

# Bird Behaviour and Mortality Monitoring Prince Wind Farm

## Introduction

Natural Resource Solutions Inc. (NRSI) was retained by Brookfield Renewable Power Corp., formerly Superior Wind Energy Inc., in October 2001 to participate in a study of a proposed wind power facility in Sault Ste. Marie, Ontario. The work included pre, during, and post-construction stages of development. Post-construction monitoring surveys were conducted in 2006 through to the end of October 2008 and included:

- bird and bat mortality surveys
- breeding bird surveys
- aerial waterfowl surveys
- spring and fall bird migration monitoring.



## Study Site

- Located in Sault Ste. Marie, Ontario, the Prince Wind Farm is comprised of 126 turbines, resulting in a total combined capacity of 189MW
- The final study area is 10,000ha in size, and spans approximately 25 kilometres

## Study Design & Techniques

### Mortality Monitoring

- Commenced operation in fall of 2006, covering 4 seasons ending in October 2008
- Monitoring methods varied but was conducted at all 126 turbines in 2008
- All areas were searched within a 45m radius from the base of each turbine
- Searcher efficiency and scavenger removal trials were conducted

### Bird Surveys

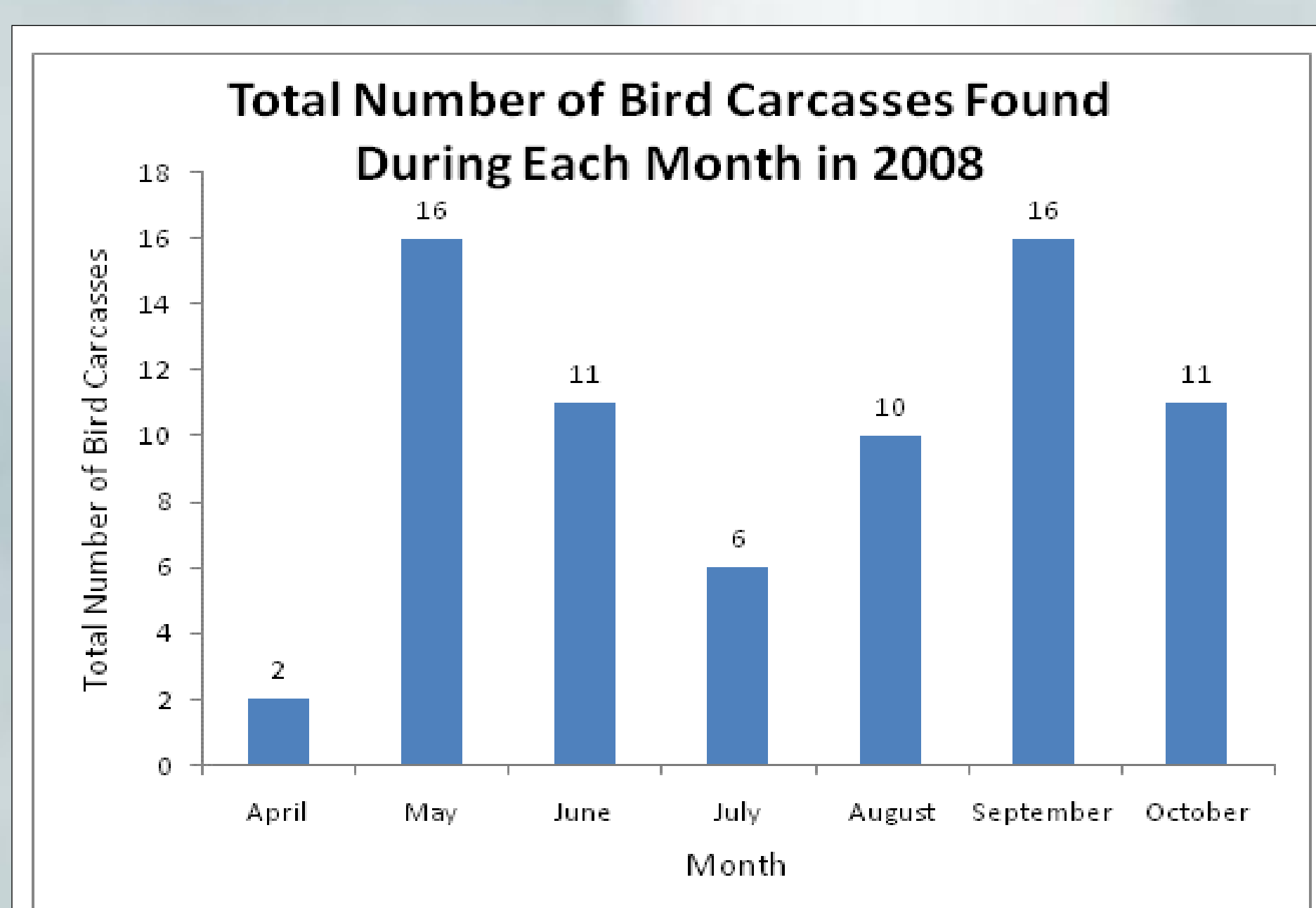
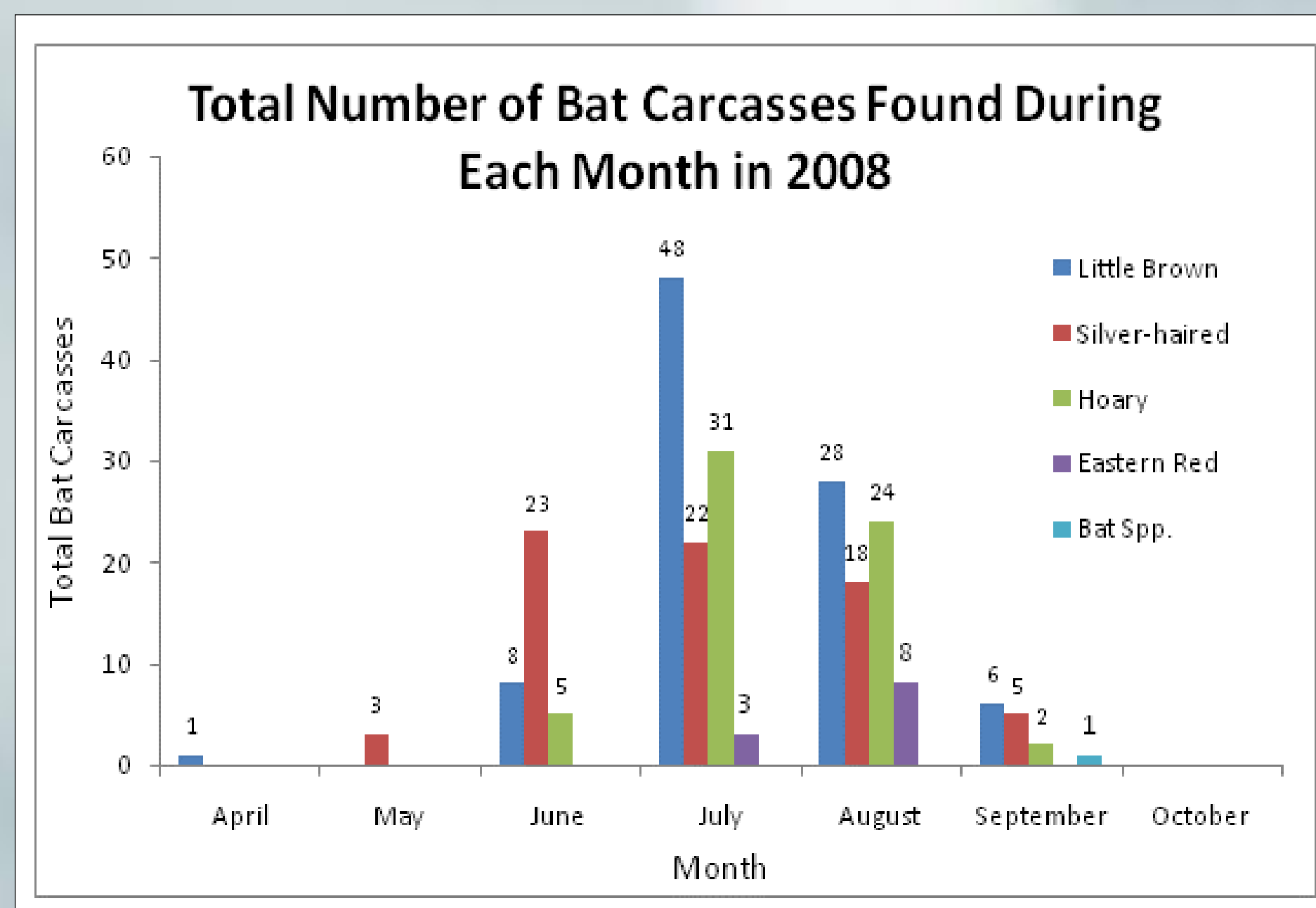
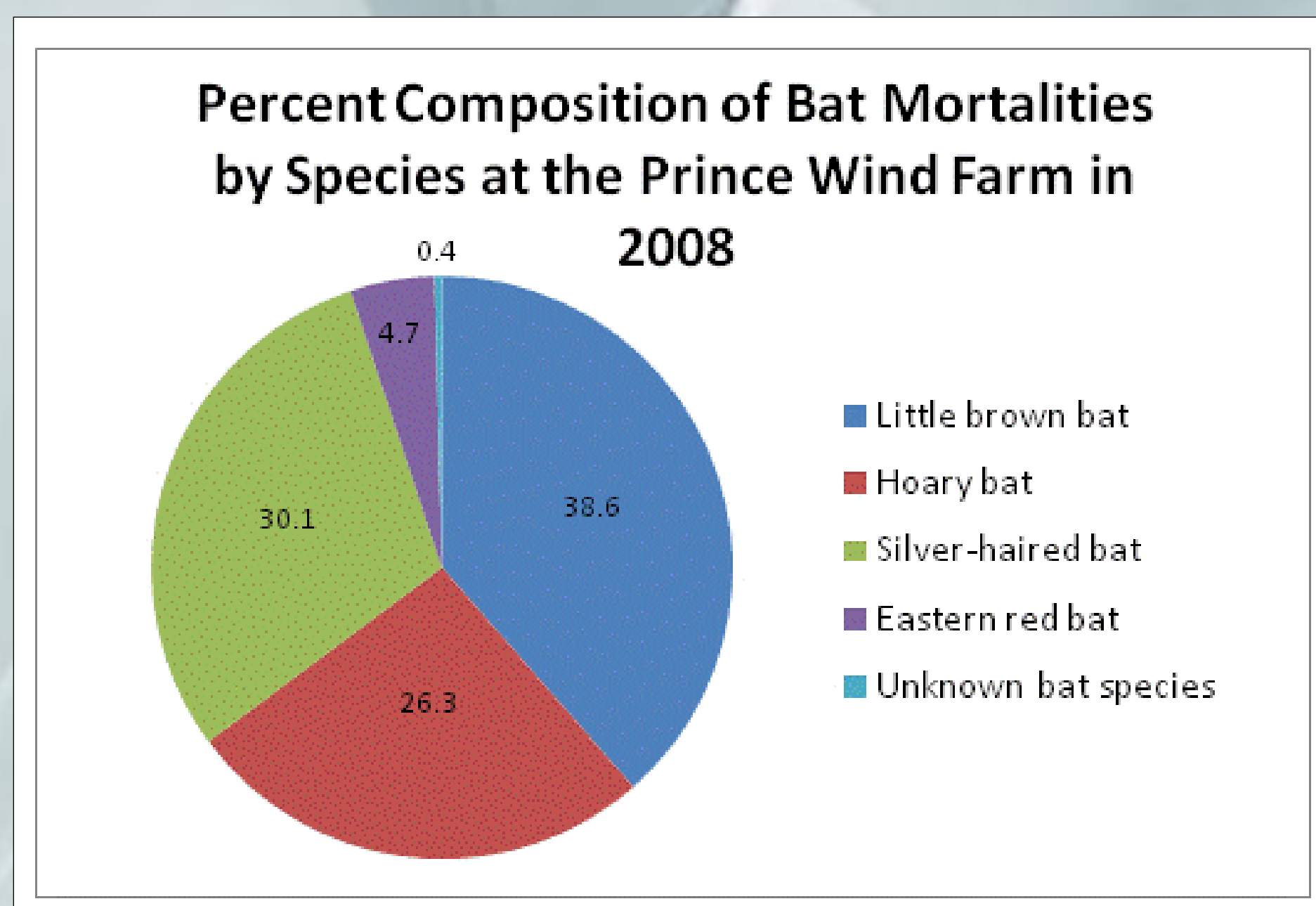
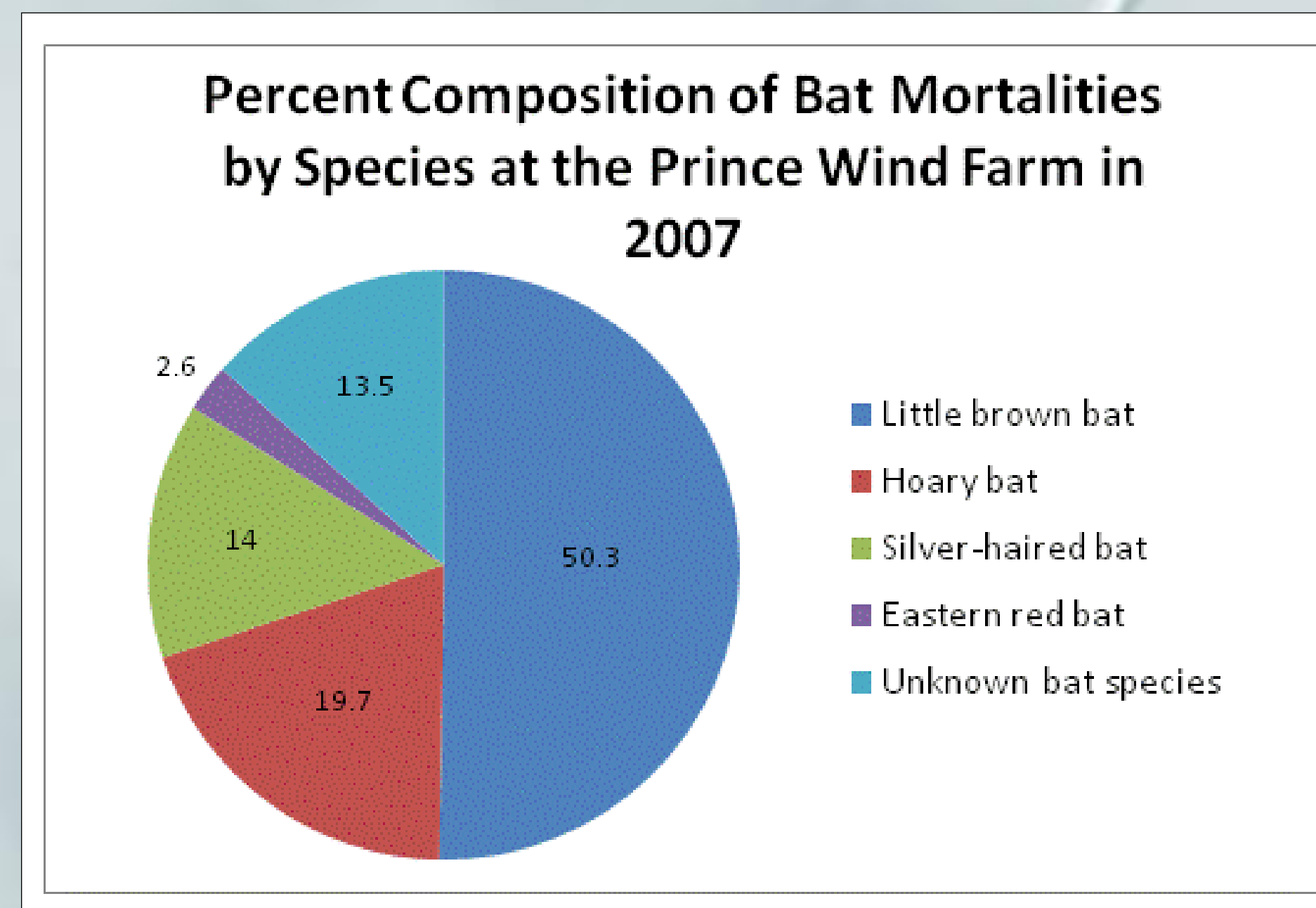
- Pre-construction behaviour, migration and breeding bird surveys
- Post-construction monitoring included behaviour migration, breeding surveys, and aerial waterfowl survey



