

FIVE-YEAR STATUS REPORT

- I. COMMON NAME: Greater Sandhill Crane
SCIENTIFIC NAME: Grus canadensis tabida
CURRENT CLASSIFICATION: Threatened
- II. RECOMMENDED ACTION:
- Retain threatened classification
- III. SUMMARY OF REASONS FOR RECOMMENDED ACTION:

In California, Greater Sandhill Cranes presently winter in the Central Valley and nest in six northeastern counties. These birds are part of the Central Valley Population of Greater Sandhill Cranes estimated at about 5,000 to 6,000 individuals (Pogson and Lindstedt 1988) and are featured in a Pacific Flyway Management Plan (Schlorff et al. 1983). Of the 276 nesting pairs located in northeastern California in 1988, 185 (67.0%) were on private land and 91 (33.0%) were recorded on state and federal lands. Of those recorded on public lands, 40 were on National Wildlife Refuges (NWR), 36 on State Wildlife Areas (WA), and 15 on U.S. Forest Service (FS) lands. The high percentage of crane pairs nesting on private lands continues to result in a significant threat to the state's nesting population. The potential for private landowners to convert meadow and marsh habitat to cereal grain and/or alfalfa crops still remains. Land conversions, combined with high predation rates on both eggs and young in some regions, powerline collisions, disease, drought, early meadow haying, livestock grazing, and lowering water tables continue to threaten nesting and wintering Greater Sandhill Cranes in California and neighboring states. Generally, California pair numbers have increased for at least the past 4 decades (Walkinshaw 1973, Littlefield 1982); however, in localized areas, pairs have decreased or disappeared since 1981 (Littlefield, in prep.). Based on continuing land use threats and low population numbers, the Department recommends retaining the Threatened status of this species.

IV. NATURE AND DEGREE OF THREAT:

Nesting Greater Sandhill Cranes are inhabitants of healthy wetland ecosystems. Therefore, cranes are highly vulnerable to changes which occur in these systems. Presently, agricultural technology is available to convert large areas of wetlands to crops in only a short period of time. This has occurred in California in recent years (USFWS 1978), and this trend is likely to continue. For example, about 2,430 ha (6005 acres) of meadow habitat in southern Surprise Valley, Modoc County may be drained and converted to alfalfa in the near future (R. Schlorff, pers. comm.). If this conversion occurs, five crane territories will be lost. Existing and future market values of agricultural crops such as alfalfa could provide the incentive for landowners to increase drainage activities in crane nesting habitats.

Weather conditions can influence productivity of Greater Sandhill Cranes. During the above normal precipitation years of the early

1980's, crane production apparently increased. However, some losses from flooding were recorded, particularly in Jess Valley, Modoc County (W. Flourney, pers. comm.). At the other extreme are years similar to 1988, when drought conditions persisted through much of the winter, spring, and summer. Many California crane territories never received water and in some locations (e.g. Surprise Valley, Lassen National Forest (NF), Siskiyou County) approximately 50% of the pairs never attempted to nest. Prolonged drought conditions can certainly have a detrimental influence on crane productivity. In addition, predator rates increase during these dry periods. In Ash Valley, Lassen County, of eight nests located in a marsh with limited water, seven were destroyed by predators (six by coyotes (Canis latrans), and one by a Common Raven (Corvus corax)), and one was abandoned (Littlefield, in prep.). Similarly, most pairs which successfully nested in Siskiyou County had lost their chicks by the end of July. These were taken by coyotes which had little difficulty in reaching chicks as they fed in the drying meadows (R. Johnstone, pers. comm.).

Common Ravens have increased dramatically in northeast California since 1981 (Littlefield, pers. obs.), and several crane nests examined in 1988 were lost to this predator. On Malheur NWR, Harney County, Oregon, high predation rates have resulted in a 25% reduction in crane pairs (236 to 181 pairs) since the mid-1970's (Littlefield, unpubl. data). Similar losses can be expected in California if predator populations continue to increase, particularly in years with below normal precipitation.

Powerline collisions are presently believed to be the major mortality factor for all age classes of post-fledged cranes. The majority of mortalities occur on wintering areas; however, five adult cranes were lost from powerline collisions in Modoc County in 1988 (C. Bloom, T. Melanson, pers. comm.). The first nest located in 1988* was unsuccessful after one pair member died from colliding with a powerline near Alturas, Modoc County.

