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USE OF WATERFOWL PRODUCTION AREAS BY DUCKS
AND COOTS IN EASTERN SOUTH DAKOTA

BY

SPENCER J. VAA

A thesis submitted
in partial fulfillment of the requirements for
the degree Master of Science, Major in
Wildlife Biology, South Dakota
State University

1972

USE OF WATERFOWL PRODUCTION

AREAS BY DUCKS AND COOTS

IN EASTERN SOUTH DAKOTA

This thesis is approved as a creditable and independent investigation by a candidate for the degree, Master of Science, and is acceptable as meeting the thesis requirements for this degree, but without implying that the conclusions reached by the candidate are necessarily the conclusions of the major department.

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USE OF WATERFOWL PRODUCTION AREAS BY DUCKS

AND COOTS IN EASTERN SOUTH DAKOTA

Abstract

SPENCER J. VAA

The use of Waterfowl Production Areas (WPA) by American coots (Fulica americana) and ducks was studied during 1970 and 1971 in east-central South Dakota. The Eriksrud WPA, a type IV wetland with 55 acres of water area and 35 acres of upland, contained 188 coot nests during the 2-year study. Of the 188 coot nests, 178 hatched for a success rate of 95 percent. Average clutch size of 130 completed clutches was 8.4. Average size of 21 coot broods from 4 to 6 weeks of age was 6.1. Coot production on the Eriksrud area was estimated at 543 young per year. Most coot nests were located in stands of cattail (Typha latifolia), the dominant plant species of the wetland. Condition of the habitat influenced the number of coots nesting on the area. Lowered water levels in 1971 left many emergents standing in very shallow water or on dry ground, limiting available nesting sites. Renesting by coots depended on the stage of incubation at the time of egg removal; 90 percent of the nests in which eggs were removed early in incubation resulted in renesting attempts.

Counts of breeding pairs of dabbling ducks were made on four WPAs in 1971 and blue-winged teal (Anas discors), mallard (Anas platyrhynchos), and gadwall (Anas strepera) were found to be the

most abundant. On the Eriksrud area, the most common nesting ducks were blue-winged teal and canvasback (Aythya valisineria), eight nests of each being located during the 2-year study. Mallards, ruddy ducks (Oxyura jamaicensis), and a redhead (Aythya americana) also nested on the area. The most commonly observed duck broods on the Eriksrud area were those of blue-winged teal, ruddy duck, mallard and canvasback. One wood duck (Aix sponsa) brood was observed.

INTRODUCTION

The key factor determining waterfowl production in North America's prairie pothole region is the number of wetland basins holding water during the breeding and brood-rearing seasons. Many acres of prime wetlands have been lost, primarily to agricultural drainage. In an attempt to preserve wetlands, Congress enacted a law in 1958 providing for the purchase and lease of WPAs (Sanderson and Bellrose 1969).

WPAs are acquired in North Dakota, South Dakota, Minnesota, and Nebraska by the Bureau of Sport Fisheries and Wildlife under its small wetlands preservation program, and are funded by the sale of Migratory Bird Hunting Stamps to waterfowl hunters (Salyer and Gillett 1964). In South Dakota over 20,000 acres of waterfowl habitat have been purchased under this program (Sanderson and Bellrose 1969). In addition to producing waterfowl, these areas are important to upland game birds, deer, rabbits, furbearers, and many non-game species.

The present study was initiated to determine use of WPAs by American coots (Fulica americana) and ducks. Specific objectives were to determine (1) basic nesting data and production for the coot, and (2) use of the areas by ducks for breeding, nesting and rearing of broods.

DESCRIPTION OF STUDY AREA

The study area is located in southwestern Brookings County, South Dakota. It is in the physiographic region known as the Prairie Coteau, a plateau-like highland between the James River Lowland and the Minnesota-Red River Lowland (Westin et al. 1967). Topography consists of undulating hills with numerous potholes.

Soils in southwestern Brookings County originated from the Cary substage of the Wisconsin Age glacial drift sheet (Flint 1955). The Cary substage is the youngest in the Wisconsin age. The soils are mainly calcareous, fine textured, silty clay and silty-clay loams, intermixed with areas of poorly drained soils of closed depressions and glacial till (Westin et al. 1967).

The climate of Brookings County is continental. Spring is moist, cool, and windy, and summer is hot and sunny. Average temperature during July is 72 F and in January 14 F. Average precipitation is 21.6 inches, most of which falls in June (Westin et al. 1967).

Native vegetation of the area was short-grasses, mid-grasses, or tall-grasses; the dominance of any being determined by the type of soil, degree of slope, and drainage of the site. On hilly, silty soils, the short-grasses and mid-grasses prevailed. On nearly level, silty soils and on sandy soils, the tall-grasses and mid-grasses dominated. The poorly drained soils were sites of marsh vegetation (Westin et al. 1967).

Under the current system of wetlands classification, the wetlands used in the study are classified as type IV, indicating a deep fresh-water marsh (Martin et al. 1953). This system uses water depth as its major criterion for classification. Under a new classification system proposed for wetlands by Stewart and Kantrud (1971), the wetlands used in the study are classified as IV-B-2. This indicates a semi-permanent pond (class IV), slightly brackish (subclass B), with an interspersed cover of emergent cover and open water (cover type 2). The new system is more flexible than the current system and reflects seasonal, regional, and local variation in the wetland environment (Stewart and Kantrud 1971). It utilizes water permanence, water chemistry, and water depth as major criteria for classification.

Common cattail (Typha latifolia), hardstem bulrush (Scirpus acutus), softstem bulrush (Scirpus validus), and river bulrush (Scirpus fluviatilis) are the predominant plant species on the study area.

