

Integrating Neotropical Migratory Birds into Forest Service Plans for Ecosystem Management

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The USDA Forest Service is undergoing a major change in focus in response to public interests, growing concern for sustaining natural resources, and new knowledge about wildlife, fisheries, forests and grasslands, and how they interact at the ecosystem level. This shift in direction affects how Forest Service lands are managed, what research is conducted, how resource values are prioritized and how Forest Service employees are trained to meet future management needs. In meeting public concerns over time, Forest Service stewardship has evolved from an emphasis on (1) regulation of uses (avoidance of unfavorable activities) to (2) sustained yield management (managing for a few desired products) to (3) sustainable ecosystem management (focusing on the integrity of the ecosystem, which supplies many goods and services) (Salwasser 1990). "New Perspectives" was a Service-wide initiative designed to develop a new ecological and philosophical approach to effectively sustain public lands, biological diversity, landscape integrity and intact ecosystems. In June 1992, New Perspectives culminated in the Chief's decision to create a Forest Service staff group to implement "Ecosystem Management" (Overbay 1992). Ecosystem Management, as observed by the Forest Service, is the use of an ecological approach to manage multiple uses of national forests and grasslands, achieved by blending the needs of people and environmental values in such a way that national forests and grasslands represent diverse, resilient, productive and sustainable ecosystems. Goals for Ecosystem Management include: restoring and sustaining the integrity of the land, soils, air, waters, biological diversity and ecological processes; within the sustainable capacity of the land, meeting the resource needs of people and improving the well-being of communities, regions and the nation through environmentally sensitive production, use and conservation of natural resources; seeking balance and harmony between people and the land with equity between interests, across regions and through generations; meeting this generation's resource needs while maintaining opportunities for future generations to also meet their needs; improving the effectiveness of public participation in land and resource decision making; expanding conservation partnerships between Forest Service managers, other organizations and the public; and strengthening interdisciplinary teamwork between managers and scientists.

During the same time period that its vision and directive for Ecosystem Management emerged, the Forest Service also played a lead role in helping to establish the framework for inter-organizational **cooperation** in "Partners in Flight," a program to conserve Neotropical migratory birds. Not only has the Forest Service been a Partners in Flight co-

operator and contributor since the program's inception at the first national meeting in Atlanta, Georgia, in December 1990 (Finch 1991), it also invested heavily in the organization of the ground-breaking conference. Status and Management of Neotropical Migratory Birds, in Estes Park, Colorado (Finch and Stangel 1993). Attended by over 700 people, this third national meeting of Partners in Flight was designed specifically to bring natural resource managers and scientists together to communicate, synthesize and produce information on Neotropical migratory birds.

To maintain Forest Service momentum in Partners in Flight, we recommend that priorities for Neotropical migratory birds be incorporated into the broader goals and projects of Ecosystem Management. The fit between Ecosystem Management and Partners in Flight is natural because common goals are shared. Both programs emphasize:

- ecology-based, nontraditional management of natural resources;
- partnerships with private and public organizations;
- reliance on research information and teamwork to form management decisions;
- a shift from single interests (e.g., timber, single species) to a synthesized approach for addressing multiple, diverse needs;
- the need to monitor success of projects and to determine trends in ecosystems and organisms over time and space;
- sustaining natural resources, natural processes and landscape-level interactions; and
- proactive, rather than reactive, management of resources.

Neotropical migratory birds form a complex group of species, ranging across taxonomic, geographical and temporal boundaries, and using the full variety of early and late successional habitats available throughout the Western Hemisphere. What approaches are needed for the Forest Service to manage habitats for such a complex array of species? A holistic view of the natural world must be adopted, with a recognition of complexity, interconnections and dynamics over time and space, and the understanding that collaborative efforts are needed among all those whose activities affect ecosystems. To effectively conserve populations of Neotropical migratory birds breeding on natural forests and grasslands effectively, their needs must be incorporated into Forest Service plans for the management of ecosystems. Teamwork between researchers and managers is needed to develop and apply knowledge for managing multiple species within an interdisciplinary framework of action.

