

Western Ecological Research Center

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Central Valley Habitat Changes Affect Space Use by White-fronted Geese

During the past decade, changing agricultural practices and conservation programs have altered the landscape in the Central Valley of California. These habitat changes included wetland restoration and enhancement of agricultural habitats related to the implementation of the Central Valley Joint Venture Plan beginning in 1990, increased land area used in rice production due to improved prices and subsidies, and more frequent flooding of rice fields after harvest to speed straw decomposition since air-quality legislation enacted in 1991 restricted rice burning. As a result, wintering habitat for waterfowl has increased in the Central Valley.

This increase has been most apparent in the northern Central Valley where availability of ricelands increased by 94,000 acres (23% increase), flooded rice fields by 62,000 acres (47%), and wetlands by 72,000 acres (67%) between 1989 and 1999. USGS scientists, with help from the California Department of Fish and Game, U.S. Fish and Wildlife Service, California Waterfowl Association, and Ducks Unlimited, investigated the space and habitat use of wintering Pacific greater white-fronted geese in response to these landscape changes and reported their results in a recent issue of the *Journal of Wildlife Management*.

The authors radio-marked and tracked more than 200 white-fronted geese during the winters of 1987–1990, before these major habitat changes occurred, and again during 1998–2000, after a decade of habitat change in the Central Valley. In total, they recorded 4,516 goose locations. Geese traveled shorter distances between roosting and feeding sites during 1998–2000 (24 km) than during 1987–1990 (33 km). The distance traveled tended to decline throughout winter during both decades and varied among watershed basins. Goose population range size was smaller during 1998–2000 (3,367 km²)

Management Implications:

- Our results suggest that white-fronted geese have altered their spatial use of California's Central Valley during the past decade in response to changing agricultural practices and the implementation of the Central Valley Joint Venture.
- To ensure that these habitat gains are sustained into the future, the challenge for the Central Valley Joint Venture and other habitat program managers will be to meet the long-term habitat needs of waterfowl while maintaining the distribution of geese throughout the valley.

than during 1987–1990 (5,145 km²), despite a 2.2-fold increase in the size of the Pacific Flyway population of white-fronted geese during the same time period.

Feeding and roosting distributions of geese also differed between decades — geese shifted into basins that had the greatest increases in the amount of area in rice production (i.e., American Basin) and out of other basins (i.e., Delta Basin). The use of rice habitat for roosting (1987–1990: 40%, 1998–2000: 54%) and feeding (1987–1990: 57%, 1998–2000: 72%) increased between decades, whereas use of wetlands declined for roosting (1987–1990: 36%, 1998–2000: 31%) and feeding (1987–1990: 22%, 1998–2000: 12%). Within post-harvested rice habitats, geese roosted and fed primarily in burned rice fields during 1987–1990 (roost: 43%, feed: 34%) whereas they used flooded rice fields during 1998–2000 (roost: 78%, feed: 64%).

Ackerman, J. T., J. Y. Takekawa, D. L. Orthmeyer, J. P. Fleskes, J. L. Yee, and K. L. Kruse. 2006. Spatial use by wintering greater white-fronted geese relative to a decade of habitat change in California's Central Valley. Journal of Wildlife Management 70:965–976.