SKD-6.4

SEEDSKADEE NATIONAL WILDLIFE REFUGE
DUCK NESTING SUCCESS REPORT
1990

SUMMARY REPORT

Prepared By: Mike Bryant, Tom Pabian
Reviewed By: Fran Maiss
Date Submitted: 10-11-90

INTRODUCTION

The fourth consecutive year of data collection for the duck nesting success study was completed at Seedskadee National Wildlife Refuge (NWR) during the 1990 nesting season. This years data revealed a decrease in nesting success, but a slight increase in numbers of nests found, relative to 1989. Duck production, which is covered in another report, also increased over 1989 (Table 1). The objectives of the duck nesting success study are: 1) to calculate current nesting success and to determine the effect of nest predator trapping on nesting success, 2) to identify high use nesting areas on the refuge, and 3) to provide insight for future management planning.

METHODS

A nest searching crew of three to five people was used for data collection. Two Biological Aids were hired as temporary employees to primarily conduct data collection and analysis. Nest searching was conducted by walking and dragging uplands, and by searching overwater areas in canoes. Data collection on the study area was conducted in three rounds: round one, May 22-June 6; round two, June 12-25; and round three, July 5-12. The man-hours and acreage searched for 1990 were slightly less than 1989 and previous years of the study. All prime nesting habitat in the developed wetlands of the refuge were searched, however the effort to find overwater nests was less than previous years.

Specific methods of the study are outlined in the Wildlife Inventory Plan for Seedskadee NWR and closely follow "Techniques for Studying Nest Success of Ducks in Upland Habitats in the Prairie Pothole Region" (Klett et al. 1986). Seedskadee NWR file 19.1.87 WILDLIFE-Birds-Waterfowl-Duck Nesting Survey contains this information and other pertinent data (maps of areas searched, selected readings, previous years reports, etc.) which is relevant to the study.

RESULTS

The number of nests found per round are as follows: round one--54 nests, round two--55 nests, and round three--20 nests. Areas searched, acreage, and number of nests found are presented in Table 3. Maps of the study area are located in File 19.1.87.

Searchers located a total of 129 nests in 1990. Eighty nests successfully hatched, 34 nests were destroyed by predators and the remaining 15 were abandoned or destroyed in search operations. Of the 129 nests located, 114 were able to meet the criteria set by the Mayfield Method for computing nesting success.

Mayfield, Shortcut and Apparent methods were used to calculate nest success (see Calculations). Overall nesting success using the Mayfield Method was 51%. Shortcut nesting success was 56%

and Apparent nesting success was 71%. Table 1 displays nesting success for the four years of the study.

The most prevalent nesting species found during the study was cinnamon teal (Anas cyanoptera)/blue-winged teal (Anas discors) with 52 total nests. Since the hens of these two species are identical they are grouped together. The remaining species and the number of nests found were: gadwall (Anas strepera) 34, mallard (Anas platyrynchos) 26, northern pintail (Anas acuta) 9, redhead (Aythya americana) 4, ruddy duck (Oxyjura jamaicensis) 1, green-winged teal (Anas crecca) 1, American widgeon (Anas americana) 1, and northern shoveler (Anas clypeata) 1. Table 2 displays species composition for the four years of the study. Due to the lowered effort to find overwater nests, redheads and ruddy ducks are under-represented relative to previous years.

Robel pole readings were recorded from 124 upland nest sights. The average visual obscurity height for all nests was 3.5 decimeters, with a range from 1.0 to 10.4 decimeters. Half of the nest sites were in immediate association with some type of grass, especially salt grass (Distichlis spicata). Blue-winged/cinnamon teal seemed to favor this type of habitat. Other upland nests were in immediate association with shrubs such as black greasewood (Sarcobatus vermiculatus), rabbitbrush (Chrysothamus spp.), or sagebrush (Artemesia spp.). Gadwalls and mallards appeared to prefer this type of habitat. Relative to other duck species, only the blue-winged/cinnamon teal consistently used visual obscurity heights less than 3 decimeters.

