

Why water for Central Valley wetlands is important for migratory birds and people

Main Points

Managed wetlands on public and private lands in California's Central Valley provide habitat for millions of waterfowl, shorebirds, and other waterbirds from across the Pacific Flyway.

Estimates indicate that California has lost over 90% of its original wetlands; what remains is therefore important for waterbirds.

These remaining managed wetlands need a dependable water supply to ensure adequate bird habitat and limit the risk of disease.

Wetlands provide substantial human benefits through increased recreational opportunities and support for local and state economies.

Wildlife refuges enhance local communities because they generate revenue, provide jobs, and may even increase property values.

California has lost over 90% of its original wetlands and what remains is extremely fragmented and highly managed (Dahl and Johnson 1991). The United States Congress recognized that birds and other wildlife were suffering from a lack of water and wetland habitat in the Central Valley of California. The 1992 Central Valley Project Improvement Act (CVPIA) mandated that 19 "refuges", including federal, state, and private wetland complexes within the Central Valley receive regular water allotments through the U.S. Bureau of Reclamation's extensive water storage and conveyance systems (The Central Valley Project).

Public and private wetlands also provide recreational opportunities for wildlife viewing, bird watching, hunting, fishing, and photography and bolster local economies. In years of drought, however, water becomes more precious and the value of providing water for birds is often questioned. Science has demonstrated the value of Central Valley wetlands for migratory waterbirds and local economies, and subsequently it suggests that we need to ensure adequate, if not enhanced, water delivery to them even in times of drought.

The importance of the Central Valley for Pacific Flyway shorebirds

Between 1992-1995, Shuford et al. (1998) conducted surveys of shorebirds across California's Central Valley during winter and migratory periods. They concluded that:

- The Central Valley is one of the most important regions in western North America to migratory and wintering shorebirds.
- Up to 40% of all shorebirds in the region were on managed wetlands in winter and over 60% during spring migration.
- The Central Valley Joint Venture regions most important to shorebirds were those with the greatest acreage of managed wetlands.

The importance of managed wetlands has been recognized by the Western Hemisphere

Shorebird Reserve Network which designated the Grasslands Ecological Area of the San Joaquin Basin and the ricelands and wetlands of the Sacramento Valley as sites of international importance to shorebirds. In recognition of the value of wetlands to birds in the region, the National Audubon Society and Bird Life International have designated eleven Global and fourteen State Important Bird Areas in the Central Valley.

Importance of the Central Valley for waterfowl or other waterbirds

Nearly two centuries ago, estimates suggest that Central Valley wetlands supported between 20 million and 40 million waterfowl annually. This number dramatically declined to between 6 to 7 million by the 1970s and current estimates hover at around 5.5 million (Heitmeyer 1989). Today,

- Nearly 40% of all the food that supports wintering waterfowl comes from managed wetlands (Petrie and Petrik 2010).
- The Central Valley supports up to 60% of the waterfowl in the entire Pacific Flyway, making it one of the most important places for waterfowl in North America (CVJV 2006).
- 38 species of waterbirds are supported by Central Valley wetlands, 24 of which nest in wetland habitats (CVJV 2006).

When there's not enough water, waterbirds suffer from disease

The drought could negatively impact bird populations by creating conditions that promote avian disease (primarily botulism and cholera). The loss of historic wetlands has already concentrated birds into fewer and smaller areas; crowding is well

known to increase the chance of disease transmission and the frequency of disease outbreaks in waterfowl (Rosen 1972, Friend 1981, Friend 1992, Smith and Higgins 1990, Friend and Franson 1999). Conditions that further exacerbate bird concentrations may put bird populations at risk of disease. For example, an avian cholera outbreak in the Central Valley in 1970-71 was attributed to late winter drought with resultant local high concentrations of birds (Rosen 1972).

Central Valley wetlands help ensure that waterbird populations are as successful as possible on the breeding grounds

Further reductions to the amount of wetland habitat, via drought or other causes, can negatively affect bird populations. Studies have shown that habitat quality of the wintering grounds can affect the timing of arrival to the breeding grounds; lower quality habitat results in later arrival and lower reproductive success (Heitmeyer and Fredrickson 1981, Kaminski and Gluesing 1987, Raveling and Heitmeyer 1989, Gil et al. 2001).

Bird watching is a popular recreation with significant economic benefits

In the 2013 report titled "Birding in the United States: A demographic and economic analysis", Erin Carver generated a snapshot of bird watching in 2011. In that year alone:

- 18 million Americans spent time away from home watching birds.
- Of these away-from-home birders, 75% observed waterfowl and 60% observed other waterbirds.
- Trip- and equipment-related expenditures by away-from-home birdwatchers totaled \$41 billion.

Waterfowl hunting is a popular recreation with significant economic benefits

In the 2008 report titled “Economic impact of waterfowl hunting in the United States”, Erin Carver generated a snapshot of waterfowl hunting in 2006. In that year alone:

- Over 1.3 million hunters spent over 13 million days hunting waterfowl.
- Total expenditures including travel, lodging, food, and equipment was greater than \$900 million.
- Hunter expenditures only tell part of the story – these expenditures have ripple effects through the economy by impacting economic activity, employment, and household income. In 2006 alone, waterfowl hunting in California generated over 1000 jobs and over \$43 thousand in employment income.

The popularity of California refuges provides economic benefits to local communities

Visitors to wildlife refuges generate significant income for local communities. In the 2013 report titled “Banking on Nature”, Erin Carver and James Caudill summarized the economic impact of National Wildlife Refuge visitation on local economies. Their analysis included the Sacramento and San Luis National Wildlife Refuges in California’s Central Valley.

For the Sacramento NWR, they estimated that in 2011:

- More than 71,000 visitors spent \$2.5 million in the local community.

- 90% of this expenditure was by non-residents, and 75% was for non-hunting activities.
- These expenditures generated 28 jobs in the local community.

Similarly, for the San Luis NWR, they estimated that in 2011:

- More than 92,000 visitors spent \$5.2 million in the local community.
- 64% of this expenditure was by non-residents, and 85% was for non-hunting activities.
- These expenditures generated 52 jobs in the local community.

Refuges may enhance property values

The economic value of National Wildlife Refuges goes beyond income generated by visitors. In the report titled “Amenity Values of Proximity to National Wildlife Refuges”, Taylor et al. (2012) summarized the value of property as a function of distance to the nearest National Wildlife Refuge. They reported that:

- In California and Nevada homes located within 0.5 miles of an NWR and within 8 miles of an urban center are valued 3% to 6% higher than other homes in the same region.

The monetary value of water delivered to refuges may be greater than other uses

Information on the economic impact of National Wildlife Refuges on the local economies can be used to generate a value of water delivery to these refuges. In 1992, Michael Creel and John Loomis estimated the economic benefits derived from recreational value of water delivered to wetlands of National Wildlife Refuges in the San Joaquin region

of the Central Valley. In their analysis, they estimated that:

- 1 acre-foot of water delivered to a Central Valley wildlife refuge generated \$303 in recreational value.
- At the time, this was greater than the agriculture value of water (\$67 to \$119 per acre-foot).
- It was also greater than the value the State Water Board paid farmers for water to be reallocated to urban uses (~\$150 per acre-foot).

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