

FINAL REPORT
2001 GREATER SANDHILL CRANE NESTING SEASON
AT CONBOY LAKE NATIONAL WILDLIFE REFUGE,
KLICKITAT COUNTY, WASHINGTON

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INTRODUCTION

Since 1995, the Ridgefield NWR Complex has monitored the only known breeding population of greater sandhill cranes in Washington. This sandhill crane population is classified as endangered by the state of Washington due to its limited range and small extant population. Formerly more widespread, this subspecies is currently known to nest only in the following areas: Conboy Lake NWR within the Glenwood Valley (Klickitat County), Panakanic Valley (Klickitat County), Yakama Indian Nation land (Yakima County), and one site on Department of Natural Resources land (Klickitat County). For the purposes of this report, the "on-refuge" designation pertains to cranes nesting in the entire Glenwood Valley because all individual crane territories lie partially or entirely within the refuge boundary.

METHODS

From 1995-2000, refuge staff regularly monitored the crane population in the Glenwood Valley. Off-refuge sites were monitored 1-2 times per season through multi-agency aerial surveys. Beginning 08 March 2001, refuge staff monitored arrival, territory establishment, pair formations, nest building, and colt (chick) production of Conboy Lake cranes. Systematic surveys were conducted at least once per week during the nesting season. Additional surveys were conducted through September as needed to determine colt survival, fledging, and fall departure dates. Overall, survey effort was reduced from the previous two years. Incidental crane observations by other refuge personnel and cooperators were entered into the database as well.

The first comprehensive survey was conducted at the refuge on 16 March. This survey focused on locating all territorial crane pairs. Survey effort increased during the nesting period in order to locate as many nesting sites as possible and collect data on nest initiation and nest success. A refuge-wide survey was conducted on 09 July by refuge staff and a Washington Youth Conservation Corps crew. This survey focused on attaining a total population count as well as locating colts for banding. During surveys, cranes were counted and their locations mapped, color banded birds were recorded, nesting territories identified and colt status was evaluated.

This year, two helicopter surveys were conducted on 11 May and 14 June. The purpose of these flights was to verify ground observations, fill data gaps, locate nest sites, locate new or unconfirmed pairs, and determine off-refuge nesting activity. As part of an ongoing color-banding project on the refuge, one colt was banded on 19 July.

The relatively low number of crane pairs, the presence of color-banded cranes, and their use of discrete territories allows for many birds to be identified to known pairs or territories. This has

allowed for the establishment of a long-term database on individual crane pairs, their territories, and their reproductive history. This data will be incorporated into the refuge GIS system in order to assess habitat utilization. Further descriptions of survey methods can be found in previous annual reports.

Sandhill crane survey objectives for the year 2001 included:

- determination of nesting population (on and off refuge)
- evaluation of nest success
- monitoring of colt survival
- continuation of colt color-banding project
- evaluation of the effects of drought conditions on crane territories and nesting success

RESULTS

Glenwood Valley Production

The first cranes returning to Conboy Lake were documented on 08 March 2001. All four colts color-banded in 2000 were observed with their parents upon their return to Conboy Lake, however they were forced from their parent's territories within a week after arrival. All expected crane pairs were documented back on the refuge by 27 March.

Ground monitoring and aerial flights identified sixteen territorial pairs and ten non-breeding subadults on the refuge. Fourteen pairs were confirmed as nesting, while two pairs were suspected of nesting. The distinction is made here between territorial pairs (16) and nesting pairs (15). The latter is determined by confirmed nesting attempts plus highly suspected nesting attempts due to the presence and behavior of established pairs in known territories. Due to drought conditions only six pairs were able to nest in their established territories and four pairs were forced to abandon their established territories. The remaining pairs used a combination of new nesting areas and portions of their established territories for foraging. It is estimated that only 20-25% of wetlands typically available for nesting and foraging were available in 2001. This reduction in nesting habitat caused contractions in territory size, considerable territory shifts, and increased territorial interactions. In one instance, three pairs nested within a 28 hectare (70 acre) wetland; a site perennially occupied by a single pair. A banded pair established a new territory approximately 3200 meters (2 miles) from its previous nesting territory. Another banded pair re-nested 1400 meters (0.9 miles) from its earlier failed nest, as waters continued to recede.

