

NARRATIVE REPORT
SAND LAKE WETLAND MANAGEMENT DISTRICT
1971

UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE
COLUMBIA, SOUTH DAKOTA 57433

SAND LAKE WETLAND MANAGEMENT DISTRICT

COLUMBIA, SOUTH DAKOTA 57433

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Primarily Assigned to Sand Lake Refuge

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SAND LAKE WETLAND MANAGEMENT DISTRICT

NARRATIVE REPORT

1971

I. GENERAL

A. Description of the Area

1. General

The Sand Lake Wetland District lies in a rectangular area 120 miles by 100 miles in north-central South Dakota. The district stretches from the rich rolling lowlands of the James River on the east, to the Missouri River on the west and to the North Dakota border on the north. The gently rolling prairie hills range from tall grass in the east to intermediate and short grass prairie in the west. The western portion of the district lies in the Coteau de Missouri and the eastern portion is part of the James River basin. The entire district is covered by a relatively thick mantle of glacial drift and is underlain by a thick succession of Cretaceous sediments including Dakota sandstone. The district headquarters is located at Sand Lake National Wildlife Refuge.

2. Management Responsibility

At the end of calendar year 1971, Sand Lake had management responsibility for 76 Waterfowl Production Areas totaling 12,431.95 acres and 1,110 easements totaling 581,070.43 acres. Sand Lake Wetland Management District and Sand Lake Refuge are managed as a joint operation. The 2,540 acre Pocasse National Wildlife Refuge near Pollock will continue to be managed as a refuge, but for funding and outputs it will be considered part of the Wetland District.

B. Fee Title Program

The rate of fee area acquisition dropped off sharply in 1971. Only six tracts, totaling 630.50 acres, were purchased this year compared to twenty-one tracts totaling 4,209.49 acres in 1970. This is the lowest annual acquisition rate since 1965. The state of WPA fee title acquisition as of December 17, 1971, for each county in the wetland district is shown on the following page.

FEE TITLE ACQUISITION STATUS - 1971

<u>County</u>	<u>No. Mgmt. Units</u>	<u>No. Purchased Tracts</u>	<u>*Acres</u>
Brown	8	10	1,924.13
Campbell	9	15	1,113.44
Edmonds	11	23	1,434.61
Faulk	4	7	544.45
McPherson	28	50	4,896.22
Potter	1	2	360.00
Spink	10	15	1,476.87
Sully	1	4	266.52
Walworth	4	4	415.71
TOTALS	76	130	12,431.95

* Acres for management units and purchased tracts are the same.
Does not include BLM tracts totaling approximately 920 acres.

Figure 1 shows the location of the prairie pothole region.

Figure 2 shows the location of Sand Lake Refuge (wetland management office), Pocasse Refuge and WPA's within the district.

WATERFOWL PRODUCTION AREAS
UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF SPORT FISHERIES AND WILDLIFE
DIVISION OF WILDLIFE REFUGES

