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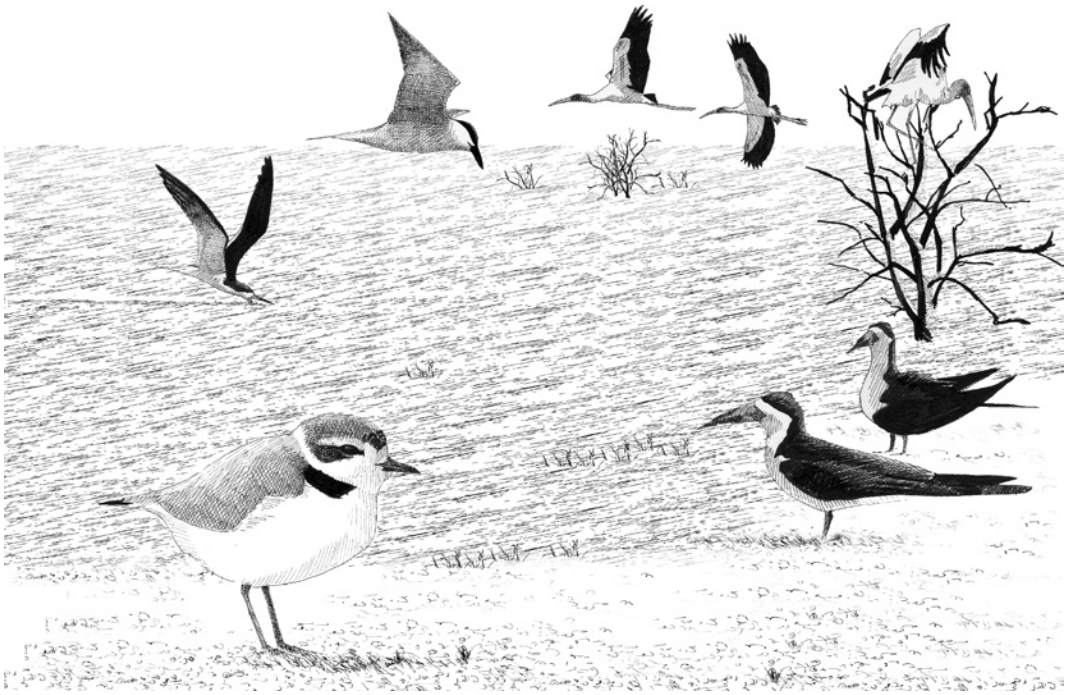


