

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

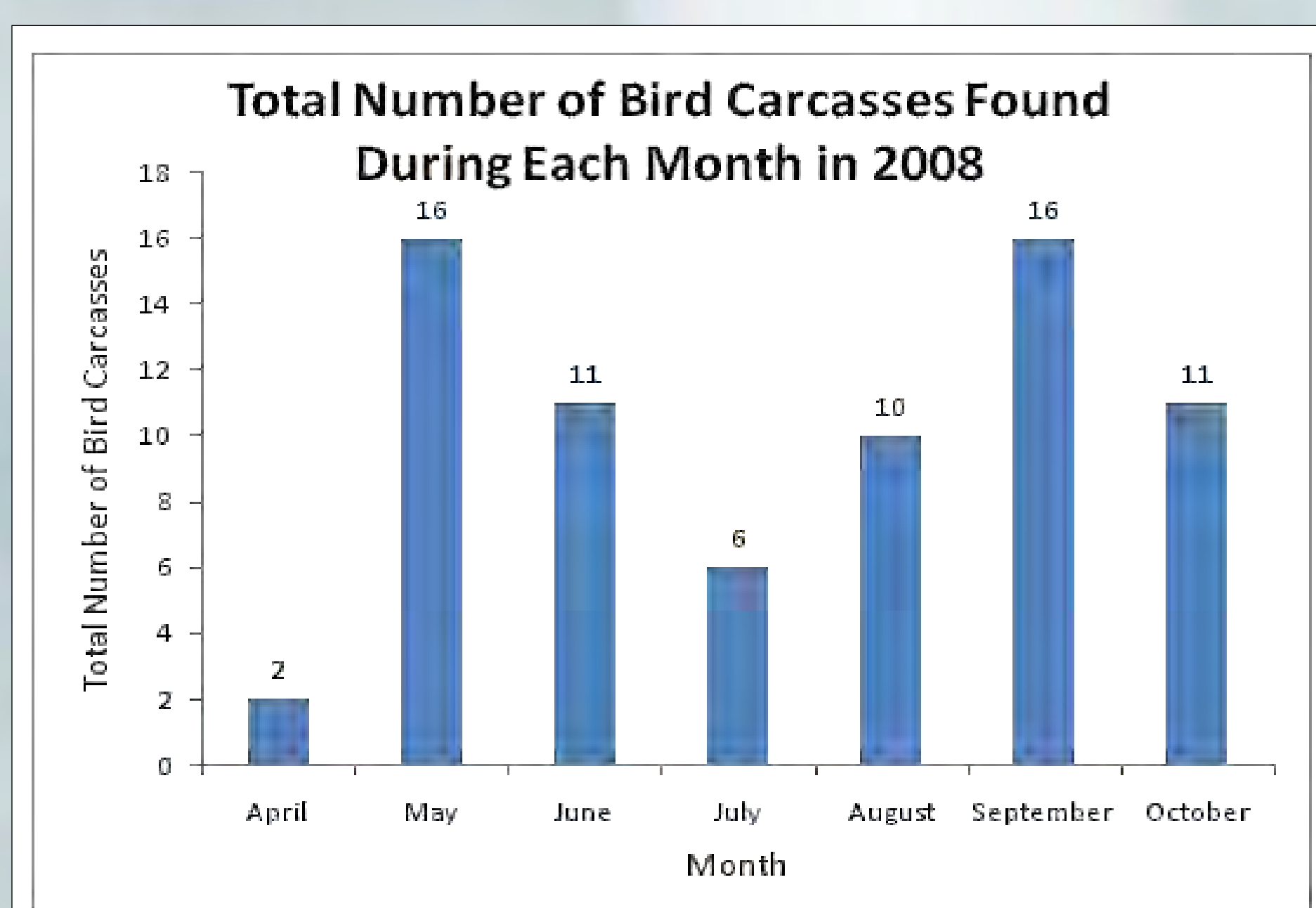
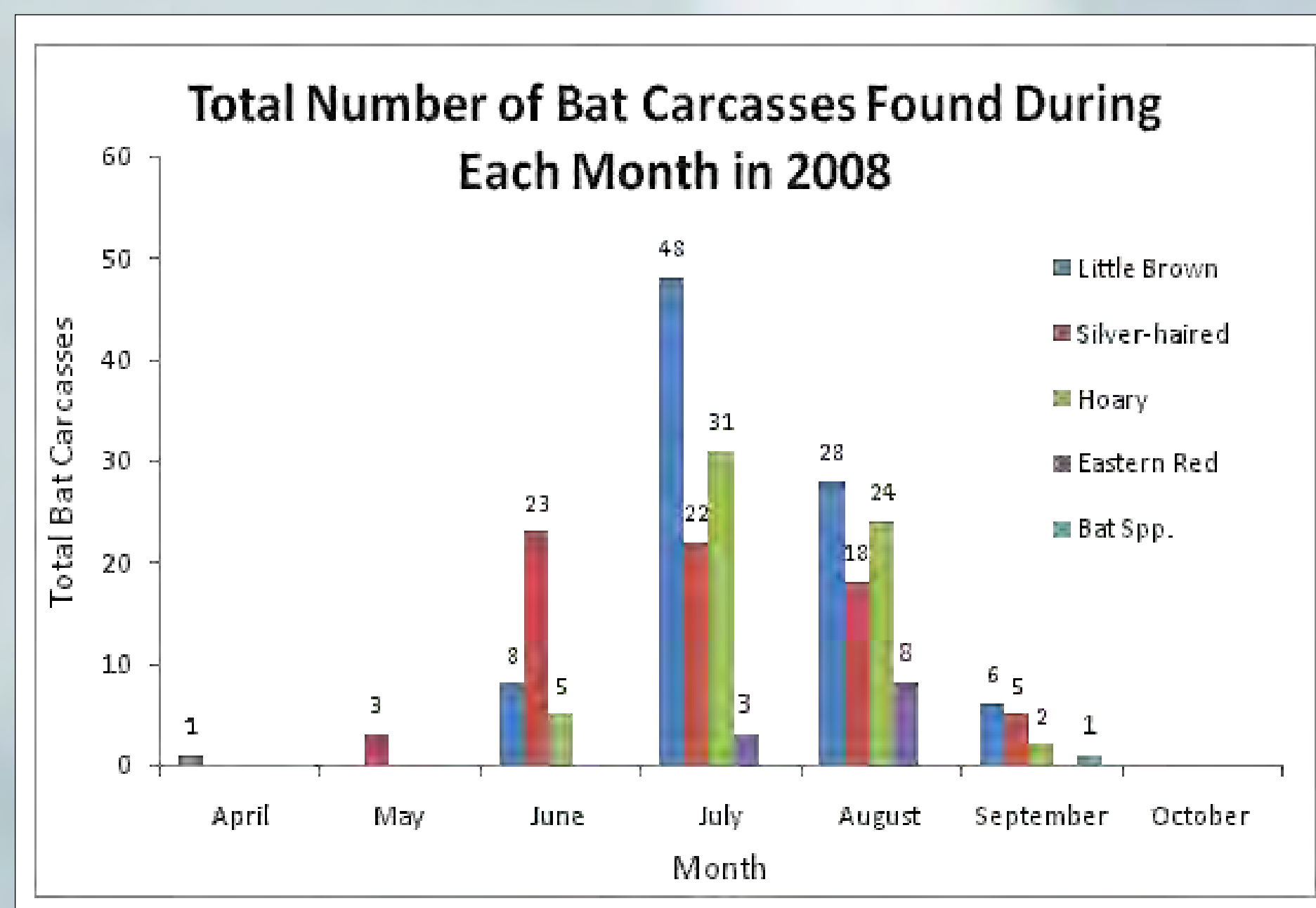
