

**FINAL REPORT
1999 GREATER SANDHILL CRANE NESTING SEASON
AT CONBOY LAKE NWR**

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INTRODUCTION

The Ridgefield NWR Complex has intensively monitored the only known breeding population of greater sandhill cranes in Washington since 1995. This breeding population of greater sandhill cranes 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 on or adjacent to the Conboy Lake NWR in or adjacent to the Glenwood Valley (Klickitat County); the Panakanic Valley (Klickitat Valley); and on Yakama Indian Nation lands (Yakima County). For the purposes of this report, "on-refuge" cranes pertain to those nesting in the Glenwood Valley, since at least part of the individual territories lie within the refuge boundary.

METHODS

During the 1995-1998 period, the crane population has been regularly and intensively monitored by refuge staff. In 1999, staff monitoring was reduced significantly during the early season due to other work priorities. Conboy Lake volunteer Jill Begala monitored crane family groups and assisted with banding operations from June 1 to August 15. Refuge staff provided some assistance to the monitoring program from June through September, however, effort was greatly reduced.

All documented crane sightings are mapped and will be included in the refuge's GIS system, once it becomes functional. This will enable additional analysis of territory boundaries, with subsequent evaluation of habitat utilization. Observed cranes are counted, checked for color-bands, linked to a nesting territory when possible, and nesting/colt status is evaluated and documented. Further descriptions of methods can be found in previous annual reports.

Monitoring objectives on the refuge included: 1) determining the nesting population; 2) determining nest success; 3) monitoring colt survival; 4) facilitating color-banding of colts. Additionally, one helicopter survey was conducted on 14 June to: 1) verify refuge monitoring results; 2) fill data gaps; 3) locate nest sites; 4) determine off-refuge nesting activity; 5) locate new or unknown nesting pairs.

RESULTS

Glenwood Valley Production

The first returning cranes were documented on 8 March; generally cranes start returning the last

week of February. Cranes were documented sporadically by personnel conducting Oregon spotted frog breeding surveys during March and April.

The first (and only) intensive refuge-wide nesting survey was conducted on 27 April by Engler and Anderson. Follow-up limited surveys were conducted by Engler on 19 and 23 May, to fill in missing data gaps. These surveys proved insufficient to locate and verify all refuge nesting pairs, in part, because two pairs abandoned their territories due to lack of water (Kreps and Giersch pairs), and one pair (Miller #1) was displaced by another adjoining crane pair.

As of 15 June, only 7 nests were verified; however, an additional 4 pairs were confirmed through the presence of colts within known territories. The twelfth confirmed pair believed to be the Miller #1 pair was observed with 2 colts, however, their new nesting location was never verified. Pairs believed to be the Kreps and Giersch birds were occasionally seen in the vicinity of Kreps Lane; one of these pairs was suspected of nesting north of Kreps Lane on/near refuge property (aspen groves) but was not verified. During this period: 1) two pairs were known to renest after initial nest failures; 2) at least 4 non-breeding subadult cranes were observed, including a subadult color-banded (white/blue) as a colt in 1998; 3) two colts banded in 1997 were not observed this season.

This population continued its trend of excellent hatching success with 10 of 12 pairs known to have hatched clutches (at least 13 colts were observed). One additional nest was suspected of hatching (Willard) but could not be confirmed. Of the two pairs that abandoned territories, one was subsequently observed with a fledged colt on 16 September; no additional information was collected for the second pair. The first colts were observed on 19 May and believed to have hatched approximately May 12. Monitoring through the summer verified that at least 5 colts fledged. For the season, 13 of the 14 pairs expected to return to the Glenwood Valley were confirmed as nesting. Table 1 summarizes the population estimate, the number of breeding pairs, and production in Washington from 1990-1999. Table 2 summarizes breeding chronology for individual crane pairs from 1995-1999.

