

Introduction & Objectives

- Wildlife strikes are a serious threat to aviation safety and management. In the US <20% of wildlife strikes are reported. 97% of wildlife strikes occur with bird species. (FAA, AC 150/5200-32B, 2013)
- Our objectives are to determine:
 - If biological, (species richness) and landscape (land cover and land use) variables are good predictors of wildlife strikes.
 - Whether seasonal differences affect wildlife strikes.
 - If there are any new and effective mitigation methods to be implemented.

Study Area

- 7 Phoenix-metropolitan airports
 - 2 FAA Part-139 (Required to inspect for wildlife strikes or wildlife damage)
 - 5 general aviation (Not required to inspect for wildlife strikes)
- 30 airports across western U.S.
 - 26 Part-139
 - 4 general aviation

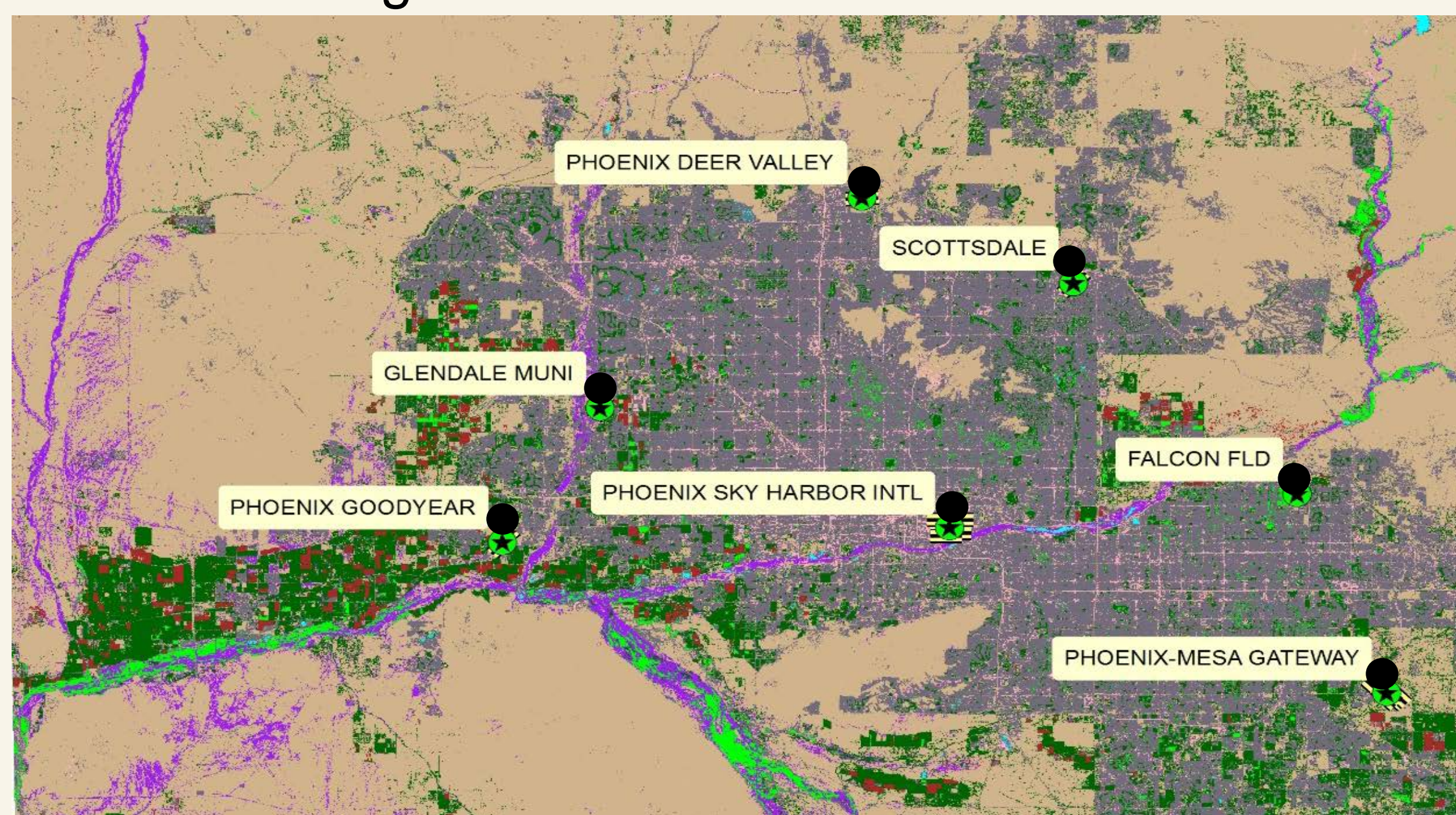


Figure 1: Map of Phoenix-metro study area from ArcGIS

Methods

- Wildlife strike data were gathered from Federal Aviation Administration (FAA) database.
- Species richness and bird hotspot data was taken from the citizen-science database, eBird in November 2014.
- Bird richness measured within 15 km of each airport.
- ArcGIS software used to analyze CAP LTER raster data for land cover. Data gathered within 15 km of airports.

