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CHAPTER 3

PERSPECTIVES ON MIGRATORY CONNECTIVITY

D. Ryan Norris,[1,4] Michael B. Wunder,[2] and Marylène Boulet[3]

[1]*Department of Integrative Biology, University of Guelph, Guelph, Ontario N1G 2W1, Canada;*
[2]*Department of Fish, Wildlife and Conservation Biology, Colorado State University, Fort Collins, Colorado 80525, USA; and*
[3]*Department of Biological Anthropology and Anatomy, Duke University, Durham, North Carolina 27708, USA*

Abstract.—The previous two chapters present detailed case studies describing the connectivity in two Nearctic–Neotropical migratory songbirds, the American Redstart (*Setophaga ruticilla*) and the northern yellow warbler (*Dendroica petechia*; group *aestiva*). Using different approaches, these studies demonstrate how multiple sources of information and assignment techniques can be combined to reveal broad patterns of connectivity between breeding, wintering, and migration periods. Here, we summarize the results of these studies and briefly discuss whether these tools can be applied to other systems. We also explicitly address the assumptions, limitations, and potential sources of variation in these approaches. Next, we discuss how patterns of connectivity can be used to advance our understanding of population dynamics and make sound conservation decisions. Finally, we outline a few key ideas for future projects that we believe would make significant contributions to improving our ability to link migratory populations, placing emphasis on projects that would be suitable for graduate students interested in pursuing research in this field.

Resumen.—Los dos capítulos anteriores presentan casos detallados que describen la conexión Neártica-Neotropical de dos especies migratorias de aves canoras, *Setophaga ruticilla* y *Dendroica petechia*; grupo *aestiva*). Mediante el uso de diferentes análisis, estos estudios demostraron como múltiples fuentes de información y técnicas de asignación pueden se combinadas para demostrar patrones generales de conexión entre los sitios de reproducción, de invernada y los períodos de migración. En este capitulo, resumimos los resultados de estos estudios y discutimos brevemente si estas herramientas pueden ser utilizadas en otros sistemas. También nos referimos ampliamente a las suposiciones, limitaciones y a las fuentes potenciales de error en estos análisis. Acto seguido, discutimos como los patrones de conexión pueden ser usados para mejorar nuestro entendimiento sobre dinámica poblacional y tomar decisiones responsables sobre conservación. Por ultimo, hacemos énfasis en algunas ideas clave para los proyectos futuros que creemos harán contribuciones importantes para el mejoramiento de nuestra habilidad de enlazar las poblaciones de aves migratorias, poniendo énfasis en proyectos que creemos serian apropiados para estudiantes de postgrado interesados en este campo de investigación.

Describing migration patterns for birds has a long history (see Alerstam 1990, 2006), but the more recent applications of intrinsic markers, such as stable isotopes and genetic markers, have dramatically improved our ability to track the long-distance movements of birds. These technological advances have helped invigorate the study of migration and seasonal connectivity patterns (Webster et al. 2002, Webster and Marra 2005, Marra et al. 2006). Several studies over the past decade have used stable isotopes and molecular markers to examine migratory connectivity in a variety of species, such as raptors, waders, thrushes, and warblers (see Boulet and Norris [2006] for a partial list). Here, we summarize the major findings of the two studies presented in this monograph (Boulet et al. 2006, Norris et al. 2006), discuss limitations and advantages of the approaches, and address specific needs for future research in this field.

This monograph presents case studies that use intrinsic markers to study migratory connectivity of two songbirds, the American Redstart (*Setophaga ruticilla*; Norris et al. 2006) and the northern yellow warbler (*Dendroica petechia*;

[4]E-mail: rnorris@uoguelph.ca