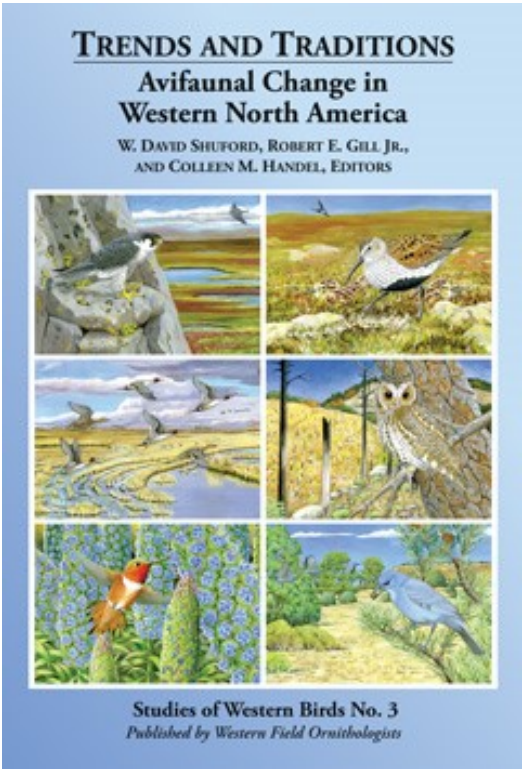
Book Review



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Trends and Traditions is the newest monograph in the series, *Studies of Western Birds*. Editors Shuford, Gill, and Handel assembled 25 technical papers that had been presented at the 2014 Western Field Ornithologists' conference in San Diego. The book contains many long-term studies and other papers that "look to the past and to the future for insights about long-term change." In a thorough and insightful introduction (pgs. 2-10), the editors make the case for the value of long-term studies in establishing the range of natural variation, temporal trends, and rare events needed to fully understand bird population trends. They also caution about the "shifting baseline syndrome" in which each new generation of scientists or policy makers may accept as "baseline" the environmental conditions that existed at the beginning of their career. Over time, this reference point comes to represent more recent degraded conditions rather than earlier more intact conditions—a critical concept to recognize for setting targets and management objectives.

Few bird populations are static. Geographical ranges expand and contract, and populations rise and fall. Populations of many western species

are declining, although not all. Some species are expanding their ranges or even moving southward in response to changing environmental conditions. The population status of some species can be difficult to detect because of inherent characteristics of a particular species or its unique breeding habitats. For example, special efforts and skills are required to determine the distribution of the Marbled Murrelets (*Brachyramphus marmoratus*) and Tricolored Blackbirds (*Agelaius tricolor*). For other species—consider Gadwall (*Mareca strepera*), California Gulls (*Larus californicus*), Peregrine Falcon (*Falco peregrinus*), and Common Ravens (*Corvus corax*)—breeding range expansions are relatively easy to detect and monitor. Tracking these shifts is a subject of intensive study by legions of field ornithologists and volunteers who work for government resource agencies, nonprofit research organizations, and universities. Climate change adds an immediate new dimension, now factored into most efforts to understand and calculate population trends. Documenting change is the first step. It's much more difficult to identify the specific, fundamental causes of such change.

The papers in this volume are presented in four sections: *Changes in Distribution*; *Population Trends and Changing Demographics*; *Response to Changes in Climate and the Environment*; and *Looking Back-Looking Forward*. The papers cover a broad geographic and taxonomic scope, and over half are based on studies conducted for more than 30 years. Although I didn't do a tally, it seems that the status of almost every species found in the West is addressed somewhere in this volume. Nearly two-thirds of the papers concentrate on birds in California (11 papers) and Alaska (5). Waterbirds are the subject of eight papers, and seven papers consider a single species or two closely related species.