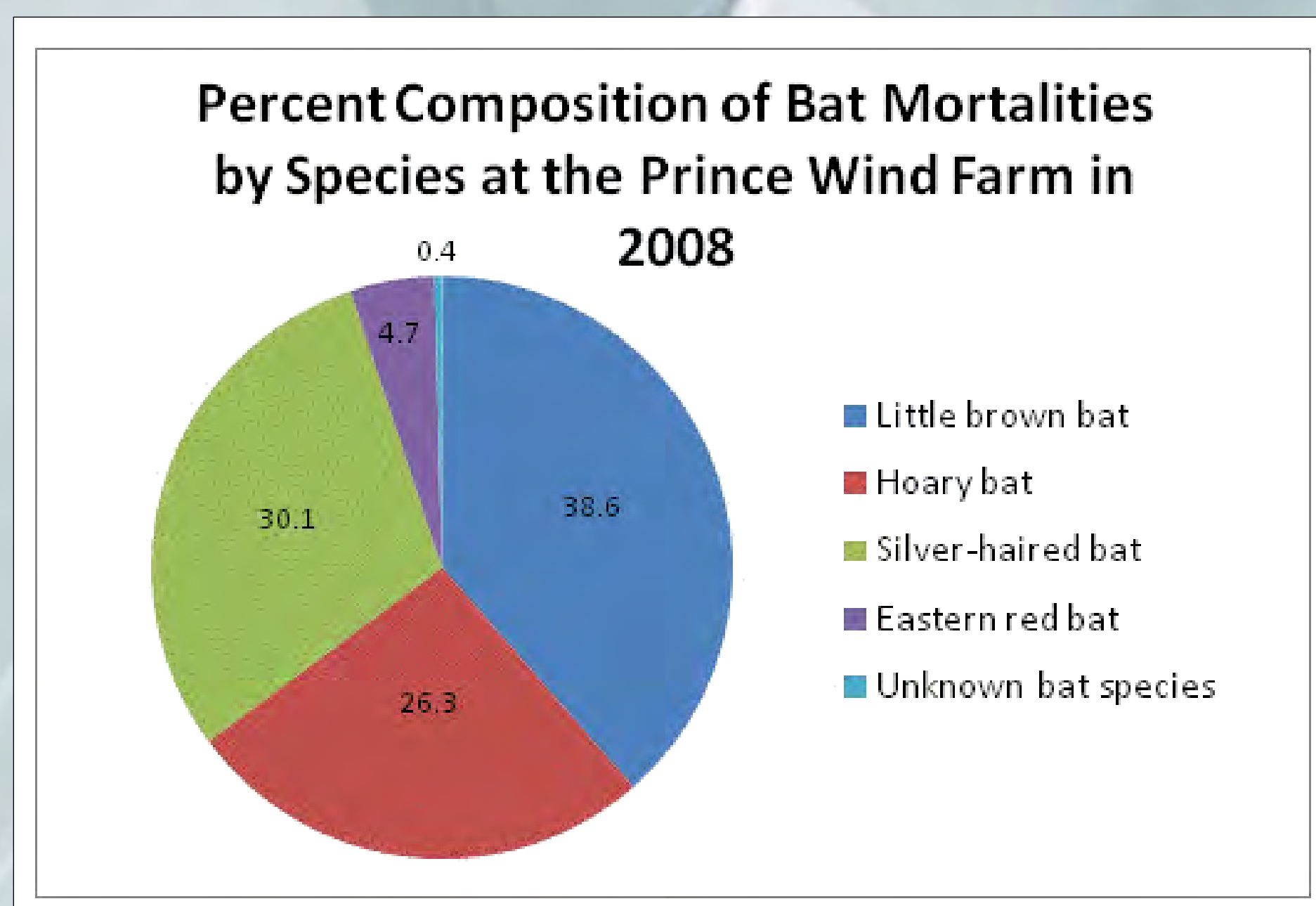
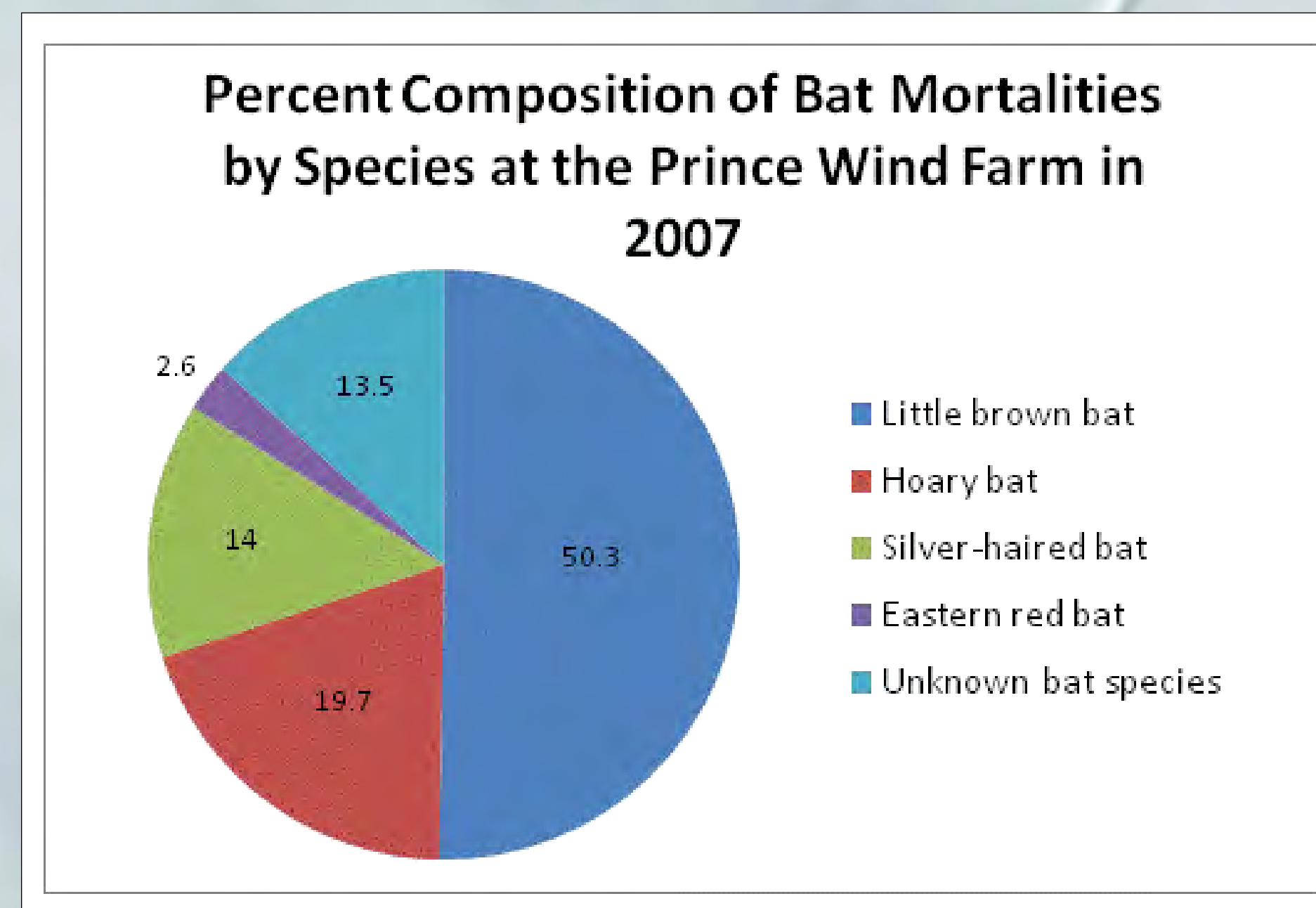
- Pre-construction