

# Effects of drainage pipes and vegetation on frog populations

Ankit Shah and Helena Puche  
CIRRUS Program

## Introduction

Amphibians have high sensitivity to environmental changes and are thus reliable indicators of environmental quality. Worldwide, frog populations are declining due to climate change, disease, overexploitation, decreasing water quality and introduction of exotic species<sup>1</sup>. In DuPage County forest preserve, drainage pipes and paved trails around Silver Lake and Herrick Lake alter the natural habitat of frogs. Systematic sampling of frogs was conducted to determine the effects of runoff and non-vegetated areas on frog populations.

## Objectives

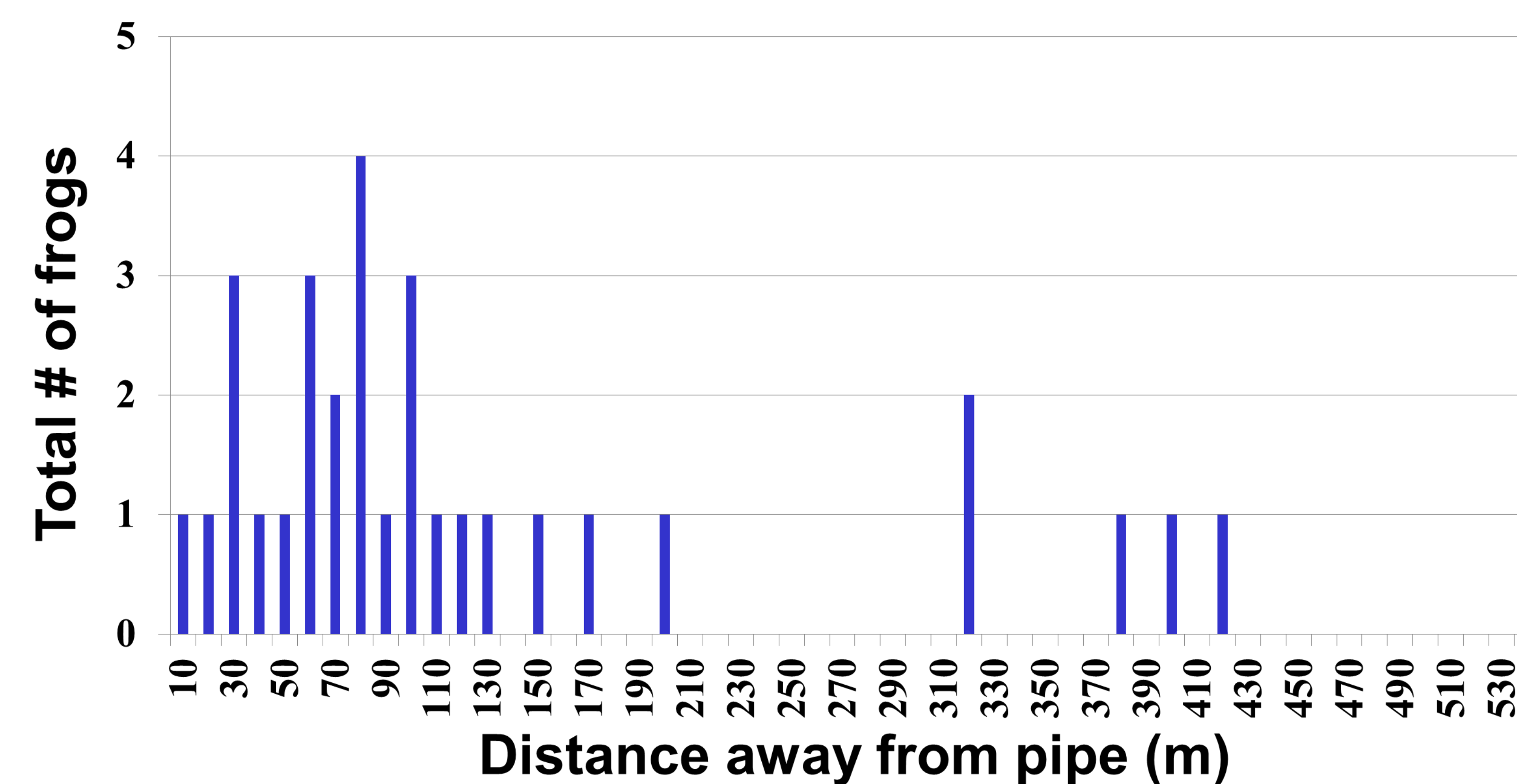
- To determine the effects of pipes on frog population around Silver Lake, White Pond and Sand Pond.
- To determine the effects of vegetation on frog populations around Herrick Lake.
- To determine the probability of connectivity of frogs between 4 lakes.

