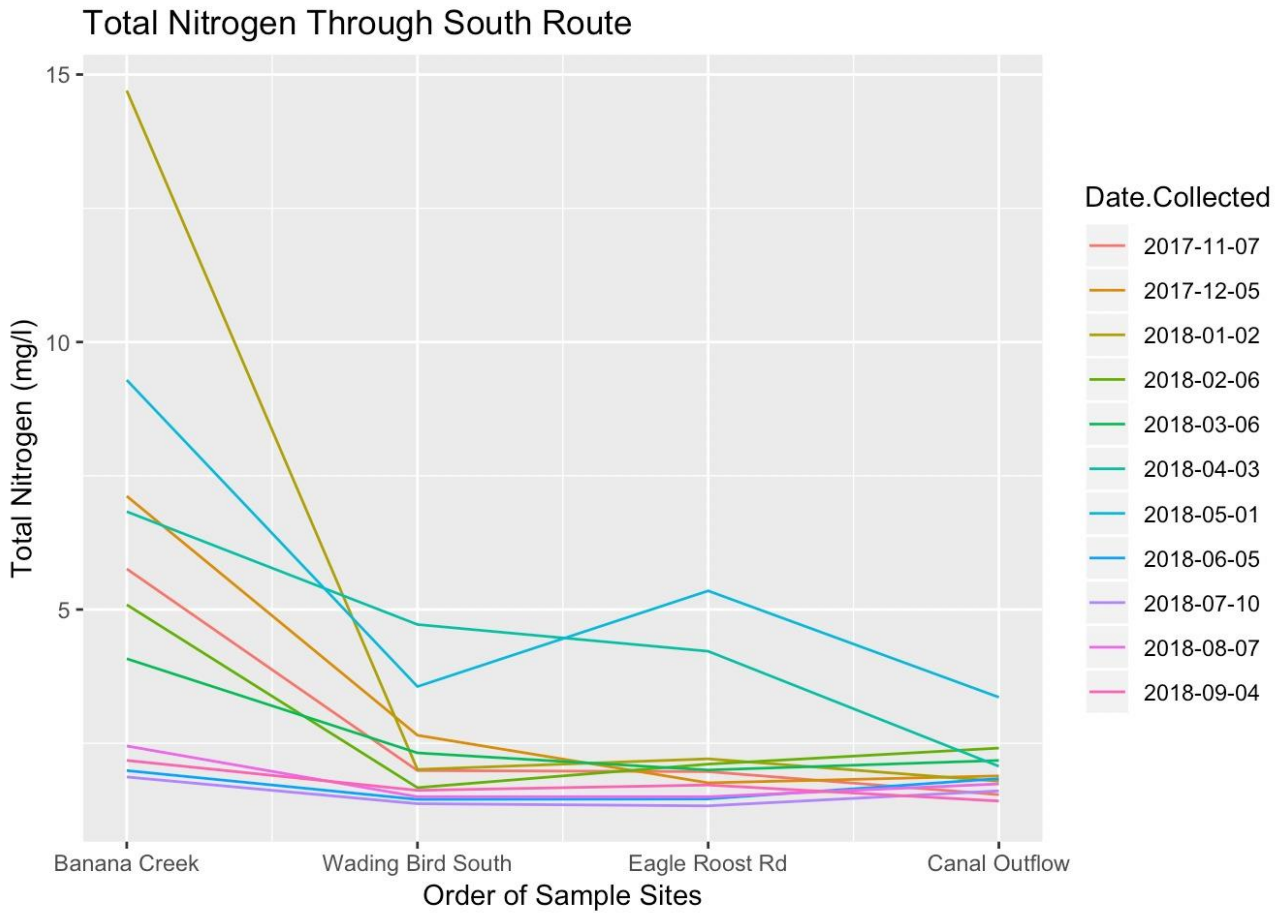


Crooked Lake Prairie

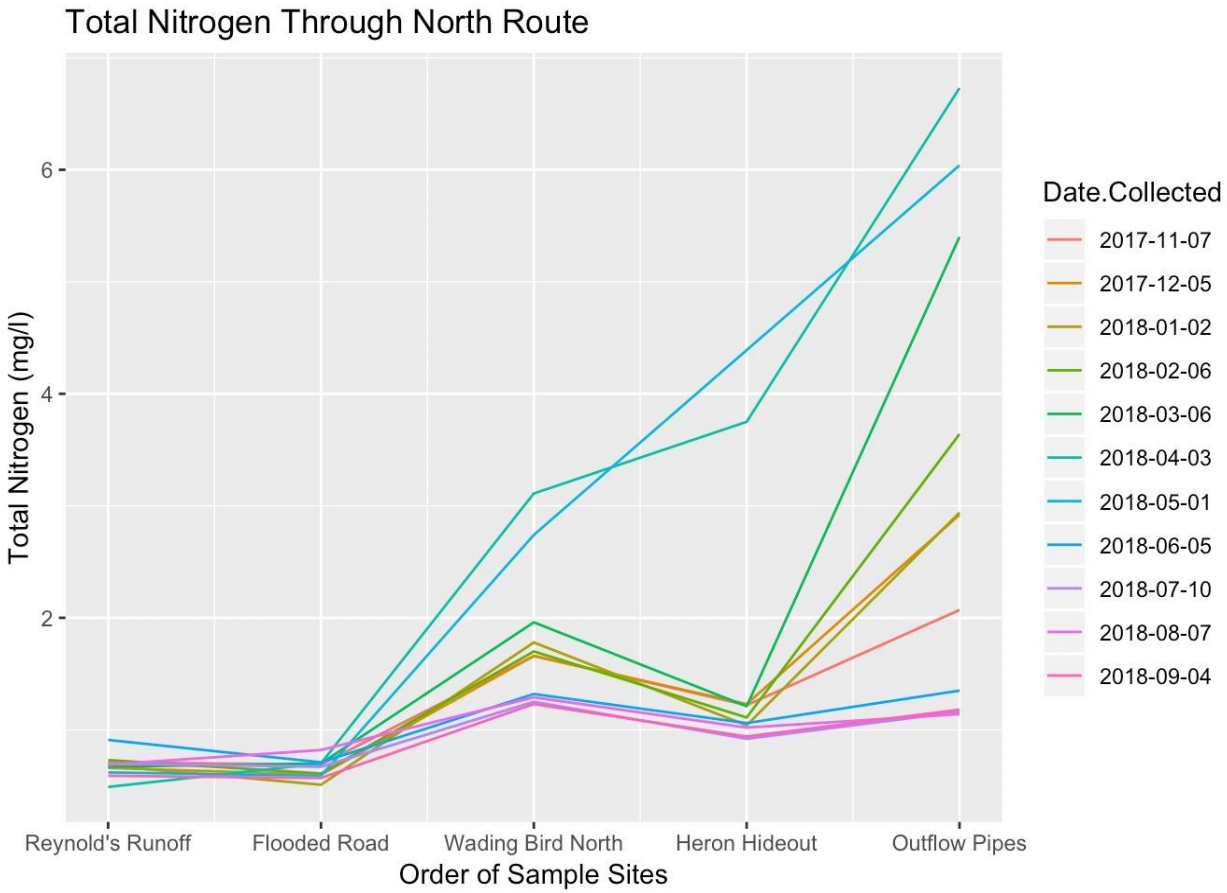
- Sand skink presence has declined compared to the year 2005 from where it remained constant
- Even though the burn made an increase in 2016 a burn in 2017 decreased the sand skink count