DISCUSSION

As displayed in Table 1, the data conclusively showed that predator control is an essential ingredient to producing ducks at Seedskadee NWR. At a Mayfield level of 5% (1987) duck nesting success and production remained very low, while nesting success rates of 45% and higher dramatically increased duck production, even over the relatively short span of three years.

The data also indicated that upland nesting ducks select habitat on the refuge that has: grassy cover about 3 decimeters high, good juxtaposition of brush among grass, close proximity to water, and preferably some isolation from predators, such as an island. Hawley Pool 1 and portions of Hawley Pool 7 consist of this type of habitat and had great numbers of nests and high nest densities (Table 3). For overwater nesting ducks, the extensive bulrush patches of Hawley Pool 1 and Pool 2 provided high densities of both redhead and ruddy duck nests.

Seedskadee NWR was established as a waterfowl refuge. Included in its goals is an objective of producing 10,000 ducks annually. Approximately 2000 ducks were produced in 1990. If the refuge is to meet the duck production objective, predator trapping must continue, and future wetland development and management must also concentrate on providing the habitat types described above.

Is this a realistic objective given perfect habitat and [illegible] predator pressure?

Table 1. Nest Success and Production Compared With Trap Effort on Seedskadee NWR 1987-1990.

	1987	1988	1989	1990
Mayfield Success	5%	45%	70%	51%
Shortcut Success	5%	47%	73%	56%
Apparent Success	14%	63%	84%	71%
Total Nests	60	92	113	129
Trap Nights	0	5679	5919	5292
Total Predators	0	97	65	63
Duck Production	462	1131	1638	1816

Table 2. Species Composition of Nests Found on Seedskadee NWR 1987-1990.

Duck Species	Year			
	1987	1988	1989	1990
Blue-winged/Cinnamon Teal	22	31	41	52
Gadwall	16	12	23	34
Mallard	3	16	13	26
Northern Pintail	0	2	10	9
Redhead	3	14	14	4
Ruddy Duck	7	16	7	1
Green-winged Teal	8	1	3	1
American Widgeon	0	0	0	1
Northern Shoveler	1	0	2	1
Total	60	92	113	129

Table 3. Number of Nests Found Within Habitat Management Units on Seedskadee NWR 1990.

Management Unit	Acres Searched	Total Nests	Nests/ Acre
Hawley Pool 1	38	45	1.18
Hawley Pool 2	10	9	.90
Hawley Pool 3	18	4	.22
Hawley Pool 4	19	8	.42
Hawley Pool 5	8	2	.25
Hawley Pool 6	16	5	.31
Hawley Pool 7	35	23	.66
Hawley Pool 8	14	3	.21
Hawley Pool 9	7	4	.57
Hawley Pool 10	2	0	0
Hawley HQ Ponds	16	4	.25
Pear Island Slough	3	4	1.33
Pear Island	40	0	0
Old HQ Field	25	8	.32
Hay Farm Ponds	8	3	.38
Dunkle Pools	23	7	.30
Total	282	129	.46

Calculations

Nesting success was calculated using three different methods; 1 apparent nest success 2) Mayfield exposure method 3) shortcut method (Klett et al. 1986).

Apparent nest success is simply the number of successful nests divided by all usable nests.

$$P1 = N_s / (N_s + N_u)$$

N_s = Number of successful nests
N_u = Number of unsuccessful nests

The Mayfield exposure method takes three variables into account.

$$P2 = (1 - N_u / E)^h$$

N_u = Number of unsuccessful nests
E = total exposure days of all useable nests
h = mean age of all nests at hatching

The shortcut method also takes three variables into account.

$$P3 = [P1^{1/(h-f)}]^h$$

P1 = Apparent nest success
h = Mean age of nests at hatching
f = Mean age of nests when found

Nest densities were calculated using one method, the observed nest per acre method.

$$\text{Observed} = \frac{\text{number of nests located}}{\text{acres searched}}$$

LITERATURE CITED

Klett, A.T., H.F. Duebbert, C.A. Faanes, and K.F. Higgins. 1986. Techniques for Studying Nest Success of Ducks in Upland Habitats in the Prairie Pothole Region. U.S. Dept. of the Interior, Fish & Wildlife Service, Resource Publication 158. 24 pp. 1986

Wildlife Inventory Plan for Seedskadee National Wildlife Refuge, updated 1988.