behaviour, migration and breeding bird surveys
- Post-construction monitoring included behaviour migration, breeding surveys, and aerial waterfowl survey



Results

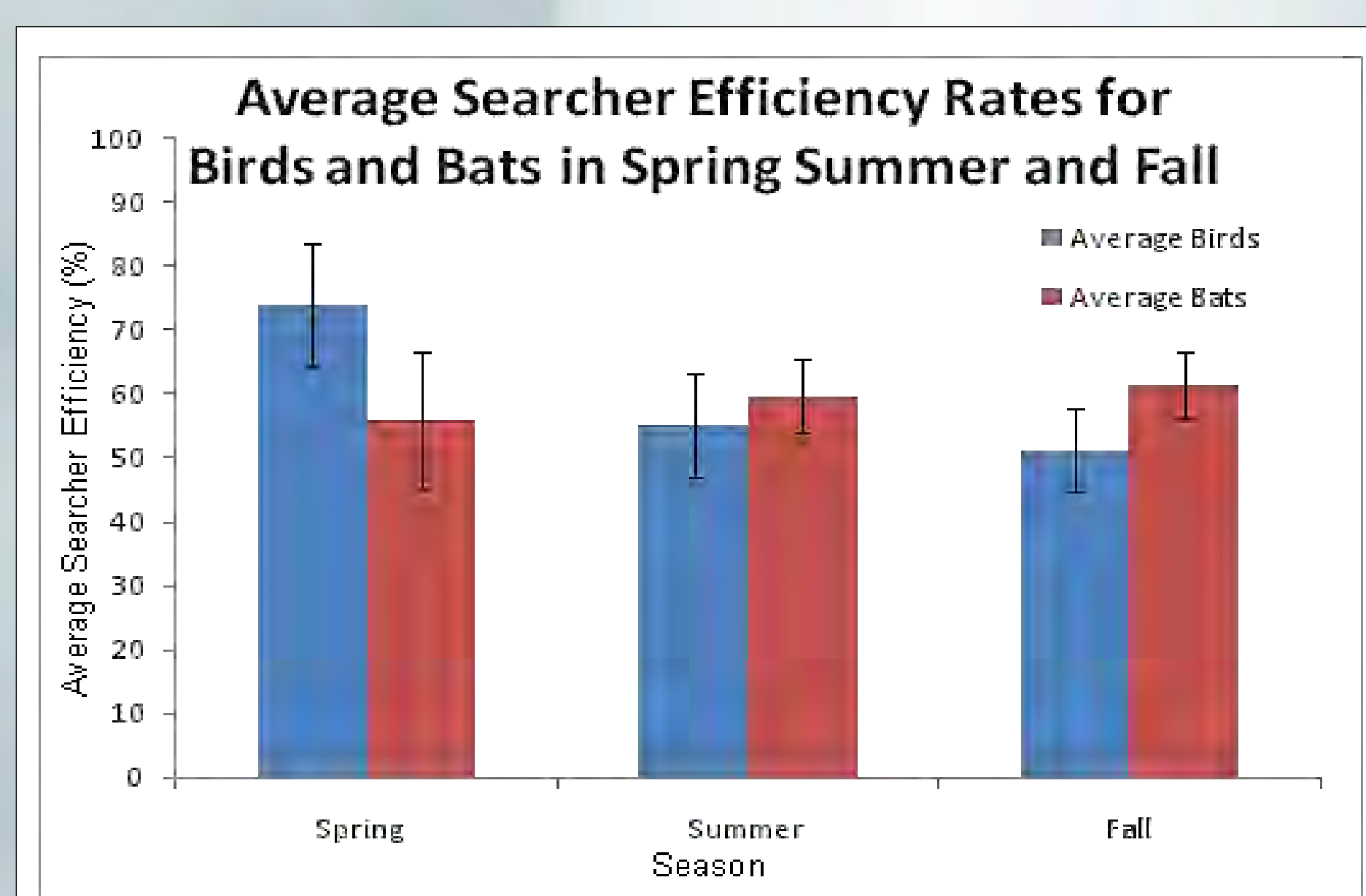
Mortality Monitoring

