

## MIGRATION CHRONOLOGY OF AMERICAN WIGEON IN WASHINGTON, OREGON AND CALIFORNIA

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**Abstract.**—Census data were compiled on American Wigeon (*Anas americana*) from 25 National Wildlife Refuges for the years 1976–1985 to determine migration chronology in Washington, Oregon and California. Arrival of wigeon on wintering grounds in Washington begins in August, and in Oregon and California in September and October. Peak numbers of wigeon typically occur November–December in Washington and Oregon while populations in California peak in December–February. Migration to northern breeding areas is prominent in March and April. Wigeon are for the most part absent from California, Oregon and most of Washington, from May to September each year.

### CRONOLOGÍA MIGRATORIA DE ANAS AMERICANA EN WASHINGTON, OREGON Y CALIFORNIA

**Sinopsis.**—De 1976–1985, y a través de censos, se compilaron datos en 25 refugios de vida silvestre, para determinar la cronología migratoria de *Anas americana* en Washington, Oregon y California. La llegada de estas aves, a áreas de pasar el invierno en Washington, comenzó en agosto, y en septiembre y octubre en Oregon y California, respectivamente. El pico de llegada ocurrió durante noviembre y diciembre en Washington y Oregon, y de diciembre a febrero en California. La migración de estos patos a sus áreas de reproducción en el norte, es considerable entre marzo y abril. Estas aves están ausentes de la gran mayoría de las partes de California, Oregon y principalmente Washington, de mayo a septiembre de cada año.

American wigeon (*Anas americana*; hereafter wigeon) are migratory, largely breeding in Canada and Alaska and wintering in the contiguous United States (Bellrose 1976). Wigeon are common migrants in the Pacific coast states and the Central Valley of California is a major wintering ground for the species (Bellrose 1976). However, there are no existing published data on wigeon migration chronology specific to California, Oregon and Washington. Bellrose (1976), the standard reference on mi-

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FIGURE 1. National Wildlife Refuges in the states of California, Oregon and Washington, USA, that provided monthly aerial counts of American wigeon.

TABLE 1. Designated regions, and accompanying National Wildlife Refuges (NWR), in the states of Washington, Oregon and California used to summarize data on American Wigeon migration chronology.

Region	National Wildlife Refuges
1	Nisqually, Dungeness, and San Juan Islands NWR (Puget Sound, northwestern Washington)
2	Willapa NWR (southwestern Washington)
3	Columbia, Umatilla, Toppenish, McKay Creek and Cold Springs NWR (southern Washington)
4	William J. Finley, Ankeny and Baskett Slough NWR (northwestern Oregon)
5	Tule Lake, Upper Klamath, Klamath Forest and Lower Klamath NWR (southern Oregon)
6	Sacramento, Colusa, Delevan and Sutter NWR (northern California)
7	San Luis, Kesterson and Merced NWR (central California)
8	Salton Sea and Imperial Valley NWR (southern California)

gration chronology of wigeon, and other waterfowl, for the most part reports migratory patterns for designated western regions whose eastern boundaries extend as far east as New Mexico, Colorado and central Wyoming. Information on timing of wigeon movements is of general interest regarding migratory behavior but also may have various practical applications; e.g., such as setting dates for hunting seasons. We collected the data for the purpose of making recommendations for the timing of insecticide applications to golf course turf where wigeon are known to feed (Kendall et al. 1992).

#### METHODS

The managers of 25 National Wildlife Refuges (NWR) in the states of Washington, Oregon and California (Fig. 1) were contacted by telephone and/or letter to request results of monthly aerial population surveys at their stations. Results of surveys were compiled for the 10-yr period 1976–1985. The Pacific states were divided into eight regions (Table 1). For each year, within each region, the monthly mean number of wigeon (mean of the refuge values) was calculated to provide an abundance index. These means were then averaged across the 10-yr period for each month and region to produce the final plotted averages (Figs. 2 and 3).

