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Preface

A century of avian research on USFS experimental forests and ranges: Introduction to the special section on long-term avian research on experimental forests and ranges

In August of 2009 a symposium was convened at the 127th Stated Meeting of the American Ornithologist's Union in Philadelphia, Pennsylvania to commemorate the 100th anniversary of the nationwide system of Experimental Forests and Ranges (EFRs) established by the US Forest Service in 1909. Fifteen scientists from across the United States and the Caribbean gathered to highlight research conducted at EFRs to an audience of ornithologists and citizens with an interest in bird research, to share the significance of past scientific research on EFRs, as well as the potential for future work. EFRs are places that were set aside for science. They are dedicated to long-term research, and include opportunities for controlled manipulations. The array of over 80 EFRs across the Nation provide access to a wide diversity of ecosystems and established study sites, and many offer on-site facilities and infrastructure. Another asset of EFRs is the ready connection to expertise in a variety of other disciplines from various institutions and agencies, and the integration to other types of long-term data. Collectively, the USFS EFRs also provides a network of study locations that can be used for scientific questions at a regional or continental scale. These features have facilitated important advances in a number of areas of avian research, including population dynamics, effects of forest management, responses to disturbance, and other aspects of avian ecology and conservation. The research at many EFRs have influenced land management and policy decisions, as well as the direction of future research; e.g., topics such as, wildfire, prescribed fire, wildlife habitat, invasive species, wilderness, clean air, watershed management, and climate change. This special section represents contributions from ten of these scientists that demonstrate both the breadth of research conducted on National Forests and Ranges, and the opportunities for linkages with long-term data sets, multiple disciplines, and active forest management.

The following papers provide several examples of the value of EFRs for their long-term data and capacity to foster collaborative, interdisciplinary research. King et al. (this volume) illustrate this with work conducted on the Bartlett Experimental Forest in which a 25-year data set on snag longevity collected as part of a silvicultural experiment was used to evaluate habitat conditions for cavity nesting birds and provide guidelines for managers for bird conservation. Purcell (this volume) describes the long and rich history of avian research from The San Joaquin Experimental Range in California. Work dating from 1935 has demonstrated that oak woodlands are one of the most diverse habitat types in North America and has provided a means of detecting changes in wildlife populations over time in response to management practices, the effects of livestock grazing, the impacts of an invasive species, and climate change. Holmes (this volume) describes how 40 years of research on the Hubbard Brook Experimental Forest has provided valuable insights into bird population and community processes showing that bird populations are dynamic, and that species often respond differently to habitat structure, food availability, and other features of the forest environment. Nearly five decades of research from the Luquillo Experimental Forest in Puerto Rico (Wunderle and Arendt, this volume) provides an example of a long-term research program featuring the effects of disturbance processes, specifically hurricanes. Work on the Luquillo Experimental Forest has provided important baseline information to gauge the effects of hurricanes on forest ecosystems. This work includes research on the population ecology of individual species, such as the critically endangered Puerto Rican Parrot (*Amazona vittata*), which has been the focus of intensive long-term research and recovery efforts.

Many EFRs include large unmanaged areas to facilitate the study of natural processes, ecosystem functions, and old growth characteristics. Ralph et al. (this volume) demonstrate how the old growth redwood stands of the Redwood Experimental Forest in northern California provided an ideal base for their research into the ecology and behavior of the old growth-dependent, endangered Marbled Murrelet. Their work formed the basis for the development of range-wide monitoring protocols, and has informed management and conservation actions across the Pacific Northwest. EFRs also provide a conduit for information to managers by virtue of their collocation with National Forests, and King et al. describe how work at the Bartlett Experimental Forest provided valuable information on the potential for forest management to fragment habitat in forested landscapes in the northeast, and the effects on bird demographics. Up to that point, the only studies on this topic were from the Midwest or Mid-Atlantic States where forest patches are isolated by agricultural or suburban development. This work showed that unlike less forested landscapes, cowbirds (*Molothrus ater*) are rare, and that edges created by forest roads in extensively forested landscapes have little effect on mature forest birds. The facilities available on Experimental Forests, such as laboratory and storage space, supported the development and construction of the wireless video graphic system we used to describe the nest predator community in northern hardwoods forests. The deployment and security of these systems from vandalism and theft, as well as telemetry work on fledgling birds that involved repeatedly traversing study areas, was facilitated by road networks and controlled conditions with limited public access.

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In conclusion, Research in forested systems has evolved from addressing basic, locally focused silvicultural issues, to more holistic, ecosystem-based, multidisciplinary work. Ornithology has become an integral component of the latter. The Forest Service's Experimental Forests and Ranges have provided a network of lands dedicated to research that has played a prominent role through both phases. The success of the EFs can be attributed to the commitment to science, the framework for collaboration, the relevancy of the research results, and the dedication of the scientists within and outside of the U.S. Forest Service who work in these places. Current trends suggest future research in forests will expand in temporal and spatial scales to focus on topics such as global climate change, landscape level conservation, as well as understanding and mitigating the effects of continued utilization and alteration of the environment. Hence, the locations of Experimental Forests and Ranges across latitudes and longitudes of the Nation are uniquely designed to play a vital role in such future research. As birds are widely recognized as bellwethers of environmental quality because of their diversity and mobility, we can expect ornithological studies to become an increasingly important component of that research.

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