Bat Conservation on Joint Base Lewis-McChord and Weather Effects on Emergence Times

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Bats face multiple threats including habitat destruction and degradation, climate change, and White Nose Syndrome (a fungal infection that has killed thousands of bats across North America). For this study, we worked with Joint Base Lewis-McChord Fish & Wildlife to enhance bat habitats on JBLM. We built new bat boxes to replace old ones and conducted emergence count surveys to monitor bat populations. Bat boxes function as artificial roosts (places where bats rest during the day) to supplement the loss of natural ones that are often removed during logging. Based on observations from emergence surveys, we found evidence that bats on JBLM favored a particular bat box style which could inform decisions on which box type to use here in the future. Additionally, we wanted to find out if time of sunset and/or weather factors such as wind speed, pressure, humidity, and daytime temperatures affected emergence times. We hypothesized that unusually high or low daytime temperatures would impact emergence times most because bats are very sensitive to temperature fluctuations while roosting. To test this, individual emergence times were recorded over 6 nights. We found that time of sunset was most correlated with emergence times (P=0.05) and that a regression model that included both sunset and humidity was a better predictor for emergence times than sunset alone (using AIC model comparison). Higher humidity levels were associated with earlier emergence. All other factors tested did not have detectable effects on emergence times. The sample was small (n=6) so it would be beneficial to conduct more studies in Puget Sound with larger samples. These studies could provide insight into how climate change will impact bat species in this region, especially when comparing emergence times with those of their prey insects. This knowledge can guide conservationists on how to protect sensitive populations.