#### RESULTS AND DISCUSSION

Substantial numbers of wigeon are first seen in Region 2 (southwest Washington) during August (Fig. 2). Wigeon migration chronology data in Region 1 (northwest Washington/Puget Sound) is limited to the months of September through May. As this region is north of Region 2, however, it is likely that wigeon numbers also increase in the Puget Sound area

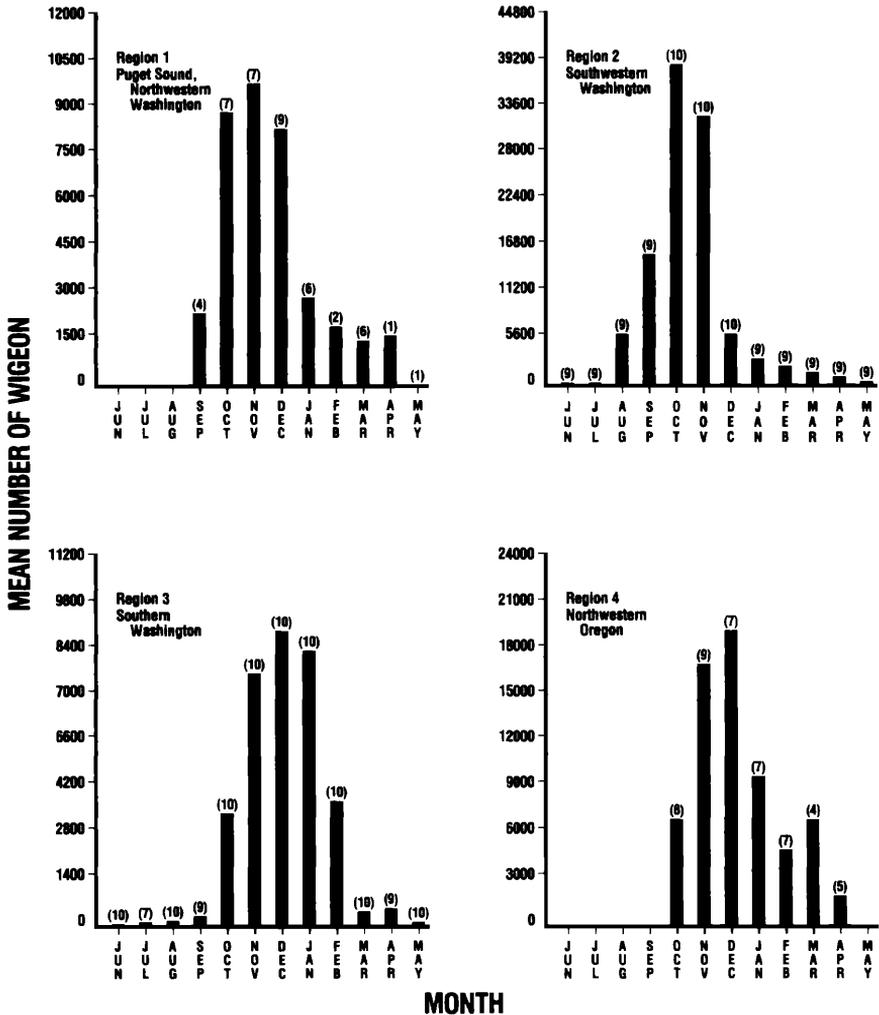


FIGURE 2. Mean number of American Wigeon counted at National Wildlife Refuges per month in Regions 1-4 (see Table 1, Fig. 1) from 1976-1985. Numbers in parentheses represent the number of years for which a monthly estimate of wigeon numbers were available. Note scale differences between regional graphs.

during August. Wigeon numbers peak in October and November and then diminish during December and January in Regions 1 and 2, probably reflecting wigeon movements further south. Most wigeon are gone from Regions 1 and 2 by May.

Migration of large numbers of wigeon into Regions 3 (southern Washington), 4, 5 (Oregon) and 6 (northern California) begins in October and continues through December (Figs. 2 and 3). Wigeon numbers start to

