

1991 CANADA GOOSE PRODUCTION STUDY

FISH SPRINGS NATIONAL WILDLIFE REFUGE

JANUARY 1992

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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:

The study was scaled down considerably in intensity in 1991 due to an extended off-refuge personnel schedule from late April to late May and also to the fact that the Assistant Refuge Manager position, the person with primary responsibility for conducting this survey effort, was vacant after May 5th. This curtailed intensive post-hatching observations of brood activity, such as foraging and loafing areas, dispersals, and brood specific mortality.

Pair count numbers were based on a single count that was conducted by ARM Engler just prior to his departure on May 5. His previous observations of goose pairing and behavior lent a high degree of accuracy to this count. Incidental observations prior to and after this count allowed verification of territory and nest site locations. Only those pairs or lone males which displayed a specific site fidelity 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 began nesting, locatable nests were checked at least once to determine clutch size. Nests with less than 5 eggs were rechecked to verify the final clutch size. The initial nest check was made approximately two weeks after individual females were observed incubating. This allowed sufficient time for a full clutch to be completed, thus eliminating the need for rechecking as well as limiting disturbance. Nests were checked by foot, canoe, and airboat depending on the nesting location. Nest observations were made from vehicles, using a spotting scope, to note nest activity.

Brood counts were started after the first brood was observed on May 5th. Broods size and location were noted by Refuge personnel throughout most of the brood period. Unfortunately, due to lack of personnel in the field during most of May, brood tracking was inadequate.

RESULTS:

A pair count was conducted on April 29th. There were 15 definite and 3 possible nesting pairs. The total goose population on this count was 86.

Eighteen (18) 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 18 apparent nesting pairs, 15 nests were located. Ten of these located nests were on artificial islands or platforms. Appendix 1 summarizes nest site locations and nest data.

Fourteen (14) of the 15 known nests hatched (success = 93%). One nest (H5) 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 May 3, almost 2 weeks later than in 1990 but quite comparable to the first brood date for 1989. The first brood hatched from Harrison Unit .

Nearly all brood counts that were made during the hatch period were by maintenance staff due to the absence of any managerial staff during that period. Based on the data provided by them, a minimum of 10 different broods were seen during this period. The average brood size for the 10 broods that were seen during the first month of hatching was 3.3. This figure is almost undoubtedly low since definitive tracking of new broods to accurately identify 1A brood size was not possible. However, using this figure would indicate a hatch of approximately 50 goslings from the 15 known nests. By late June, the high count of 6 broods showed 18 still surviving, for an average brood size of 3.0. At this point the assumption was made that no new losses were likely to occur, thus setting total production at 18 fledged goslings. This would indicate a gosling mortality rate of 64%.

Refuge personnel banded 6 goslings from June 24 to July 9, bringing the total number of goslings banded since 1989 to 39 of the estimated 73 fledged. Banding effort was hampered this year by not being able to track brood locations often enough to enable us to keep their location separate from the nearly 400 molting adults that were on the refuge just prior to banding.

DISCUSSION:

The 1991 Canada Goose production at Fish Springs was similar in many respects to 1989 and 1990, i.e., no positive growth. The total number of breeding pairs decreased one. The number of successful nests increased to 14. Average clutch size was reduced. Appendix 2 summarizes nesting data for 1989 and 1990.

The gosling survival rate of 36% was down considerably from the 1990 rate of 51%. It was still above the 1989 rate of 30%. Production was estimated at 18 fledged goslings in 1991 versus the 33 in 1990. Because intensive brood observations were not possible during the critical period in late April and May, the reasons for this decrease are unknown. The breeding goose population represents a small sample size therefore allowing minor changes in survival of 1 or 2 broods to be magnified in the final tally.

Production is still well below the pre-hunting season levels prior to 1987. Because the breeding population is essentially unchanged since 1989, true population growth will not be realized until the number of breeding pairs increases. Total number of breeding pairs and the estimated production for 1991 represents the lowest total since 1965. Assuming that the subadult population declined simultaneously with the breeding population, significant recruitment into the breeding population will probably not occur until at least 1993.

Marsh Drawdowns

The two drawdown units this year were Mallard and Gadwall. In 1990, these units accounted for 3 of the 19 nests, while this year they accounted for 2 of the 15 nests. Neither of these units had a brood observation recorded in 1991. However, the fact that neither of these units were burned probably contributed to not producing higher quality forage conditions. Harrison and Egret units were subject to both drawdowns and prescribed burning in 1990. While the number of brood observations in Egret unit was limited to one, Harrison unit broods tended to utilize areas that showed burning influence.

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 between 1989, 1990, and 1991 also occurred in respect to nest site selection and nesting outcome. 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 three years. Appendix 1 denotes "site fidelity" pairs; this fidelity is also the reasoning behind using some of the same nest #'s as in 1989 and 1990 for natural island nesters. Ten of the pairs used the same nest site as in 1990, and seven of these ten sites were used all three 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 increasing the Refuge's Canada goose population.

It is notable that none of the known nests in 1991 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:

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. This year's study was less intensive due to time constrictions and a few discrepancies arose concerning the final assumptions (though none are considered serious enough to effect the conclusions). 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.

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 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. This data is crucial before any attempts are made to reopen the goose hunting season.

PRIORITIES:

1. Keep the goose hunting season closed indefinitely. Until the breeding population reaches 75 pairs and crucial migratory data is collected and analyzed or it is established that primary factors limiting the gosling survival rate can not be remedied by management action, there can be no harvest level that is acceptable.
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 quotas.
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
A9	X*	AVOCET	NAT ISLE	5	5	5/14
A18	X*	AVOCET	NAT ISLE	6	5	5/14
A01		AVOCET	NAT ISLE	5	5	5/17
E12	X*	EGRET	NAT ISLE	4	4	4/30
P21	X	PINTAIL	PLATFORM	6	6	5/01
G1	X	GADWALL	PLATFORM	5	5	5/21
G2	X*	GADWALL	PLATFORM	5	5	5/21
I4	X*	IBIS	ARTIF ISL	5	5	5/04
I7		IBIS	ARTIF ISL	3	3	5/03
I13		IBIS	ARTIF ISL	4	3	5/03
I15	X*	IBIS	ARTIF ISL	5	5	5/21
I19	X	IBIS	ARTIF ISL	3	3	5/03
H2	X*	HARRISON	PLATFORM	7	7	4/30
H11	*	HARRISON	ARTIF ISL	3	0	ABAN
C1		CURLEW	NAT ISLE	6	6	4/30
		TOTAL KNOWN		72	62	

* 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 (27)	6 (40)	5 (33)	15
1990	8 (42)	4 (21)	*7 (37)	18
1989	6 (33)	5 (28)	7 (39)	18

# & (%) SUCCESSFUL	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 (15 NESTS)	23	23	26	72
1990 (14 NESTS)	51	19	12	82
1989 (13 NESTS)	39	31	11	81

# EGGS HATCHED & (%)	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	5.7	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 SIZE OF SUCCESSFUL NESTS	5.7	4.6	5.0	4.9
1990	6.2	4.7	5.0	5.5
1989	6.5	6.5	5.5	6.3

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