Ducks using the area throughout the breeding season were the blue-winged teal (Anas discors), mallard (Anas platyrhynchos), gadwall (Anas strepera), shoveler (Anas clypeata), green-winged teal (Anas carolinensis), pintail (Anas acuta), redhead (Aythya americana), canvasback (Aythya valisineria), ruddy duck (Oxyura jamaicensis), and wood duck (Aix sponsa).

METHODS

Nesting data were obtained for the coot by a systematic search for nests on the Eriksrud area, located 0.25 miles west of Sinai, South Dakota (Fig. 1). This wetland contained 55 acres of water area and 35 acres of upland. Emergent vegetation was waded and a canoe was used in the deeper water. Several persons aided in the initial search each season. Each nest was numbered and marked by tape attached to the surrounding vegetation and its location was plotted on a map to facilitate return to the nest. The nest was visited at weekly intervals until the eggs had hatched (Fig. 2). A nest was rated successful when at least one egg hatched.

Brood counts of coots were conducted twice during July, 1971, when young were 4 to 6 weeks of age. The number of young in a brood was used to estimate the survival rate. Production on the Eriksrud area was estimated by multiplying survival rate by the number of successful nests. Several wetlands adjacent to Highway 81 south of Arlington were selected for conducting brood counts.

A study to determine the renesting tendencies of coot was undertaken in 1971 on the northern end of Brush Lake, a privately-owned wetland within the study area. Eggs were removed from nests and the stage of egg development was noted. After removal of eggs, any original nest containing fresh eggs or any newly-built nest containing

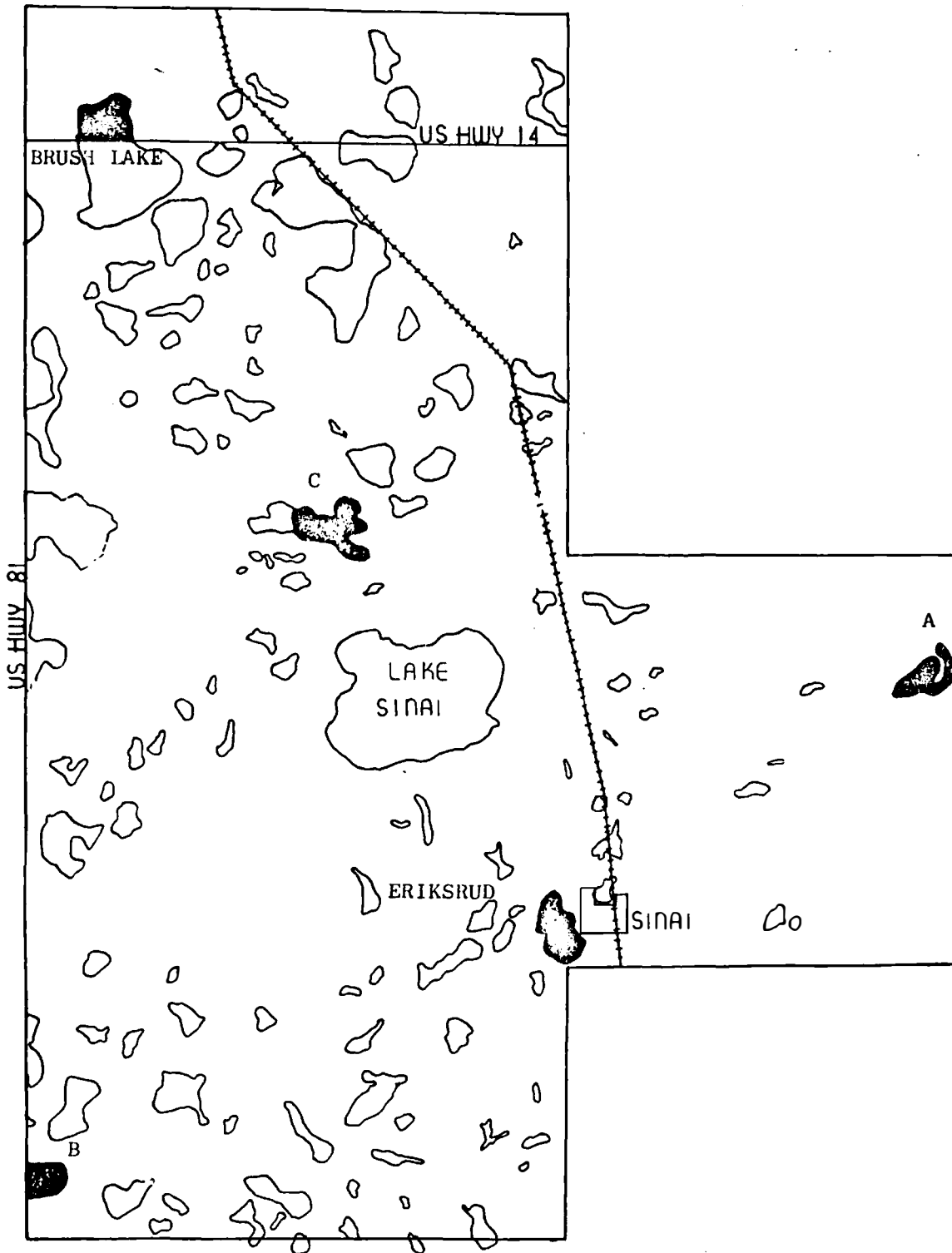


Fig. 1. Wetlands located on the study area. Darkened areas, including A, B, C, Brush Lake, and Eriksrud were used in this study, 1970-71.