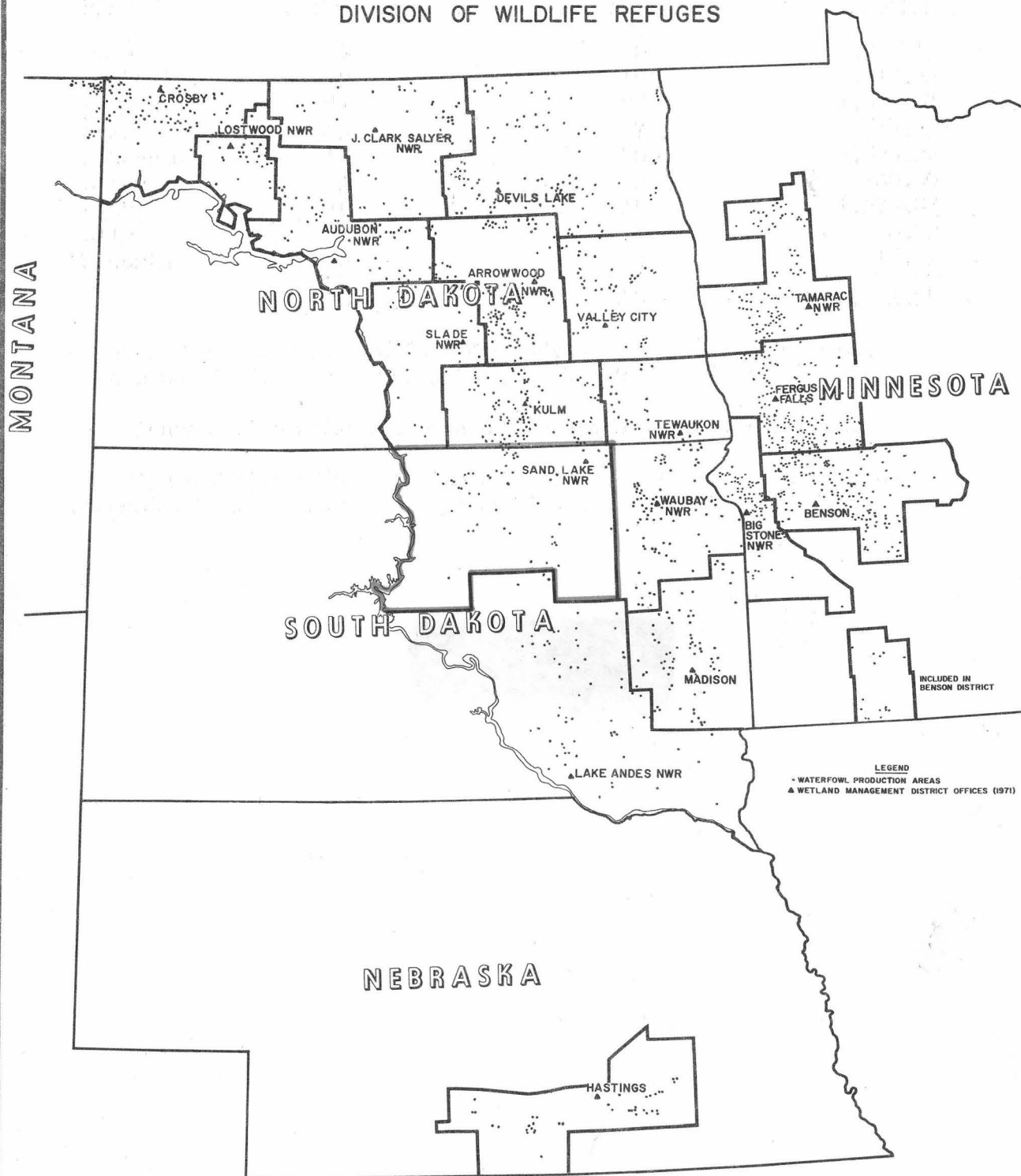


FIGURE 1

**Sand Lake Wetland
Management District**

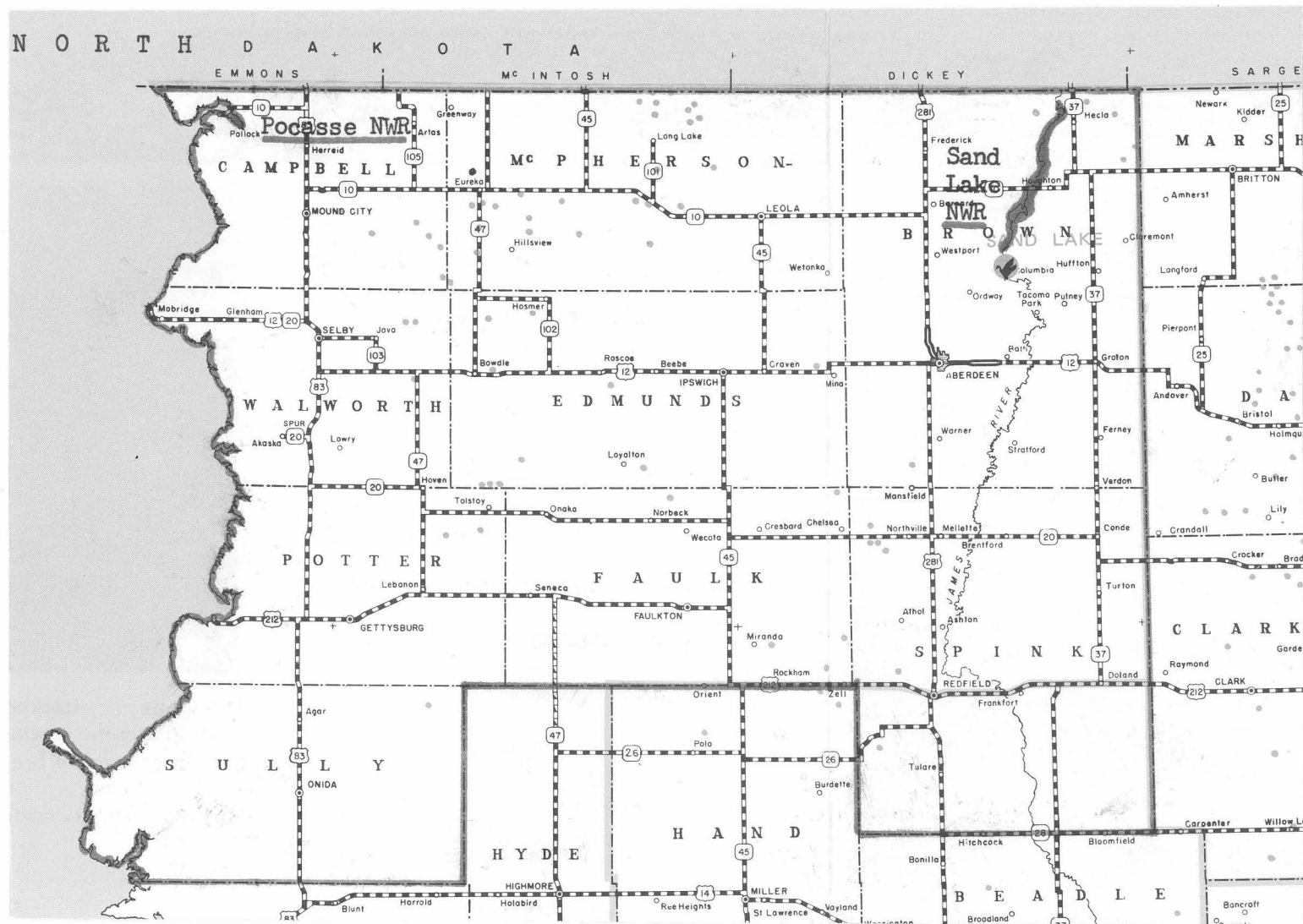


FIGURE 2

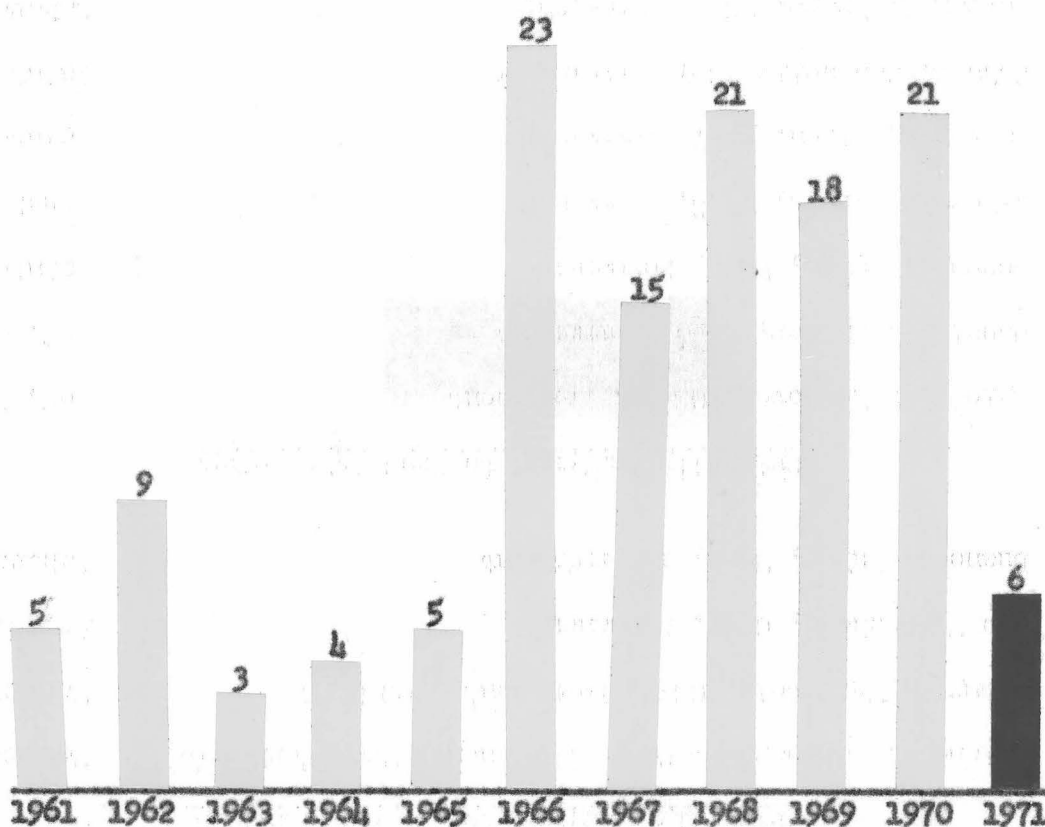
Location of Sand Lake Refuge (Wetland Management Office), WPA's and Pocasse Refuge.

There is no apparent reason for this sharp drop in acquisition as the realty staff at the Aberdeen acquisition office has expanded, and with the exception of McPherson County, the public and the County Commissioners have accepted the program well. McPherson County Commissioners have refused to approve any purchases which include less than 80% wetlands.

Current authorization to purchase small wetlands will be terminated in 1976. The acreage goal for fee title areas in this district is 28,540 acres. At present, 44% of the goal has been met with 12,431.95 acres having been purchased.

The trend in fee area purchase in this district since acquisition began in 1961 is shown below. Continuing progress is being made in "rounding out" management units by purchasing wetland tracts which are contiguous.

TRENDS IN PURCHASE OF WETLAND TRACTS 1961 - 1971



2. Easement Program

As of December 17, 1971, Sand Lake had administration jurisdiction over 1,110 easements totaling 581,070.43 acres. The table below shows the easement acquisition status for each county in the district.

EASEMENT ACQUISITION STATUS AS OF 12/17/71*

<u>County</u>	<u>No. Easements</u>	<u>Wetland Acres</u>	<u>Total Acres</u>
Brown	78	3,888.54	31,121.51
Campbell	16	765.00	6,148.55
Edmunds	336	23,715.00	165,807.00
Faulk	249	25,984.00	169,150.77
McPherson	339	25,534.00	165,431.91
Potter	24	2,896.00	16,592.08
Spink	41	2,254.00	14,660.02
Sully	2	212.00	1,120.00
Walworth	25	2,555.80	11,038.59
TOTALS	1,110	87,804.34	581,070.43 = 15.11% wet

* Data were provided by the Aberdeen Acquisition Office.

The easement acquisition rate made a sharp increase over the year 1970 from 63 tracts acquired under easement in 1970 to 111 tracts acquired in 1971. A summary of the rate of easement acquisition follows.

TRENDS IN RATE OF EASEMENT ACQUISITION - 1962-12/17/71*

<u>County</u>	<u>'62</u>	<u>'63</u>	<u>'64</u>	<u>'65</u>	<u>'66</u>	<u>'67</u>	<u>'68</u>	<u>'69</u>	<u>'70</u>	<u>'71</u>	<u>Total</u>
Brown	0	1	8	7	2	0	11	25	12	12	78
Campbell	0	0	2	3	1	1	0	7	2	0	16
Edmunds	0	17	93	81	68	30	9	16	4	18	336
Faulk	0	13	32	54	76	6	27	17	5	19	249
McPherson	1	0	8	31	47	51	52	80	37	32	339
Potter	0	0	0	1	2	1	9	7	1	3	24
Spink	0	0	6	2	4	1	1	2	0	25	41
Sully	0	0	0	0	0	0	0	0	2	0	2
Walworth	0	0	8	13	2	0	0	0	0	2	25
TOTALS	1	31	157	192	202	90	109	154	63	111	1,110

* 1968-1971 data were provided by the Aberdeen Acquisition Office.
All other data are from Sand Lake files.