Setting Priorities

Ecosystem Management emphasizes processes rather than endpoints, and as such, should prove to be an effective vehicle for achieving the conservation of Neotropical migratory birds. Interdisciplinary teams in each Forest Service Region are in the process of defining methods and plans for ecosystem management. Within these plans, Neotropical migratory birds can be actively rather than passively accommodated if priorities for their conservation are defined. For ecosystems to be sustained, their weakest links must be identified because these will be the first to break under pressure. Likewise, to sustain the full array of Neotropical migratory bird species, we must have knowledge of which species are most vulnerable to changes in land management. To sustain a dynamic equilibrium of multiple bird species and their habitats, we recommend the following scoping approach:

1. Identify those species that currently need most attention, i.e., those sensitive to

current management practices or rare with declining populations, or already listed as threatened or endangered.

2. Identify those sets of species favored by current patterns of habitats and land use.
3. Identify those species on the second list that are likely to decline if management is changed to favor those on the first list.
4. Define which species are most vulnerable off of List 1 (those species that already are of concern) and List 3 (those that will become a concern if management is altered to favor species on List 1), and then determine the future conditions necessary to sustain both sets of populations.
5. Finally, integrate management of these desired conditions with other resource values. Management should be for a dynamic landscape, adjusting to new knowledge and allowing for critical habitats, old-growth forests, and a full and natural variety of successional habitats.

To prioritize species at the level of ecosystem or higher, their global, national and regional **rankings** must be taken into account. We recommend that the Partners in Flight prioritization scheme developed by Hunter et al. (1993) be used to select high priority species on national forests and grasslands. Species of concern already have been identified under this scheme for western, midwestern, northeastern and southeastern regions of the United States (see Finch and Stangel 1993).

Monitoring Populations Within the Ecosystem Context

An integral part of the Ecosystem Management process is the monitoring of ecosystem diversity, integrity and productivity. An important concept in Ecosystem Management is "adaptive management," the flexibility to adjust management practices in response to new information, e.g., findings from monitoring data. To monitor the ecosystem as a whole, one must monitor its parts and processes, including Neotropical migratory birds. We recommend monitoring populations of Neotropical migratory birds using the methods defined by the Partners in Flight Monitoring Working Group (Butcher 1992), with the goal of achieving dynamic future landscapes that will support Neotropical migratory birds in association with other resource values. To effectively monitor and sustain neotropical migrants in complex ecosystems effectively, it is essential to recognize the multiple scales by which they live. Migratory birds are adapted to daily, seasonal, long-term and evolutionary cycles. The long-term scale encompasses successional changes in habitat and is therefore the appropriate scale for monitoring population responses to **land-management** patterns. This also is the appropriate scale for monitoring other ecosystem components. Population monitoring during different seasons is important because migratory birds use different habitats during breeding, migration and winter.

To monitor migrants in space, one must recognize that they are adapted to multiple spatial scales: (1) site characteristics (e.g., habitat structure, age classes, nest sites, microhabitats and stand characteristics); (2) watershed or landscape characteristics (e.g., patterns of stand isolation and distance that affect individual habitat use and population patterns and dynamics); and (3) regional, continental and hemispheric characteristics (e.g., migration distances, and kinds and configurations of stopover habitats). Monitoring birds at the landscape level requires intensive sampling at numerous sites across the landscape in coordination with habitat monitoring. While fine-scaled approaches to understanding bird populations still are needed, we recommend that more coarse-filtered

mapping and monitoring (e.g., gap analysis) be adopted to assess how Neotropical migrants contribute to regional, national and global biological diversity.

Recommended Steps for Integration

We suggest that the following steps be taken to integrate the conservation of Neotropical migratory birds into Ecosystem Management projects.