During the 1988 crane survey, as in past surveys, no crane pairs initiated nesting activity in wetlands presently being grazed by cattle. In Surprise Valley, one pair deserted their nest the same day cattle were turned into their nesting marsh. Likely some nesting might occur during years with above normal precipitation, but if water is limited, spring and summer livestock grazing can be extremely detrimental. Even on winter grazed wetlands, nesting can be negatively impacted. On Malheur NWR, Oregon, areas which were winter grazed had 21% lower nesting success than similar areas which had not been grazed (Littlefield, unpubl. data).

On private land, and to some extent on federal lands, wetlands which are not spring and summer grazed are generally used for hay production. Mowing activity usually occurs in July, depending on annual precipitation. In years with below normal precipitation, mowing usually begins in June. When threatened, crane chicks hide in tall vegetation, and remain hidden until killed by a mower. Little can be done to eliminate pre-August mowing on private land; however, on public lands, wetland mowing should be avoided until after 10 August.

The lowering of the ground water table often results in stream downcutting and subsequent drying and degradation of wetland habitat. In Round Valley, Modoc County, two crane pairs formerly nested (1971), but by 1988 the area had been abandoned. During the intervening years streams have been severely eroded, and resultant lowered water tables have likely contributed to the early drying of meadows. Other wetlands in northeast California and eastern Oregon show similar symptoms of degradation, primarily from overgrazing, channalization, and ground water pumping (Littlefield, pers. obs).

The incidence of disease caused mortality appears to be increasing in the Central Valley Population of Greater Sandhill Cranes. On the Central Valley wintering ground, water becomes limited in February and large numbers of birds are forced to concentrate in the few scattered ponds available. It is during this time that disease outbreaks have been noted (T. Pogson, S. Lindstedt, R. Schlorff, pers. comm.). The most prevalent is avian cholera (Pasteurella multocida), but recently one crane was found which eventually died from tuberculosis (Mycobacterium tuberculosis) (R. Schlorff, pers. comm.). Botulism (Clostridium botulinum), salmonellosis (Salmonella spp.), avian pox (Poxvirus avium), and herpesvirus have been reported from sandhill cranes elsewhere, but their importance in the Central Valley Population has not been ascertained.

Numerous parasite species have been recorded from sandhill cranes, but generally these do not result in mortality unless the bird is in a weakened condition due to injury or disease. However, on Malheur NWR, Oregon several dead chicks have been found which apparently died from gape worm (Syngamus sp.) infestations (Littlefield, unpubl. data). Whether or not these parasites are prevalent in California nesting populations is presently unknown.

V. HISTORIC AND CURRENT DISTRIBUTION:

Historic

Historically, Greater Sandhill Cranes were known to nest in eastern Siskiyou County, northeastern Shasta County, and south to Honey Lake, Lassen Co. Definite breeding records were from near Ft. Crook, Shasta County (in 1860), Eagleville, Modoc County, and near Alturas (Grinnell and Miller 1944). Walkinshaw (1949) estimated that three to four pairs had territories in California in 1944. Nothing remotely close to a range-wide search for active territories was conducted during these early times, however.

Current

Results of intensive surveys in 1971, 1981 and 1988 allow for very accurate delineation of range and estimate of extant populations in California today. Presently crane pairs are found in Lassen, Modoc, Plumas, Shasta, Sierra, and Siskiyou counties. In 1988, greatest numbers were in Modoc County (165 pairs-59.8%), while Lassen County had 75 pairs (27.2%), Siskiyou County 27 pairs (9.8%), Plumas County 7 pairs (2.5%), Shasta County 1 pair (0.4%), and Sierra County 1 pair (0.4%). Four pairs near McArthur, Shasta County, occasionally fed in Shasta

County, but their nesting territories were east of the county line in Modoc County. Surprise Valley had the largest number of pairs with 53, followed by Big Valley, Modoc and Lassen counties, with 36, Modoc NWR, Modoc County, 30, and Ash Valley, 17.

