

A Study of Biodiversity In and Around the Heath Fen at the Cathance River Preserve

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Purpose:

- To determine the biodiversity of the Heath Fen;
- To relate the diversity to factors such as pH and nitrate concentration;
- To compare Heath diversity with surrounding upland diversity.

Hypothesis:

- The Heath fen will support a low diversity of plants due to a very harsh environment regarding pH and nutrients.
- The surrounding uplands will have different species and biodiversity.

Background Information:

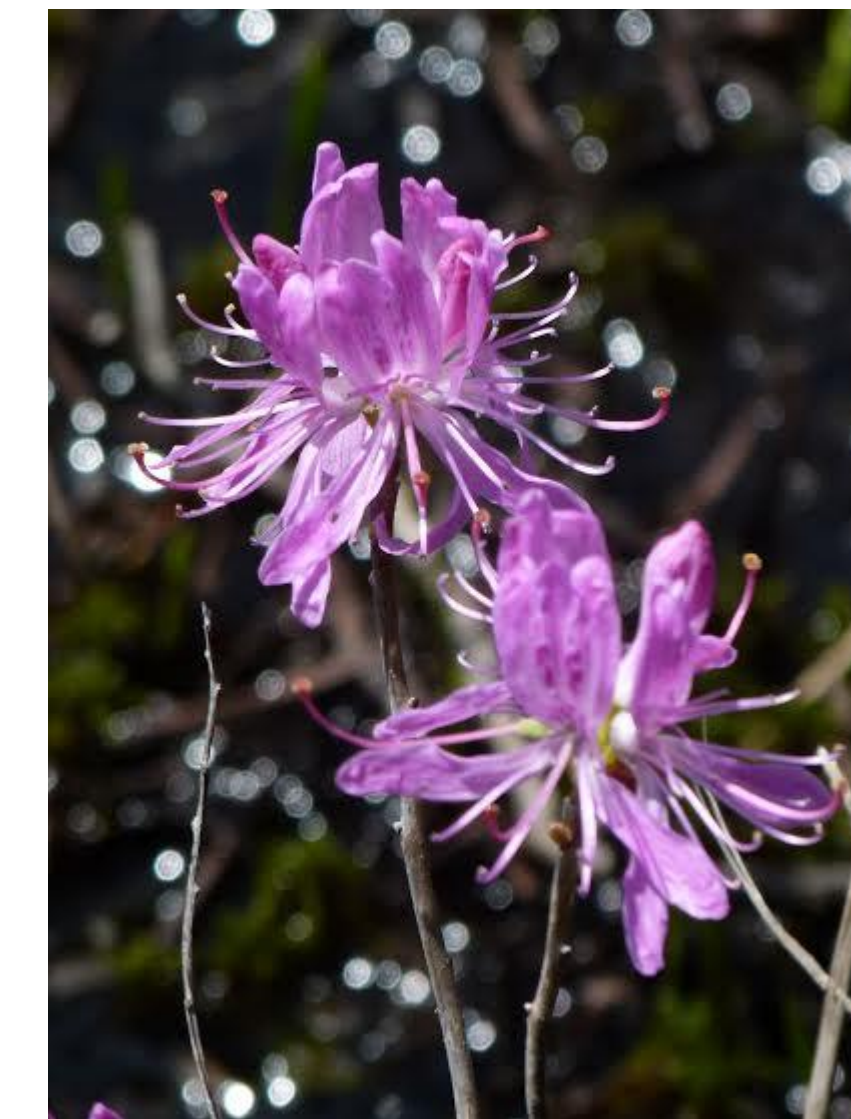
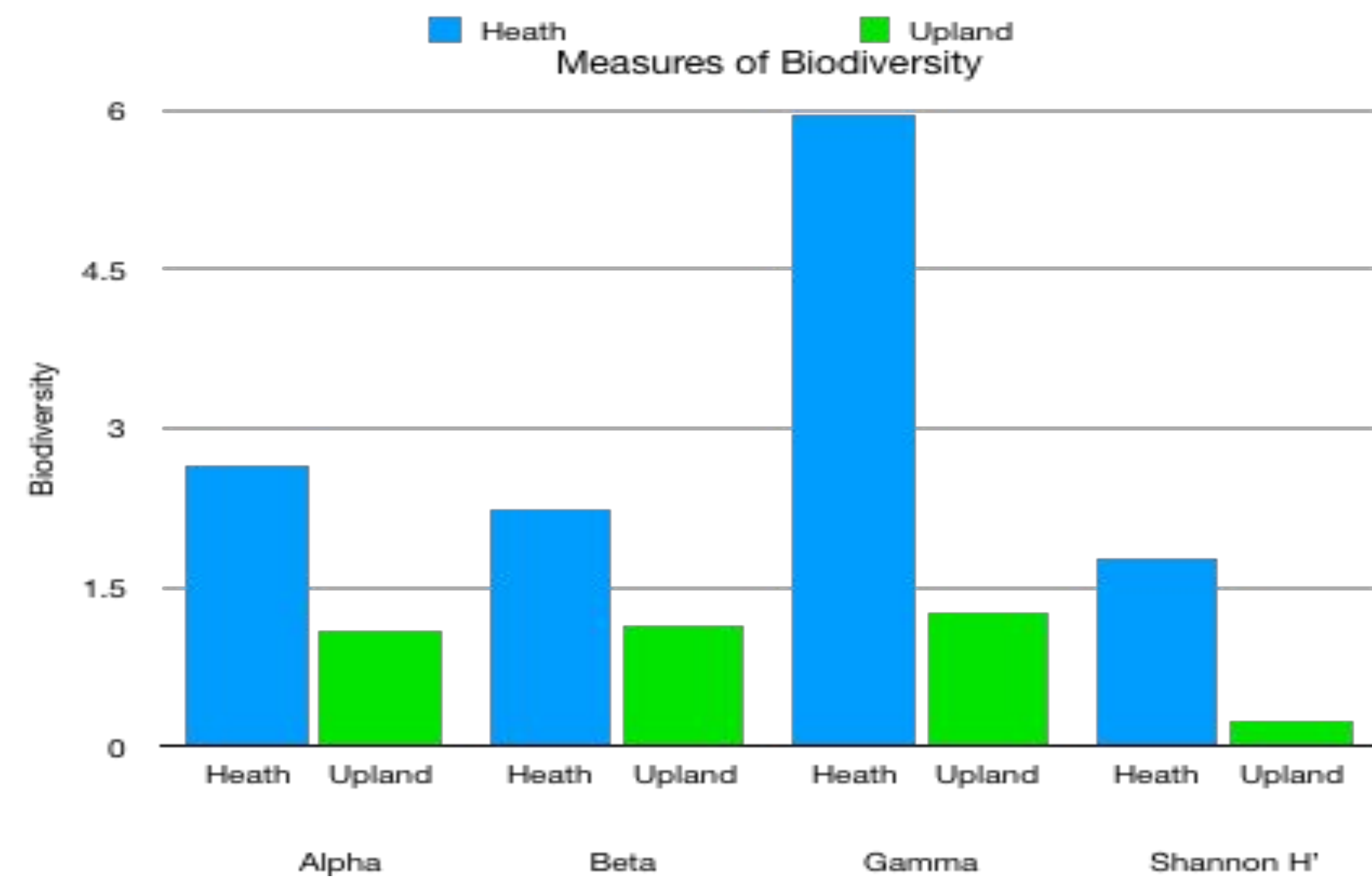
The Cathance Preserve Heath is a fen, a *Sphagnum* moss dominated wetland known for its acidity and unusual plant community. Ecosystems change over time. Currently, the Heath fen is slowly transforming from a fen into a forest, as trees invade and transpire much of the fen's water away.

