

Symposium Overview

A CENTURY OF AVIFAUNAL CHANGE IN WESTERN
NORTH AMERICA: OVERVIEW

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In 1992 a Centennial Committee established by the officers of the Cooper Ornithological Society planned a series of events to celebrate the organization's first one hundred years. Several of these events were inaugurated at the Society's 63rd Annual Meeting in Sacramento, California, April 13-18, 1993, and included a symposium organized by us. The topic, "A Century of Avifaunal Change in Western North America," seemed a fitting tribute to members of the Society and their associates who played such a seminal role in western North American ornithological research from the late 1890s to the present. The symposium also provided a challenge: to describe and analyze responses of birdlife to the unprecedented, human-induced environmental changes that have occurred during the 20th century in this vast and ecologically diverse region. Our intent was to ask specialists to provide concise but comprehensive overviews of topics. Insofar as possible we sought the participation of senior investigators because of the personal historical perspectives they could provide.

This Special Centennial Publication represents the fruition of that symposium. The 26 papers are divided into five sections: Regional Avifaunal Change, Population Trends of Major Groups of Birds, the Effects of Human-induced Environmental Change on Avian Populations, Case Histories, and Prospects. Our coverage is necessarily incomplete. There remain many geographic areas, habitats, or species for which a more complete accounting is needed. For example, essays on exploration and avifaunal change in western Canada and Mexico, including their offshore islands, could not be included. We must still await the long-needed, general treatment of avifaunal exploration in western North America, for which W. H. Behle's masterly *Utah birds: historical perspectives and bibliography* will serve as a template. Population trends of wetland species, exclusive of waterfowl and shorebirds, could not be treated for want of an available author. We also regret the lack of a comparative analysis of avifaunal responses to forest and woodland fragmentation between eastern and western North America, a topic of considerable current interest. Despite these admitted gaps, which we hope will be filled by future symposia, the included papers represent the most complete compilation to document the remarkable avifaunal change witnessed over the last century in western North America.

Brief comments on several of the most significant findings are in order. As anticipated, many authors concluded that population trends and adjustments in distributional boundaries often represent obvious responses to anthropogenic habitat modification. In contrast, some changes qualify instead as natural events. Especially perplexing are those trends that could have resulted from either human induction or natural causes or a complex combination of the two. In a troublingly large number of examples, the conclusion of change itself rests on unconvincing evidence, and a major finding of the volume is that baseline data typically are either too vague or incomplete to serve as a convincing basis for detecting change.

The most pervasive cause of negative population trends continues to be outright habitat destruction, with clear documentation of declines or extirpation of birds requiring riparian woodland, old-growth coniferous forest, grassland, saline lakes, marshes, and coastal

beaches. For example, an estimated 95% of riparian woodland, the richest ecologic formation for nesting birds in western North America, has either been degraded or destroyed in the past century by water management, agriculture, and domestic livestock grazing. The latter activity continues to be the most pervasive current threat to riparian habitats and their avifauna. Nest parasitism by the Brown-headed Cowbird (*Molothrus ater*), promoted by habitat destruction and the clumping or concentration of some hosts, is also implicated in the profound population losses of several riparian species. Public agencies and owners of private property must change their destructive land management practices if the avifauna of western North America is not to undergo further decline.

Direct human disturbance, especially of colonial species nesting in wetlands and on islands, has also exacted its toll. Introduced and domestic species have generally been detrimental to native birdlife. Predators, feral pigs, and disease have severely impacted the Hawaiian Islands' forest avifauna. Human overfishing of prey, coincident with severe climatic stress, appears to have played a major role in the decline of some seabirds. Habitat alteration and loss, exacerbated by hunting, has led to population reduction in some species of waterfowl, shorebirds, and raptors. In contrast, a large number of species show increasing population trends and expanding distributions, both during the breeding season and on the wintering grounds. Many more species expanded rather than contracted their winter ranges. Although the most striking enlargements of both nesting and wintering range are illustrated by introduced and managed species, native and non-managed birds are also well represented. Natural, ongoing climatic change is probably responsible for a significant number of distributional adjustments by native birds.

A few instances of conflicting interpretation vividly illustrate the problem of determining the validity of baselines against which change can be assessed. For example, one author reported severe declines in the Franklin's Gull (*Larus pipixcan*) and Cassin's Sparrow (*Aimophila cassinii*) in the Great Plains while another documents dramatic breeding range expansion in each. If either or both species are simply shifting populations among years, from deteriorating sites to favorable ones, then the easy conclusion of declines would be unjustified. The White-faced Ibis (*Plegadis chihi*) and American Avocet (*Recurvirostra americana*) clearly illustrate the phenomenon of geographic shifting of nesting distribution without demonstrable change in overall population size—the bane of population monitors!

Surprisingly, putatively detrimental habitat changes, for example, losses of old-growth forests and snags, have not universally led to declines expected in certain species apparently requiring such habitats. Therefore, either these species 1) do not really *require* old-growth forests and snags, 2) are somehow compensating for the loss of necessary resources or 3) have traits that mislead our population monitoring schemes, (in this example, Breeding Bird Surveys [BBS]). We suspect the latter reason and many authors share our view; indeed, a recurrent concern in the papers of this volume is the unreliability of current monitoring techniques, at least for particular species. Because this admission has far-reaching consequences for the allocation of precious financial resources, for management decisions by government and conservation agencies, and even for the creation of a National Biological Survey by the U.S. Department of the Interior, it calls for nothing less than a wholesale re-evaluation of methods by which population levels are assessed. Given these uncertainties, managers and conservationists should continue to focus their efforts at preservation 1) on endangered habitats, and 2) on those species whose deteriorating populations and distributions can be firmly documented (e.g., Spotted Owl [*Strix occidentalis*]), while simultaneously developing accurate and realistic methods for studying other taxa.

Without trustworthy temporal baselines, it is premature to invoke processes responsible

for patterns of abundance. Although correlations can be relatively easy to find, causation remains as elusive as ever. Furthermore, because anthropogenic influences on natural biological processes are now global in scope, the separation of human from natural events in explaining fluctuating numbers and distributions will become increasingly difficult if not impossible.

It is time for biologists to face squarely the complexity of the natural world we attempt to interpret. A stochastic element, perhaps large and always of undefined dimensions, haunts every explanation for the population dynamics of birds.

Finally, a sobering note. Many authors properly lament the massive role played by humans in destroying natural landscapes and the birds they support. Recognition of this fact over the last decade or more has led to commendable conservation efforts, with some outstanding successes. We can be heartened by increasing public concern for the environment and expanded general efforts to protect biotic diversity. Despite these gains, however, the long-term prognosis is bleak. Incomprehensibly, national and international political leaders and the media either do not believe or will not discuss the connection between continued growth of the human population, with its attendant multitude of human social ills, and degradation of the world's resources. How ironic that overpopulation, the most pressing problem for ourselves and the earth's biota, is not only routinely ignored but its urgency is completely unappreciated. In company with many others, we conclude that *all* conservation efforts are doomed to eventual failure without prompt stabilization of the human population, which is now expanding at the rate of approximately one million every four days.