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Why We Should Adopt a Broader View of Neotropical Migrants

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Our worldview dictates our approach to science. Sometimes this influence is obvious; often it is not. In the latter case, we are at risk of intellectual stagnation because of unconscious biases. Here I argue that the study of Neotropical migrant birds still suffers from largely unacknowledged temperate-zone biases. My purpose is to illustrate that, for both conservation-related and scientific reasons, we need to adopt a broader, less traditional view of Neotropical migrants.

The most widely held view of a Neotropical migrant is a species that breeds north of the Tropic of Cancer and spends the nonbreeding season to its south (MacArthur 1959, Hagan and Johnston 1992a, Stangel 1992). This definition excludes Austral and intratropical migrants, an exclusion that is more than a problem of semantics.

First, a narrow view of any topic usually defines a narrow scope of study. It is not coincidental that research on Neotropical migrants remains tightly focused on species that fit the above definition (hereafter referred to as Nearctic-Neotropical migrants). Despite recognition that Austral and intratropical migrants are also Neotropical migrants (e.g. Hagan and Johnston 1992a), they are rarely studied as such. In fact, they are rarely studied at all (Loiselle and Blake 1991, Chesser 1994, Powell and Bjork 1994). One reason is a relative paucity of Neotropical ornithologists (Short 1984). Another reason is that lack of awareness of these migrants may breed lack of interest.

Second, the typical definition of a Neotropical migrant disregards the evolutionary connection between intratropical and Nearctic-Neotropical migrants. The former probably gave rise to the latter and presently the two groups are practically indistinguishable in terms of taxonomy, diet, and habitat use (Dixon 1897, Mayr and Meise 1930, Rappole et al. 1983, Ramos 1988). Their ecological and evolutionary parallels are especially apparent while Nearctic-Neotropical migrants are in the tropics; they become well integrated into tropical communities (Levey and Stiles

1992, Rappole and Tipton 1992). Thus, to understand the ecology of Nearctic-Neotropical migrants we need to understand the dynamics of tropical communities from which they came. This necessitates, for example, a broad view of interactions between resident and migrant birds and how their populations are linked (Ricklefs 1992).

These points are not new. They crystallized at a 1977 symposium (e.g. Rappole and Warner 1980, Stiles 1980) and, although eloquently repeated since then (Ramos 1988, Greenberg 1992a), have been ineffective in guiding current research. An exception is work on shorebirds, some of which integrates resident and migrant ecology and encompasses the temporal dynamics of tropical species assemblages (e.g. Van Dijk et al. 1990, Hockey et al. 1992). More recently, Young and Morton (1994) took a broad view of Neotropical migrant landbirds.

Third, the narrow view of Neotropical migrants restricts the types of questions we ask, which consequently may rob us of fresh insights. Tropical habitat requirements of Nearctic-Neotropical migrants provide a clear example. Contrary to the notion of tropical "stability," many tropical bird communities are highly dynamic (Davis 1945, Beebe 1947, Karr and Freemark 1983, Ramos 1988, Loiselle and Blake 1992). In Costa Rica, for example, a large proportion of species show evidence of seasonal movements (Stiles 1983, Levey and Stiles 1992). Presumably, many of these movements are driven by resource fluctuations (Loiselle and Blake 1991, Rosselli 1994). Nearctic-Neotropical migrants also experience and likely respond to spatial and temporal variation in their tropical resource base. Indeed, many species display movements in the tropics that are analogous to the seasonal movements made by closely related tropical residents (Morton 1971, 1980, Levey and Stiles 1992).

Despite the dynamic nature of Neotropical bird communities, most habitat studies on nonbreeding Nearctic-Neotropical migrants are short term. This practice may reflect a temperate-zone bias, since the

methodology was perfected on breeding birds (i.e. territorial individuals) for which short-term censuses are sufficient. The methodology is clearly appropriate for nonbreeding migrants that hold long-term territories, a common situation among warblers in the Caribbean (Holmes et al. 1989, Staicer 1992). However, many nonbreeding migrants hold territories sporadically or not at all (reviewed in Levey and Stiles 1992). Focusing on territorial species or studying vagile species with the same methodology will lead to a distorted view of habitat requirements for nonbreeding Nearctic-Neotropical migrants (see Ramos 1988). In particular, short-term censuses of vagile species are likely to underestimate habitat requirements. Tropical species that regularly cover large areas while tracking resource flushes are difficult to study but I predict they will be especially vulnerable to habitat change.