Helicopter Survey

The helicopter survey was conducted on 14 June. Flight funding was provided by Ridgefield NWR, Washington Department of Fish and Wildlife, and Champion International. The flight covered the Glenwood Valley, Panakanic Valley, Yakama Indian Nation lands (YIN), and potential sites on Champion International lands. Due to insufficient funding, the flight was abbreviated from past years due to insufficient funds for refueling, which is necessary to adequately cover all areas.

Within the Glenwood Valley, the flight failed to resolve specific territory and nesting questions, as it was conducted quickly due to the shorter flight schedule. The Panakanic pair attempted to nest according to the landowners, however, the nest apparently failed. On the YIN, the Polo Field (north of Signal Peak) pair was incubating 2 eggs; the fate of this nest is unknown. Due to

distance (low fuel supply) and heavy snow coverage, the Camas Patch (Dry Creek) site was not flown; it is assumed that the pair attempted to nest. No other nests were located on the YIN. A new nest was located northeast of Glenwood along Deer Creek, Klickitat County, on land owned by the Department of Natural Resources. This pair was observed incubating 2 eggs, however, a subsequent ground survey failed to reveal the fate of this nest. Follow-up surveys need to occur in 2000 to verify this as a new breeding pair, and not the Camas Patch pair. With the high late snowpack, it is conceivable that the Camas Patch pair could have dropped to this lower elevation nesting site.

Color-banding Project

Three colts were color-banded in 1999. The Dean Meadow colt was banded on 6 July with a green over black identifier band, a tall blue/white/blue site band, and a FWS band #0599-25719. This subadult was known to have fledged but was observed late season (16 September) limping badly. It is believed to have hit a fence, some other unforgiving surface, or possibly was injured by a predator. This bird exhibited no signs of injury during the monitoring period (ending in mid August), so the injury is not expected to have been banding-related. Its long-term survival is dubious.

Banding of the two Arena colts was attempted on 6 July, however both colts flew (probably for the first time) when approached. One was subsequently captured after it landed, and banded with black/red, a site band, and a FWS band #0599-25720. These colts were obviously mis-aged as they were believed to be younger than the Dean Meadow colt. This mis-calculation occurred because of the lack of early season monitoring.

The third colt, believed to be from the C&H pair, was banded on 25 July with red/blue, a site band, and a FWS band #0599-25721. Neither the colt or the adults were observed after banding, so the colts status is unknown at this time. If this bird is re-sighted in 2000, it would represent the sixth fledged colt for the 1999 season.

Discussion

A total of 14 crane pairs were expected to nest in the Glenwood Valley in 1999. Thirteen of these pairs nested; nesting by the final pair could not be verified. Three pairs were expected to nest outside of the Glenwood Valley, of which 2 were confirmed as nesting; the status of the third is unknown. One new nest site was located. Due to some unverified data and certain assumptions having been made, it appears that there is currently 18 breeding pairs of greater sandhill cranes in Washington. Furthermore, at least 4 non-breeding subadults exist with an additional 5 young fledging, for a total fall population of 45 birds.

With staff monitoring and participation substantially reduced in 1999, long-term staff knowledge and data analysis of individual crane territories, pair behavior, and habitat utilization was compromised. Data shortfalls included: 1) lack of data for secretive and displaced pairs; 2) age

mis-calculations of colts which affected banding proficiency; 3) lack of habitat conditions and water level information; 4) lack of territory assignment for some crane sightings; 5) identification and location of nest sites and their specific habitat data. These shortfalls exemplify the need to maintain some consistency in the monitoring program from year to year. This is particularly important in the next few years, when this data is needed for making recommendations and decisions to guide management actions and develop a biologically sound Comprehensive Conservation Plan.

During the next few seasons, it is necessary to evaluate habitat utilization on a pair by pair basis. From the productivity data, it is obvious that some pairs are better producers than others, with 4 pairs producing 68% of the fledged colts since 1995. While this is likely a function of both adult parenting skills and habitat suitability, the commonalities between successful pairs (or unsuccessful pairs) needs to be determined. This information will help guide habitat improvement projects and provide data to evaluate the refuge's realistic carrying capacity of cranes, the refuge's contribution to the state's crane population, and thus the future of breeding cranes in Washington.