WEATHER DATA

<u>Precipitation</u>	<u>Pollock</u>	<u>Aberdeen</u>	<u>Roscoe</u>	<u>Redfield</u>	<u>Gettysburg</u>	<u>District Average</u>	<u>District Normal</u>	<u>Dev. From Normal</u>
January	.53	.35	.12	.20	.23	.42	.47	- .05
February	.45	.41	.32	.37	.46	.39	.51	- .12
March	.26	.04	.10	T	.15	.09	.85	- .76
April	3.08	1.86	2.71	3.00	3.96	2.74	1.68	+1.06
May	2.71	1.70	2.93	1.94	2.30	2.39	2.37	+ .02
June	6.54	4.29	5.15	5.95	4.37	4.60	3.63	+ .97
July	1.61	3.75	1.42	1.57	.60	1.64	2.18	- .54
August	.93	1.39	.60	3.00	3.04	1.89	1.96	- .07
September	1.25	2.30	1.93	1.97	.86	1.70	1.28	+ .42
October	2.48	2.80	3.88	2.95	3.63	3.04	1.08	+1.96
November	.76	1.39	.90	1.42	.92	1.07	.57	+ .50
December	.59	.47	.60	.51	1.21	.68	.41	+ .27
TOTALS	21.19	20.75	20.66	22.88	21.73	20.65	16.99	+3.66

<u>Temp. (Avg.)</u>	<u>Max.</u>	<u>Min.</u>	<u>Max.</u>	<u>Min.</u>	<u>Max.</u>	<u>Min.</u>	<u>Max.</u>	<u>Min.</u>	<u>Max.</u>	<u>Min.</u>	<u>Max.</u>	<u>Min.</u>
January	14.5	-5.4	15.3	-4.6	12.2	-4.7	14.6	-3.1	16.0	-2.4	14.4	-4.4
February	25.2	2.0	26.3	4.0	25.3	4.8	26.6	4.7	26.2	6.7	25.6	4.0
March	39.3	17.7	42.4	20.4	40.6	20.1	40.6	20.4	40.1	19.6	40.6	19.2
April	60.6	33.1	62.7	33.0	60.2	34.1	61.7	34.5	60.8	33.3	61.1	33.2
May	69.2	41.8	69.6	41.6	66.0	44.4	69.8	42.8	66.7	41.5	68.2	41.4
June	79.3	57.9	82.1	58.5	79.3	57.9	83.2	59.0	80.9	56.9	81.4	57.7
July	82.5	55.1	82.2	54.2	82.0	54.4	84.9	56.7	83.1	53.7	83.1	54.2
August	90.1	56.4	89.5	56.4	88.8	54.1	89.2	56.8	91.3	54.9	89.9	55.9
September	74.0	45.6	73.2	46.2	73.8	46.2	73.5	47.6	74.9	47.9	73.5	46.3
October	58.8	35.9	59.0	38.0	59.0	36.2	60.1	38.5	58.9	34.0	59.4	37.1
November	41.9	20.3	41.7	22.7	40.9	21.9	41.6	22.8	42.1	22.2	41.2	21.9
December	22.3	- .2	22.6	2.6	21.5	1.6	24.7	4.9	23.5	3.5	22.9	2.5
EXTREMES	103	-34	105	-37	105	-30	103	-31	105	-26	104	-33

Weather information was provided by the National Weather Records Center, Asheville, North Carolina.

Low temperatures were below normal for the area. Snow cover was not as deep as normal. The heaviest ground cover was nine inches of snow in early February. By the end of March, all snow was gone and the ground stayed nearly bare through April. With the lack of snow cover and subsequent lack of water in potholes, early migrants passed on through the area to seek nesting areas farther north. Precipitation during January, February and March was .93 inches below normal. The month of April brought us back out of the hole and the wet cycle continued through June. Again in July, precipitation fell below normal for the month, but we were still above normal on the year. Dry, hot winds prevailed through the last part of July and nearly all of August contributing to the near decimation of the corn crop throughout the district.

September's moisture was again above normal, a trend which continued through the balance of the year. Snowfall during October, November and December totaled 21 inches at Sand Lake Refuge and at the end of the year, the ground was covered at a depth of 6 inches. If the conditions remain near normal through the balance of winter and early spring, optimum nesting conditions should prevail throughout the district in the spring of 1972.

D. Habitat Conditions

1. Water

Wetland water conditions in the spring of 1971 were relatively poor until several inches of rain fell in the central and western counties between April 16 and 19. This brought the central tier (McPherson, Edmunds and Faulk) and the western tier (Campbell, Walworth, Potter and Sully) up to fair levels until mid-July. After mid-July, only Type III and Type IV marshes retained water in the western two tiers.

After early July, about 90% of the Type III marshes in Brown County were dry.

Heavy rainfall in the western two-thirds of the district in October brought nearly all Type III wetlands in this area up to maximum level prior to freezeup.

2. Food and Cover

Relatively dry conditions during the early spring caused upland nesting cover to be only fair.

Small grain crops throughout the district were good. Corn left as wildlife food plots was poor, yielding from 20 to 30 bushels per acre.

Marsh area habitat was marginal in the spring. Low water levels during the summer and subsequent flooding of these areas in October resulted in good food conditions for waterfowl during the fall. Brood cover and food were adequate through the end of June. Many Type III marshes dried up in July, especially in the eastern part of the district.

Only fair cover and food conditions existed on uplands in the fall due to dry summer conditions. Snow cover was present from November 23 through the end of the reporting period.

II. WILDLIFE

A. Migratory Birds

1. Waterfowl (Anseriformes)

a. Swans

The first observation of swans occurred on March 17, when 6 were sighted on the Herman-Jutzy WPA in Edmunds County. Swans are seen in all 9 counties of the district, but are seldom observed in large flocks. Seventy-five to eighty normally use Sand Lake Refuge during fall migration.

b. Geese

(1) Spring Migration

On March 13, eleven lesser Canada geese were observed on Zell Lake WPA in Spink County. Laborer Duane Huber reported that a small flock of giant Canada geese were using the Jessen WPA in Spink County on March 6. White-fronts were observed on several units along the western edge of the district. The rapid movement of the geese through the district makes it difficult to obtain detailed data.

(2) Fall Migration

The major routes for the fall migration are along the Missouri River on the west edge of the district and down the James River valley along the east edge of the district. Small flocks are observed throughout the district, but large concentrations are present only on Sand Lake Refuge. About 1,500 geese used the Pocasse Refuge on the west edge of the district. Over half the geese at Pocasse during the fall of 1971 were white-fronts.

c. Ducks

(1) Spring Migration

The spring migration began during the middle of March and reached its peak about April 10. Many of the Type I marshes were dry resulting in large concentrations of mallards and pintails on the large Type IV marshes. The breeding populations of mallards and pintails were below the 1970 breeding population. However, heavy rains in mid-April filled many of the Type I marshes which held the later migrating ducks to normal breeding populations.

(2) Breeding Pair Counts

In 1971, two pair counts were made on four blocks of pothole habitat. Habitat Block I contained 1/2 section, Blocks II and III contained 1 section each and Block IV contained 1 1/2 sections. The first count was made on May 13 and 14 and the second count on June 8 and 9.

The datum collected shows that there were 24.8% fewer pairs than in 1970 and 19.3% fewer than in 1969. Blue-winged teal pairs were down only 8%. Heavy rains in April flooded many Type I marshes which were dry during the early migration period. This evidently benefited the later nesting ducks.

BREEDING PAIRS OF WATERFOWL FOR WPA's - 1971

<u>Species</u>	<u>I</u> Pairs on		<u>II</u> Pairs on		<u>III</u> Pairs on		<u>IV</u> Pairs on	
	<u>5/13</u>	<u>6/8</u>	<u>5/13</u>	<u>6/8</u>	<u>5/14</u>	<u>6/9</u>	<u>5/14</u>	<u>6/9</u>
Mallard	8	14	10	12	3	7	13	13
Gadwall	12	13	5	5	23	10	7	7
B-w. Teal	41	34	26	37	31	13	34	31
Shoveler	7	6	6	6	3	-	21	4
Pintail	4	5	10	10	9	5	7	6
Redhead	1	3	1	4	-	-	10	7
Canvasback	-	-	-	-	-	-	6	2
L. Scaup	-	2	5	-	-	-	3	-
Ruddy	2	2	-	2	-	-	4	4
Unk. Dabb.	-	-	3	-	-	-	-	-
Sub-totals	<u>75</u>	<u>69</u>	<u>79</u>	<u>76</u>	<u>67</u>	<u>36</u>	<u>105</u>	<u>74</u>

TOTALS - 326 First Count
255 Second Count

(3) Production

The 1971 brood survey consisted of four auto transects designed to include the four wetland blocks in the breeding population survey. The auto transects were 15 miles long in McPherson County (No. 1) and in Spink County (No. 3). They were 20 miles long in Edmunds County (No. 2) and in Campbell County (No. 4). Ecological data were recorded in addition to the numbers of broods observed.