1. Identify research needs and transfer research information on Neotropical migratory birds to managers early in the ecosystem management planning process.
2. Include on Ecosystem Management teams a **member(s) knowledgeable** about the requirements of Neotropical migratory birds.
3. Identify priorities and monitoring goals for Neotropical migratory birds in Ecosystem Management plans.
4. Have Ecosystem Management plans reviewed by technical experts on **Neotropical** migratory birds.
5. Define ways to collaborate with Partners in Flight cooperators within the Ecosystem Management strategy.
6. Specify roles of Neotropical migratory birds in Ecosystem Management demonstration projects.

We view demonstration projects as excellent vehicles for stimulating interest in how Neotropical migratory birds can be managed at the ecosystem level and how the principles of adaptive management can be implemented. To illustrate the advantages of establishing demonstration projects, we highlight the Red Rock Canyon Riparian Project on the **Coronado** National Forest in southeastern Arizona. The **Redrock** Canyon Watershed includes approximately 17,400 acres along 11 miles, draining into Sonoita Creek near the community of Patagonia, Arizona. The watershed previously was identified as being in less than satisfactory situation when measured against the desired condition for riparian, rangeland and water resources common to similar areas. The **Redrock** Canyon demonstration project represents a series of goals designed to ultimately will improve the species and age-class diversity of riparian vegetation, an overall indicator of the condition of the entire watershed. This, in turn, will ensure suitable habitat for Neotropical migratory birds and suitable fisheries habitat for the endangered Gila topminnow, improve soil and water resources for the benefit of other desired plant and animal species, retain options for semi-primitive recreation opportunities, and ensure sustainability of suitable herbaceous plants used by livestock.

Of the approximately 180 species of birds that use the canyon, over 70 are neotropical migrants. These include gray hawk (*Buteo nitidus*), zone-tailed hawk (*Buteo albonotatus*), black vulture (*Coragyps atratus*), vermilion flycatcher (*Pyrocephalus rubinus*), varied bunting (*Passerina versicolor*), hepatic and western tanagers (*Piranga flava* and *Piranga ludoviciana*, respectively), Cassin's kingbird (*Tyrannus vociferans*), magnificent hummingbird (*Eugenes fulgens*), hooded and Scott's orioles (*Icterus cucullatus* and *Icterus parisorum*, respectively), elf owl (*Microrhene whitneyi*), and yellow-billed cuckoo (*Coccyzus americanus*). **Redrock** Canyon is less than five miles from the heavily visited Patagonia-Sonoita Preserve managed by The Nature Conservancy. Currently, **Redrock** Canyon receives less than 50 **birdwatchers/per** year, but visitation is predicted to increase as habitat conditions improve and word spreads about the project.

This project applies the principles of Ecosystem Management on national forests by stressing:

- **Stewardship.** It endeavors to sustain land health and diversity while providing goods and services. Twenty-five improvement activities were identified during the planning process, including better distribution control of livestock through additional fences and water developments, exclusion of livestock from portions of streams, plantings of trees to speed up recovery, closing of portions of roads, and steps to stabilize channels.
- **Partnerships.** It involves people in resource management decisions. Public concerns were evaluated early in the planning process, and partnerships were established with forest users and interested organizations, such as livestock grazing permittees, the community of Patagonia, and the Arizona Game and Fish Department.
- **Integrated management.** It takes a creative and flexible approach to multiple-use management. This project is innovative in that it charges both the public and agency personnel to evaluate the conditions and needs of an entire ecosystem rather than address individual problems and solutions. The traditional approach would have been to address needs for each range allotment individually, in a process separate from planning for wildlife and recreation resources.
- **Research teamwork.** It involves collaboration with researchers, educators and other natural resource managers. The U. S. Fish and Wildlife Service and the Arizona Game and Fish Department were involved directly in the needs analysis and development of specific proposals. The Nature Conservancy and the University of Arizona Cooperative Extension Service contributed information about the distribution and management of sensitive plant and animal species.

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