Off-refuge monitoring has been woefully inadequate the past 2 seasons, primarily because of the lack of flight funding due to the reduction in cooperating partners, and individual agency contributions. It is expected (at this time) that off-refuge nesting will have to provide the bulk of new nest sites, if the Washington population is to expand. There is little information regarding the adequacy of current off-refuge nest sites, and no information regarding minimal requirements for these small meadow sites. The availability of suitable expansion sites is purely conjecture. This aspect is probably best investigated through a university graduate project.

Color-banding has and will continue to provide valuable data regarding Washington sandhill cranes. However, due to the low number of cranes banded, many information gaps still exist. Specifically, the connection between Washington's on- and off-refuge cranes is unknown. While it is suspected that refuge crane production would 'seed' off-refuge sites, the seasonal intermingling of these birds is unknown. This lack of data has the potential to confound population and production estimates. Likewise, there is a lack of information regarding emigration or immigration in the Washington population. This issue, along with habitat availability, has important ramifications on the long-term viability of the Washington population.

Despite good productivity from refuge cranes, the known WA breeding population is not expanding in stride with output, suggesting that some subadult cranes are not returning to their natal areas. As might be expected, 2 color-banded males (which generally exhibit better natal site fidelity than females) returned to the refuge to nest their third season. However, 2- third-year banded birds and 3 - three and four year old unbanded birds have not returned this season. There are several possible reasons for these birds not to return including mortality; immaturity (not ready to breed) and may be wandering; emigration to unknown breeding sites. These issues may be partially resolved by increased color-banding, particularly of off-refuge birds, or utilization of satellite radio telemetry. The latter project is probably more suitable as a university graduate

project.

Recommendations

- 1) Utilize a seasonal technician or volunteer to conduct the bulk of the monitoring activities. However, maintain at least one staff person experienced with the Conboy Lake crane project to provide direct oversight and field assistance as needed, from April through October.
- 2) Continue the development of the GIS system for Conboy Lake NWR.
- 3) Initiate the collection of pertinent habitat data as it pertains to individual crane pairs. Continue the collection of territory data, and initiate entry and analysis of territory data via GIS capabilities.
- 4) Locate a reliable funding source for monitoring flights. The current year by year funding has not been reliable and has resulted in poor off-refuge data the past two seasons. At the current funding scenario, continuation of both on- and off-refuge flights is not feasible, if worthwhile data is expected to be collected. Utilization of several fixed-wing flights may improve off-refuge data, specifically for presence/absence data; however, nesting data would be compromised.
- 5) Agencies, private organizations, and Native American tribes should be approached as partners for a broad-scale monitoring program. Many potential crane nesting sites throughout the historic breeding range of this subspecies have not been surveyed. Data on potential expansion sites is required to evaluate the future of this subspecies in Washington and affect management strategies for these sites.
- 6) A short-term color banding program for adult cranes should be implemented to increase the number of identifiable individuals in the population; this should target at least 2-3 off-refuge cranes. Satellite transmitters should be utilized on colts or known subadults to collect data on site fidelity and pre-breeding dispersal.

Acknowledgments

Jill Begala for conducting most of the field monitoring and assisting with banding operations; Harold E. Cole for observation data, banding assistance and logistics; Jon Cole, Jeff Dillon, Ann Meckstroth, and Kent Olson for assisting with banding operations; Daniel C. Friesz, Marc P. Hayes, and Charlene Sperry for providing observation data; Sarah Russum for providing field monitoring assistance; Teunis Wyers and the Conboy Lake Youth Conservation Corps for assisting on population surveys and banding operations.