Waterfowl production in the Sand Lake Wetland District was down from the 1970 level, but above the 10 year average. SD-SDL-1149

Data collected on July 13 and 14 indicates that there were 46% fewer broods in 1971 than in 1970. However, this does not accurately indicate that production in 1971 was 46% below production in 1970. Vegetation was considerably denser in brood marshes in 1971 than it was in 1970. This resulted from many marshes being dry in the fall of 1970 and reflooding during late spring of 1971. Observations of broods while visiting the wetlands indicate that production in 1971 was almost equal to production in 1970.

BROOD COUNT ON WPA's - 1971

<u>Species</u>	<u>I</u>	<u>II</u>	<u>III</u>	<u>IV</u>
Mallard	1	2	1	2
Gadwall	1	-	-	-
G-w. Teal	1	-	-	-
B-w. Teal	5	4	1	4
Pintail	2	-	1	2
Unk. Dabb.	14	5	1	4
Ruddy	-	-	-	1
TOTALS	24	11	4	13

Presently, the breeding pair and brood counts provide us with little usable information for the cost incurred.

Data provided from a ten mile transect conducted by M&E personnel south of Roscoe in Edmunds County would probably provide adequate production trends. These trends, combined with cable-chain dragging of various habitat types (See Section V), should give us adequate production information to evaluate management practices.

(4) Fall Migration

The main flight of ducks moved through the district the last week of October and the first week of November. Many of the small marshes were frozen over, which hurried them farther south. The Missouri River aerial waterfowl survey which was flown on November 9 by state of South Dakota personnel showed 841,210 ducks using the South Dakota section of the Missouri River. This is about three times the 1970 total of 281,340 and over double for the 1969 total of 356,310 for the peak period.

2. Water and Marsh Birds - (Gaviiformes, Ciconiiformes, Colymbiformes, Gruiformes and Pelicaniformes)

A colony of approximately 50 eared grebes nest on the Hoffman-Ehley-Rau management unit in northern McPherson County. Western and pied-billed grebes also nest on this unit, but in lesser numbers.

Cranes and pelicans have not been observed nesting in the district except for the white pelicans which nest at Sand Lake Refuge.

Sandhill cranes migrate down the Missouri River on the western edge of the district. Five to fifteen thousand use Pocasse Refuge during October and feed in surrounding grain fields. The peak population observed on Pocasse in 1971 was 7,800 on October 26.

Whooping cranes also migrate along the Missouri River and are often mixed with sandhill crane flocks, however, there were no recorded whooping crane observations in 1971.

3. Shorebirds, Gulls and Terns - (Charadriiformes)

There is a wide variety of shorebirds which migrate through the district and nest here. The most common are killdeer, upland plover, spotted sandpiper and semi-palmated sandpiper.

The Franklin's gull is the most common of the gulls, with the fall migration normally peaking at 500,000 or more. Forster's and common terns are the most abundant terns.

black
No
SPW

4. Doves

Mourning dove populations were estimated to be about the same as they were in 1970. A few doves remained in the district at the close of the calendar year.

B. Upland Game Birds (Galliformes)

Open winter conditions during 1970-71 left upland game bird populations in excellent condition. Production was good for both the ring-necked pheasant and Hungarian partridge.

Sharp-tailed grouse were observed at seven locations and greater prairie chickens were observed at two locations in the wetland district.

At the end of 1971, it was estimated that 4,500 pheasants and 125 Hungarian partridges were using WPA's as a primary source of food and cover. No sharp-tailed grouse or prairie chickens were observed on WPA's in 1971. A summary of the 1971-72 winter populations is located in Section V.

C. Other Birds (Falconiformes, Strigiformes, Passeriformes)

1. Hawks

Marsh, ^{W0}sparrow and red-tailed hawks were the most frequently observed summer residents. Other hawks occasionally sighted during the spring and fall were the rough-legged, Cooper's, sharp-shinned and Swainson's.

2. Owls

The most commonly observed owl was the great horned. Burrowing and short-eared owls were seen occasionally. The first snowy owl was observed on November 28.

3. Eagles

Two immature golden, one immature bald, one adult bald and one unknown species of eagle were observed over WPA's in 1971.

Two injured golden eagles were nursed back to health, banded and released in November. One immature bald eagle which died shortly after we received it was turned over to the Northern Prairie Wildlife Research Center to determine the cause of mortality. An adult bald eagle, which died in October, is being held for disposition at the close of the reporting period.

3. Passeriformes

A wide variety of perching songbirds are seen as summer residents and migrants throughout the wetland district. By virtue of the geographical location of the district, both eastern and western bird species are observed.

D. Big Game Animals

White-tailed deer populations increased slightly over recent years in the wetland district. Two mule deer were observed near the Koehn WPA in Potter County and one mule deer was observed on Sand Lake Refuge. Nearly all WPA's in the district receive some use by white-tailed deer during the season. A total of 390 deer were estimated to be using WPA's as a primary source of food and cover in December, 1971. Population estimates taken during the winter census in December, 1971 and January, 1972 are summarized below.

DEER POPULATION ESTIMATES - 1971-72

<u>WPA</u>	<u>County</u>	<u>Population</u>
Engle Dam	Brown	4
Hays	Brown	75
Kruse	Brown	15
Woehlhauff	McPherson	3
Hoffman #299	McPherson	13
Adam	McPherson	15
Hecla	Brown	30

Heavy cattail stands serve as one of the primary winter cover types for deer in the district.

The herd of pronghorn antelope in McPherson County is estimated to contain 100 head, however, none were observed on WPA's this year.

E. Fur Animals, Predators, Rodents and Other Mammals

Musk rats are the most abundant fur animals in this district. Low water levels during late summer and early fall kept the muskrat population below 1970 levels. Type III and Type IV marshes averaged about one main rat house and one or two "push-ups" per six acres of marsh going into the winter.

Red foxes are considered one of the major nest predators in the district. Populations, according to aerial hunters and trappers, are up slightly from 1970. Pelt prices, including bounty, were running as high as \$16.50. With the heavy hunting pressure and

issuing of aerial hunting permits by the state of South Dakota, fox populations are not expected to increase significantly prior to the 1972 nesting season.



Lord Lake WPA is presently one of the more popular muskrat trapping areas. Emphasis will be placed on developing this WPA for Environmental Education.

SD-SOL-1150

The skunk is also considered to be a primary nest predator in the district. Few observations are made, but trappers have reported removing as many as 30 skunks from along a two mile lake edge for use as fox bait.

Raccoon populations appear to be low throughout the district.

White-tailed jackrabbit populations are higher throughout the district than in 1970. Cottontail rabbit populations are up slightly from 1970. Winter censuses showed heavy use of dense nesting cover areas by cottontail rabbits.

F. Rare, Endangered and Unusual Species

Greater prairie chickens were observed on the east side of Sand Lake Refuge on November 27 and 3 miles northwest of the town of Long Lake on January 6, 1972.

Sharp-tailed grouse populations west of the Missouri River were very high. East of the river they were seen several times in McPherson County and several times in Brown County.

An American woodcock was observed feeding at a spring area on the Heis Tract in Brown County on October 25.

G. Fish

Very few WPA's in the Sand Lake District provide good habitat for fish. By virtue of the shallowness and size of many of the water bodies, game fish have difficulty surviving. Even those areas that do hold fish receive little fishing pressure.

Fishing in Lake Pocasse was reported as being fairly poor in 1971. One 24 pound Northern was caught on the shore of Lake Pocasse Park - only four blocks from the main street of Pollock.

H. Reptiles and Amphibians

Thousands of mudpuppies/water dogs (aquatic salamanders), which remain a larva throughout life, were observed in the open water created by the 55 gpm. artesian well flowing into the Mehlhoff WPA in December.

I. Disease

Nothing to report.

III. WPA DEVELOPMENT AND MAINTENANCE

A. Physical Development

1. Fencing

A total of 15.3 miles of new fence was constructed in 1971. Whenever possible, fencing was accomplished by contract at \$1.05 per rod with the Government furnishing the material. Force account fencing has ranged from \$1.50 to \$2.50 per rod and has been used only when a contract could not be used and on special problem areas. At the end of the calendar year, 61 management units have required approximately 96 miles of new fence. Realizing the problems involved with maintaining over 115 miles of fence, fencing is used only as a last alternative for controlling unauthorized use. Current cost of fencing averages \$1,000 per mile.

Fencing completed in 1971 is summarized in the table below.