In making this prediction I do not downplay the extinction-prone nature of many sedentary, forest interior species (Karr 1982, Canaday 1991). Rather, I suggest that fragmentation can interfere with large-scale seasonal movements just as seriously as it can alter resource levels or population structure within patches of remnant forest. For example, disrupting forest along an elevational gradient is likely to adversely affect both highly sedentary and highly migratory species (Loiselle and Blake 1992).

Evidence for the predicted vulnerability of vagile species comes from recent studies on Neotropical resident birds. Species most dependent on spatially and temporally variable resources (e.g. fruits, flowers, and ant swarms) tend to be disproportionately likely to face local extinction after forest fragmentation (Willis 1979, Bierregaard and Lovejoy 1989, Levey and Stiles 1994, Kattan et al. in press). I predict that ecologically similar species of Nearctic-Neotropical migrants will be equally sensitive while they are in the tropics.

Many readers may disagree with these predictions. Certainly, numerous Nearctic-Neotropical migrants are quite flexible in their habitat requirements, which presumably buffers them from environmental change (Keast 1980, Greenberg 1992b). Just as certainly, many migrants appear dependent on a single habitat type—primary forest (Terborgh 1980, Askins et al. 1992, Mabe and Morton 1992, Robbins et al. 1992).

The point is not whether the above predictions are right, wrong, or hopelessly too general. My intent is to provide examples of how a broadly based view of Neotropical migrants can generate new, even counterintuitive, predictions. To carry this process one step further, I suggest that areas unable to support populations of intratropical migrants are unlikely to support viable communities of Nearctic-Neotropical migrants. Perhaps intratropical migrants can be used as "indicator species" of long-term habitat suitability for Nearctic-Neotropical migrants.

Fourth, adoption of a less provincial view of Neotropical migrants will help encourage collaborative

research between Latin Americans and North Americans. A narrow view of migration could reflect poorly on the person holding it. In particular, consider what kind of message is sent by focusing on Nearctic-Neotropical migrants while acknowledging that the rest of the Neotropical avifauna is probably in more immediate danger of extinction (Bibby et al. 1992). The issue is not one of studying "our" versus "their" birds. As argued above and by others, such a dichotomy is false and misguided. We need to encourage collaborative study of all tropical birds, from sedentary species to Nearctic-Neotropical migrants. Rationale and suggestions for achieving this goal are summarized by Sherry (1991), Naranjo et al. (1992), and Strahl (1992). I suggest that intratropical migrants offer a unique opportunity to foster participation by Latin American scientists in migrant research, since these birds can help link studies of Neotropical residents to Nearctic-Neotropical migrants (e.g. the habitat-use example given above). Furthermore, Latin American ornithologists are certainly in a better position than North American ornithologists to study seasonal population fluctuations within the tropics.

In conclusion, we have made enormous strides in understanding the ecology of Nearctic-Neotropical migrants (Hagan and Johnston 1992b). Previous generalizations about migrants are now viewed as painfully simplistic. No single theory about migrants will suffice and no single approach towards migrant conservation will prove adequate (Mönkkönen et al. 1992). The ideas outlined above are no exception. My intent has not been to criticize the views of previous researchers. It is time to build upon their work and study a more diverse array of species. This should include Austral migrants and migrants that never leave the temperate zone. I have focused on Nearctic-Neotropical and intratropical migrants only because I am most familiar with them and am convinced that their movements are more widespread and complex than we have imagined (for intriguing reports see Beebe 1947, Powell and Bjork 1994).

Effective conservation of all Neotropical migrants ultimately depends on full integration of research programs across political boundaries and broad geographical scales. The first step in doing this is to embrace an equally broad view of a Neotropical migrant.

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