Fig. 2. Recording coot nesting data on the Eriksrud area.



Fig. 3. Conducting a breeding pair count of ducks on the Eriksrud area.

fresh eggs within 20 yards of the original nest was considered to be a renesting attempt. A renesting attempt in a newly-built nest was readily discernible as usually they were the only new nests built in the immediate vicinity of the original nest.

Counts of waterfowl breeding pairs were obtained by traversing the margins of four WPAs on foot (Fig. 3). Areas A, B, C, and Eriksrud were included in the counts and contained 40, 49, 72, and 55 acres of water area, respectively. Two counts were conducted for mallards and pintails the first half of May and two counts for other dabblers were conducted the second half of May. The counts for each group were averaged to estimate the breeding population. Lone drakes, a hen and drake, and groups of drakes up to five in number were used to indicate breeding pairs of dabblers (Dzubin 1969). Ducks flying or alighting on a wetland area were not tabulated; but birds flushed from a wetland were counted (Hammond 1966) and watched to avoid recounting. Breeding pairs were not estimated for diver ducks but a nesting study was done on these species on the Eriksrud area in 1970 and 1971.

Dzubin (1969) stated that a ground census of divers would not adequately estimate number of breeding pairs. Pairs of divers, except ruddy ducks, tend to aggregate on deep ponds (Dzubin 1955) and fly to surrounding smaller ponds for nesting, feeding, and loafing activities. The distorted sex ratio made counts of lone male divers meaningless, and ruddy ducks are very secretive making them difficult

to census. Therefore, he concluded that the best way to estimate a breeding population of divers on a study block was through a nesting study. He recommended that the maximum number of viable, destroyed, or deserted nests found during the peak breeding season be used to estimate the breeding population.

Use of the Eriksrud Area by duck broods and nesting hens was determined for both 1970 and 1971. Duck broods were recorded whenever seen and during several early-morning and late-afternoon brood counts. The species and number of young in each brood were noted. Nests of divers were located in conjunction with the search for coot nests. Intensive effort was not made to locate all nests of dabblers in upland areas. Nests were found by walking the upland twice during May with several persons, approximately 30 feet apart. Also, several upland nests were located by observing the hen fly to and from the nest site. Upland nests were not marked but were plotted on a map to facilitate relocation.

RESULTS AND DISCUSSION

Coot Nesting and Production

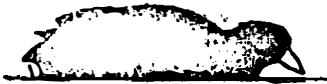
Behavior During Breeding Season.—Coots arrived on the Eriksrud area on April 7, 1970, and April 12, 1971. At those early dates, many of the wetlands were partially frozen. Soon after arrival, coots sought out their nesting territories. On April 17, 1971, 5 days after first arrival, aggressive display was observed. Ryder (1959) stated that the coot is pugnacious in the defense of its breeding territory and young. Gullion (1952) recognized distinct displays, based upon the nature of the body posture, undertail coverts, wing arches, frontal shield, and ruff (Fig. 4 and 5).

Distinct displays were commonly observed on the Eriksrud area during pre-nesting, incubation, and brood-rearing periods. On May 18, 1971, a coot using a patrol display drove a pair of gadwall from its nesting territory. On July 22, 1971, an adult coot with young charged another coot brood, driving them from the former's feeding territory. Although coots are aggressive, they do not always emerge as the dominant bird in interspecific contests. A drake red-head was seen to chase a pair of coot with young from a muskrat (Ondatra zibethicus) house that the coots were utilizing as a loafing and brooding platform. Also, individuals varied in their degree of pugnacity. Some pairs allowed me to inspect their nests and performed

Normal posture—This is the posture held by a coot when foraging undisturbed. The head is erect, the tail is held horizontally with the under-tail coverts inconspicuous. The wings are held close to the body.



Patrol—Whenever a coot has reason to believe some aggressive action may be necessary against other coots approaching its territory, it pulls its head down and slightly forward, the neck feathers are erected to form the ruff, the tail is slightly depressed and a patrol against invasion commences.



Charging--If an intruder enters a territory before the resident bird can go into patrol, the defender generally moves toward the invader in a charge. In this display the neck is extended forward on a horizontal plane, the tail and wings are held in the normal position, but the ruff is erected and the frontal shield is prominent. The bird swims rapidly in this display.



Fig. 4. Three mild displays of the American coot (Gullion 1952).

Splattering—This display is a rapid charge. The bird retains essentially the same head posture as in the charge while it runs over the water with flapping wings. The attacked bird very often flees in like manner, but holds its head erect rather than on a nearly horizontal plane.



Paired Display—This display is used entirely in intraspecific territorial activity. This display is normally the final act of aggression. The head is held low, the wings are arched high above the back, often with tips crossing, and the tail is held vertically, bringing the white under-tail coverts into prominence. The ruff is erected and the frontal shield is prominent.



Swanning—This is distinctly an interspecific display and is employed almost exclusively in defense of nests and young. The wings play a dominant role, being not only arched over the back, but also expanded laterally with the primaries touching the water. The tail is not lifted to expose the under-tail coverts but the head is extended as in paired display, the ruff is erected and the frontal shield is prominent.



Fig. 5. Three intense displays of the American coot (Gullion 1952).

a minimum of display. Others vigorously attempted to evict me from the nest site. One pair actually attempted to "fight" with me as I inspected the nest site.