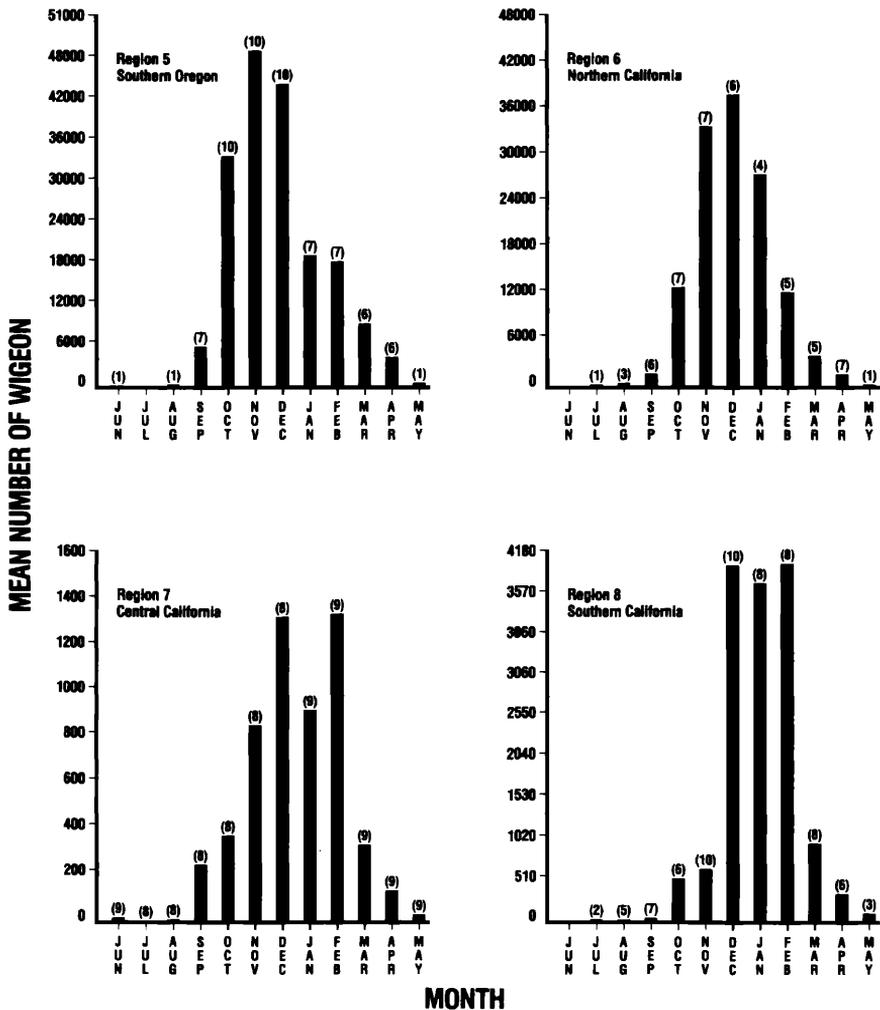


FIGURE 3. Mean number of American Wigeon counted at National Wildlife Refuges per month in Regions 5-8 (see Table 1, Fig. 1) from 1976-1985. Numbers in parentheses represent the number of years for which a monthly estimate of wigeon numbers were available. Note scale differences between regional graphs.

decline in Regions 3, 4 and 5 in January and most are gone by April. Data on wigeon migration chronology for Region 4 is limited to the months October-April. Wigeon are reported to be uncommon in the region from April through August (D. L. Boone, W. L. Finley, NWR, pers. comm.). Wigeon are mostly gone from Region 6 by March.

Wigeon migration into Regions 7 and 8 (southern and central California) mostly occurred in the months of October-December (Fig. 2).

Peak numbers in these most southerly refuges tend to occur later (December–February) than more northerly refuges where maximum concentrations typically occur October–December. Numbers decline sharply in these areas in March as wigeon migrate to their breeding grounds.

Wigeon wintering in California's Imperial Valley reportedly nest in the western part of the Northwest Territories, British Columbia, Alaska, Alberta and Saskatchewan (Reinecker 1976). Wigeon wintering in Oregon and Washington predominantly breed in western Canada and Alaska (Bellrose 1976). Field observations in western Canada and Alaska corroborate the migration pattern determined from NWR in the United States. Wigeon first arrive in Alberta, Canada, and the Cook Inlet and Copper Delta Region of Alaska, in mid-April. Peak numbers of wigeon are achieved in both areas by May 10–15. Wigeon start migrating from this region of Alaska in late August and by the first of October most are gone. Wigeon are still common in Alberta in September but by mid-October they are scarce (B. Turner, Canadian Wildlife Service, pers. comm., and T. Rothe, Alaska Fish and Game, pers. comm.).

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