WPA FENCING - 1971

<u>WPA</u>	<u>County</u>	<u>Rods Removed</u>	<u>Rods Fenced</u>
Woehlhauff-Schnabel	McPherson	400	580
Bierman	Edmunds	240	845
Voight	Faulk		240
Necla	Brown	320	430
Rath-Dornbush	McPherson	380	540
Kary	McPherson		540
Eureka	McPherson	400	640
Thorpe	Brown	800	800*
Sanderson	Spink		80
Schuh	Walworth	160	220
		TOTAL	4,915 (15.3 Miles)

Neuhardt?

* 320 rods constructed by County, material furnished by wetland district

2. Posting

Eleven new tracts were posted this year. This includes six tracts that were purchased in 1970 but the title was not received until 1971. All tracts for which we now have title have been posted (178 miles) with the green Waterfowl Production Area signs.

Sand Lake has been acting as the base of distribution for WPA signs.

WPA Sign Status as of December 31, 1971

<u>Type</u>	<u>On Hand</u>
Green	500
Green (Decal)	940
Decals (Green)	550
Blue (New)	1,200
Blue (Used) - Estimate	5,000
Green (Delivered February 3, 1972)	8,000

In an attempt to make use of the old blue and white WPA signs, plastic, green and white (canvasback) decals were purchased by the Regional Office for about \$.65 each and are being attached for a price of \$.10 each. The decals are difficult to attach without creating air pockets between the decal and the aluminum alloy base. A bid estimate of \$.75 per sign for repainting the old blue and white signs was received from the Highway Sign Company of Aberdeen.

The Regional Office's most recent order for 8,000 signs on November 8, 1971 was received for distribution on February 3, 1972. The cost per 13" X 15" sign was \$1.09.

Two problems have occurred frequently with our present signs: 1) shaking loose of nuts due to wind vibration and 2) Lack of compliance with the "unauthorized entry prohibited" portion of the sign. This is especially true where vehicular trespass is concerned.

3. WPA Cleanup

Building site cleanup was completed on the Thorpe, Adam, Fischer, Woehlhauff-Schnabel and Eureka WPA's. Old fence, car bodies and trash were consolidated on the Jessen WPA for burial in 1972. The cattle yard feeding setup on the Einspahr WPA was cleaned up. An old pump house was removed from the Hahler WPA.

Approximately 3.5 miles of electrical and telephone lines and poles were removed during 1971. A mile of lines and poles was re-located on the Eureka Demonstration Area.

4. Potholes - Islands

Two nesting/resting islands 150 feet long and 50 feet wide were pushed up with the D-7 dozer on the Kruse WPA at an estimated cost of \$60 per island. An abandoned drainage ditch was blocked on the Kruse WPA.

No potholes were blasted with ammonium nitrate in 1971. Potholes blasted in recent years (30' X 60' X 5') have cost an average of \$60 each. Presently we have 525 20 pound charges of Gulf Nitro-Carbo-Nitrate on hand.

Ditches were dug connecting the five islands and five pools on the Einspahr WPA. New pool depths average about four feet below the bottom of the original marsh. Most of the total cost (\$1,500) for the 5 1/2 acre complex was incurred in 1970.

5. Trail/Road Improvement

A .3 mile roadway going into the artesian well on the Mehlhoff WPA was raised about 12" and surfaced with gravel at a rate of 700 yards per mile for an estimated total cost of \$535.

The .4 mile roadway going into the Eureka Demonstration Area was sloped 3:1 and graveled at a rate of 800 yards per mile for an estimated total cost of \$725.

Two approaches were constructed across ditches going into parking areas and one ditch crossing was moved onto private land when our fencing cut off an adjacent landowner's access to his fields.

Four individuals were paid to mow township roads (to control snow buildup) adjacent to WPA's at a rate of \$15 to 20 per mile.

6. Dike and Dam Construction

Size and type of construction of each earthen dike or dam are shown below.

County	Management Unit	Length	Average Height	Average Top Width	Pipe Diameter
Brown	Thorpe	150'	3.0'	20'	-
Brown	Kruse	60'	5.0'	20'	-
McPherson	Eureka	95'	9.0'	14'	-
McPherson	Eureka (Repair)	65'	7.5'	14'	-
McPherson	Eureka	475'	5.5'	20'	18" & 12"
McPherson	Eureka	1,160'	3.5'	12'	18"
McPherson	Eureka	200'	3.0'	10'	12"
McPherson	Eureka	500'	3.0'	10'	-
McPherson	Eureka	160'	2.5'	10'	-

The major portion of construction was on the Eureka Demonstration Area. The dike system serves as a trail route as well as a means of water control. Unlimited water is available from the 240 acre Eureka Lakes which are fed by a 342 gallon per minute artesian well. Each dike is designed with an emergency spillway and control gate. Gravitational flow from the Eureka Lakes will enable us to flood and

drain approximately 65 acres. Total cost of the dike construction, water control structures, shaping of dikes and seeding was estimated at \$5,450. (Minimal)



SD-SDL-1151

One of several dikes constructed on the Eureka WPA which will serve as a nature trail as well as enabling us to drain and reflood a series of impoundments.

7. Equipment Acquisition

Fire pump, 5 HP., 60 gpm.

B. Plantings, Including Soil and Moisture Activities

Twenty-two and one-half acres were planted to trees and shrubs during May of 1971. This acreage was fallow during 1970. These plantings are summarized on the following page.

TREE PLANTINGS ON WPA's - 1971

Tract County Date Planted	Adam McPherson May 5, 1971	Boekelheide, M. Spink May 8, 1971	Hottman Potter May 5&6, 1971
<u>Species</u>	<u>Number</u>	<u>Number</u>	<u>Number</u>
Native Plum	165	260	775
Russian Olive	0	250	750
Red Cedar	350	1,050	3,150
Carigana	350	350	1,000
Ponderosa Pine	170	0	0
Green Ash	85	0	0

Only small clumps of native plum, buffaloberry, chokecherry and Hanson's hedgerose will be planted on WPA's other than demonstration areas in 1972.

The average four year survival of all species planted is approximately 60%. The highest rates of survival are found in native plum, buffaloberry and Russian olive. Cedar survives fairly well (30-60%) but has an extremely slow rate of growth.

Forty acres of small grain stubble was seeded to native grasses in October, 1971. At the end of calendar year 1971, 353 acres on 16 management units have been seeded to native grasses.

One hundred seventy-eight acres of dense nesting cover were seeded on 6 WPA's in the district. A mixture of 4 lbs. of intermediate wheatgrass, 2 lbs. of sweetclover, and 1 lb. of alfalfa was seeded. The cooperative farming agreements drawn up in 1971 for crop years 1972 and 1973 emphasize planting rye as a nurse crop, which will also serve as a food plot for upland game. A DNC mixture of 2 lbs. of intermediate wheatgrass, 2 lbs. of sweetclover and 1 lb. of alfalfa will be planted with the rye.

The total acreage of DNC in the district is now 473 acres. Ninety-five percent of the DNC planting has been handled by cooperative farming agreements and has been planted on ground which had been previously farmed. The cost per acre for the DNC seed, handling the permit and transportation of the seed runs just over \$2.00 per acre. We have not been able to fully evaluate the benefits of DNC (See Section V) but both from a nesting cover standpoint and a source of winter food and cover it looks extremely good. At the end of the reporting period 710 acres were under cooperative farming agreement to be planted to DNC in 1972.



SD-SDL-1152

Dense nesting cover on the Hottman WPA demonstrated its value both as an excellent nesting cover and winter cover for upland game and deer. The upper photo shows what the area looked like two years ago.



SD-SDL-1153

GRASSLAND SEEDING SUMMARY - 1971

<u>County</u>	<u>Management Unit</u>	<u>Acres Seeded</u>	<u>Seeding Mixture</u>	<u>Seeding Rate</u>	<u>Method</u>	<u>Date Seeded</u>
McPherson	Kary	35	Natives*	6#/Ac.	Nisbet Drill	10/71
McPherson	Eureka	5	Natives*	8#/Ac.	Nisbet Drill	10/71
McPherson	Neuharth	20	DNC**	71#/Ac.	Field Drill	5/71
McPherson	Lammle, L.L.	8	DNC**	71#/Ac.	Oats Cover	5/71
Brown	Kruse	30	DNC**	71#/Ac.	Field Drill	5/71
Campbell	Fischer	40	DNC**	71#/Ac.	Oats Cover	5/71
McPherson	Eureka	9.5	DNC**	71#/Ac.	Field Drill	5/71
McPherson	Hoffman #299	70	DNC**	71#/Ac.	Oats Cover	5/71

* Native grass mixture: 20% Big Bluestem, 20% Little Bluestem, 15% Switchgrass, 10% Indiangrass, 15% Green Needlegrass, 20% Western Wheatgrass.