Displays in order of increasing intensity according to Fredrickson (1970) are as follows: patrol, charge, splattering, paired display, and actual fighting. On the Eriksrud area, I observed that the most aggressive displays occurred during late incubation and early brood-rearing. Fredrickson (1970) stated that the degree of aggressiveness seemed to correlate with the time of the nesting season, with pugnacity reaching greatest intensity immediately after the clutch hatched. After coots become 5 weeks of age, there is a breakdown in territorialism and broods mingle and feed together (Ward 1953).

Competition Between Coots and Ducks.—Much has been written in regard to competition between coots and ducks for nesting, feeding, brooding, and loafing sites. On the Eriksrud area, coot nests were more numerous in 1970 than in 1971. Likewise, successful duck nests and duck broods were more numerous in 1970 on that same area. Ruddy ducks and canvasbacks nested within 15 yards of coots. It appeared that there was no serious competition between coots and ducks on the Eriksrud area. In a Utah study, Ryder (1961) found no evidence to indicate that duck production per unit was greater on an area where coots were reduced than on control areas. Stollberg (1949), in his study on Horicon marsh, Wisconsin, did not observe important competition for food between ducks

and coots. Low (1940) reported coots nesting within a yard of redhead nests in Iowa and both brought off broods. Sooter (1945), however, stated that a large number of coots may limit nesting and feeding sites for ducks.

Census Period.—A census to indicate the breeding population of coots was conducted on the Eriksrud area in 1971. No counts were made in 1970. Kiel (1955) stated that the interval between arrival and first egg laying is the proper time for censusing to determine trends in breeding populations. On the Eriksrud area in 1971, April 25 to May 5 was the proper censusing period. Three hundred and twelve coots were counted on April 29, 1971. A subsequent search of the wetland resulted in locating 73 nests, accounting for approximately half of the coots observed. Apparently some coots counted were transients or non-breeders.

Location of Nests.—In 1970, nests were scattered over the wetland. In 1971, most coot nests were along the edge of the wetland in emergent cover (Fig. 6). Nests were usually situated within 5 yards of open water. Cattail was the dominant plant species on the Eriksrud area and most nests were located in that type of emergent cover.

Nest Construction.—Most coot nests were built from dry, old vegetation, particularly cattail (Fig. 7). New vegetation was often used for late nests and renests. Both sexes build the nest,

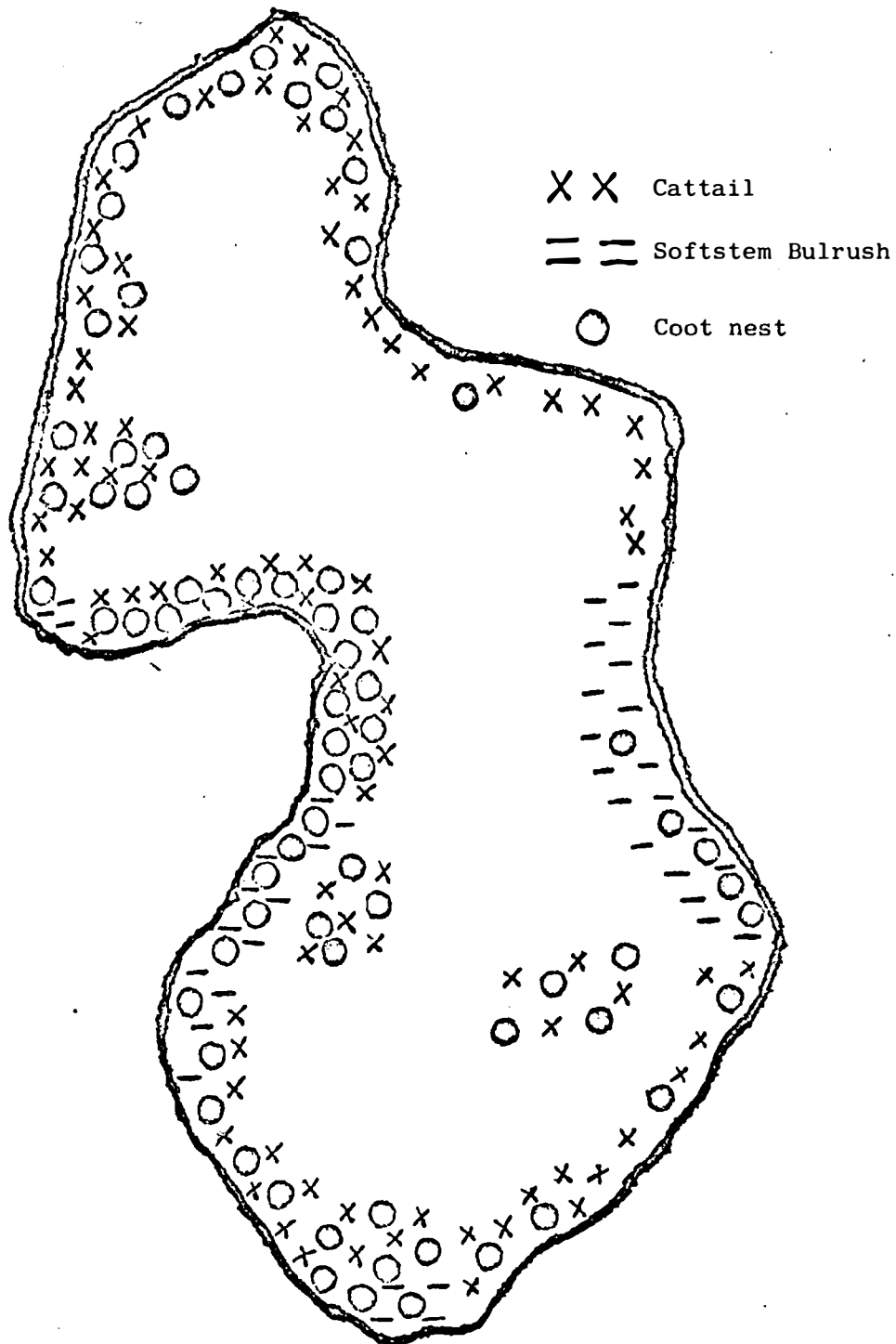


Fig. 6. Location of coot nests and emergent vegetation on the Eriksrud area, 1971.