TABLE 1. Greater Sandhill Crane: Breeding Pairs and Production in Washington, 1990-1999

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
WA Population Estimate ^A	6	8	6	6	8	22	26	34	39	40
# Breeding Pairs on-refuge () ^B	3	3	3	3	3	7 (2)	8 (2)	12	14	13 (1)
#Breeding Pairs off-refuge () ^B					1	1 (1)	2 (1)	3	(3)	3 (1)
# Young Fledged	1	1	3	0	0	1	3	5	5	5

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

^A - data includes confirmed and unconfirmed pairs, and subadults but does not include young fledged that year
^B - data in parenthesis represent territorial pairs without confirmed nesting data

The designation “on-refuge” refers to all cranes within the Glenwood Valley, whether they nest on or off the refuge.
 The designation “off-refuge” refers to cranes nesting outside the Glenwood Valley.

TABLE 2. SUMMARY OF INDIVIDUAL CRANE PAIR NESTING SUCCESS AND PRODUCTION, 1995-1999

Pair Name	Year	Nest Outcome	# Colts Observed	# Colts Fledged	Pair Name	Year	Nest Outcome	# Colts Observed	# Colts Fledged
Arena	1995	hatched	1	0	Myer	1995	hatched	2	1
	1996	hatched	2	2		1996	hatched	2	0
	1997	failed	0	0		1997	hatched	2	1
	1998	hatched	2	1		1998	failed	0	0
	1999	hatched	2	2	1999	hatched	1	1	

Pair Name	Year	Nest Outcome	# Colts Observed	# Colts Fledged	Pair Name	Year	Nest Outcome	# Colts Observed	# Colts Fledged
Dean's Meadow ¹	1995	hatched	1	0	Ziegler ²	1995	hatched	1	0
	1996	hatched	1	0		1996	hatched	2	1
	1997	hatched	1	0		1997	hatched	2	0
	1998	hatched	2	1		1998	hatched	2	0
	1999	hatched	2	1	1999	hatched	1	0	

¹ also referred to as Lakeside or Powerline pair

² also referred to as Gamble or Bird Creek pair

(r) - indicates that pair re-nested after initial failure

TABLE 2 (continued)

Pair Name	Year	Nest Outcome	# Colts Observed	# Colts Fledged	Pair Name	Year	Nest Outcome	# Colts Observed	# Colts Fledged
Miller #1	1995	hatched	2	0	Willard	1995	failed	0	0
	1996	failed	0	0		1996	unknown	0	0
	1997	hatched	1	1		1997	hatched	0	0
	1998	failed	0	0		1998	hatched	1	0
	1999	hatched	2	0		1999	unknown	0	0

Pair Name	Year	Nest Outcome	# Colts Observed	# Colts Fledged	Pair Name	Year	Nest Outcome	# Colts Observed	# Colts Fledged
Head- quarters	1995	failed	0	0	Troh	1995			
	1996	failed (r)	0	0		1996	hatched	1	0
	1997	failed (r)	0	0		1997	hatched	1	0
	1998	failed (r)	0	0		1998	hatched	1	0
	1999	hatched	1	0		1999	failed	0	0

(r) - indicates that pair re-nested after initial failure

TABLE 2 (continued)

Pair Name	Year	Nest Outcome	# Colts Observed	# Colts Fledged	Pair Name	Year	Nest Outcome	# Colts Observed	# Colts Fledged
Dymond ³	1995	no data			Laurel	1995	no data		
	1996	hatched	0	0		1996	no data		
	1997	hatched	0	0		1997	hatched	1	1
	1998	failed	0	0		1998	hatched	2	2
	1999	hatched ^a	1	1		1999	hatched (r)	1	0

Pair Name	Year	Nest Outcome	# Colts Observed	# Colts Fledged	Pair Name	Year	Nest Outcome	# Colts Observed	# Colts Fledged
C & H	1995				Giersch	1995			
	1996					1996	no data		
	1997	hatched	1	1		1997	failed	0	0
	1998	hatched	1	0		1998	hatched	2	1
	1999	hatched	1	unknown		1999	no data		

³ also referred to as Krep's pair

no data indicates that a pair was present in territory, but no confirmed nesting information was collected

(r) - indicates that pair re-nested after initial failure

^a - the observed colt could not be 100% attributed to this pair; this colt may have been with Giersch pair

TABLE 2 (continued)