A summary of the massive and long-term MAPS bird-netting data set (De Sante et al. pgs. 269-293) provides an in-depth look at population trends of 86 landbird species from throughout the west. Arter et al. (pgs. 442-452) describe bird skeletal remains collected at archeological sites near San Diego that document 10,000 years of human occupation and avifaunal change. Three papers use historical avifaunas, mine existing data, and compile current references to focus on the big picture. Erickson et al. (pgs. 12-49) use Joseph Grinnell's early 20th-century syntheses of California and Baja California avifaunas as a baseline to examine latitudinal changes documented over the past century for 672 taxa. Seavy et al. (pgs. 331-343) summarize studies that link climate change to phenology, distribution, population change, molt cycles, and even to alterations in a species' morphology and physiology. Winker (pgs. 453-465) argues that we must make greater use of tools developed for studies of avian systematics, diversity, and population genetics to be more effective at understanding and managing the impacts of climate change on bird populations. He makes a strong case for the value of museum specimens in this endeavor.

This volume is of special interest to those who want to know more about the status of bird populations in the Central Valley and Sierra foothills. Three papers deal with Central Valley birds and two papers focus on breeding birds of the adjacent foothills. As the paper by Pandolfino and Handel emphasizes, "The scale and degree of human-induced transformation of the habitats in California's Central Valley during the 20th century may be unequaled in any other area of North America." The Central Valley is a dynamic region where we see habitats undergoing serious changes or outright destruction on an annual basis.

Fleske et al. (pgs. 50-74) looked at changes in waterfowl abundance and distribution between 1973 and 2000. Aerial surveys conducted from 1973 through 1982 were compared with similar surveys conducted during 1998 to 2000. Data from the U.S. Fish and Wildlife Service Midwinter Waterfowl Index were also analyzed for comparison. Additionally, the authors captured and tagged 1,500 Northern Pintails (*Anas acuta*) and Mallards (*Anas platyrhynchos*) in order to track their movements using radio telemetry. Total dabbling duck abundance (defined as "use days") declined from 294 million use days per year during 1973-1982 to only 199 million during 1998-2000, a 32% drop. A decline in pintails was mainly responsible for the overall decline, although five duck species were stable or increased during this period. Waterfowl have shifted north in their CV distribution, evidenced by substantial increases in numbers wintering in the Sacramento Valley. This shift is attributed to extensive new wetland foraging opportunities as managed wetlands and flooded agricultural lands increased significantly during the study period, perhaps by as much as 75%. Post-harvest flooding of almost 100,000 ha of rice fields in the Sacramento Valley, beginning in the 1990s, was the largest contributor to the increase in wetland area, and the birds took advantage of it.

Stenzel and Page (pgs. 236-257) have censused wintering waterbirds on Bolinas Lagoon, a central California estuary in Marin County, since 1973. This is an unprecedented data set from which to examine population trends of coastal waterbirds, enabling these researchers to speculate about shifts that some waterbirds appear to have made to new suitable foraging habitat in the Central Valley. Their paper examined the relationship between rainfall patterns and bird abundance on the lagoon during two periods, 1972-1993, and 1998-2015. The latter period coincides with the switch from the after-harvest burning of rice fields to field flooding in the Sacramento Valley. This important, positive change in agricultural practices has reduced air pollution and at the same time created significant new wetland habitat for waterbirds. Twenty-two of the 42 taxa (species and subspecies) that foraged at Bolinas Lagoon in winter also now regularly use flooded rice fields in the Sacramento Valley.

Taking advantage of their data set and the concept that, "long-term data from local sites can provide insight into processes at larger spatial scales", the authors sought to relate changes in waterbird abundance at Bolinas Lagoon to regionwide precipitation patterns and to the increase in rice field flooding. They speculated as to whether the declines in numbers of some species on the coast could be caused by a shift in distribution to the Sacramento Valley to take advantage of the large increase in new wetlands there. Twelve of 22 taxa (6 ducks, 5 shorebirds, and the Pied-billed Grebe, [*Podilymbus podiceps*]) that had been increasing in numbers on Bolinas Lagoon during the first period of their study, decreased significantly after 1997. The decline strongly suggests a shift by the birds to another area (i.e., rice fields), a result well supported by other studies in the Central Valley. This paper shows the value of having a long-term data set, which has allowed these researchers to apply the results from a study in one area to changing environmental conditions in a broader geographical area.

