

Rattlesnake road mortality rates and hot-spots: Adjusting for scavenger removal, observer error, and temporal variation

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Arguably the greatest adverse effect of roads on wildlife populations is direct mortality which reduces population size above natural causes of mortality, and effective mitigation requires a fundamental understanding of location, timing and the rate at which animals are killed on roads. Road surveys are a key part in identifying and quantifying road mortality in order to assess the population level impacts, however recent research has recognized two main potential sampling biases in estimating the extent of road mortality: scavenging and observer error. Scavenging rates are often high for animals killed on the road while surveyor identification is not always perfect. As a result of these biases, the observed counts will inevitably underestimate the total animals killed on the road, and only represents the minimum amount of road mortality. Additionally, mitigation planning often relies on surveys conducted within short time windows which can be confounded by seasonal and annual variation.

In my research, I am interested in quantifying overall road mortality impacts on a population of Northern Pacific Rattlesnakes. As such I have focused on estimating the two sampling biases in road surveys and assessing the temporal variation in road mortality patterns. Specifically, I estimated the rate of removal by scavengers and determined observer error in road surveys. I then used these measurements to correct overall road mortality rates obtained through road surveys showing an increase of almost two times the measured rate. This research has revealed the current rate of mortality due to roads and identified important road mortality hot-spot locations for rattlesnakes. Being able to accurately determine these parameters allows us to implement mitigation as well as measure the success of these efforts.