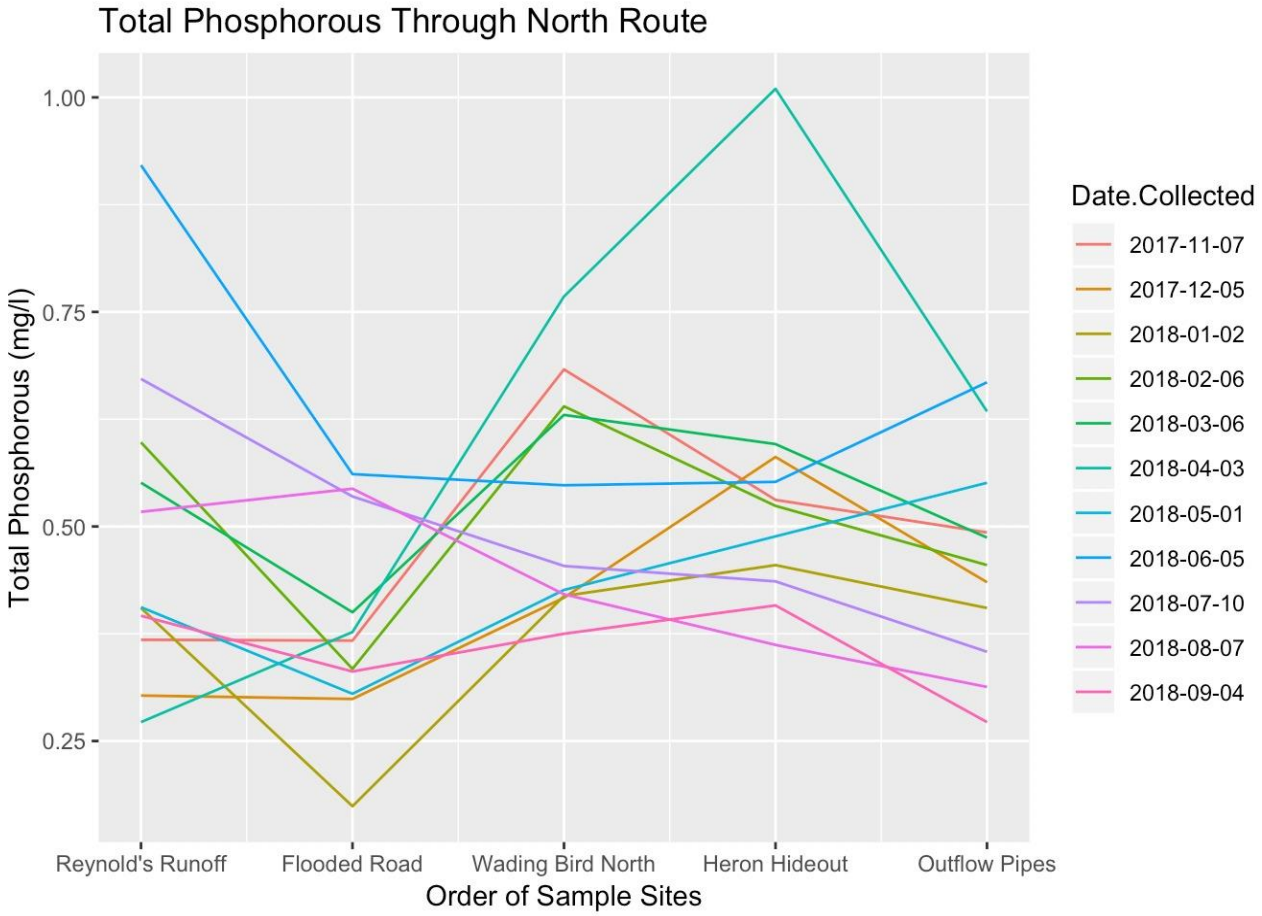






- The measures for the observed particulates are decreasing as the water moves through the system
- Most of the reduction in particulate occurs at the second observation site





- The nitrogen increases the farther the water gets through the system
- Phosphorus seems to have a downward trend, but it isn't as stark or clear as the Southern route

Decisions to be made based on analysis

Water Quality Project:

- Water filtration occurs as expected along the South route.
- Minimal monitoring of the South site should be sufficient to make sure the ideal behavior continues.
- The aberrant behavior along the North route is expected to be because of the lower elevation changes along the route along with canal backflow.

Sand Skink Project:

- We did not observe a consistent pattern of sand skink presence after the burns at any sites.
- Supplementary data on the burn history would be valuable to gain any insight on their effect on sand skinks.