## Methods

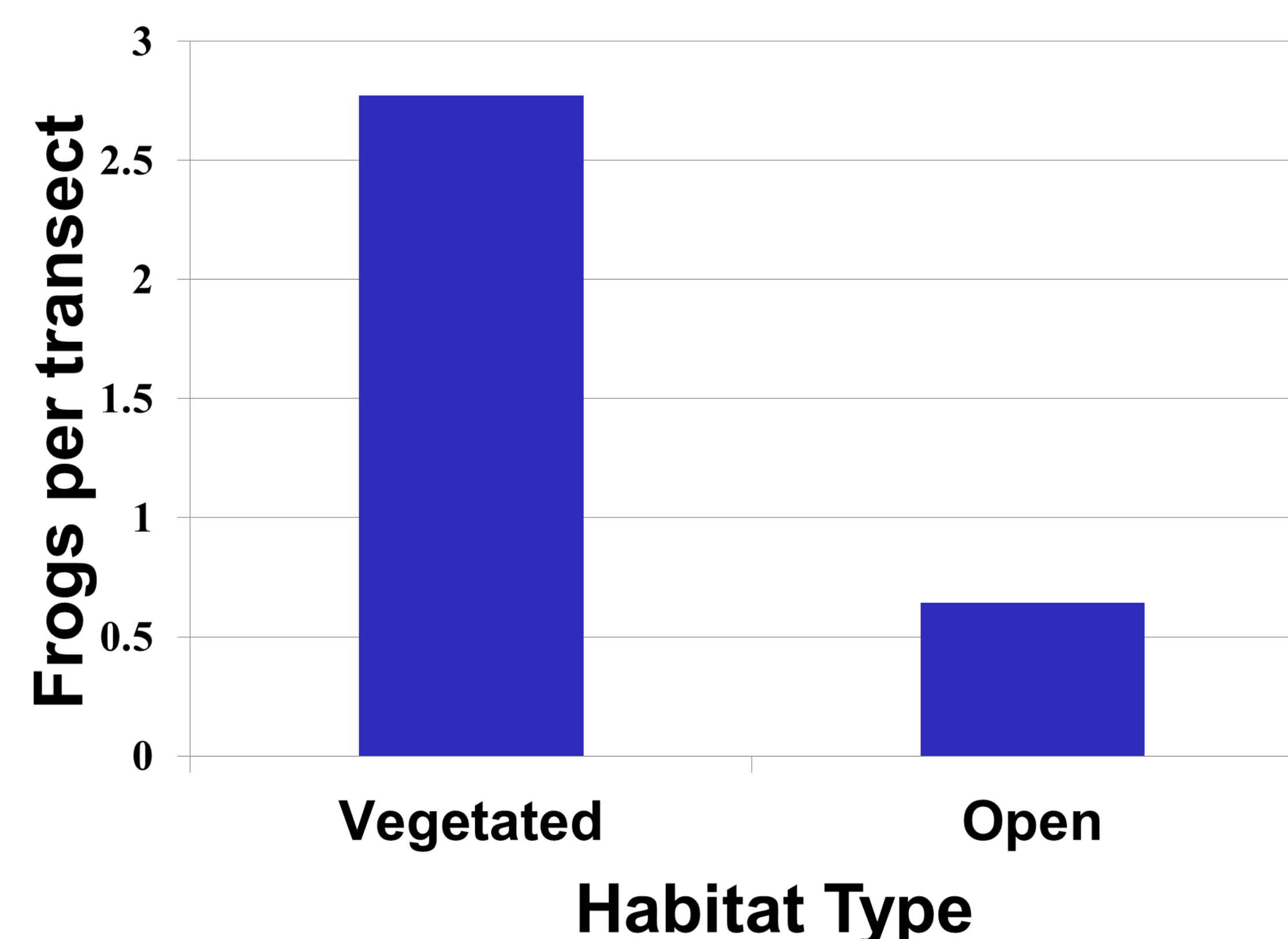
- Surveyed frog population at every ten meter transects around the lakes.
- Recorded GPS coordinates every ten meters.
- Defined transects as open or vegetated area.