Procedure:

- Create a 90 meter transect at the Heath fen, 30 of which extends into the woods and 60 meters into the Heath.
- Randomly generate 15 points along the transect.
- Study a one by one meter quadrat along the transect at each of these points.
- Catalogue the species and number of plants in each quadrat.
- Find the pH of each quadrat. Find the phosphorus and nitrate concentration at the start, middle, and end of the section of the transect extending into the Heath.
- Use the the Shannon H' method to find biodiversity.
- Compare biodiversity to nutrient and distance factors



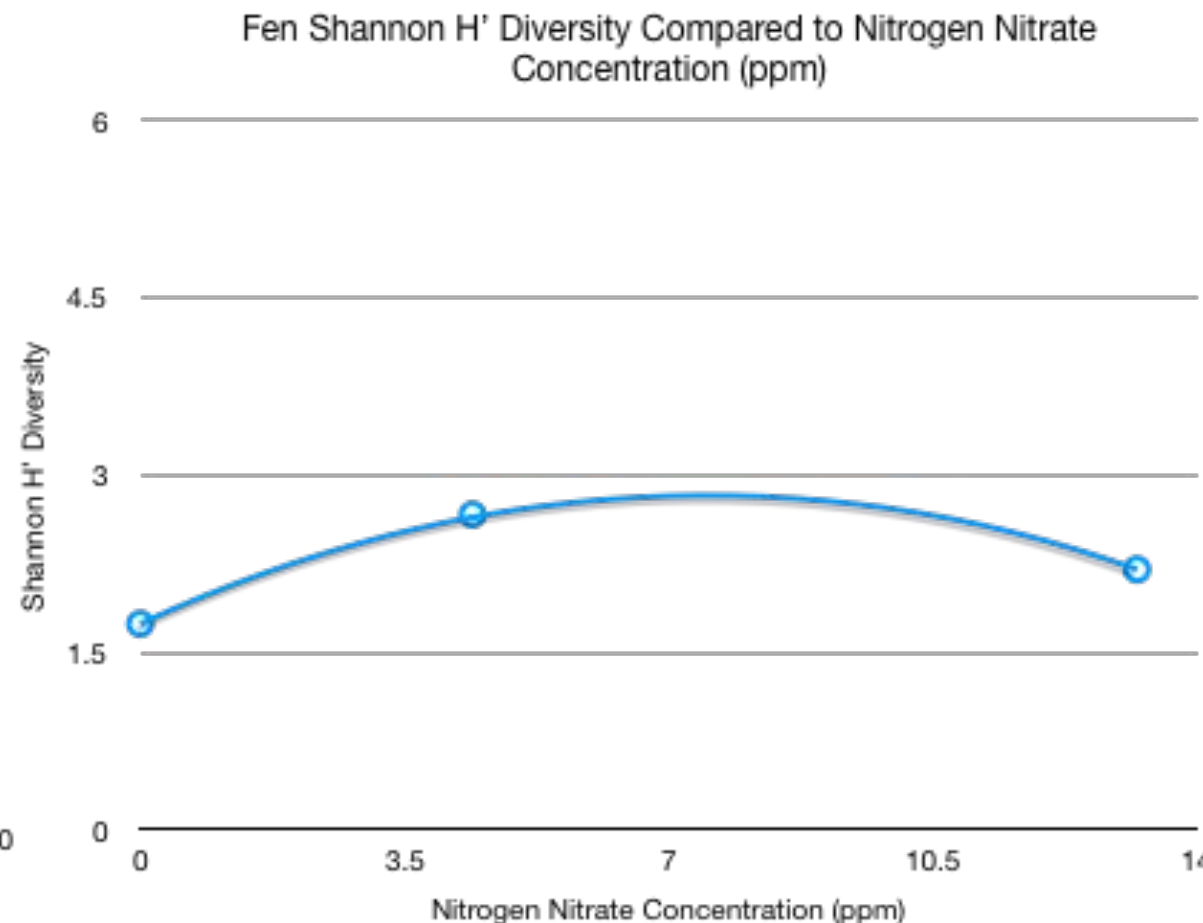
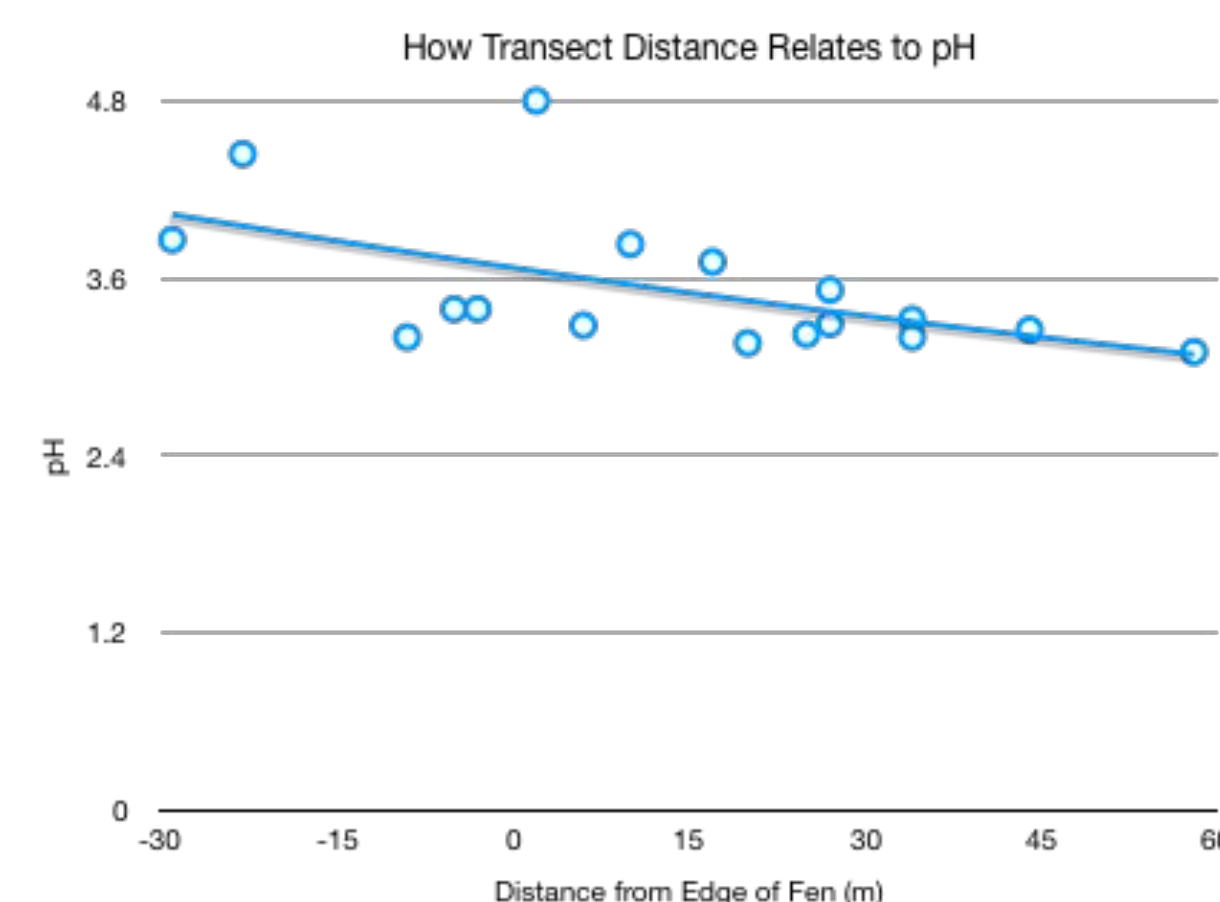
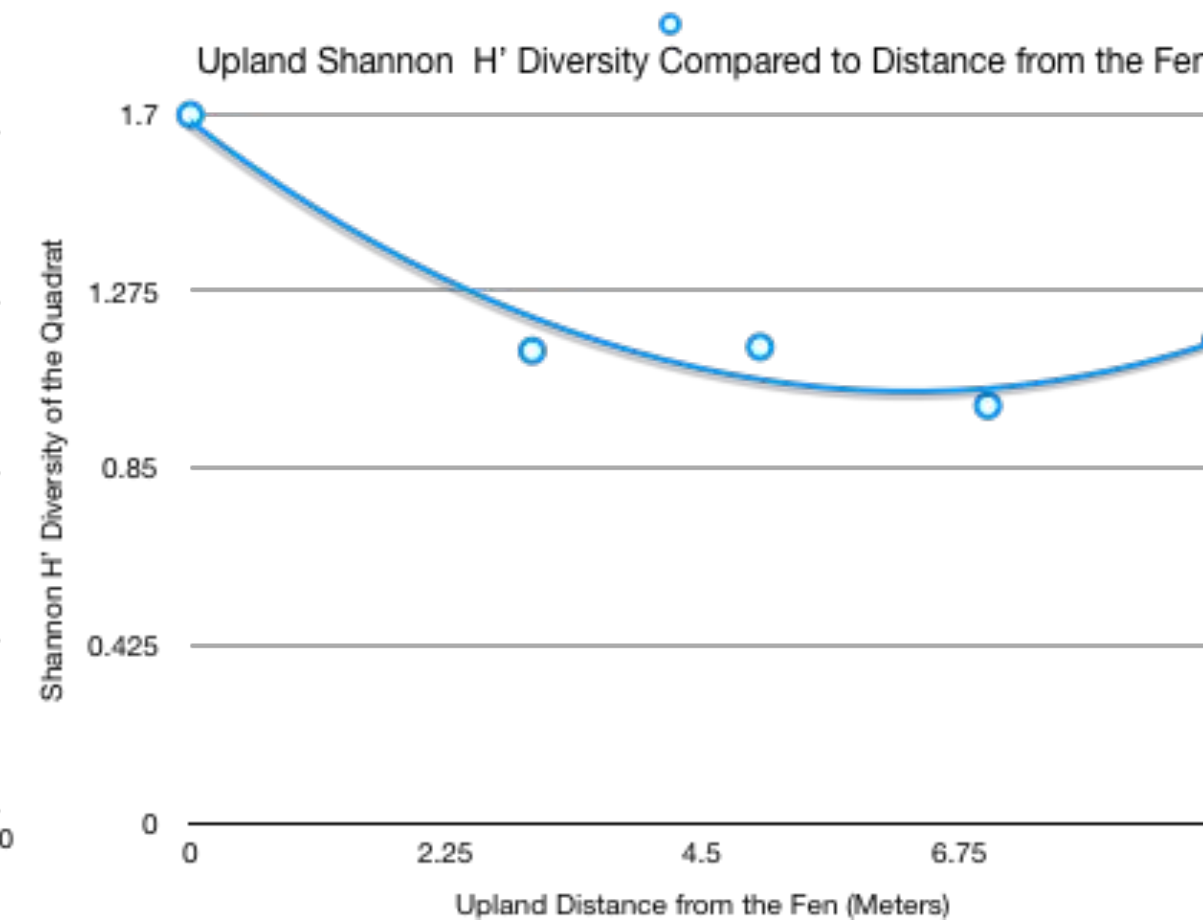
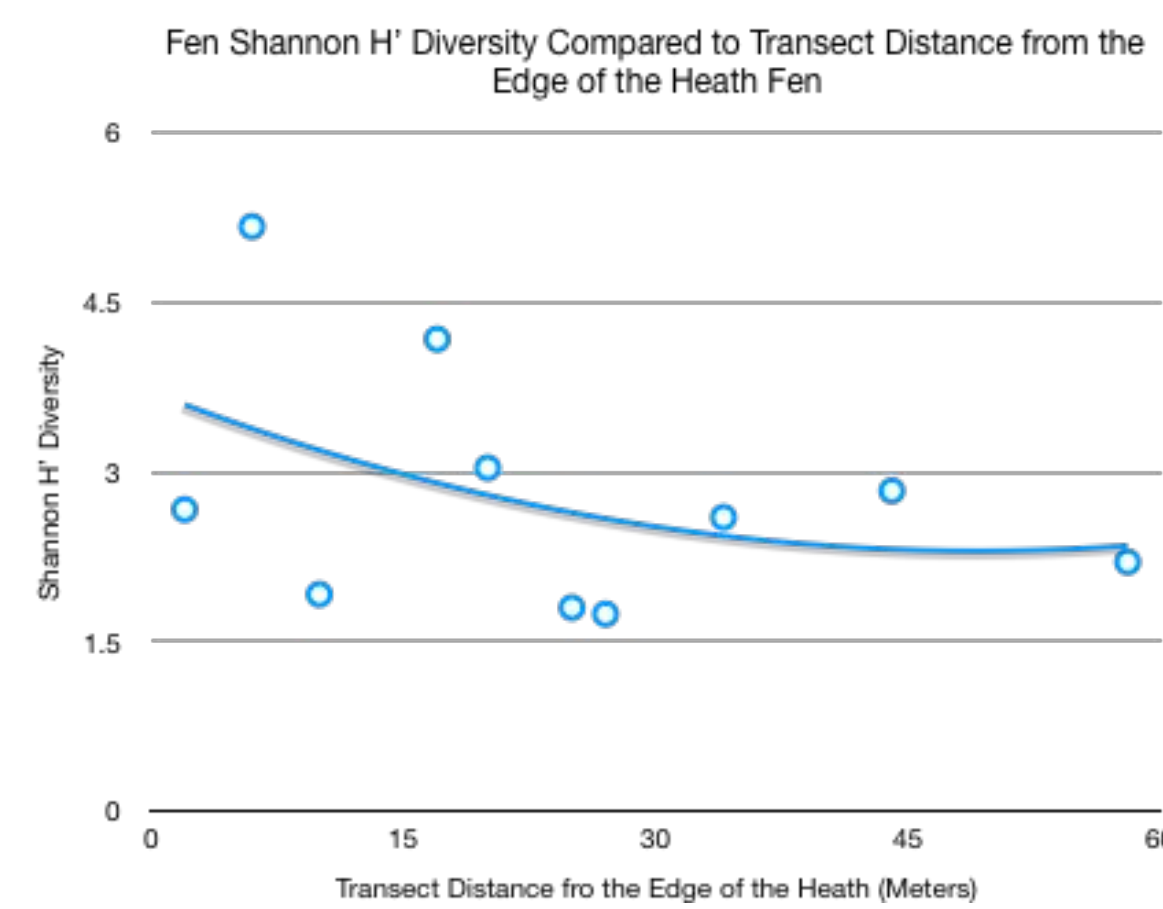
Lg. Cranberry (*Vaccinium macrocarpon*)



Rhodora (*Rhododendron groenlandicum*)

Conclusion:

- Both hypotheses were correct. The Heath fen has a low Shannon H' diversity(1.783) when compared with most ecosystems(1.5 and 3.5). The low pH (3.1-4.8) seemed to have the most effect on the biodiversity within the Heath fen.
- The surrounding uplands have a lower Shannon H' diversity(0.2357) than the Heath, as well as a low pH (3.2-4.4) and different array of species.
- In order to improve this study, more samples could be taken to test for nitrates to achieve more accurate results.
- A more precise test for phosphorus could be done to reveal another possible factor correlating with biodiversity.
- In the future, more research on the nearby upland may reveal why it had lower diversity.



The Heath overview



The heath group, left to right Nate, Anya, Hudson



The group laying down the transect



The heath transect on a satellite map

Thank you to Fred Cichocki, Mr. Evans, and CREA for helping with this study!