## Results

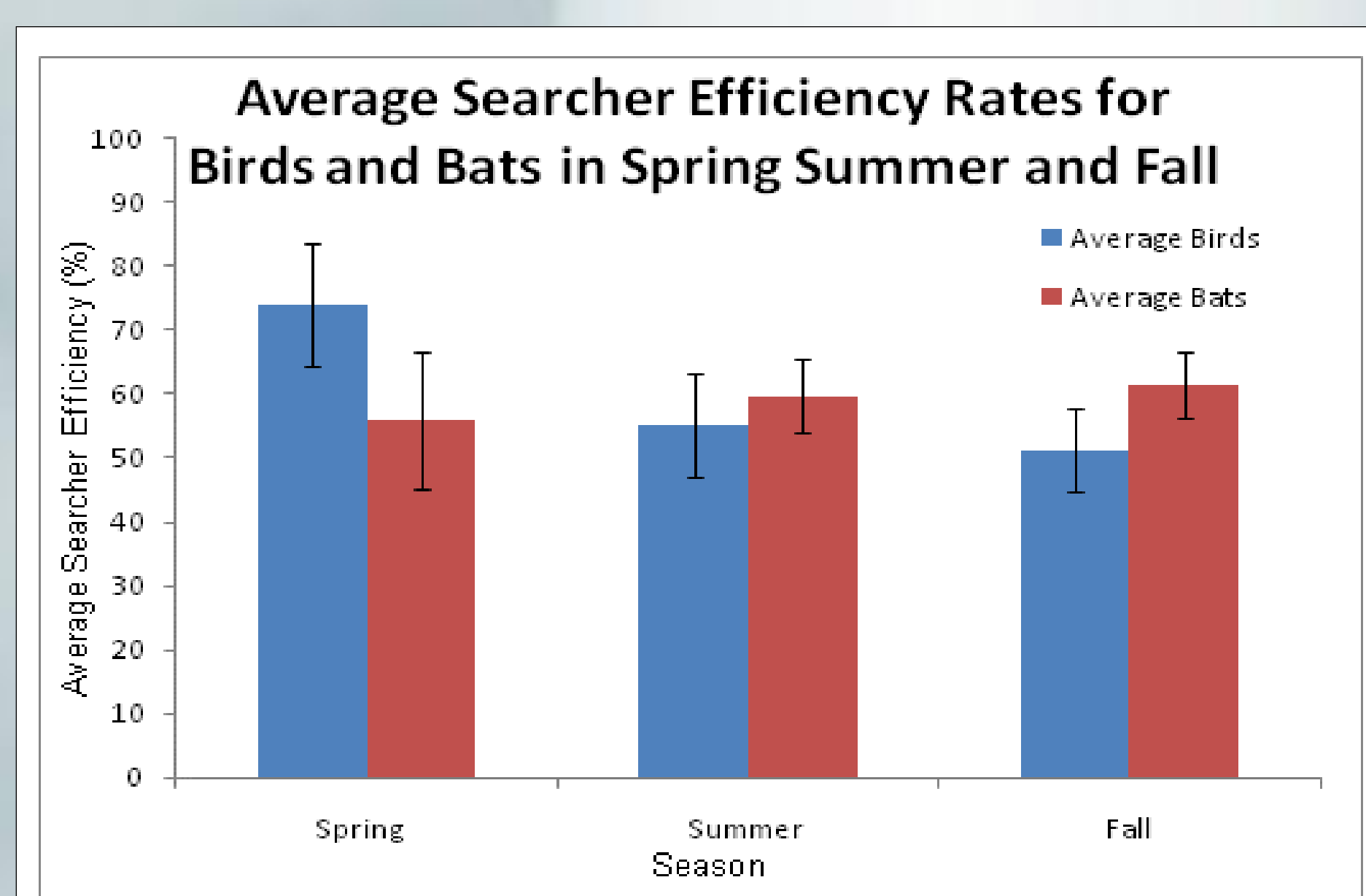
### Mortality Monitoring

- 236 bat carcasses and 72 bird carcasses were found
- Total estimated bat and bird mortalities were 452 and 167 respectively (searcher efficiency & scavenger removal factors)
- Little Brown bat was found to be the most common fatality
- This differs from other studies where long distance migratory bat species were particularly vulnerable to wind turbines (MNR 2006)
- Passerines are most commonly affected by wind energy facilities in North America (Kingsley and Whittam 2005)
- The majority of the 22 species of bird carcasses