**DNC Mixture: 4 lbs. Intermediate Wheatgrass, 2 lbs. Sweet-clover, 1 lb. Alfalfa, 6 1/2 lbs. Oats

C. Cultivated Crops

Nine cooperative farming agreements were issued on 381 acres of agricultural land. The Government's share of this crop was left unharvested. Low corn yields, 20 to 30 bushels per acre, resulted in insufficient winter food for an estimated 850 pheasants on the Einspahr WPA. All other food plots provided adequate winter food and were well utilized by upland game and deer.

Besides providing winter food plots, the cooperative farming system enables us to prepare the ground for native grass seedings and also enables us to get DNC established at minimal cost. We have found that nearly all cooperators will plant the DNC seed mixture concurrently with their normal small grain drilling operations. The 2/3 - 1/3 crop division still applies and the only cost to the Government is the cost of the seed, permit negotiation and writing and delivery of the DNC seed.

D. Collections and Receipts

1. Seed and Other Propagules

None

2. Specimens

One immature bald eagle was turned over to the Northern Prairie Wildlife Research Center for analysis of cause of death.

One adult bald eagle, turned over to GMA Lovrien, is in our possession at the end of the reporting period.

3. Building Disposal

One barn, one pumphouse and several small buildings were removed during 1971. No revenue was received.

E. Control of Vegetation

Ten acres of leafy spurge were sprayed with Tordon 101 in Brown County (2 acres), Campbell County (3 acres) and McPherson County (5 acres). Spraying has kept this pest species under control but spurge always seems to appear in the same location the following year.

F. Fires

No fires occurred in 1971 on Waterfowl Production Areas.

IV. RESOURCE MANAGEMENT

A. Grazing

No grazing was permitted on WPA's in this district in 1971. Land for grazing is in strong demand throughout the district. The use of heavy, early spring grazing on an intermittent basis appears to have merit as a means of encouraging warm season grasses and improving nesting cover on several WPA's.

B. Haying

No hay was cut on WPA's in 1971. Ten acres of hay was cut, stacked and left for winter feed in 1970 in an attempt to alleviate deer depredation around the Fischer-Nelson WPA in Sully County. The hay was not utilized in 1971.

C. Fur Harvest

All WPA's in the district are open to trapping. One permit was issued for trapping on the Pocasse National Wildlife Refuge during the 1971-72 season. No special attempt was made to determine the level of fur harvest in the district.

V. FIELD INVESTIGATION OR APPLIED RESEARCH

1. Nesting Structure Study

This was the fourth year that a nesting structure study was conducted on the wetland district. The objectives of the study are: 1. to find methods to increase production of ground nesting wild ducks, 2. to test and evaluate nesting structures that have been designed to provide safe nesting sites, 3. to develop and evaluate new types of artificial nesting structures, and 4. to provide conservation agencies, sportsmen's clubs, youth groups, and the general public with guidelines for construction and installation of nesting structures.

A basket type structure, constructed from 1/2 inch welded wire in the form of a cone was used in this district. In 1969, there were 58 structures available on 26 marshes, by 1971, this number had dwindled to 34 structures on 20 marshes. Twenty-four had been blown down or pushed over by ice.

Duck use data were recorded in late June, 1971.

USE OF NESTING STRUCTURES - 1970-71

	<u>1970</u>	<u>1971</u>
Number Available	36	34
Number Used	20	20
Percent Used	55.5	59.0

At the time the baskets were checked, 13 nests had hatched out and 7 nests were still being incubated. No depredation occurred in 1971 and only one nest was destroyed in 1970.

To improve management efficiency these structures will be removed from marsh areas having low usage and concentrated on 3 or 4 marshes having high usage.

In addition to these baskets, 50 floating platforms were put out in the fall of 1969. Use of the platforms was low in both 1970 (14.7%) and 1971 (24.8%). The floating type structure will not be used in the future because of: 1. high maintenance cost and 2. strong winds cause wet nesting areas.

DUCK PRODUCTION CENSUSING METHOD FOR WATERFOWL PRODUCTION AREAS USING A CABLE-CHAIN DRAG

This study was initiated in 1970 and, with a few changes, was continued in 1971.

The purposes of this study are: 1. to determine a method of evaluating management practices on Waterfowl Production Areas, and 2. to provide a method of estimating actual waterfowl production on upland habitat.

By using the cable-chain drag we can sample six to eight hundred acres and four or five habitat types in a five-day period. The data collected from this sample can be expanded to all similar habitat on fee areas in the management district. It is felt that this method will give an accurate census of duck production on the uplands and provide a means of management evaluation.

Methods

The study area consisted of seven units located in the management district. A cable-chain drag was used for locating the nests. The drag was constructed from 115 feet of 5/8 inch steel cable. Sections of 5/16 inch steel chain were attached to the cable to form loops (Higgins, 1969).

The drag was towed between two vehicles approximately 100 feet apart. In 1970 and 1971, pickups were used for towing the drag. We believe that tractors or jeeps would be more efficient. Pickups have the following deficiencies: 1. do not turn short enough, 2. overheat in heavy cover, 3. lack power in heavy cover, and 4. do not clear rocks easily. The drag was pulled at approximately 7 mph. An observer rode on one of the vehicles to mark the location of the nests and to identify flushed hens. With better visibility from a tractor, it is possible that the observer may not be necessary. The nest locations were marked with a white flag attached to a 4 or 5 foot willow stick. Datum was recorded at each nest site on an unisort analysis card.

Results

In 1971, 550 acres of idle habitat were searched between June 8 and June 16. Heavy rainfall the last week of May and the first week of June made it impossible to drag 150 acres that were previously selected.

Chart A has a breakdown of the numbers of nests located in each habitat type. Kirsch (1969) found that the cable-chain drag flushed 67% of the hens nesting in idle cover; therefore, an additional

33% was added to the total nests in Chart A. Data collected in 1969 and 1970 by Duebbert (Pers. correspondence, 1971) indicate that 19.6% more nests are found during the second dragging in July. This 19.6% was also added to the total nests in Chart A. Hatching chronology data for this district compiled by Duebbert (1969) indicated that 13% of the duck nests hatched prior to June 4. Thirteen percent was added to the hatched total in Chart C.

Expansion

The data collected from the nest search sample is expanded to all upland acres with similar nesting habitat. The total acres of upland habitat were computed from wetland inventory cards. Those units that have been purchased but have land use reservations by the previous owners were not included.

In Chart C, 50% nesting success was used for non-use pasture. The nesting success on non-use grassland seems to be unusually high when compared to other studies with similar habitat. Kirsch (1969) reported 28% nesting success in North Dakota, 21% of the nests were successful at Crescent Lake (Imber, unpub. report filed at Crescent Lake Refuge) and 24.4% nesting success was found by Glover (1956) in Iowa. A larger sample taken over a period of several years should give more reliable data for nesting success on grasslands in the Sand Lake Wetlands District.

Conclusion

The data collected in 1971 is not sufficient to develop an index for duck production by habitat type. It is estimated that from 3 to 5 years' data will be required for this purpose. This index will show: 1. what production can be expected from various land use practices, 2. how production any given year compares with the long-term average production, and 3. total duck production on upland acres.

At the present time, managers are using pair and brood counts to calculate waterfowl production in Wetland Districts. This census tends to duplicate data from the breeding ground surveys presently conducted by Management and Enforcement personnel without furnishing data useful for management.

With some expansion to include over-water nesters, the proposed census method could show production on Bureau-owned land as well as the results of management practices.