Fig. 7. Typical coot nests built of dry, old vegetation of the previous year.

gathering material from a distance (Ryder 1961). Fredrickson (1970), using marked birds, found that one member of the pair carried materials to the nest while the other member constructed the nest. Friley et al. (1938) found that nests generally are anchored to fresh vegetation to prevent drifting and submergence. Hendrickson (1936) observed that coot nests seem to rise with the water.

Egg Laying.—By backdating from the peak hatching period and assuming a 23-day incubation period (Fredrickson 1970), most egg laying occurred between May 5 and May 20 in both 1970 and 1971. Average size of 130 completed clutches on the Eriksrud area was 8.4 eggs with a range of 4 to 14 (Table 1). Late clutches tended to be smaller than earlier ones. Eight nests initiated after June 1, 1971, averaged 7.1 eggs. Only three nests were initiated after June 1, 1970, and these contained nine, eight, and seven eggs. Fredrickson (1970) stated that smaller clutches may be the result of first nests of young birds or renests.

Table 1. Clutch sizes of completed coot nests on the Eriksrud area, 1970-71.

	1970	1971	1970-71
Number of clutches	60	70	130
Number of eggs	524	570	1094
Average clutch size	8.7	8.1	8.4
Range	4-14	4-12	4-14

Incubation and Hatching Periods.—The peak hatching period for coots occurred during the first half of June in both 1970 and 1971 (Fig. 8). Only 7 nests hatched prior to June 1 during the 2-year study. The latest date of hatching was July 11 in 1971. The hatching period extended approximately 6 weeks and 81 percent of the nests hatched between June 2 and June 19. Since a high percentage of first coot nests were successful, few renesting attempts were necessary and the hatching period was relatively short.

On the Eriksrud area, approximately as many days were required for hatching a clutch as there were eggs in that clutch. Friley et al. (1938), found this same relationship when studying coots in Iowa. Gullion (1954), in California, found the hatch followed the staggered 1-day interval of deposition. Fredrickson (1970) stated that coot eggs in Iowa usually hatched over a period of 3 to 4 days. The result is that incubation and brooding are required at the same time. Both sexes play a role in incubation and brooding (Fredrickson 1970).

Renesting.—Stage of incubation at time of egg removal was the primary factor governing renesting attempts in the renesting study at Brush Lake. When eggs were removed early in incubation, the coots were most likely to renest (Table 2). Of 10 clutches removed early in incubation, 9 resulted in renesting attempts whereas 2 clutches removed late in incubation resulted in no renesting attempts. Ryder