Results

- Bird species richness (**Fig. 2**) was totaled between 4 of the nearest bird watching hotspots for each airport. The data were then compared to the number of airport operations to evaluate a correlation.
- Phoenix Sky Harbor and Phoenix-Mesa Gateway are Part-139 airports and are required to conduct frequent wildlife strike inspections.
- Only 2.8% of airports in the US are considered Part-139 facilities.

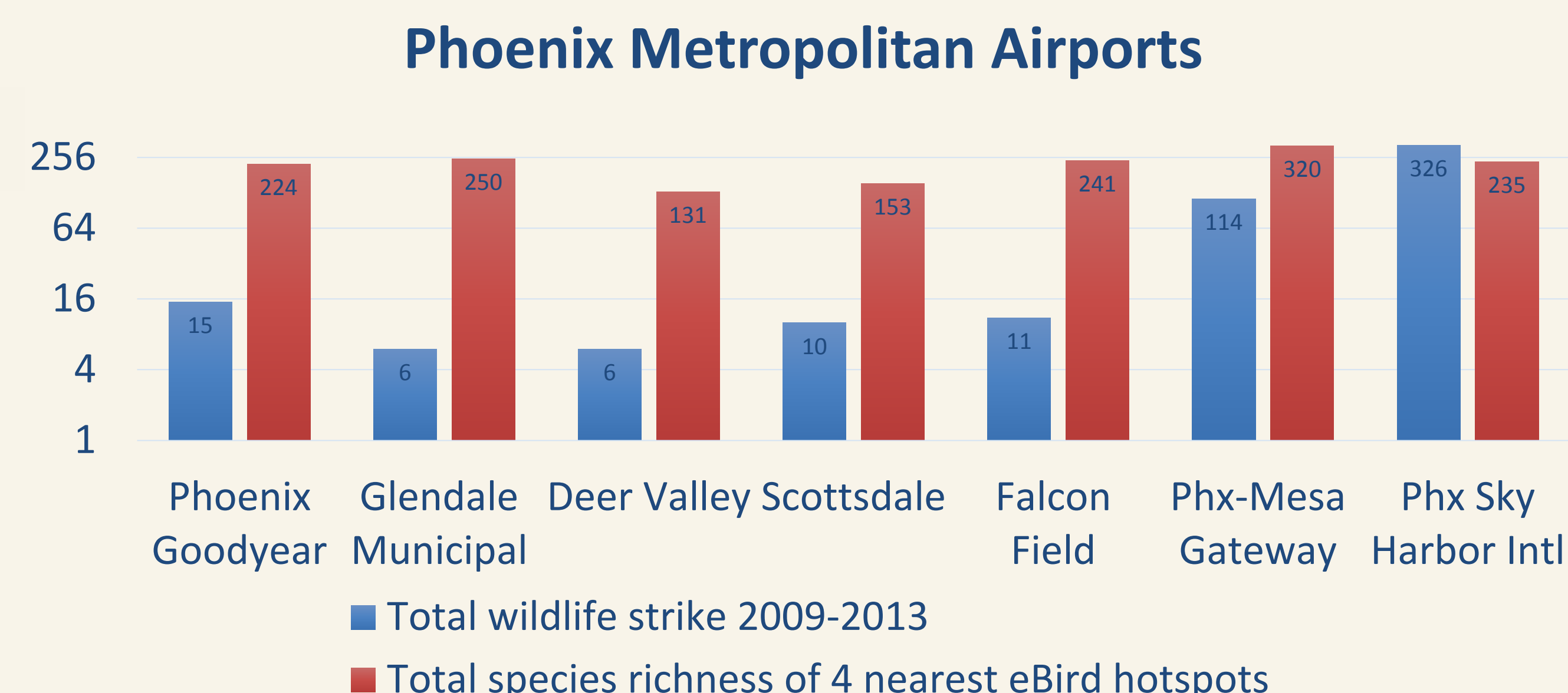


Figure 2: Graph of species richness compared to number of airport operations

