

Book Review

***The Fall and Rise of the Wetlands of California's Great Central Valley* by Philip Garone, UC Press, 2011.**

Arguably the most distinctive element of the avifauna of the Central Valley is its use by a large proportion of the waterfowl in the Pacific flyway, as well as use of wetlands and rice fields by shorebirds, wading birds, and other wetland species. The broad outlines of the tremendous decline in wetlands in California's Central Valley since the Gold Rush are widely known. Early land reclamation and flood control for agriculture, and later losses to development, have led to an oft-cited estimate of 90% loss of wetland habitat. The details of how and where these losses occurred, and how remaining wetlands have been saved and managed, often reside in yellowing accounts in agency file and the memories of older participants. Also, substantial recent efforts to preserve and restore wetlands seldom penetrate the popular press.

Philip Garone rectifies the lack of a comprehensive treatment of the more distant and recent history of Central Valley wetlands in this comprehensive volume. Garone is a historian, but has a keen ecological understanding that brings the focus of the wetlands saga on biological resources.

The history of wetland and wildlife loss involves a variety of activities undertaken in the Sacramento and San Joaquin Valleys, Tulare Basin, and the Delta. The book provides a comprehensive discussion of the actions that led to the essential elimination of the >13,500 square mile Tulare Lake and the astounding biological abundance and diversity that once occurred there. Early land reclamation activities, and especially flood control, deprived millions of acres of seasonal and permanent wetlands of their water sources and allowed near-total conversion to agriculture.

As documented in California as elsewhere in the U. S., these wetland declines in the early 1900s contributed importantly to the genesis of the conservation movement. In particular at this time, sportsmen were the lead proponents for protection of habitat and regulation of harvest to sustain their sport harvest. *The Fall and Rise* documents how this interest, as well as farmer's concerns about crop depredation by waterfowl, led to the establishment of many of the large state and federal wildlife refuges that we know and enjoy today.

The amazing story of the Grasslands hunting region near Los Banos, an internationally recognized 50,000 acre wetland area historically managed for cattle grazing and duck hunting, is well recounted. Grasslands' sportsmen successfully challenged the federal government over losses of their historic

water supply to the U. S. Bureau of Reclamation's federal Central Valley Project (CVP). This monumental challenge ultimately led to signing of legislation in 1954 that established an allocation of federal water from the CVP for the Grasslands, thereby helping to recognize management of wetland habitat as a beneficial water use that required protection.

The book also covers the controversial period during the 1980s when delivery of agricultural drainage water, from subsurface drains constructed to prevent salt accumulation, led to concentration of selenium and other toxic elements at Kesterson Reservoir and the Grasslands. Its dramatic effects, including massive deformities in embryonic and hatched wetland birds, were initially suppressed, but came to light due to the courage and dedication of certain individuals, including Sacramento's Felix Smith. This caused a public outcry that led to corrective actions and ultimately led to policy changes that recognized fish and wildlife as equal beneficiaries of the federal Central Valley Project, and increased amounts and certainty of water supplies for the federal refuges.

The book documents the recent period since the 1980s, when a concerted effort by the federal and state governments and conservation groups has substantially increased the amount and quality of wetlands and managed rice field habitats and the populations of species that inhabit them. This good news story, which includes dramatic increases in waterfowl populations and massive recovery of breeding wetland species such as the White-faced Ibis, deserve broader recognition, to which Mr. Garone contributes. Finally, the book briefly describes potential challenges posted by oncoming climate change.

While extremely thorough and well referenced, *The Fall and Rise* is written in an interesting, engaging style. My only disappointment is that the book does not clearly quantify the recent increases in wetland acreage, which would have provided an important context for comparison with past and future conditions. I strongly recommend the book to anyone with an interest in the history of California's land use, wildlife, and conservation. It will provide many birders with a valuable and interesting perspective on how many of our cherished habitat areas came to be. Last and most importantly, it provides us all with perspective on how our actions as a society can both tragically diminish and heroically restore our biological heritage.

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