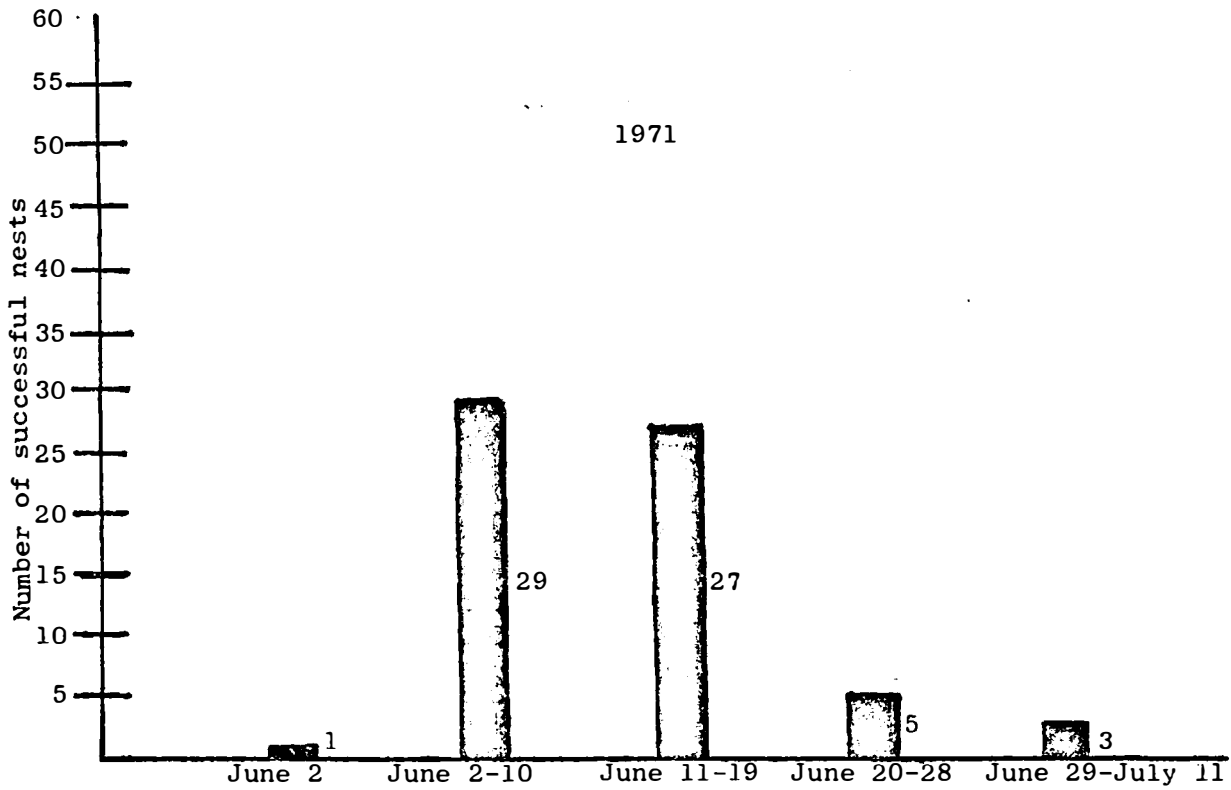
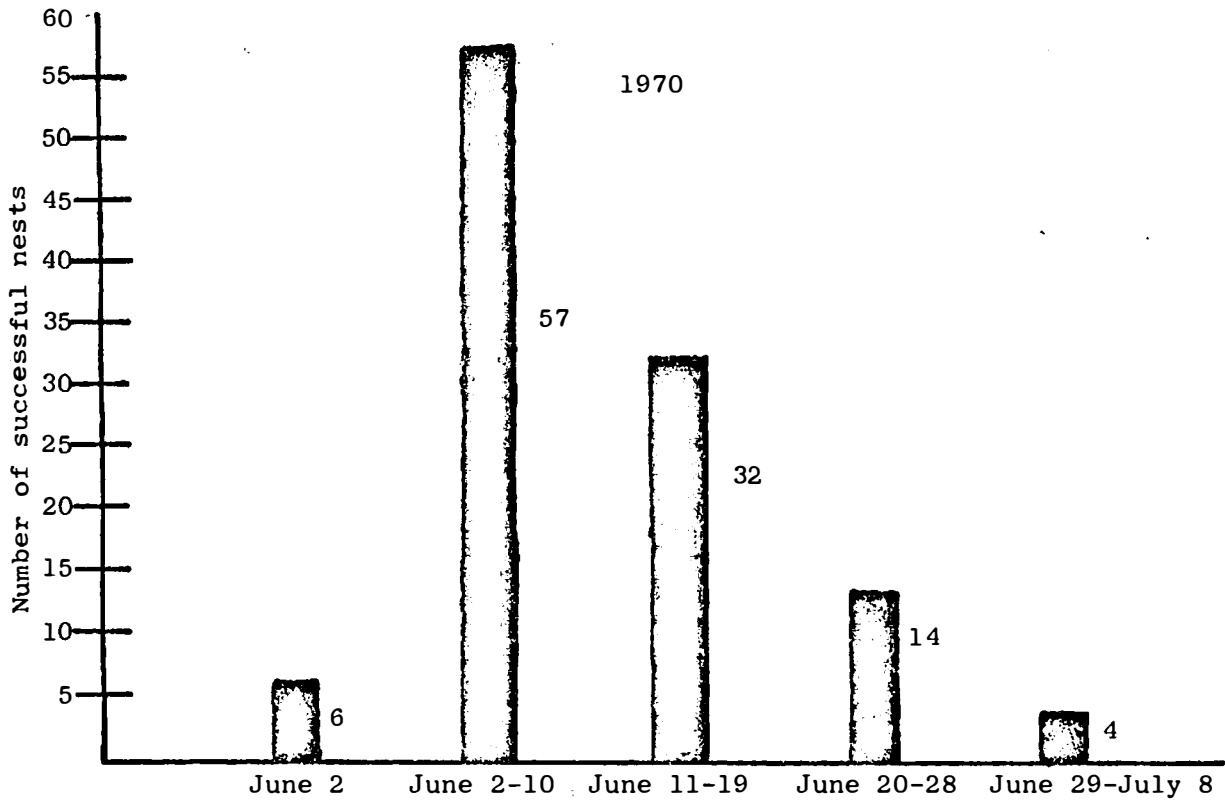


Fig. 8. Hatching chronology of coots at the Eriksrud area, 1970-71.

Table 2. Incidence of coot renesting following egg removal.

Nest	Number of Eggs Removed	Stage of Incubation at Time of Removal	Renest Attempt	Renest Successful	Clutch Size of Renest
A	3	Early	Yes	No	5
B	2	Early	Yes	Yes	6
C	4	Early	Yes	Yes	7
D	8	Early	No	--	-
E	7	Late	No	--	-
F	5	Early	Yes	Yes	8
G	4	Early	Yes	Yes	5
H	5	Early	Yes	No	4
I	7	Early	Yes	Yes	7
J	7	Late	No	--	-
K	5	Early	Yes	Yes	5
L	<u>8</u>	Early	Yes	Yes	<u>8</u>
Averages	6.2				6.1

(1961), in Utah, found coots to be persistent renesters and occasionally they produced a second brood. Gullion (1954) also reported coots to be persistent renesters and capable of producing second broods in California. No evidence was found to indicate that second broods were raised on the Eriksrud area. Of the nine reneesting attempts, six were in the original nest while the other three were in new nests within 20 yards of the original nest. Reneesting was a negligible factor in total production on the Eriksrud area because of the high nest success and consequent lack of reneesting.

Brood Counts.—Twenty-one coot broods from 4 to 6 weeks of age were counted to estimate survival of young. An understanding of coot rearing behavior is necessary for coot brood counts to be reliable. Parents tend to split broods and feed them in different parts of their territory. Both parents must be seen and a count of young with each parent must be made (Gullion 1956). Brood size averaged 6.1 and ranged from 3 to 9. Ryder (1961) believed coots suffer a higher rate of brood mortality than duck broods. Since the average number of hatched eggs per clutch could not be determined, mortality of coots from the time of hatching until broods were counted could not be determined.