Pandolfino and Handel (pgs. 215-235) compared results from 17 Christmas Bird Count (CBC) circles in the Central Valley in 1978-1979 with CBC counts in 2013-2014 to calculate annual rates of population change for 112 relatively widespread and abundant taxa. After grouping taxa into eight habitat categories, they calculated trends between the two time periods. Overall, the proportion of taxa that had positive trends (46%) was much larger than those with a negative trend (18%); about 33% of taxa showed no trend. They focused most of their attention on birds that primarily use wetland, riparian, or grassland/open country habitats. Of the 28 species that mostly used natural wetlands and flooded rice fields, 23 showed a positive annual percent change in population size. Cackling Geese (*Branta hutchinsii*), Black-necked Stilt (*Himantopus mexicanus*), Double-crested Cormorant (*Phalacrocorax auratus*), Hooded Merganser (Lophodytes cucullatus), and Gadwall (*Mareca strepera*) showed the greatest increases; unsurprisingly, Northern Pintails declined significantly. In riparian habitats, cormorants and Hooded Mergansers also increased. Of 19 species associated with grasslands, irrigated pastures, and agricultural fields, 12 species showed a negative trend. Grasslands are disappearing at a fast rate via conversion to orchards, vineyards, and housing development. Tricolored Blackbirds were not analyzed in this study, but this species in particular, is at great risk from loss of grasslands for foraging. The authors also analyzed Breeding Bird Survey (BBS) data for species that occur year-round in the Central Valley, and for most taxa, BBS trends were similar to the CBC trends. A special plea is made for greater research and conservation efforts that focus on Central Valley grasslands.

Two papers by Purcell and Mori are based on a 27-year data set of breeding season surveys made in the oak woodlands within the San Joaquin Experimental Range near Fresno. They and their large cadre of field assistants

studied 35 species every spring from 1986 through 2012 by making twice-weekly, 5-minute point counts at 210 points—virtually covering the entire 1,875 ha research station multiple times in March and April. Their first paper (pgs. 198-214) considers population trends. Based on two types of trend analysis, they found that 12 species increased, five species decreased, and 18 showed no significant change. Of greatest concern are the Blue-gray Gnatcatcher (*Polioptila caerulea*), Western Meadowlark (*Sturnella neglecta*), and Bullock's Oriole (*Icterus bullockii*). Meadowlarks declined even though their grassland habitat in the study site and surrounding region did not. California Scrub-Jay (*Aphelocoma californica*) results were especially interesting. Numbers began to decline markedly in 2004, a year after West Nile virus was first detected in California. By 2009, however, numbers were on the rise, apparently because surviving birds had developed resistance to the disease.

Purcell and Mori's second paper (pgs. 344-373) modeled the importance of weather and climate variables to annual abundance in order to assess potential responses to climate change. Species' sensitivity to cold and hot temperatures or to changes in precipitation were assessed, allowing the researchers to speculate how climate predictions might impact future population trends. Sensitivity to temperature was determined by comparing seven temperature variables (e.g., prior-year temperatures; within-season high temperatures, and number of days below freezing in year preceding counts) with seasonal bird survey totals. Four species (Anna's Hummingbird [*Calypte anna*], California Scrub-Jay, Oak Titmouse [*Baeolophus inornatus*], and Bewick's Wren [*Thryomanes bewickii*]) were sensitive to heat, and 18 species were sensitive to cold temperatures. Precipitation seemed to have little predictive value. Adding to these direct impacts on bird populations, a recent study (L. Kueppers et al. 2005. Modeled regional climate change and California endemic oak ranges. Proc. Natl. Acad. Sci. USA 102:16281-16286.) predicts that the range of the Blue Oak (*Quercus douglasii*), a keystone species in the California foothills, could decline by 59% over the next 80 years. Long-term data such as those of Purcell and Mori are crucial to prioritizing future research and conservation efforts.

Trends and Traditions is a valuable addition to the literature on populations and conservation of western birds. The editors and authors are to be commended for their efforts to produce this comprehensive and timely reference work. Field ornithologists and others with a serious interest in the current status and future trajectory of our bird populations, especially resource conservation specialists and decision-makers, will want to have this book on their bookshelf.

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