VI. HISTORIC AND CURRENT ABUNDANCE:

(See V. above)

VII. SPECIES DESCRIPTION AND BIOLOGY:

Greater Sandhill Cranes are the largest of the six subspecies of Sandhill Cranes. The average weight of adult males is 5,385 gms, range = 4,762-5,895 (168 oz, range = 149-184), while the average weight for adult females is 4,308 gms, range = 3,628-4,988 (135 oz, range = 113-156). Chicks that are 70 days old have an average weight of 3,268 gms (102 oz) (Johnsgard 1983). Average wing cord measurements for adult males is 561.5 mm, range = 526-598 (22.1 inches, range = 20.7-23.5) and females 546.0 mm, range = 510-575 (21.5 inches, range = 20.1-22.6). Tarsus, exposed culmen, and bare tibia average 244.5 mm, range = 226-264 (9.6 inches, range = 8.9-10.4), 137.1 mm, range = 122-144 (5.4 inches, range = 4.8-5.7), and 111.2 mm, range = 88-125 (4.4 inches, range = 3.5-4.9), respectively for adult males. Adult female measurements average: tarsus 230.5 mm, range = 222-239 (9.1 inches, range = 8.7-9.4); exposed culmen 125.0 mm, range = 113-134 (4.9 inches, range = 4.4-5.3); and bare tibia 112.7 mm, range = 108-117 (4.4 inches, range = 4.3-4.6) (Walkinshaw 1965). Except for size differences, sexes are similar. General coloration is pale gray, with dark primaries. Cheeks, ear coverts, and chin are usually white, and all but juveniles have bare reddish foreheads. Fledged juveniles are usually similar to adults in body size, but are rust-brown in coloration, particularly on the wings and nape. The juvenile forehead does not become bare and reddish until late autumn; however, juveniles can still be distinguished from adults well into February by the rust-brown on the nape. Frequently, adult cranes have bright orange on their body feathers as a result of ferric oxide deposition (Taverner 1929). Sandhill cranes place mud on their feathers with their beaks, and if this occurs on soils which contain ferric oxide the orange coloration results.

Greater Sandhill Cranes have an omnivorous diet consisting primarily of vegetable matter such as small grains; however, they will consume almost any available food. Toads, frogs, eggs, young birds, small rodents, invertebrates, roots, and tubers are all included in their diet. Immediately before egg deposition, females increase their consumption of invertebrates, and through the fledging period young are fed almost exclusively invertebrates, particularly earthworms.

Pairs usually mate for life (cf. Littlefield 1981), but will take a new mate if one member of the pair is lost. They return to the same breeding territory annually, but will not nest if nesting conditions are unfavorable (Littlefield, unpubl. data). The clutch usually consists of two eggs, occasionally one and rarely three. During 1988, in California, of 41 nests where complete clutches were present, five contained a single egg, 35 two, and one three eggs (Modoc NWR files, Littlefield, unpubl. data). Both members of a pair participate in the

30 day incubation period. Shortly after the second egg hatches, adults lead the young from the nest and begin feeding them. Generally, each parent feeds one chick. The chicks are aggressive toward each other, and shortly after hatching one becomes dominant. Gradually the dominant chick becomes more aggressive, pushing the other chick away from the adults, often causing it to starve or be consumed by a predator. Consequently, usually only one chick fledges. After the first 3 weeks, young grow rapidly and fledge when 60 to 70 days old. Family groups leave their territories once young fledge, and usually move to nearby grain fields. Here they remain until late September to early November when they migrate southwest to the wintering ground in the Central Valley (Littlefield 1986).

VIII. HABITAT REQUIREMENTS:

Five isolated populations of Greater Sandhill Cranes occupy favorable wetland ecosystems from the Great Lake States westward to the Pacific States. In California and Oregon the Central Valley Population of Greater Sandhill Cranes establish nesting territories in wet meadows, often interspersed with marshes. On Malheur NWR, Oregon, nesting regularly occurs in stands of giant burreed (Sparganium eurycarpum), hardstem bulrush (Scirpus acutus), and common cattail (Typha latifolia) (Littlefield and Ryder 1968). This tendency to nest in dense emergent vegetation appears unique and apparently evolved with heavy predation pressure (Littlefield, pers. obs.). In other regions of the Central Valley Population's nesting range, a large percentage of nests are located in more open habitats such as rushes (Juncus spp.), spikerush (Eleocharis spp.), grasses, and/or sedges (Carex spp.). California pairs generally nest in open habitats; however, exceptions do occur, particularly in Surprise Valley (east of Eagleville) and on the Lakeshore Ranch near the south shore of Goose Lake, Modoc County. Here, some nesting occurs in bulrush and burreed (Littlefield, pers. obs.).