Production on the Eriksrud Area.—One hundred and fifteen nests were located in 1970 and 73 in 1971, resulting in an average of 1.7 nests per acre of water for the 2 years (Table 3).

Table 3. Coot reproduction on the Eriksrud area, 1970-71.

	1970	1971	Average
Number of nests	115	73	94
Successful nests	113	65	89
Percentage successful nests	98.2	88.9	94.6
Average clutch size ^a	8.7	8.1	8.4
Nests/acre water	2.1	1.3	1.7
Production of young ^b	689	397	543

^aAverage clutch was based on 60 nests in 1970 and 70 nests in 1971.

^bNumber of successful nests x 6.1 young/brood.

Eggs hatched in 178 of 188 nests located during the 2-year study, for a success rate of 95 percent. A hatched nest was identified by small chips of eggs found on top of the nest and in the nesting material. Membranes seldom are present in coot nests to indicate successful hatching (Kiel 1955). Production on the Eriksrud area averaged 543 young per year for the 2-year study (89 successful nests x 6.1 young per brood). This production figure is slightly inflated

since mortality may have occurred after brood size was determined and before young were able to fly.

Although fewer nests were found in 1971, I feel more coots were present on the area but not nesting because of poorer habitat conditions. Much emergent cover stood on dry ground in 1971 because of lowered water levels and afforded no nesting sites for coots. As an example, approximately 200 yards of wetland margin on the northeast sector of the wetland was void of nests in 1971, but in 1970, when water levels were high, 20 coot nests were in that area.

Coot nesting data from the Eriksrud area were compared with several earlier studies from other states (Table 4). The percentage of successful nests and average clutch size on the Eriksrud area were similar to those obtained in the earlier studies.

Use of Areas by Ducks

Breeding Pair Counts.—Blue-winged teal were the most abundant breeding ducks on all WPAs studied in 1971 (Table 5). The study area is in a region of intensive agriculture and much of the undisturbed nesting cover is located on WPAs. As the blue-wing has a small home range during the breeding season, its requirements during this critical time period can be met on small management units, such as WPAs, if these areas provide sufficient cover for nesting and sufficient water for rearing broods. Numerically, other important breeders on the area

Table 4. A comparison of coot nesting data from various studies.

Area	Number of Nests	Percentage Successful	Average Clutch Size	Authority
South Dakota	188	95	8.4	Present study
Utah	318	91	8.8	Ryder (1961)
Manitoba	380	97	9.9	Kiel (1955)
Iowa	42		7.0	Friley et al.(1938)
Total	928	94.5	9.1	

Table 5. Estimate of dabbling breeding population on four waterfowl production areas in 1971.

	Eriksrud Area	Area A	Area B	Area C	Total
Blue-winged teal ^b	32	11	13	14	70
Mallard ^a	5	3	2	2	12
Gadwall ^b	4	2	1	2	9
Shoveler ^b	3	1	0	1	5
Pintail ^a	1	1	1	0	3
Green-winged teal ^b	0	0	0	1	1
Wood duck ^b	<u>1</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>1</u>
	46	18	17	20	101

^aAverage of two counts the first half of May.

^bAverage of two counts the second half of May.

were mallards and gadwalls. Sauder (1969) stated that blue-winged teal, mallards, and gadwalls were the most abundant breeding ducks in this area in 1967-68.

Nesting on the Eriksrud Area.—Twenty-three duck nests were located on the Eriksrud area during the 2-year study (Table 6). Six nests were located on the 35 acres of upland cover, 13 in emergent cover over water, and one nest in an artificial nesting structure over water. Three nests were also located in an alfalfa field adjacent to the area. (Fig. 9). Blue-winged teal nested close to water, all eight nests being within 40 yards. Three of the teal nests were located in the adjacent alfalfa field and other five were found in the 35 acres of upland cover. A mallard used the artificial nesting structure and the other mallard nest was found in the upland.

Table 6. Success of duck nests on the Eriksrud area, 1970-71.

	<u>Number of Nests</u>		<u>Number of Successful Nests</u>		<u>Number of Abandoned or Dump Nests</u>	
	1970	1971	1970	1971	1970	1971
Blue-winged teal	2	6	2	2	0	4
Mallard	1	1	1	0 ^a	0	0
Canvasback	4	4	3	0	1	4
Ruddy duck	2	0	2	0	0	0
Redhead	0	1	0	0	0	1
Canvasback-Redhead	0	1	0	0	0	1
Redhead-Ruddy duck	<u>1</u>	<u>0</u>	<u>1</u> ^b	<u>0</u>	<u>0</u>	<u>0</u>
Totals	10	13	9	2	1	10

^aOne mallard nest was trampled by a cow.

^bThe redhead-ruddy duck nest hatched 7 ruddy ducks. The lone redhead egg did not hatch.

