

Science Support for Managing Migratory Waterfowl

Migratory birds in North America are an international resource shared by Canada, the United States, and Mexico. Ultimate population management authority in the U.S. lies with the U.S. Fish and Wildlife Service (FWS), but states participate in development of management decisions through the Flyway system. The FWS, state wildlife agencies, and nongovernmental organizations participate through independent actions and cooperative Joint Ventures under the North American Waterfowl Management Plan (NAWMP) to acquire, protect, restore, and enhance wetlands and other habitats critical to the long-term conservation of breeding, migrating, and wintering waterfowl. A thorough base of scientific information is required to support and evaluate waterfowl populations and habitat management in North America.

Scientists at the Western Ecological Research Center (WERC) make important contributions to the scientific foundations of migratory bird management, and conduct evaluations of management actions to insure that conservation programs stay relevant to the FWS and state wildlife agency missions of maintaining abundant waterfowl resources into the future. Scientists are conducting a variety of field investigations to obtain biological information critical to support habitat restoration programs of the Central Valley Habitat Joint Venture, San Francisco Bay Joint Venture, Pacific Coast Joint Venture, Arctic Goose Joint Venture, and the Intermountain West Joint Venture (NAWMP), and to evaluate those programs.



Adult female pintail fitted with a satellite transmitter and ready for release at Llano Seco National Wildlife Refuge in California. Photo: J. Fleskes, USGS

Primary areas of research support:

- Population survival rates
- Population bioenergetics
- Spring migration and wintering ecology
- Habitat use and distribution patterns
- Waterfowl survey analyses
- Satellite and VHF telemetry
- Contaminant exposure

Other field studies provide information to FWS Division of Migratory Bird Management and the Flyway Councils to support population management of geese and ducks, and to assist restoration of declining species and maintenance of abundant species

The majority of Pacific Flyway waterfowl winter in the Central Valley of California. WERC research biologists are investigating the response of waterfowl to a decade of habitat changes in this region resulting from NAWMP conservation efforts and changing agricultural practices. In other research, they are tracking the spring migration of northern pintails from wintering grounds in the Central Valley of California, the Gulf Coast and playa lakes of Texas, and southcentral New Mexico with satellite telemetry to identify critical spring staging areas; link important winter, spring, and nesting areas; estimate efficiency of spring waterfowl surveys for pintails; and measure their exposure to botulism.

In southern Oregon and northeastern California, satellite tracking has shown that about 80 percent of pintails from the Central Valley rest and feed on their way to northern breeding areas. WERC scientists are examining details of pintail use of spring habitats in this region to document its importance in their annual cycle. Additionally, these scientists are studying survival and migration patterns of post-breeding mallards in the Klamath Basin and the energetics, distribution, and habitat requirements of Tule white-fronted geese on their wintering grounds in California and Oregon. Results of these studies will be used to improve management of migratory waterfowl and their migration habitats.



WERC biologists evaluate response of migratory waterfowl to habitat changes such as this newly restored wetland basin being filled with water in the Sacramento National Wildlife Refuge complex. Photo: FWS

The San Francisco Bay area, including the Suisun Marsh and Delta, is home to 8 million people and provides more than half of California's water supply. Yet, this urbanized estuary supports up to one million waterfowl, including over half of the diving duck populations wintering in the Pacific Flyway. Resource managers must preserve the delicate balance between human demands and natural resource value in the estuary.



Female northern pintail ducks, tracked by satellite, traveled from wintering grounds in the California Central Valley to nesting destinations ranging from the prairies of southern Alberta and Saskatchewan to Alaska, and even Russia in 2000-2001. Some migrated over land, some worked their way up the coast in short hops, and several directly crossed more than 2,000 miles of open ocean to reach Alaska. This research is helping to shed light on why the North American breeding population of pintails fell from an estimated 5 to 7 million in the 1970s to an all-time low of 1.8 million in 1991 and 2002. Map: USGS



Capture of a surf scoter in San Francisco Bay with a net gun. Surf scoters are found in subtidal areas of the estuary during the winter, feeding on clams and herring roe. Studies of individually radio-marked birds provide critical information on their distribution and movements, and insights into their foraging behavior and the risks of bioaccumulation of contaminants. Photo: USGS

WERC biologists are providing science support to regional managers by modeling carrying capacity, examining habitat use, determining disturbance effects, and evaluating risks of contaminant exposure to diving ducks.

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