Linking Local and Regional Weather Variables to Migration Phenology in North American Raptors

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Changes in fall raptor migration phenology have been documented at hawk count site across North America. Delays in fall migration phenology are the most common shift reported, however these changes vary from species to species. Changes in fall migration phenology are often attributed to climate change, but direct links to climate are rarely demonstrated. Those studies that do attempt to link the shifts to climate change often use global weather phenomena such as the North Atlantic Oscillation. Using updated methods, we examined fall migration phenology in 14 raptor species counted at Hawk Ridge in Duluth, MN in relation to local and regional climate variables. Variables explored were related to temperature, favorable wind conditions, and cold fronts because they have previously been identified as having effects on raptor migration. Raptor phenology was regressed against weather variables as well as year, against the weather variables could be compared. The number of raptor species experiencing significant shifts in migration phenology was found to be less than has been previously reported. Furthermore, for most species, the weather variables analyzed in this study were not able to explain shifts in migration phenology better than year. Unravelling the mechanisms behind fall migration phenology in raptors may require analyzing phenology on a daily, rather than seasonal basis or looking for variables outside of weather, such as changes in the phenology of their prey.