The tracking of six pairs proved difficult this season due to the various territorial shifts. Certain assumptions were made based on previous years data and presence at foraging sites to designate these specific pairs to new nest sites. In two instances, new territories have been designated, as these sites are considered discrete enough to become long-term territories. The assumptions made regarding these territorial shifts are subject to change depending on additional information collected in 2002. The sixteen pairs observed at Conboy Lake in 2001 equals the number of pairs present in 2000. All pairs/territories will be re-aligned if necessary after the 2002 field season, once an assessment of the drought effects is completed.

One new territory was established this year by the 1999 color-banded colt Green/Black. This bird was observed on several occasions in the Panakanic Valley, however nesting was not confirmed. This bird was also observed several times at Conboy Lake accompanied by the 2000 color-banded colt Blue/Red; this pair was also observed once together in the Panakanic Valley. This latter bird (Blue/Red) had not been observed otherwise during the season, since its March arrival. It is not expected that this bird would have attempted nesting this season therefore the true affiliation of these two birds will need to be resolved in 2002. The whereabouts of the crane pair that had occupied the Panakanic Valley since the early 1990's is unknown.

The first observation of a nest exchange and nest occurred on 10 April. Fourteen nesting attempts were verified by 09 June. Nests for the North Oxbow and Laurel pairs were never confirmed. The North Oxbow represented a new territory and observations suggest that any nesting attempt was short-lived. The Laurel pair is a well-established pair but difficult to collect nest data on due to its utilization of private property. Timing and observations of single territorial birds suggest that this pair probably had two failed nest attempts. Nest documentation or survey data indicates that eleven pairs re-nested after initial nest failures. This high level of re-nest attempts might be expected given the poor water conditions. In at least two instances, elk are suspected of causing nest abandonment. Elk/crane interactions were noted where elk activity was high. Frazier Meadow and Conboy Lake had unusually high summer elk concentrations, probably due to dry conditions in the surrounding mountains. Nine nests were documented between the three pairs at these two sites.

This year, nine of the fourteen known nesting attempts hatched and twelve colts were initially observed. The first nest hatched (Willard) on 10-11 May. The first colt (C&H) was observed on 15 May and was estimated to have hatched on 12 May. The last nest was estimated to have hatched on 24 June based on the observation of two very young chicks.

Only one colt (Myer pair) was known to survive to near fledging age (8 weeks). This bird was color-banded but disappeared within a week after banding. In 2001, this territory was dry so no escape water or significant vegetation cover existed on the site. The Myer pair nested north of Camas Ditch (outside of their typical territory) but routinely walked/swam the colt between available roosting water and the foraging area. The exposure of this colt to potential predation was considerable and a family of coyotes was noted denning within the foraging area. Private land within this parcel also dictates the cranes to negotiate a considerable amount of fence line. The combination of factors probably played a role in the loss of this colt.

The last sighting of cranes in the Glenwood Valley occurred on 19 September. During the 26 and 28 September surveys, no cranes were observed. Typically, cranes linger into late September or the first week of October.

Table 1 summarizes the population estimate, number of breeding pairs, and production in Washington from 1990-2001.

TABLE 1. Greater Sandhill Crane: Breeding Pairs and Production in Washington, 1990-2001

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
WA Population Estimate ^A	6	8	6	6	8	22	26	34	39	40	47	50
#Breeding Pairs On-Refuge ()^B	3	3	3	3	3	7 (2)	8 (2)	12	14	13 (1)	13 (3)	14 (2)
#Breeding Pairs Off-Refuge ()^B					1	1 (1)	2 (1)	3	(3)	3 (1)	2 (1)	2 (3)
#Subadult Individuals On-Refuge						0	0	4	5	4	9	10
# Young Produced*	1	1	3	0	0	1	3	5	5	5	6	0

1990-1994 data is based on incidental observations; the numbers presented are unconfirmed estimates.