- 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



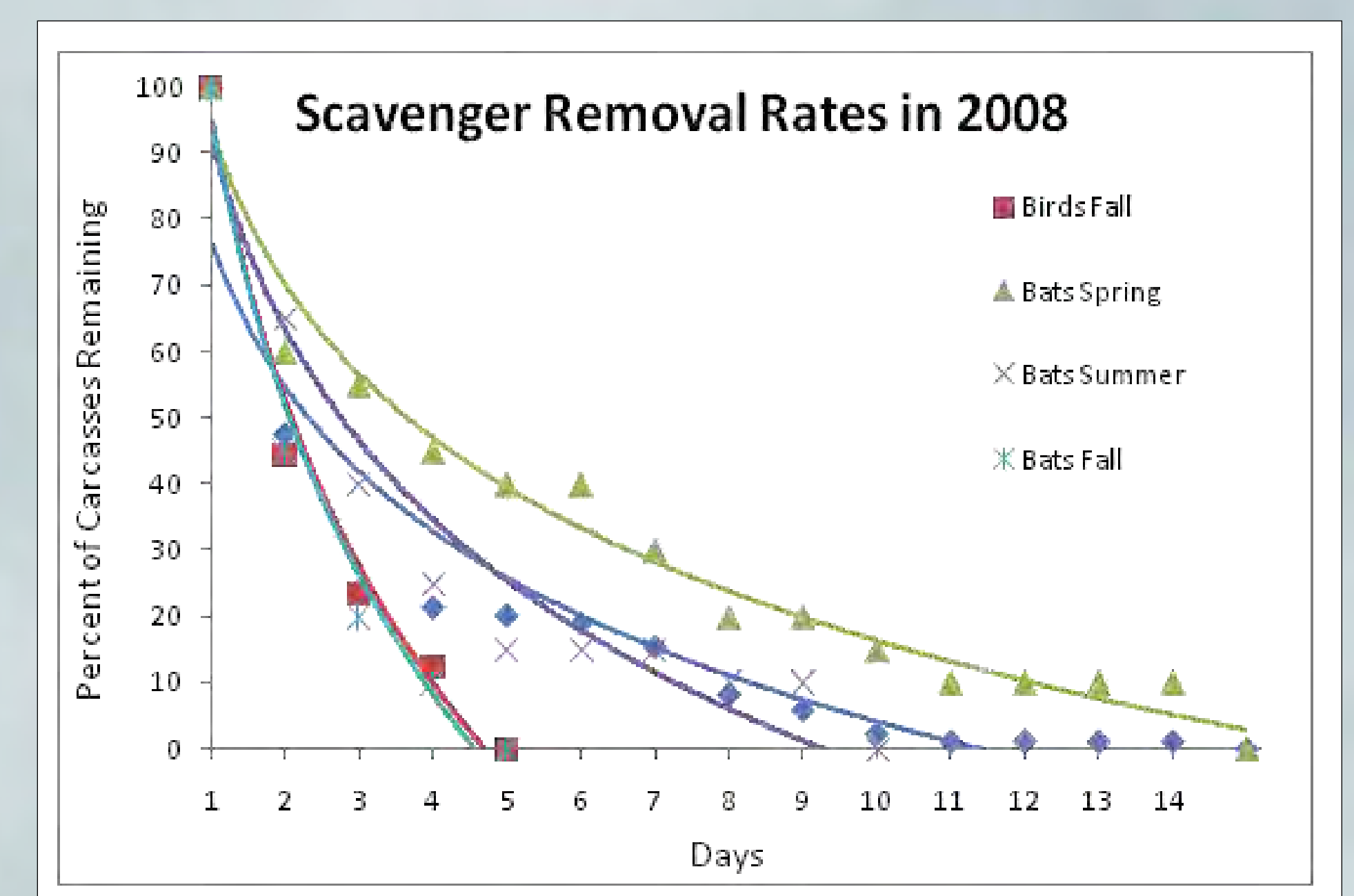
Searcher Efficiency and Scavenger Removal Trials

- 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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