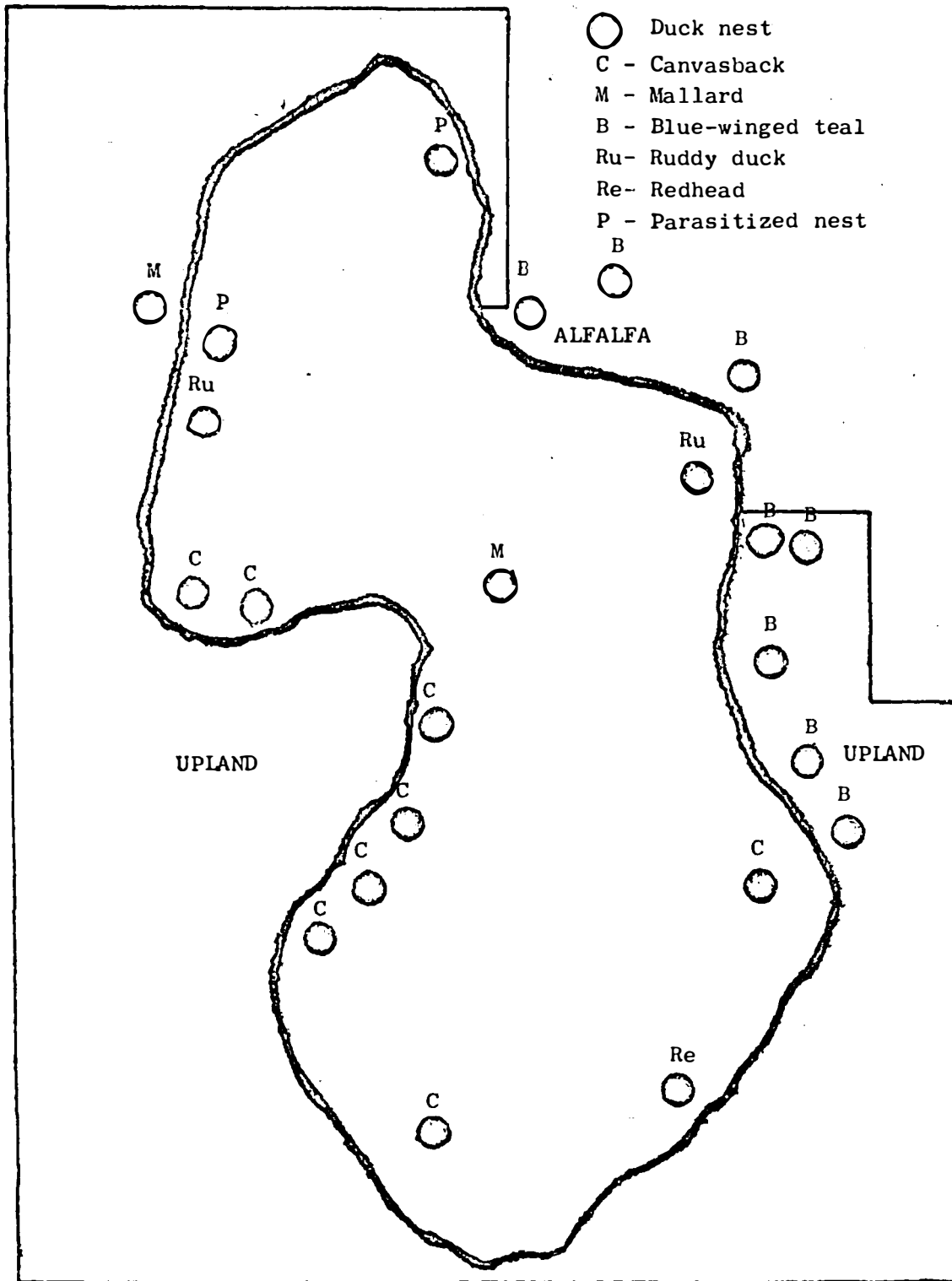


Fig. 9. Location of duck nests on the Eriksrud area, 1970-71.

Through succession, the upland on the Eriksrud area has become a monotype of smooth brome (Bromus inermis) and is not as attractive to nesting dabblers as an early successional stand of grasses and legumes. The canvasbacks utilized softstem bulrush for their nesting while the ruddy ducks nested in cattail. The lone redhead nest found was located in cattail. Canvasbacks nested close to the edge of open water, whereas ruddy ducks nested in the emergent cover further from open water.

Canvasbacks showed a tendency to lay eggs in nests that they did not incubate. Four such nests were found in 1971. One dump nest contained a total of 17 eggs. Disturbance by the author early in the egg-laying period probably caused abandonment of four blue-winged teal nests. Parasitism was observed in two nests; one that contained five canvasback and 12 redhead eggs and the other one redhead and seven ruddy duck eggs.

Use of the Eriksrud Area by Broods.—Twenty-three duck broods were seen on the Eriksrud area during the 2 years; 14 in 1970 and 9 in 1971 (Table 7). Blue-winged teal accounted for the greatest percentage, followed by ruddy ducks, mallards, and canvasbacks. One wood duck brood was observed on the Eriksrud area in 1971.

Table 7. Number and size of duck broods observed on the Eriksrud area, 1970-71.

	<u>Number of Broods</u>		<u>Average Brood Size</u>
	1970	1971	1970-71
Blue-winged teal	4	3	8.7
Mallard	2	3	6.2
Canvasback	3	1	5.0
Ruddy duck	5	1	6.8
Wood duck	<u>0</u>	<u>1</u>	11
	14	9	

CONCLUSIONS

The Eriksrud area was used extensively by coots as a breeding marsh. Water levels determined the extent of emergent cover available for nesting which in turn determined the number of coots nesting on the area. Coots were successful nesters because of several factors: they nested over water, thus limiting mammalian predation; they were aggressive in the defense of nesting territory and young; and both sexes participated in brood rearing.

The blue-winged teal was the most abundant breeding dabbler in each of the WPAs censused. Numerically, other important breeding dabblers were mallards and gadwalls. On the Eriksrud area, successful nests of blue-winged teal, mallard, canvasback, and ruddy duck were located. The Eriksrud area normally retains water throughout the year and is an important wetland for brood rearing. Broods observed on the wetland in order of decreasing abundance were those of blue-winged teal, ruddy duck, mallard, canvasback, and wood duck.

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