^A - data includes confirmed pairs, unconfirmed pairs, and subadults but does not include young fledged that year

^B - data in parentheses represent territorial pairs without confirmed nesting data

"On-refuge" refers to cranes nesting within the Glenwood Valley

"Off-refuge" refers to cranes nesting outside the Glenwood Valley

* - this number reflects young known or suspected of joining the fall migration

Helicopter Surveys

The first helicopter survey was conducted on 11 May 2001. The flight covered the Glenwood Valley, Department of Natural Resources land (DNR), and the Panakanic Valley. The Yakama Indian Nation (YIN) was not surveyed this year due to lack of funding.

Within the Glenwood Valley, the flight confirmed 9 nests (5 of which were second nesting attempts) and 0 colts. At the Deer Creek site on DNR land, two birds were observed near a suspected nest, however no further data was collected on this pair's nesting and reproductive status. The Panakanic Valley pair (Green/Black & Blue/Red) was observed throughout much of the season, however nesting was not confirmed. As stated earlier, the age of the apparent female (Blue/Red) suggests that nesting was unlikely.

The second helicopter survey was conducted on 14 June 2001 and covered the Glenwood Valley and the DNR lands. Funding for both flights was provided by Ridgefield NWR and the Washington Department of Fish and Wildlife. During this flight, 2 colts were observed, 1 each for the Conboy Lake and Myer pairs.

Color-banding Project

All four of the colts banded in 2000 returned to Conboy Lake NWR as subadults.

Only one colt was banded in 2001. The Myer colt was banded with a Red/Black identifier on its left leg and a Blue/White/Blue site band and a FWS band #599-25726 on the right leg. This bird did not survive to fledging.

A total of 17 crane colts have been color-banded on the refuge since 1996. Six of these were suspected of not having survived to the fall migration. Of the eleven banded colts (pre-2001) that we assumed migrated in the fall, 10 subsequently returned to the Glenwood Valley the following season. Three banded male cranes have established nesting territories at Conboy Lake NWR, while another male has apparently set up a territory in the Panakanic Valley. A female has been nesting on the Mt. Hood National Forest since at least 2000. As follows is a summary of re-sightings and status of known fledged colts, by unique band color code.

- A. Red/Green was banded on 6/26/96. It was observed near the town of Glenn, Glenn County, CA on 14 January 1997. It returned as a non-breeder to Conboy Lake NWR during 1997. This male crane returned to Conboy Lake NWR as a breeder from 1998-2001; so far, it has been unsuccessful in fledging young.
- B. Black/White was banded on 6/26/96 and is the sibling of Red/Green. It was observed near the town of Glenn, Glenn County, CA on 14 January 1997. It returned as a non-breeder to Conboy Lake NWR during 1997. This male crane returned to Conboy Lake NWR as a breeder from 1998-2000; so far, it has been unsuccessful in fledging young.
- C. White/Red was banded on 7/16/97. It returned as a non-breeder in 1998 and it was subsequently observed during the fall migration on 29 September 1998 at Lower Klamath NWR, Siskiyou County, CA. It was not observed in 1999. This female crane was observed with an unmarked bird on 22 May 2000 on the Camas Prairie in the Mt. Hood National Forest, Wasco County, OR. (FS personnel, M Gould, pers. comm.) This bird's color-band code was later verified by G. Ivey on 6 June 2000; nesting was not confirmed. This pair was observed on 6 April 2001 at the Camas Prairie by J. Engler. Nesting was confirmed in 2001 when the pair was observed with two colts on 20 May (M. Gould, pers. comm.); fledging is unknown but the timing suggests that fledging was likely
- D. Green/White was banded on 7/16/97. It returned as a non-breeder in 1998 and it was subsequently observed during the fall migration on 29 September 1998 at Lower Klamath NWR, Siskiyou County, CA. It was re-observed at Conboy Lake NWR only once per season in both 1998 and 1999. It was not observed in 2000 or 2001. It is believed to be a male.

