1992 CANADA GOOSE PRODUCTION STUDY

FISH SPRINGS NATIONAL WILDLIFE REFUGE

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OBJECTIVES:

1. Determine the reproductive success of the breeding population including average clutch and brood size, total hatched, total fledged.

2. Evaluate the breeding goose population in relation to 1989 and 1990 production, population growth, nest site selection and drawdown response.

PROCEDURES:

Three pair counts were completed between April 5 and May 14. Locations of goose activity were noted and/or mapped during the counts. Supplemental observations were made between counts to verify nesting territories and foraging/loafing areas. Only those pairs or lone males which displayed a specific site affiliation were tallied as nesting pairs. Groups of geese that broke into pairs when flushed were treated as flocked birds. Pairs which did not show any strong territoriality were considered to be non-nesting, first or second year subadults. These pairs were not used to calculate nesting data.

As pairs started nesting, intensive observations were made to locate the exact nesting site. "Located" nests were checked at least once to determine clutch size. Nests with less than five eggs were rechecked to verify the final clutch size. Nests checks were made by foot, canoe, and/or airboat depending on the location of the nest. Nest observations were made by distant vehicle and spotting scope to note nest activity and limit disturbance. When hatching times approached, nests were checked if the female was not visible from the vehicle after two or more sighting attempts (usually within two days) or when new broods were sighted in the area. This was dependent on the degree of visability exhibited while incubating, others were more wary and only the tops of their heads could be observed from time to time.

Brood counts were started after the first brood was observed on April 23. Broods counts were conducted two to three times a week, and during pair counts and bi-monthly avian surveys. Incidental observations provided valuable information on broods and use areas. Brood age, size, and location were recorded and efforts were also made to monitor brood mortality. Location of use-areas became important in latter weeks to determine the overall gosling population. Known use-areas were the focus of subsequent gosling banding efforts.

RESULTS:

Pair counts were conducted on April 5, May 8, and May 14. There was an average of 26 pairs counted (high-27, low-24). The adult goose population on May 14 was 177.

Twenty two (22) pairs of geese were considered to be breeders. Other pairs observed on pair counts could not be pinned down at the later date to suggest nesting activity. Of the 22 apparent nesting pairs, 13 nests were located. Appendix 1 summarizes nest site locations and nest data.

Twelve (12) of the 13 known nests hatched (success = 92%). One nest (P21) was apparently abandoned.

The average clutch size of known nests was 4.8 (high-7, low-3). Artificial structures and islands again provided most of the nesting sites. Appendix 2 summarizes overall nesting data, in regard to nest site selection.

The first brood was observed on April 23, almost 2 weeks earlier than in 1991 but quite comparable to the first brood date for 1990. The first brood hatched from Harrison Unit .

Based on brood counts conducted in late April, a minimum total of 18 different broods were present on the refuge during that period. The average brood size for the 18 broods observed during the first month of hatching was 4.5 (high-7, low-2). All broods observed during this period were class I in development. The 18 broods accounted for 82 goslings. Brood counts conducted during May revealed three additional broods, accounting for 13 additional goslings. This would indicate a production total of 95 goslings. By late June, there were 31 goslings comprising a total of eleven broods. The average brood size was 2.8. All broods observed during this period were class II or III in development. At this point, a total of 31 fledged goslings would indicate a gosling mortality rate of 67%.

Refuge personnel banded 23 goslings from June 12 to June 24, bringing the total number of goslings banded since 1989 to 62 of the estimated 104 fledged. A great deal of time and effort was spent this year monitoring brood activities and locations. This aided our banding effort greatly, and enabled the refuge to band nearly 75% of this years fledged geese.

DISCUSSION:

The 1992 Canada Goose production at Fish Springs was similar in many respects to the past several years i.e., little positive growth. The total number of breeding pairs increased four from last year.

The gosling survival rate of 33% is a slight decrease from the

1991 rate of 36% and considerably lower than the 1990 rate of 51%. Production was estimated at 31 fledged goslings in 1992. This is nearly double the production of 1991 (18 fledged goslings) and quite similar to production for 1990 (33 fledged goslings).

Though this years production is an encouragement over 1991, production is still well below the pre-hunting season levels prior to 1978 (average of 104 fledged per year). Because the breeding population has essentially remained unchanged since 1989 (an increase of 4 breeding pairs over 3 years), true population growth will not be realized until the number of breeding pairs increases.