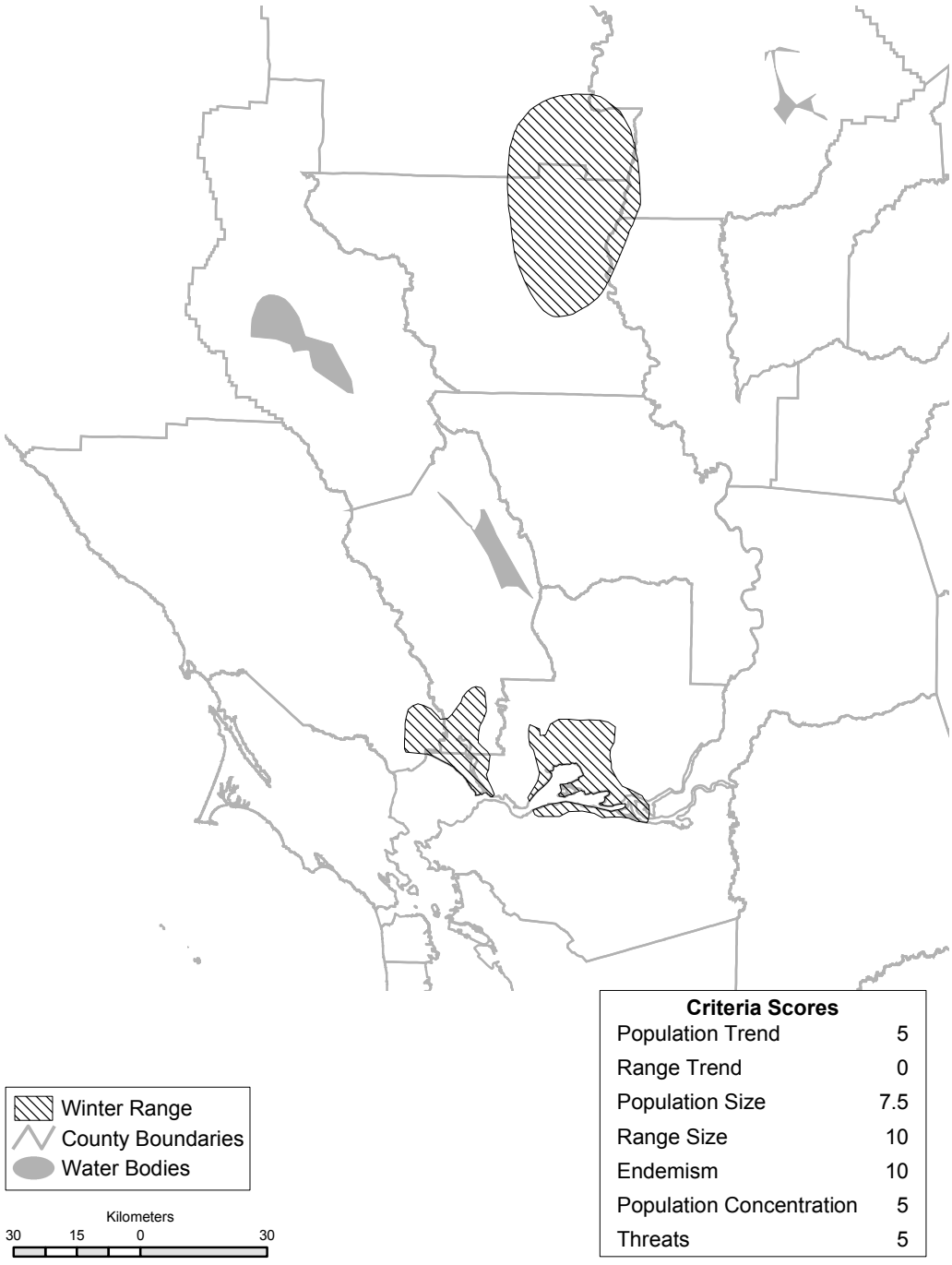
Andy Birch

PDF of Tule Greater White-fronted Goose account from:

Shuford, W. D., and Gardali, T., editors. 2008. California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento.

TULE GREATER WHITE-FRONTED GOOSE
(*Anser albifrons elgasi*)

Bruce E. Deuel and John Y. Takekawa



Winter range of the Tule Greater White-fronted Goose in California. Restricted mainly to the vicinity of federal and state refuges and the Butte Sink in the Sacramento Valley, Grizzly Island Wildlife Area and adjacent duck clubs in Suisun Marsh, and, marginally, the Napa Marshes. In some areas, numbers may have declined since 1944.

Special Concern Priority

Currently considered a Bird Species of Special Concern (wintering), priority 3. Not included on prior special concern lists (Remsen 1978, CDFG 1992).

Breeding Bird Survey Statistics for California

Does not breed in California.

General Range and Abundance

Comprising four subspecies worldwide, the Greater White-fronted Goose (*Anser albifrons*) has a nearly circumpolar Arctic breeding distribution (Ely and Dzubin 1994, Ely et al. 2005). Two subspecies breed in North America. The Pacific Greater White-fronted Goose (*A. a. frontalis*) is composed of two populations: the Pacific population (approx. 300,000 individuals) breeds in west-central Alaska and migrates to winter in the Pacific states and western Mexico; the midcontinent population (approx. 700,000 individuals) breeds in northern and eastern Alaska east through Canada to Hudson Bay and migrates through the Central Flyway to winter in Texas, Louisiana, and central and eastern Mexico (Ely and Dzubin 1994, Ely and Takekawa 1996).

The known nesting range of the Tule Greater White-fronted Goose (*A. a. elgasi*, also known as *A. a. gambeli* or *gambelli*; see Dunn 2005 for a discussion of confusion over nomenclature) is the upper Cook Inlet region of southern Alaska, concentrated between the Susitna and Yentna rivers (Ely et al. 2006, 2007; Takekawa unpubl. data). The Tule Goose winters in California's Central Valley, where it is sympatric with much larger numbers of *A. a. frontalis* (Bauer 1979, Wege 1984).

Seasonal Status in California

Present in California as a migrant and winter visitor, mainly from late August though April. The first birds arrive in the Klamath Basin on the Oregon-California border in late August, and much of the population stages there and in southeastern Oregon (Summer Lake, Warner Valley) until late September or early October (Ely and Dzubin 1994, Ely and Takekawa 1996), before migrating to the Central Valley for the winter. Large numbers bypass these staging areas, however, and fly directly to the Sacramento Valley, before arriving in late August or early September (Becker 2000, M. Wolder in litt.); birds arrive in Suisun Marsh in mid-September (Becker 2000). On their way north in spring, these geese return to the Klamath Basin and southern Oregon in February and March. Two decades ago, many of the Tule Geese migrated through the Klamath Basin (Wege 1984), but in the past decade fewer have been found in that area, while larger numbers have occurred in southeastern Oregon in both fall and spring (Becker 2000).

