

Title – “Migration Dynamics of Northern Saw-whet Owls in the Inner Piedmont of Central Virginia”

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Mentor(s) and Mentor Email - Dr. Gene Sattler (edsattle@liberty.edu)

Student name(s) and email(s) – Alexis Macpherson (amacpherson@liberty.edu), Dimode Rhee (drhee@liberty.edu)

Category – Experimental (Basic)

Abstract: We examined the migration patterns and dynamics of Northern Saw-whet Owls (*Aegolius acadicus*) in the Inner Piedmont region of Central Virginia. The Northern Saw-whet Owl is a woodland owl that breeds in the northern and western regions of North America. Their diet is predominately woodland mice and a fall migration is necessary from much of their breeding range because heavy snow cover makes these prey items inaccessible. This owl is secretive during migration, however, and difficult to detect then. Mist netting is therefore necessary to investigate their migration dynamics. Our study site was located in Campbell County, Virginia at Liberty University’s Camp Hydaway. Mist netting was conducted in the falls of 2002-2007 and in 2012-2015. An audio lure incorporating the male breeding call was used to attract owls to the net. Netted owls were aged by feather molt criteria, and sex was determined by utilizing a mass discriminant function. From 4 to 102 owls were captured per year between late October and mid-December when netting was conducted, with a peak during the first two weeks of November. Possible factors that resulted in the significant year-to-year variation in migration volume were the owls’ reproductive output and food availability following breeding. Weather-related factors are the most likely cause of variations in migration timing that were observed. During most years females predominated. Possible reasons for this include the possibility that males chose to remain closer to breeding sites during the winter, social

dominance interactions with males forcing females to migrate farther, and a female audio lure bias. In most years adults of both sexes predominated. In 2002 and 2007, however juveniles predominated, possibly because a higher than average reproductive season was followed by a decrease in prey. This study indicates that the Inner Piedmont region of central Virginia is a significant migratory pathway for Northern Saw-whet Owls, and such long-term study is providing baseline data on the species' fall migration.

Christian worldview integration: Having a Christian worldview allows us to see the ways in which God reveals Himself every day to us through His creation. Romans 1:20 states that our relationship with God is greatly strengthened as His invisible attributes are clearly seen in the things He has made. There is great value in studying all of His creation because it brings us better understanding of Him. In Genesis 2:15, God appointed us as stewards of all of His creation and as stated in Luke 12:48, "From everyone who has been given much, much will be required; and to whom they entrusted much, of him they will ask all the more." We have a responsibility to care for all of creation, and in order for us to carry out the responsibilities God has graced us with, we must increase our knowledge of how His creation operates. As biology students, training to work with animals by learning basic techniques such as how to capture birds using mist nets, how to handle them safely, and how to age and sex them are all valuable skills. Knowing how to perform these techniques will aid us in performing current and future research effectively, in order to gain an understanding of how God's creation operates. Such research on Northern Saw-whet Owls enables us to gain knowledge of their yearly migration patterns, which is needed in order to monitor their population levels. Only as we understand this can we know if

populations are being sustained or if the species is facing threats, enabling us to take the appropriate actions to ensure that God's creation is conserved and protected.