Nests are usually built over water, and in California in 1988, water depths averaged 6.6 cm (2.3 inches) (N = 50). On Malheur NWR, Oregon, water depths were deeper, averaging 16.8 cm (6.6 inches) (N = 93) (Littlefield 1968). The shallower water depths in California likely reflect the habitat type in which the majority of pairs nested, and the dry conditions which persisted through the 1988 nesting season. Seven nests were located on moist soil, while the greatest water depth was 33.5 cm (13.2 inches).

Breeding territory sizes vary depending on quality of habitat. In Idaho, five territories averaged 17 ha (42 acres) (Drewien 1973), on Malheur NWR, Oregon, eight territories averaged 25 ha (61.8 acres) (Littlefield and Ryder 1968), and in Michigan 76 territories averaged 53 ha (131 acres) (Walkinshaw 1973). In California, no territory sizes have been estimated, but in some areas, particularly Modoc NWR, territories appeared smaller than those reported elsewhere. In high quality habitat on Malheur NWR, territory sizes are about 7 ha (17.3 acres) (Littlefield, unpubl. data), and these appear similar to those at Modoc NWR. Within the territory, two things are essential - water and a feeding area. Most feeding of crane young occurs in moist meadows where

invertebrates are in abundance. In some years when meadows prematurely dry, adults move their young to upland sites where they feed primarily on grasshoppers and other insects.

After the young fledge, cranes concentrate on grain fields near favorable roost sites. There they confine most of their activities until migration. Food consists of a variety of cereal grains, which include barley, rye, wheat, and oats. Fields used consistently are usually within 6 km (3.7 mi) of a shallow water body which is used as a communal roost site (Littlefield 1986). Once cranes leave premigratory staging areas, they fly southwest to wintering areas in the Central Valley from near Chico, Butte County south to Delano, Tulare County (Littlefield and Thompson 1979, Pogson and Lindstedt 1988). Favorable roost sites and an abundance of cereal grain crops characterize winter concentration areas. Rice is used extensively by cranes near Gray Lodge WA, Butte County, and corn is the most important food source at the majority of other concentration areas in the Central Valley particularly in the Sacramento - San Joaquin delta. Irrigated pastures are used extensively as loafing sites in some wintering areas (Pogson and Lindstedt 1988, Littlefield, pers. obs.).

IX. CURRENT AND RECOMMENDED MANAGEMENT:

The Central Valley Population of Greater Sandhill Cranes was placed on the U.S. Fish and Wildlife Service, Region 1's Sensitive Species List in 1982. In 1983 the California Fish and Game Commission added the Greater Sandhill Crane to the state list of Threatened bird species. Since these actions, the subspecies has received significant management attention in California. This includes annual monitoring on the breeding and wintering grounds and land acquisitions in Big Valley (Ash Creek WA) and in the San Joaquin Valley (Woodbridge Ecological Reserve). Wetland easements include the Soil Conservation Service's Water Bank Program, which has protected some crane territories temporarily in Modoc County. However, many areas within the California nesting and wintering ranges are still in need of protection. In northeast California, major nesting areas in Surprise Valley, Jess Valley, Pit River Valley and near Davis Creek, in Modoc County, and Ash Valley, and Willow Creek Valley in Lassen County continue to be threatened by potential drainage and conversion to agricultural crops. In addition to nesting areas, portions of the wintering ground need protection. Winter roost sites are important; however, it is also critical that suitable foraging areas (usually fields of cereal grains) be available for crane use. The conversion from corn to vineyards, for example, could eliminate some of these areas as usable crane habitat.