- E. White/Blue was banded on 7/2/98. It returned as a non-breeder in 1999 and was observed on 14 November 1999 along Woodbridge Road in San Joaquin County, CA. It returned paired with an unbanded bird to Conboy Lake NWR in 2000. Nesting was likely in 2000 but not confirmed. Nesting in 2001 was confirmed, however it did not fledge young.
- F. Green/Black was banded on 7/6/99. It returned as a non-breeder to Conboy Lake NWR during 2000. It did not exhibit any noticeable signs of the leg injury it sustained prior to the fall 1999 migration. This male crane was observed periodically in the Panakanic Valley and at Conboy Lake during 2001 accompanied by the 2000 banded colt Blue/Red. Nesting was not confirmed.
- G. Black/Red was banded on 7/6/99. It did not return to Conboy Lake NWR in 2000. However it was observed at Butte Sink NWR, Sutter County, CA on 3 November 2000. It was not observed in 2001
- H. Green/Red was banded on 7/11/00. It returned to Conboy Lake NWR during 2001 as a subadult. It is believed to be a male.
- I. Green/Blue was banded on 7/11/00 and is the sibling of Green/Red. It returned to Conboy Lake NWR in 2001 as a subadult. It is believed to be a male.
- J. White/Black was banded on 8/11/00. It returned to Conboy Lake NWR in 2001 as a subadult. It is believed to be a male.
- K. Blue/Red was banded on 7/18/00. It returned to Conboy Lake NWR in 2001 as a subadult. It is believed to be a female.

DISCUSSION

This season marks the seventh year of data collection on the refuge's crane population with additional data collected regarding off-refuge crane nesting. The project has documented 1) the existence of an expanding breeding population in Washington, 2) individual pair reproductive rates and territory data, and 3) a variety of site fidelity, dispersal and migration-related data through the color-banding program.

The 2001 season offers a unique look at the impacts of drought conditions on this small population of cranes. These impacts will not be fully analyzed until after the 2002 field season when an assessment of altered territory use and reproduction can be determined. Since 1995, sixteen breeding territories have been documented on the refuge. Some of these are well defined and occupied annually, while others have experienced various habitat alterations (primarily water levels) that cause nest loss and/or territory abandonment. The drought provided extreme examples of these variables, affecting every crane pair on the refuge. Water levels play a critical role in nest initiation, placement and survival, as well as in the seasonal availability and productivity of moist foraging and roosting habitat. Cranes utilize a variety of wetland and

upland types for these activities including dry grass uplands, partially timbered uplands, emergent marsh and wet meadow. The seasonal availability and condition of these habitats within individual crane territories ultimately dictate crane productivity. Since 1997 fledging rates averaged five young per season, while there was no fledged young in 2001. The 2002 nesting season will provide information on whether drought exhibits a one season perturbation in the life of the cranes or has the potential to re-arrange territories, thus affecting the long-term productivity of the population.

As stated in previous reports, changes in a single crane pair's status can have far reaching impacts on the overall Washington population. From 1995-2000, nest success (at least one egg per nest hatching) was 67%, this based on those nesting attempts (n=69) for which good data exists. Nine of fifteen pairs (60%) met or exceeded this nest success rate. However, four pairs produced 73% of the fledglings, with one pair producing 30% of those. Furthermore, three pairs (all adjacent pairs in the northeast section of the valley) have produced 56% of the fledglings during this period. These areas were particularly hard-hit by the drought. With only a few crane pairs producing the majority of the fledglings, the loss of a single crane pair or its territory could have long-term negative consequences to the population. Whether habitat and territorial alterations due to the drought affect the most productive crane pairs in 2002 remains to be determined.

One of the major challenges facing the long-term health of the breeding crane population is locating and managing additional sites for crane production. Many of the crane pairs utilize portions of the refuge directly or indirectly influenced by private agricultural in-holdings. Similarly some pairs attempt to nest on private lands. To date, these crane pairs have been largely unproductive. While a variety of causes can be hypothesized for this lack of productivity, the variability in water conditions dictated by agricultural uses seems to rise to the forefront. Finding solutions to these use-conflicts will require considerable efforts working with private landowners and water districts both within and outside the Glenwood Valley.

The collection of data on off-refuge crane pairs has waned in the past few years, as money for flights has decreased and cooperators have dropped from the program. Off-refuge data is critical as witnessed by the apparent loss of the established pair in the Panakanic Valley and the appearance of a possible pair at Trout Lake Marsh. Yakama Indian Nation lands have not been fully surveyed for several years. Re-establishing the cooperative program and initiating additional ground surveys at off-refuge sites is vital to assessing the problems and needs for expansion of Washington's nesting crane population.

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