

Kimura, M., S. M. Clegg, I. J. Lovette, K. R. Holder, D. J. Girman, B. Mila, P. Wade, and T. B. Smith. 2002. Phylogeographical approaches to assessing demographic connectivity between breeding and overwintering regions in a Nearctic-Neotropical warbler (*Wilsonia pusilla*). *Molecular Ecology* 9, 1605-1616.

Abstract: We characterized the pattern and magnitude of phylogeographical variation among breeding populations of a long-distance migratory bird, the Wilson's warbler (*Wilsonia pusilla*), and used this information to assess the utility of mtDNA markers for assaying demographic connectivity between breeding and overwintering regions. We found a complex pattern of population differentiation in mitochondrial DNA (mtDNA) variation among populations across the breeding range. Individuals from eastern North America were differentiated from western individuals and the eastern haplotypes formed a distinct, well-supported cluster. The more diverse western group contained haplotype clusters with significant geographical structuring, but there was also broad mixing of haplotype groups such that no haplotype groups were population specific and the predominance of rare haplotypes limited the utility of frequency-based assignment techniques. Nonetheless, the existence of geographically diagnosable eastern vs. western haplotypes enabled us to characterize the distribution of these two groups across 14 overwintering locations. Western haplotypes were present at much higher frequencies than eastern haplotypes at most overwintering sites. Application of this mtDNA-based method of linking breeding and overwintering populations on a finer geographical scale was precluded by the absence of population-specific markers and by insufficient haplotype sorting among western breeding populations. Our results suggest that because migratory species such as the Wilson's warbler likely experienced extensive gene flow among regional breeding populations, molecular markers will have the greatest utility for characterizing breeding-overwintering connectivity at a broad geographical scale.