WATERFOWL ENHANCEMENT PROJECTS ANNUAL REPORT FORM

1. Reporting Station Seedskadee NWR 2. Report Year, CY 1990

3. Project Type (circle one) 08 4. Report No. 65580-1

01 large bales
02 elevated nest struc.
03 natural islands
04 artificial islands
05 peninsula cutoff (ditch)
06 peninsula cutoff (elec)
07 elec. fence exclosure
(08) unconfined predator cont.
09 control area for_____
10 other (describe)_____

*Attach control area report to corresponding project report.

5. Location/designation Hawley, Dunkle, L. Hawley 6. Initiation, CY 1988

7. Description Predator control on 1750 acres, 44 traps, 5292 trap nights. Target species: striped skunk, red fox, raccoon.

8. Habitat type/condition Riparian river bottom--good. Developed wetland--good.

9. Habitat Mgmt/CY Idle.

10. Predator Management

Species Removed

11. Dates	Skunk	Fox	Mink	Raccoon	Grd. Sqrl.	Coyote	
From 3/13 To 7/12	29	24		10			
From To							
From To							
Totals	29	24		10			
Success	.006	.005		.002			

12. Method(s) Used Maximum: 220 conibear 32; #2 Leghold 20. Average: 220 Conibear 30; #2 Leghold 14.

13. Nest Monitoring 14. Method Used Walking, Dragging, Overwater

15.

Species	Nests	Usable Nests	# Predator	# Abandoned	# Hatched	S Nests	T /acre
Cin/BWT	52	46	19	4	27	.18	.030
Gadwall	34	31	6	1	25	.12	.019
Mallard	26	24	7	1	17	.09	.015
Pintail	9	9	2		7	.03	.005
Redhead	4	1			1	.01	.002
Ruddy	1	0		1	0	.004	.001
GWT	1	1			1	.004	.001
Shoveler	1	1			1	.004	.001
Widgeon	1	1			1	.004	.001
Totals	129	114	34	7	80	.46	.074

WATERFOWL ENHANCEMENT PROJECTS ANNUAL REPORT FORM

1. Reporting Station Seedskadee NWR 2. Report Year, CY 1990

3. Project Type (circle one) 02 4. Report No. 65580-2

01 large bales
(02) elevated nest struc.
03 natural islands
04 artificial islands
05 peninsula cutoff (ditch)
06 peninsula cutoff (elec)
07 elec. fence exclosure
08 unconfined predator cont.
09 control area for _____
10 other (describe) _____

*Attach control area report to corresponding project report.

5. Location/designation Hawley, Dunkle, L. Hawley 6. Initiation, CY 1978

7. Description Currently 60 goose nesting structures on the refuge. Canada geese also constructing and using ground and tree nests.

8. Habitat type/condition Riparian river bottom--good. Developed wetland--good.

9. Habitat Mgmt/CY Idle.

10. Predator Management See report 65580-1

Species Removed

11. Dates		Skunk	Fox	Mink	Raccoon	Grd. Sqrl.	Coyote	
From	To							
From	To							
From	To							
	Totals							
	Success							

12. Method(s) Used _____

13. Nest Monitoring 14. Method Used Overwater search of wetlands and river.

15. Species	Nests	Usable Nests	# Predator	# Abandoned	# Hatched	Nests/acre
C. Goose	64		1	1	62	NA
Totals	64		1	1	62	