Pair Name	Year	Nest Outcome	# Colts Observed	# Colts Fledged	Pair Name	Year	Nest Outcome	# Colts Observed	# Colts Fledged
red/green ⁴	1995				black/white ⁵	1995			
	1996					1996			
	1997					1997			
	1998	failed ^N	0	0		1998	failed ^N	0	0
	1999	hatched	1	0		1999	hatched	1	0

Pair Name	Year	Nest Outcome	# Colts Observed	# Colts Fledged	Pair Name	Year	Nest Outcome	# Colts Observed	# Colts Fledged
Panakanic	1995				Deer Creek	1995			
	1996	unknown				1996			
	1997	hatched	1	0		1997			
	1998	unknown				1998			
	1999	failed	0	0		1999	unknown ^N		

(r) - indicates that pair re-nested after initial failure

^N - indicates a new nesting pair for the year⁴ also referred to as Miller #3⁵ also referred to as Miller #2

TABLE 2 (continued)

Pair Name	Year	Nest Outcome	# Colts Observed	# Colts Fledged		Pair Name	Year	Nest Outcome	# Colts Observed	# Colts Fledged
Cammas Patch ⁶	1995					Polo Fields ⁷	1995	hatched	0	0
	1996	failed	0	0			1996	hatched	?	?
	1997	failed	0	0			1997	hatched	1	1
	1998	no data					1998	no data		
	1999	no data					1999	unknown		

(f) - indicates that pair re-nested after initial failure

N - indicates a new nesting pair for the year

⁶ also referred to as Dry Creek Meadow pair

⁷ also referred to as Signal peak pair

Table 3: Eight-year Comparison of Sandhill Crane Counts Along the Lower Columbia River, 1991-1999

	1991	1992	1993	1994	1995	1995	1996	1997	1998	1999
	02-Oct	07-Oct	30-Sep	06-Oct	27-Sep	11-Oct	09-Oct	07-Oct	08-Oct	12-Oct
Campbell Lk.	866	281	441	54	335	757	983	455	921	1228
Bachelor Is.	0	0	ns	ns	470	365	111	240	26	73
River "S"	ns	ns	ns	ns	20	100	81	126	0	100
P.O. Lake	ns	ns	ns	ns	ns	ns	ns	231	0	ns
Fowler Lk.	ns	ns	ns	ns	ns	ns	ns	ns	45	18
Roth/RVS Dike	ns	ns	ns	ns	ns	ns	ns	269	0	ns
Rentenaar Pt.	ns	257	595	788	undet	951	507	765	355	51
The Narrows	851	341	537	836	898	1055	1640	897	1711	556
Big Wash	ns	ns	ns	ns	ns	ns	ns	ns	215	522
Coon Point	1517	289	1460	296	575	634	293	233	1000	500
Van. Bottoms	ns	40	ns	361	1	ns	0	ns	ns	ns
TOTAL	3234	1218a	2632b	2335	2107a	3862	3615	3216c	4273	3046

ns - not surveyed

undet - cranes heard in an unaccessible area, could not be counted or estimated

a - count missed the peak migration based on earlier data

b - estimated total count after subtracting duplications

c - roost counts low due to high water, cranes failed to utilize traditional roosts, many cranes were counted in flight and potentially counted multiple times. Obvious duplications have been subtracted from total.

TABLE 4: Columbia River Levels on Survey Date

	1991	1992	1993	1994	1995	1995	1996	1997	1998	1999
	02-Oct	07-Oct	30-Sep	06-Oct	27-Sep	11-Oct	09-Oct	07-Oct	08-Oct	12-Oct
Water Level * (feet)	na	1.51	2.78	2.35	3.27	4.62	2.60	5.26	3.68	2.88

* The daily mean level of the Columbia at the Vancouver gauge for the indicated date. Data supplied by the U.S. Army Corps. of Engineers. (Information available at <http://mwp71.nwp.usace.army.mil/cgi-bin/DataQuery?>)

na - data not available

Anderson, ERIC - Ridgefield NWR