Historic Range and Abundance in California

Historical accounts described the metropolis of the wintering grounds of the Tule Goose to be in the vicinity of Butte Creek in Butte, Sutter, and Colusa counties, with birds also occurring south to the vicinity of Suisun Marsh, Solano County (Moffitt 1926, Grinnell and Miller 1944). These authors thought the Tule Goose probably occurred more widely, but its status was clouded by confusion over its identification and differing habits with respect to the more numerous *A. a. albifrons* (now *frontalis*). Despite incomplete knowledge, Grinnell and Miller (1944) considered the Tule Goose "regular and formerly fairly common" as a winter visitant. Moffitt (1938) described it as "fairly numerous locally in some years in mid-winter" in Suisun Marsh. Grinnell and Miller (1944) speculated that these geese must traverse a route over northern California in migration, but they knew of no definite locales of occurrence for migrant or staging birds.

Recent Range and Abundance in California

The distribution of the Tule Goose has likely not changed much since the time of Grinnell and Miller (1944), though its local distribution in winter in the Central Valley is now known in greater detail (see map). Most are found on Sacramento, Delevan, and Colusa NWRs, as well as adjacent duck clubs and rice fields, in the central Sacramento Valley and in Suisun Marsh. In the Sacramento Valley, a few birds have been reported from Gray Lodge WA, the Butte Sink, and Sutter NWR (Hobbs 1999, Becker 2000, B. E. Deuel pers. obs.). Generally, there is a winter-long interchange of geese among the key Sacramento Valley refuges and Grizzly Island WA in Suisun Marsh (Becker 2000).

Longhurst (1955) reported Tule Geese from marshes of the lower Napa River, Solano County,

in December and January 1954–55. These were the first he had seen in 25 years' experience in the area, and he speculated whether recent construction of a peripheral levee on an island had contributed to the establishment of habitat favored by these geese. Subsequently, small numbers continued to be reported in the vicinity of the Napa Marshes (Pacific Flyway Technical Subcommittee 1991, L. Allen pers. comm.).

Prior to any systematic work, estimates in the late 1970s to early 1980s ranged from 2000 birds for the total population (Bauer 1979) to 5000 just for those wintering in the Sacramento Valley (Wege 1984). The most recent rough estimates for the entire population vary from 5000 to 10,000 individuals (CDFG files, USGS unpubl. data), but ongoing mark-recapture studies should refine those estimates (CDFG unpubl. data). Counts on the Sacramento Valley refuges totaled 5000–6000 birds in the late 1980s, and peak counts at Grizzly Island WA in Suisun Marsh ranged from about 1000 to 1500 in the 1980s, with generally less than 500 birds there in the mid-1990s (Becker 2000). Peak numbers in the Napa Marshes were less than 50 individuals (Becker 2000), and numbers have dwindled below 20 in the past decade.

Lacking any long-term data, it is uncertain what the population trends have been for this subspecies. Still, given the loss of over 90% of the Central Valley's historic wetlands (Frayer et al. 1989), it seems that the population of the Tule Goose has more likely declined since the early 20th century than remained stable or increased. The value of lost historic wetlands has been offset to an unknown degree by the Central Valley Joint Venture's recent efforts in increasing seasonal wetlands and by the availability of about 162,000 to 202,000 ha of rice fields for foraging.

Ecological Requirements

In the winter, Tule Geese frequent marshes dominated by tules and bulrushes (*Scirpus* spp.) and cattails (*Typha* spp.), more so than any other goose (Bellrose 1980). Tule Geese have a much larger bill, longer neck, and larger feet, which makes them suited to foraging in relatively deep marshes (Swarth and Bryant 1917, Wege 1984) in comparison with Pacific Greater White-fronted Geese, which are better adapted to glean and graze in fields. Still, Tule Geese have had to compensate for the loss of historic wetlands by foraging in agricultural fields. In the Sacramento Valley, Tule Geese feed in harvested rice fields in early winter, then shift to winter flooded uplands and marshes with an abundance of Alkali Bulrush (*Scirpus robustus*) and some open water (Wege 1980, Timm et al. 1982). During the hunting season (late Oct to late Jan), they shift to off-refuge rice fields and closed zones of refuges (Timm et al. 1982). Hobbs (1999) found radio-tagged Tule Geese spent most of their foraging time in rice fields in the vicinity of Sacramento Valley refuges and returned to the refuges to roost in the day. The distance that radio-tagged geese moved between roosting and foraging sites increased from a mean of 3624 m (SD = 2907) in early winter to 5879 m (SD = 8396) in late winter. In Suisun Marsh, Tule Geese feed in ponds with Alkali Bulrush or in barley or grass uplands on Grizzly Island WA (Becker 2000). In the Napa Marshes, they forage in tidal areas fringed with emergent cattails, tules, Alkali Bulrush, and cord grass (*Spartina* spp.), or with pickleweed (*Salicornia* spp.) and gumplant (*Grindelia* spp.) in higher areas. In the Klamath Basin in fall, Tule Geese feed in ponds with Alkali Bulrush or in harvested grain fields (Wege 1980).