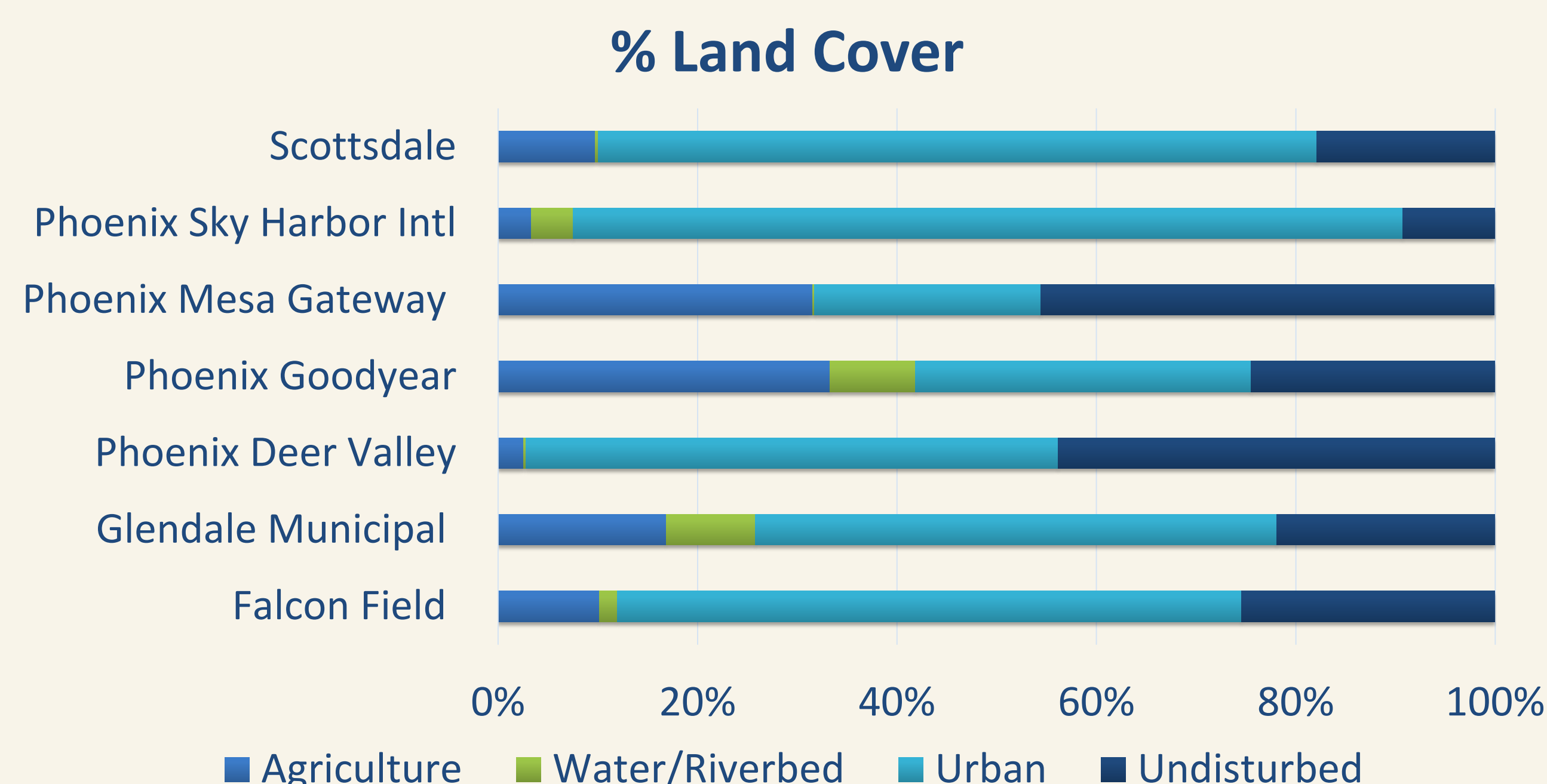


Figure 3: Graph depicting percentage of land cover and use at the Phoenix-metro airports

- Urban land was the greatest landscape variable with an average of 54.3% coverage per airport, while water/riverbed cover was the most unlikely variable with an average 3.5% coverage per airport.
- Airports with greater bird richness (Phoenix-Mesa Gateway and Goodyear) also had higher agricultural land use.

Results

- Wildlife strikes at airports varied by season (**Fig. 4**).