Chart A. Nesting Attempts

<u>Cover Type</u>	<u>Acres</u>	<u>Nests</u>	<u>33%</u>	<u>19.6%</u>	<u>Total</u>	<u>Ac./Nest</u>
Dense Nesting Cover	144	17	6	3	26	5.5
Alfalfa-Alfalfa Grass Mixtures	142	14	5	3	22	6.4
Native Grass	96	0	0	0	0	0
Non-Use Pasture	168	9	3	2	14	12.0

Chart B. Nesting Success

<u>Cover Type</u>	<u>Nests</u>	<u>Checked</u>	<u>Hatched</u>	<u>% Success</u>
Dense Nesting Cover	17	11	10	90.9
Alfalfa-Alfalfa Grass Mixtures	14	11	3	27.0
Native Grass	0	0	0	0
Non-Use Pasture	9	8	4	50.0

Chart C. Production Expansion to Fee Areas

<u>Cover Type</u>	<u>Acres</u>	<u>Ac./Nest</u>	<u>Nesting Success</u>	<u>Hatched Prior To Dragging</u>
Dense Nesting Cover	709	5.5	90.9	13%
1. $709 \div 5.5 = 129$ Nests 2. $129 \times 90.9 = 117$ Nests Hatched 3. $117 \times 13\% = 15$ Additional Nests Hatched 4. 132×6 (Ducks/Brood) = 792 Ducks Produced 5. Production = 1.11 Ducks Per Acre				
Alfalfa-Alfalfa Grass Mixtures	142	6.4	27.0	13%
1. $142 \div 6.4 = 22$ Nests 2. $22 \times 27 = 6$ Nests Hatched 3. $6 \times 13\% = 1$ Additional Nest Hatched 4. 7×6 (Ducks/Brood) = 42 Ducks Produced 5. Production = .29 Ducks Per Acre				
Native Grass	352	0	0	0
No Ducks Produced				
Non-Use Pasture	1,948	12.0	50.0	13%
1. $1,948 \div 12 = 162$ Nests 2. $162 \times 50 = 81$ Nests Hatched 3. $81 \times 13\% = 10$ Additional Nests Hatched 4. 91×6 (Ducks/Brood) = 546 Total Ducks Produced 5. Production = .28 Ducks Per Acre				

TOTAL DUCKS PRODUCED - 1,380 - This is a gross estimate based on only one year's data. It does not include ducks produced in water and marsh areas which are too wet to drag.

Chart D. Species Composition of Ducks Produced

<u>Species</u>	<u>Drag Sample</u>	<u>Expanded Total</u>
Blue-winged Teal	50.0%	690
Gadwall	19.0%	262
Mallard	16.6%	229
Pintail	11.9%	164
Shoveler	2.5%	35

The information from our dragging operations will also include estimates on deer, pheasant, sharp-tailed grouse, Hungarian partridge and prairie chicken production. This will be combined with data from our winter census, which is discussed in the next section, to allow a total evaluation of our habitat management as it relates to these species.

3. Wintering Population Census

A snowmobile was used during mid-winter to estimate the wildlife populations occupying various habitat types on selected WPA's. The wildlife use by habitat type is then combined with production by habitat type to give us a fairly complete picture of the total value of each kind of habitat.

Population estimates on 12 WPA's are summarized below:

WINTER CENSUS - 1971-72

<u>WPA</u>	<u>County</u>	<u>Pheasant</u>	<u>Hungarian Partridge</u>	<u>Deer</u>
Einspahr	Spink	850	0	0
M. Boekelheide	Spink	150	0	0
Engle Dam	Brown	95	0	4
Hayes	Brown	10	0	75
Kruse	Brown	200	0	15
Eureka	McPherson	5	16	0
Adam	McPherson	275	0	15
Woehlhauff	McPherson	55	0	3
Hoffman #299	McPherson	0	0	13
Mehlhauff	McPherson	150	20	0
Long Lake	McPherson	5	0	0
Hecla	Brown	40	0	30

VI. EASEMENT ADMINISTRATION

Portions of approximately 75 easements were checked for contract violations (burning, leveling, filling or draining) during routine travels through the wetland district. Several minor violations which occurred a few years ago were also checked. No violations were noted during these observations nor were any brought to our attention by other parties.

Current land practices in this part of South Dakota do not include fall burning. Dry conditions in late summer created ideal burning conditions in late summer and early fall. Checks of five areas observed being burned in early October revealed only haystack burning and weed burning along lanes to reduce snow buildup.

Contacts with several local heavy equipment contractors indicated that drainage construction occurs fairly infrequently in this wetland district. Most drainage that is economically feasible seems to have been completed.

The general public acceptance of the easement program in this wetland district is considered excellent.

VII. PUBLIC RELATIONS

A. Recreational Uses

Accurate tallies of public use on 76 WPA's scattered throughout the district are extremely difficult to obtain. Based on casual observations, it is estimated that there were 4,031 visits to WPA's by the public in 1971. This 34% increase over 1970 is attributed primarily to the additional acquisition of 5,000 acres in 1970 and 1971. General public awareness of the existence of these areas is also a major cause for steadily increasing public use.

B. Refuge Visitors (Pertinent to WPA's)

<u>Name</u>	<u>Organization</u>	<u>Purpose</u>
Lewis Kowalski	BSP&W	Eureka WPA
Bill Sonntag	BSP&W	Eureka WPA
John Carlsen	BSP&W	Inspection
Major Boddicker	S. D. En. Ed.	Eureka WPA
John Farley	USDA	Eureka WPA

C. Hunting1. Waterfowl

Goose hunters were given a 75 day season in 1971. Hunting pressure on fee title areas was light because few geese use WPA's during their fall migration. Most goose hunting in the district occurs along the Missouri River and around Sand Lake Refuge. The estimated goose kill in Brown County was 31,474.

Duck hunters were given a 70 day season. Duck hunting pressure was fairly light throughout the season. Late October through early November was the optimum period for duck hunting on WPA's.

2. Pheasant

Pheasant populations were up 32% in the district. Relatively heavy hunting pressure occurred in Spink and Brown Counties. Light hunting pressure prevailed throughout the rest of the district.

3. Mourning Dove

After five seasons of dove hunting, South Dakotans have shown increased interest in this challenging sport. Many WPA's provided the opportunity for hunters to test their shooting skill. The season ran from September 1 to September 14 with a daily limit of 10.

ANNUAL
MONTHLY RECREATIONAL USE REPORT

Refuge name
Sand Lake WMD
State
South Dakota

State
Code **41**
(1-2)

Congressional
District Code **01**
(3-4)

Refuge
Code **358**
(5-7)

Report Yr. **XX**
Period **71 XIX**
(8-11)

(Card Columns). (12-13) (14-18) (19-25)

ACTIVITY	Code	VISITS FOR THE MONTH	
		Total Number	Total Hours
Hunting:			
Big Game	01	60	60
Upland Game	02	1,050 1,065	1,458
Waterfowl	03	2,000	4,000
Other Migratory	04	60	30
Other	05	76	48
Bow	06	10	25
Fishing:			
Salt Water	07		
Warm Water	08	100	180
Cold Water	09		
Environmental Education	10	118	253
Wildlife Photography	11	51	53
Wildlife Observation	12	487	310
Conducted Programs	13		
Field Trials	14		
Wildlife Trails	15		
Wildlife Tours/Routes	16		
Visitor Contact Stations	17		
Camping (wildlife related)	18		
Picnicking (wildlife related)	19		
Wildlife Interpretive Center	20		
Off-Site Programs	21	125	1

(Card Columns). (12-13) (14-18) (19-25)

ACTIVITY	Code	VISITS FOR THE MONTH	
		Total Number	Total Hours
On-Site Programs	22	12	46
*Miscellaneous Wildlife	23	4	2
Swimming	24		
Boating	25		
Water Skiing	26		
Camping	27		
Group Camping	28		
Picnicking	29		
Horseback Riding	30		
Bicycling	31		
Winter Sports	32		
Fruit, Nut and Vegetable Collecting	33		
*Miscellaneous Non-Wildlife	34		
Peak Load Day	35	400	
Actual Visits	36	4,031	
Fee Area Use	37		
Number of Fee Areas	38	(14-18)	
Fee Collections	39	\$	
Collection Costs	40	\$	

4. Sandhill Crane

The fourth annual sandhill crane season was opened from November 13 through December 12, with a daily bag limit of 3. The concentration of cranes on Pocasse National Wildlife Refuge reached 7,800 on October 26; however, by the time the season opened, only one crane remained in the area. In their weekly wildlife newsletter, state management personnel expressed the general attitude of why even have a season if it doesn't open until the entire population has moved on. The reluctance of the Bureau to open the season earlier is probably influenced by the occasional whooping crane visits to Lake Pocasse.

5. Deer and Antelope

Deer hunting on WPA's was relatively heavy this year. Deer hunting from vehicles continues to be a problem on many WPA's. This type of trespass has the potential for becoming a severe problem unless strong control measures are taken immediately after acquisition. The number of deer hunting permits have increased from 400 to 900 in the past eight years in Brown County. The success ratio runs about 93%, with 56% being bucks.

A herd of around one hundred antelope is present in central McPherson County. The antelope population has been dropping rapidly in recent years and the number of successful hunters has followed the same trend. No WPA use by antelope has been documented.

D. Violations

Vehicle trespass has been the most significant kind of violation. No apprehensions have been made to date. Continued emphasis will be placed on the fact that it is a violation to drive vehicles on WPA's. Consideration is being given to the need for a specific sign prohibiting vehicles which can be placed adjacent to gates and other avenues commonly used by vehicles to enter WPA's. Federal Magistrates are now available in two towns within the district.