Currently, powerline marking devices have been used successfully on Modoc NWR to prevent collision mortality in cranes. Unfortunately, few of these devices have been used elsewhere within the California nesting and wintering ranges. Although these powerline marking devices are important to prevent collision mortality in areas where nesting cranes occur, there appears to be an even greater need for their installation on lines near winter roosting and feeding sites in the Central Valley. As many as 22 cranes are known to have been killed in a single day as birds left a roost site on a foggy morning (T. Pogson, R. Schlorff, pers. comm.). This type of loss could be eliminated by the use of

powerline markers (particularly bright orange spheres). Powerline mortalities have been virtually eliminated at some crane concentration areas in Oregon, Colorado, New Mexico, Wyoming, and Modoc NWR, California (R. Drewien, D. Lockman, C. Bloom, pers. comm.) with these marking devices. It is important that a marking program be initiated on certain powerlines in the Central Valley crane wintering area as soon as possible. Cooperation from utility companies will be required before this source of mortality can be reduced.

Spring and summer livestock grazing continues to negatively impact sandhill crane productivity on both private and public lands. Some habitat improvement has occurred on the Modoc N.F.; however, it is known that many wetlands are still being grazed during the nesting and fledging period. Most crane nesting areas on the Lassen N.F. are grazed by cattle during summer months. No crane pairs successfully nested on the Lassen N.F. in 1988. On private lands, little can be done to reduce grazing pressure except through establishment of conservation easements or the purchase of the impacted lands. However, efforts need to be initiated or expanded on National Forest lands to remove cattle from wetland habitat where conflicts are known to cause reproductive failure in cranes.

Riparian habitat must be fenced and protected to avoid erosion and subsequent water table lowering in riparian-meadow areas on all public lands. Efforts to enhance riparian-meadow habitat on private lands should be investigated. In some areas, crane habitat could actually be created simply by increasing water table levels.

Predator populations (coyote, Common Raven, raccoon (Procyon lotor)) should be monitored closely and controlled if necessary. Common Ravens have significantly increased throughout the nesting range of cranes in California since 1981 (Littlefield, pers. obs.), and coyotes were regularly seen in many crane nesting areas in 1988, particularly Ash Valley, Sierra Valley, Plumas and Sierra counties, and Lower Klamath NWR, Siskiyou County. Crane reproductive performance needs to be monitored periodically and, if it is found that persistently low recruitment rates occur in particular regions of the state, then more intensive nesting studies should be initiated. If it is determined that predators are responsible, then control measures should be taken. The high recruitment rates evident on the Modoc NWR indicate that proper management of predators can improve both nesting and fledging success (Modoc NWR files).

It is recommended that the State continue to pursue an aggressive program of acquisition and other strategies to protect wetlands used by nesting cranes. Greater Sandhill Cranes are an indicator species of productive wetland ecosystems, and by protecting these lands other wetland species will also benefit. Also, increased commodity prices make the potential for extensive land conversions more likely. Such conversions have the potential to virtually eliminate Greater Sandhill Cranes from private lands. In order to preserve a small nesting population it will become increasingly important to maximize crane production on public lands in California in the next decade.

Wintering sandhill cranes in the Central Valley currently are dependent on certain agricultural practices and cropping patterns. Cranes primarily concentrate on private lands and are vulnerable to any land-use changes that alter their feeding, loafing, and roosting habitats. Aside from purchasing certain parcels of land to ensure that critical roosting and loafing sites are available and free from disturbance, there is relatively little habitat that can be placed under the protection of governmental agencies. Most feeding areas are on private lands and the only means agencies have to ensure continued availability of these sites for crane-use may be through certain kinds of landowner cooperation programs and establishment of conservation easements. Thus, the private sector may ultimately hold the key to the future viability of crane populations on both the breeding and wintering ground. The challenge facing the Department is to ensure the persistence of Greater Sandhill Cranes on lands where we traditionally have had relatively little control in terms of land-use changes.

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XI. REPORT PREPARED BY:

Nongame Bird and Mammal Section
Wildlife Management Division
California Department of Fish and Game
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XII. CONTACT FOR FURTHER INFORMATION:

Ronald W. Schlorff
Nongame Bird and Mammal Section
916-322-1261

XIII. DRAFT REPORT REVIEWED BY:

Carroll D. Littlefield
Malheur Field Station
HC 72 PO Box 260
Princeton, OR 97721