Marsh Drawdowns

Avocet Unit was drawn down this year. Effort to de-water this unit prior to the onset of nesting by geese as well as other nesting waterfowl and wading birds was successful. In 1991 this unit accounted for three of 15 known nests. This year, Avocet Unit accounted for one of a number of suspected nests occurring on natural islands that went undetected. Pair counts revealed a breeding pair in south Avocet, and a single brood was observed regularly, however the nest was not located.

Egret and Harrison Units, which were both drawn down in 1990, were used extensively in 1992 by broods. This demonstrates well, the effect of draw downs in maintaining quality marsh habitat and increasing foraging areas during the first several years following the reflooding of draw down areas.

Negative impacts of the scheduled marsh drawdowns could include displacement of breeding pairs to unfamiliar or marginal territories, thus reducing productivity. The completion of drawdowns early in the nesting season is important to avoid having pairs nest on units that will be dry at hatching. This will reduce the gosling mortality that would be incurred by broods trekking across large open areas in search of water.

Nest Site Selection and Fidelity

Many similarities exist between nest site selection in 1992 and past years. Site fidelity is well documented in many species of birds, including geese, so it is no surprise that many of the same structures and territories were used in all four years. Appendix 1 denotes "site fidelity" pairs. Eight of the pairs used the same nest site as in 1991, and four of these eight sites were used all four years.

The affinity of the breeding goose population to utilize the same nests or territories each year underscores the importance of maintaining established nesting islands and platforms. Nesting

platforms and islands are essential in reducing nest predation, as can be seen from Fish Springs data as well as many other published reports. The maintenance and subsequent use of artificial nesting structures will play an important role toward attempting to increase the Refuge's Canada goose population.

It is worth noting, that the nesting of at least eight pairs of geese occurred in natural nesting areas this year. This is an increase over past years incidence of nesting in areas other than artificial nesting structures. Maintenance of artificial nesting structures was minimal in 1992 prior to goose nesting, and there were a number of structures that were in need of maintenance. This may, in part, explain the shift of some nesting activity, and stress the importance of maintaining quality nesting structures.

It is notable that 1992 marks the second consecutive year in which no known nests were known to have failed due to predators. In 1990 the failure of two nests was attributed to predation and in 1989 one nest was lost to predation.

RECOMMENDATIONS:

CONTINUATION OF GOOSE STUDY

The continuation of an intensive goose study is recommended until the breeding goose population rebounds or until it can be determined that the reason for the failure of the population to rebound can not be reversed by any management action. Though time consuming, the information collected is important to evaluate the progress of this population. A less intensive study can lead to many erroneous assumptions and thus skew the collected data. The collection of accurate data will benefit the Refuge both now and in the future, when hopefully, large nesting populations will confound the data collection process. This data will serve as a guideline to evaluate future production.

WATER QUALITY

The issue of naturally occurring poor water quality in goose rearing areas must be addressed in the very near future. Most goose broods are being reared on larger open water impoundments where the water salinities are above levels that have been shown to cause morbidity and possibly mortality in mallard ducklings (Mitcham and Wobeser, 1988). In those studies, ducklings reared on water with conductivities of 7,720 umho/cm showed reduced growth and vigor (increasing susceptibility to predation). When reared on water with conductivities of 20,000 umho/cm mortality occurred within 14 days.

Conductivities in brood rearing areas on the Refuge range from 7,600 umho/cm to as high as 17,000 umho/cm during the brood

rearing period (May-July). These levels are higher than those that are identified by Mitcham and Wobeser as causing morbidity and possibly direct mortality among ducklings. In discussing the refuge water quality with Dr. G. Wobeser, it was his opinion that Canada Goose goslings are no more or less susceptible than mallard ducklings to the toxic effects of salinity associated with elevated conductivity levels.

If Canada Goose production is to remain a refuge objective, it is only fundamental that the refuge water quality, and the apparent resulting effect it has on gosling survivorship, be investigated to determine its overall impact on goose production.

PRESCRIPTION BURNING AND WATER MANAGEMENT

As recommended in 1989 and 1990, prescribed burning and water control needs to be a major priority, in order to enhance the overall habitat. While it has not been proven that coyote predation on goslings is a major limiting factor on gosling survival, efforts to reduce coyote numbers prior to the hatching season should continue.