## Results

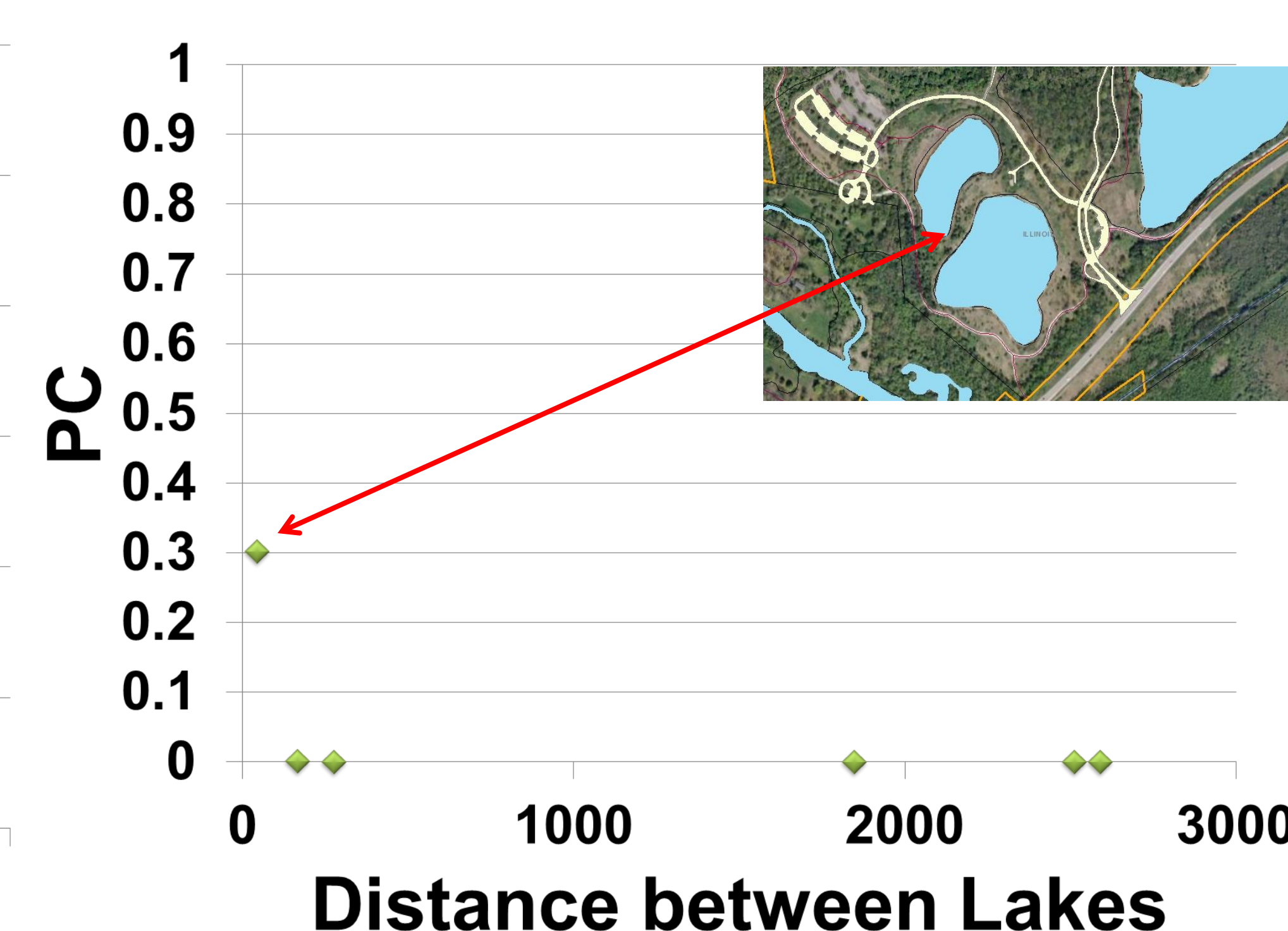
Frog populations at different distances from pipes  
at Silver Lake, White Pine Pond and Sand Pond



Average number of frogs per transect  
at two different habitat types



Probability of connectivity (PC)  
of frogs between lakes



## Conclusions

- There was no correlation between frog populations at pipe and non pipe locations.
- More frogs were found at vegetated areas than open areas.
- Greater connectivity was observed between White Pine and Sand ponds.

## Further Research

- Compare the impact of orthophosphate levels on tadpole populations.
- Observe frogs at different periods of time and temperature to determine the effects of climate change on frogs.

## References

1. Boyer R and Grue C. 1995. *The Need for Water Quality Criteria for Frogs*. 103:352-357.

## Acknowledgements

Thank you DePaul Environmental Science Department for lending GPS, Dan Wiet for helping with GIS Mapping, Blackwell and Herrick Forest Preserve for letting conduct the research and CIRRUS Program for making the research possible.