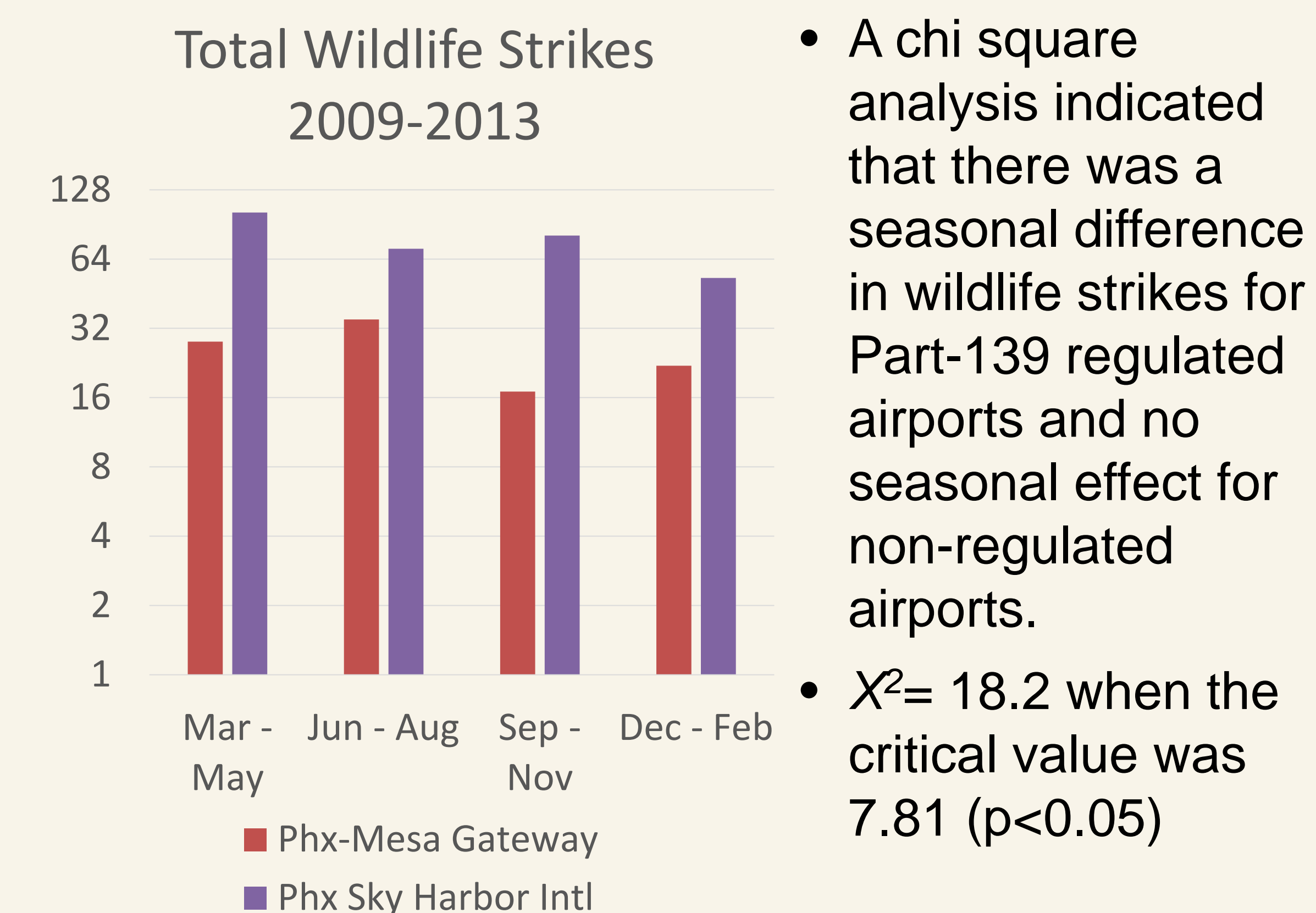


Figure 4: Graph of seasonal wildlife strike data from 2009-2013

- A chi square analysis indicated that there was a seasonal difference in wildlife strikes for Part-139 regulated airports and no seasonal effect for non-regulated airports.
- $\chi^2 = 18.2$ when the critical value was 7.81 ($p < 0.05$)

Conclusion

- Species richness was not an effective predictor of wildlife strikes and was not related to the number of wildlife strikes per operation at any of the airports, unless coupled with land use data.
- Even in high urbanized study areas, wildlife are still present and there are numerous wildlife strikes. Some wildlife may even show a preference for these disturbed areas.
- Fewest strikes occur during the winter months, which is counterintuitive when thinking of bird migrations.
- Greater awareness and regulation regarding wildlife strike reporting would increase the opportunity for effective mitigation techniques to be introduced.

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