The current marsh management practices of drawdowns and prescribed burning should prove beneficial to goose production and should be continued. It is important that drawdowns be far enough along in early spring that nest initiation does not occur in a unit that will be dry. In addition to the normal unit prescribed burning that occurs in conjunction with a drawdown, consideration should be given to burning small areas that would be preferred foraging sites for broods on a more frequent basis. This practice might attract broods to quality foraging area that are not quite so vulnerable to coyote predation due to less visual obstruction from older age cover types.

COLOR MARKING

Color marking of known breeders and locally raised geese is still a major need. All the breeding data loses it full value if the wintering and migratory dynamics of the Refuge geese is not understood. Leg band returns will provide little useful information in the short term, as the current, small population will afford few returns. Color marking, either neck bands or wing markers, will provide immediate results as to movements around the Refuge. Fall and winter monitoring will also provide an accurate assessment of migratory activities.

PRIORITIES:

1. Assess/evaluate the goose hunting season closure on an annual basis.
2. Maintain a prescribed burn plan with emphasis on goose foraging sites.
3. Maintain current water level prescriptions and drawdown schedules and evaluate their effect on foraging sites.
4. Continue monitoring all aspects of the breeding population, particularly production and survival.
5. Continue banding local and breeding adult geese, including the initiation of color marking if possible.
6. Monitor the coyote population and fulfill the Predator Control Plan goals.
7. Maintain and enhance available goose nesting structures.

APPENDIX 1

1991 CANADA GOOSE NESTING SITES

NEST #	1990 SITE	UNIT	SITE TYPE	# OF EGGS	# HATCH	DATE HATCH
E12	X$*	EGRET	NAT ISLE	?	?	?
P1		PINTAIL	ARTIF ISL	6	6	5/6
P3		PINTAIL	ARTIF ISL	5	5	5/6
P21	X$	PINTAIL	PLATFORM	3	0	ABANDN
G1	X$	GADWALL	PLATFORM	5	5	
G2	X$*	GADWALL	PLATFORM	6	5	
G3		GADWALL	BARREL	5	5	
I4	X$*	IBIS	ARTIF ISL	5	5	
I12		IBIS	ARTIF ISL	6	6	5/14
I15	X$*	IBIS	ARTIF ISL	7	6	5/6
H2	X$*	HARRISON	PLATFORM	6	6	4/23
H11	*	HARRISON	ARTIF ISL	6	5	4/23
H12		HARRISON	BARREL	3	3	5/14
		TOTAL KNOWN		63	60	

$ INDICATES NESTING SITE WAS ALSO USED IN 1990

* INDICATES NESTING SITE WAS ALSO USED IN 1989

APPENDIX 2

1991 GOOSE PRODUCTION DATA SUMMARY

	PLATFORMS	ARTIFICIAL ISLANDS	NATURAL ISLANDS	TOTAL
# OF NESTS & (% OF TOTAL)	4 (31)	7 (54)	2 (15)	13
1991	4 (27)	6 (40)	5 (33)	15
1990	8 (42)	4 (21)	*7 (37)	18
1989	6 (33)	5 (28)	7 (39)	18
# & (%) SUCCESSFUL	3 (75)	7 (100)	2 (100)	12 (92)
1991	4 (100)	5 (83)	5 (100)	12 (93)
1990	5 (63)	3 (75)	4 (57)	12 (63)
1989	4 (67)	4 (80)	4 (57)	12 (67)
# OF KNOWN EGGS (13 NESTS)	20	37	6	63
1991 (15 NESTS)	23	23	26	72
1990 (14 NESTS)	51	19	12	82
1989 (13 NESTS)	39	31	11	81
# EGGS HATCHED & (%)	16 (80)	37 (100)	6 (100)	59 (94)
1991	23 (100)	19 (83)	26 (100)	68 (94)
1990	31 (61)	14 (74)	10 (83)	55 (67)
1989	26 (67)	26 (84)	11 (100)	63 (78)
AVERAGE CLUTCH SIZE	5.0	5.8	3.0	4.8
1991	5.7	3.8	5.2	4.8
1990	6.4	4.8	6.0	5.9
1989	6.5	6.2	5.5	6.2

AVERAGE BROOD SIZES	CLASS Ia	CLASS IIa	CLASS IIIa
	4.95	3.13	2.7

* SEVEN (7) NESTS SUSPECTED DUE TO TERRITORIALITY (SOME SIMILAR TO 1989) AND PRESENCE OF BROODS. ONLY 2 NESTS CONFIRMED.