Tule Geese are primarily grazers but also grub for roots and shoots (Becker 2000). They feed regularly on the tubers of emergent plants, but also forage on rice and corn in harvested fields, in association with Pacific Greater White-fronted Geese, in the Sacramento Valley (Hobbs 1999) and on sprouted grain in the Suisun and Napa marshes (Bauer 1979). Observations of a small number of foraging birds and the contents of stomachs of two specimens from the Napa Marshes indicated these individuals were foraging mainly on the tubers and rhizomes of Alkali Bulrush (Longhurst 1955), a plant they specialize on during spring in the Klamath Basin (Wege 1984).

Tule Geese generally roost and loaf in open water ponds with some emergent vegetation such as bulrushes or cattails. In Suisun Marsh, roosting areas have shallowly flooded uplands with a grass-pickleweed mixture (Becker 2000).

Unlike Pacific Greater White-fronted Geese, which may occur in flocks of thousands of individuals, Tule Geese associate in flocks of usually less than 25 (Bauer 1979) but sometimes up to 300–400 birds (M. Wolder in litt.).

Threats

Because of their primary adaptation to marshes, Tule Geese have likely been impacted more by the loss of historic wetlands than have other geese wintering in the Central Valley, which is now dominated by agricultural fields. What remains of their natural habitat in the wintering areas

is found mostly on state and federal managed wetlands, but some portion occurs on private wetlands managed for waterfowl hunting. To the extent that this private habitat may be lost if hunting declines in the future and with increasing development, Tule Geese may continue to lose roosting habitat. However, this threat does not appear to be serious at this time. Increased efficiency of grain harvest could have a tremendous effect on food availability (Ely and Dzubin 1994). Likewise, some rice fields used by Tule Geese in the Sacramento Valley (e.g., near Williams) have been lost to development, converted to nongrain crops, or left fallow (M. Wolder in litt.). Tule Geese are dependent on marshes at spring staging areas, which at least in the Klamath Basin are at risk from over allocation of water for other interests (D. Mauser pers. comm.).

Increased exploration and visitation near the core breeding area south of Denali National Park in Alaska may reduce productivity. Some migration areas such as the Gandil River in southeastern Alaska are threatened by development.

Some biologists have expressed the opinion that Tule Geese are less wary and fly lower than other Greater White-fronted Geese, making them more vulnerable to hunting (Moffitt 1926, Bellrose 1980). However, there are no empirical data or published studies verifying these statements. Nevertheless, increased intermixing with the growing population of Pacific Greater White-fronted Geese provides fewer options for targeted management in the winter. A study on the cardiac response of Tule Geese to disturbance suggests that birds react strongly when approached at 50 m; such disturbance can have energetic costs to geese, particularly if it is prolonged prior to flushing (Ackerman et al. 2004).

Management and Research Recommendations

- Continue restrictive hunting regulations in the core wintering range with mid-December closures until the population levels and trends are better known.
- Identify additional habitat outside the federal and state refuges for possible protection.
- Delineate and survey small populations outside of the Sacramento Valley, including those in the Suisun and Napa marshes.
- Determine specific roost site characteristics, winter diet, and other important characteristics of winter habitats to aid managers in protecting and enhancing wetlands for Tule Geese.
- Improve the understanding of this subspecies' breeding range and habitats in relation to wintering populations and roosting areas.
- Document new and monitor existing molting and migration staging areas; determine limiting factors at these sites.
- Examine the degree of genetic variation with respect to other subspecies of Greater White-fronted Geese.

Monitoring Needs

Because of the difficulty in identifying Tule Geese amid the larger number of Pacific Greater White-fronted Geese in the same areas, continuing efforts to monitor the population through unconventional means, such as collar-marked or radio-marked samples, are needed. It would be valuable to use these or other means to continue to develop more accurate methods for monitoring population levels. Efforts are underway to estimate the rate of misidentification between subspecies in surveys (J. Takekawa unpubl. data). Productivity surveys and monitoring of harvest at hunter check stations also should be continued, and possibly increased with additional funding to permit the use of employees dedicated to the purpose.

Acknowledgments

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