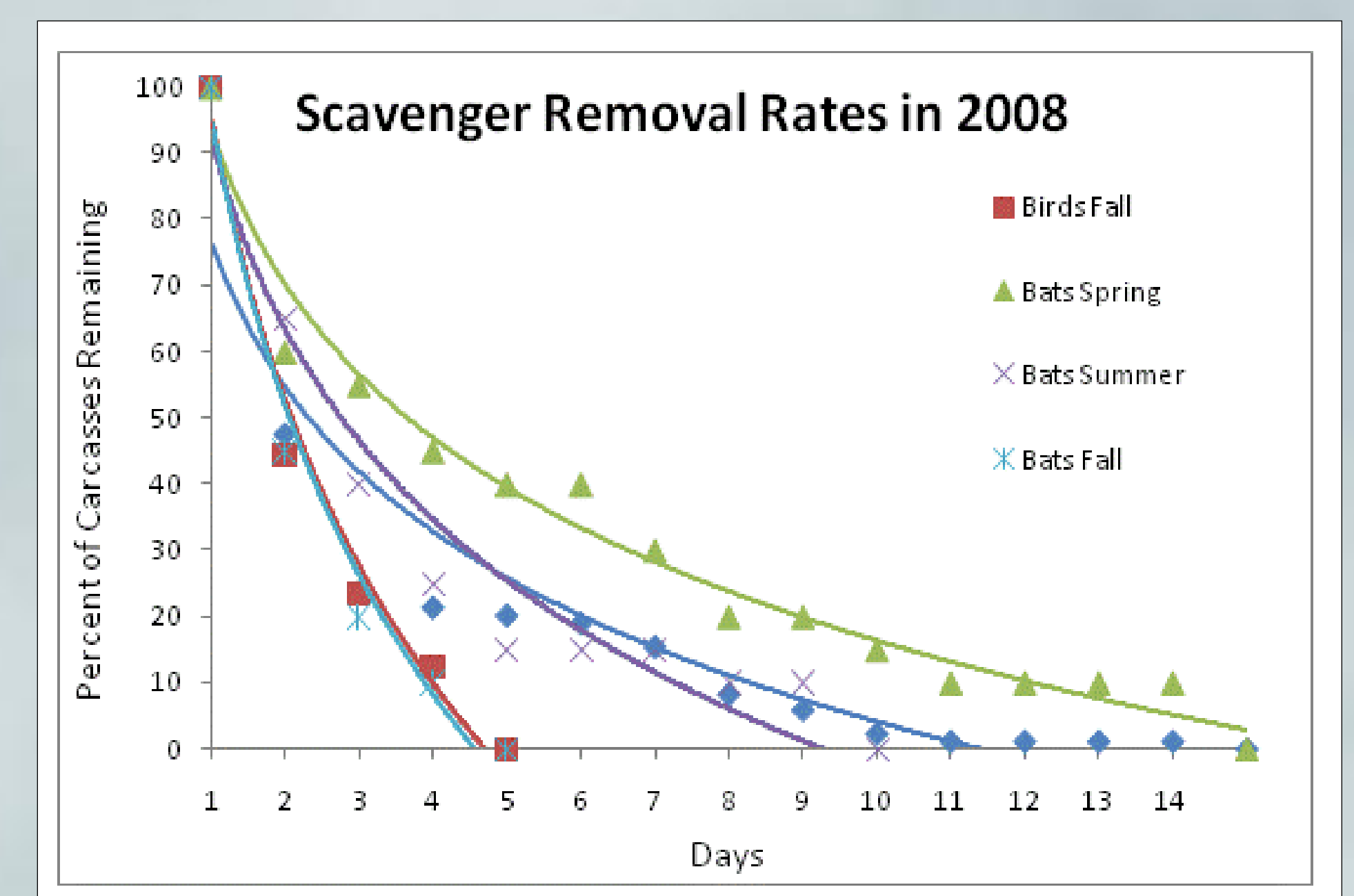
### Searcher Efficiency and Scavenger Removal Trials

- Factors in adjusting estimated mortalities
- Searcher efficiency varied, but typically 50 to 60%, with searcher-dog teams generally 100%



Caroline Walmsley, Lisa Keable,  
and David Stephenson

- Scavenger removal rates followed a semi-log relationship, and increased from spring to fall



Year	Bats		Birds	
	mortalities/turbine/yr	mortalities/MW/yr	mortalities/turbine/yr	mortalities/MW/yr
2008	3.59	2.39	1.33	0.89
2007	1.63	1.09	0.43	0.29
2006	1.67	1.11	2.15	1.43

## Conclusions

### Mortality

- Average adjusted mortalities in 2006 - 2008 similar to reported totals for wind power projects on open agricultural lands in North America, and well below mortality estimates for other wind power projects in forested ridge landscapes

### Bird Behaviour Monitoring

- No evidence suggesting that species composition and/or abundance has changed substantially between pre-turbine and post-turbine monitoring
- No evidence that flight directions have altered as a result of turbine operations
- No evidence to suggest that raptors are avoiding the wind farm

### Breeding Bird Surveys

- No adverse effects relating to breeding birds within the Prince Wind Farm detected

### Waterfowl Survey

- Waterfowl are not being negatively impacted by operating turbines

### Other Trends Observed:

- Bat mortalities peaked during periods known for summer swarming events
- Bird mortalities peaked during spring and fall migration
- No trends were observed with respect to mortalities at lit versus unlit turbines

## References

- Kingsley, A., and Whittam B. 2005. Wind Turbines and Birds: A Background Review for Environmental Assessments. May 12, 2005.
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