An inspection of the Bureks Demonstration Area on May 17 revealed that Mr. Joe Hardegger, Bureks Cheese Factory owner, was pumping cheese waste at a rate of 80,000 pounds per day onto the Bureks WPA. Illegal dumping of this waste continued until a certified letter (773670) was sent on May 28, 1971, informing Mr. Hardegger that damages would be claimed for each day the dumping continued. No dumping has reoccurred as of the end of the reporting period but considerable potential exists for recurrence of the dumping problem.

Primary emphasis on law enforcement by wetlands personnel during the hunting season was centered around Sand Lake Refuge where eleven cases were made by wetlands personnel.



Unauthorized dumping of whey from the Eureka Cheese Factory resulted in multitudes of wildlife (flies) and an accompanying aroma on the Eureka Demonstration Area.

SO-SRL-1154

E. Safety

No accidents concerning wetland personnel occurred in 1971.

F. Revenue Sharing

The nine counties within the management district received \$4,912.45 under the Refuge Revenue Sharing Act, P. L. 88-523. This was \$2,477.04 more than the payment in 1970. The 1971 payments, which represent $\frac{3}{4}$ of 1% of the adjusted fee area land value, were distributed as follows:

<u>County</u>	<u>Payment</u>
Brown	\$1,440.07
Campbell	339.59
Edmunds	401.97
Faulk	225.47
McPherson	1,689.09
Potter	231.75
Spink	464.64
Sully	79.37
Walworth	40.50
TOTAL	\$4,912.45

VIII. OTHER ITEMS

A. Personnel

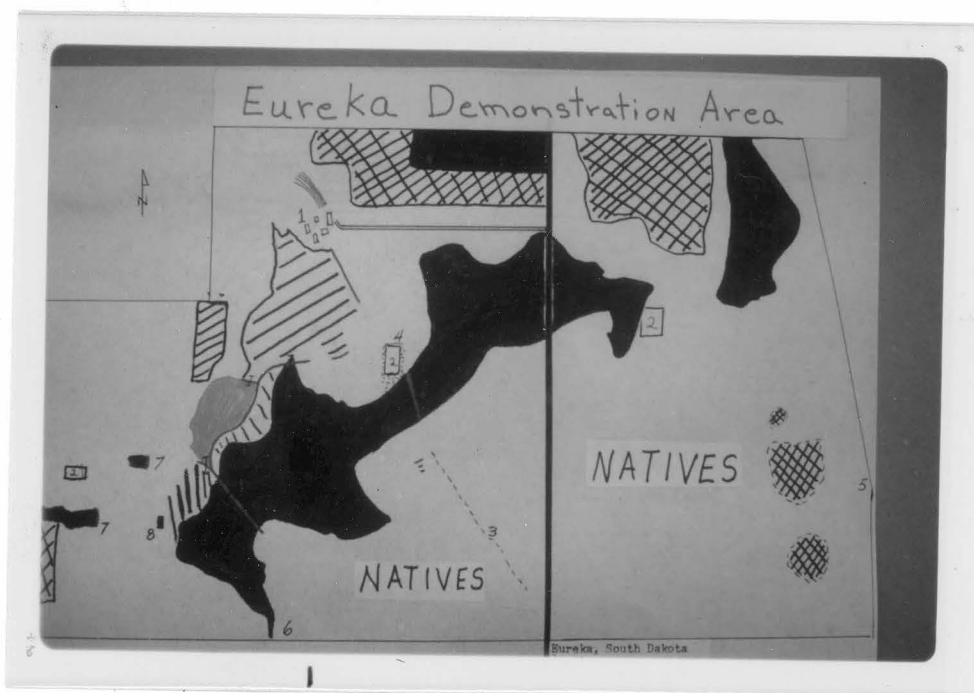
Lee Herzberger transferred from Sand Lake Refuge to Monte Vista Refuge on June 14, 1971. Our thanks go with him for his contributions to the program at Sand Lake over the past three years.

Sammy Waldstein entered on duty as Assistant Refuge Manager on August 23, 1971. He had previously worked at Iroquois, Great Swamp, Tamarac and Upper Mississippi Refuges. Sam is originally from Iowa and is happy to be back in the midwest.

The stork visited Bill and Kathy Lawhorn in September, adding Darin Wesley to the family.

B. Eureka Wildlife Demonstration Area

Five hundred and thirty-four acres of land have been purchased one-half mile north of Eureka, South Dakota for development of a Wildlife Demonstration Area. The area will be managed primarily for waterfowl production and secondarily as an outdoor classroom for environmental education.



90-50L-1155

Two thousand six hundred and fifty-five feet of low earthen dike were constructed. These dikes serve a dual purpose as a nature trail and as a means of flooding, draining and reflooding various

pools. Four water control structures were implaced. The buildings located at point one on the photograph have been removed, with the exception of one pumphouse.

One stock dam, located at point seven, was constructed and one was re-established.

Ten acres of DNC were planted and a seed bed for an additional forty-six acres was prepared on existing agricultural ground. A 1.5 acre site for demonstration of various tree and shrub species was prepared for planting next spring. All dike and scalped areas were seeded with native grasses. Four-tenths mile of road was re-sloped and graveled. One mile of electrical power line and poles was relocated.

The fill dirt for the main dike was taken from a dugout that was purchased with the area. The dike crosses a 700 foot stretch of open water.

Six hundred and forty rods of fence were constructed along the north and west boundaries.

Dikes, DNC seeding sites and tree planting sites were fertilized.

Further development of the area, in the planning stage at the time, are listed below.

- a. Removal of all old fences
- b. Planting 46 acres of DNC and an 18 acre wheat food plot by sharecropping agreement
- c. Completion of sloping and seeding of dikes
- d. Planting a 12 acre plot to millet
- e. Placing 8 inch pipe and valve through the dike joining our area to the 240 acre Eureka Lakes for water supply
- f. Planting 1.5 acres as a demonstration site for trees and shrubs
- g. Planting demonstration plots for various native grass species
- h. Planting 2,000 shrubs on selected sites
- i. Reestablish native wildlife (prairie dog, giant Canada goose and sharp-tailed grouse)

C. Pocasse Easement Refuge

Pocasse National Wildlife Refuge, near Pollock, South Dakota, is a 2,540 acre refuge on Corps of Engineers land. It is located 110 miles west of Sand Lake Refuge and is more closely associated with the wetland district than with Sand Lake Refuge. Consequently it is managed as a part of the wetland program.



SD-SDL-1156

Sandhill cranes were a common site on the 2,540 acre Pocasse National Wildlife Refuge in the fall of 1971.

Water conditions were fair in 1971. Levels fluctuated from two feet over the spillway crest to one foot below. Emergent vegetation and water interspersation on the south end were ideal during the brood season.

The Corps of Engineers completed a survey of 5 miles of boundary on the north end in November. Haying and farming permits issued by the Corps have been terminated. Fencing the north end in the summer of 1972 will help delineate the poorly marked boundary and allow better control over the refuge.

Annual management plans and expenditures have been submitted under separate cover.

D. Irrigation Projects

1. Oahe Diversion Irrigation Project

President Nixon's FY 1973 budget request included \$1,550,000 for this 495,000 acre irrigation project. The Phase I portion of this project includes 190,000 acres of land in Brown and Spink Counties.

2. Garrison Diversion Irrigation Project

Work has begun on the ditch which will supply water to the Oakes portion of this irrigation project. This project makes use of several dumping areas in northern Brown County. One of the proposed dumping areas is the 953 acre Hecla Waterfowl Production Area. President Nixon requested 16.2 million dollars for this project in his FY 1973 budget request.

E. Credits

Snider - I C, VII B, and typing; Lawhorn - II A, III E, V A (partial); Waldstein - remainder of report. Edited by office staff. Pictures by Lawhorn, Schoonover, Waldstein and Herzberger.

Submitted by:

Date:

2/25/72

Refuge Manager

Approved, Regional Office:

Regional Refuge Supervisor

Date:

Funds Set Timetable For Oahe Irrigation

(Special to American-News)

WASHINGTON — The inclusion of \$1,550,000 in construction funds for the Oahe irrigation project in President Richard Nixon's fiscal year 1973 budget request Monday sets up a timetable for activity starting after July 1, 1972. Sen. Karl Mundt's office confirmed Monday.

The funding provides for preparation of designs, issuance of specifications and award of contracts for pumps, motors and construction of the Oahe pumping plant.

It also permits the gathering of data and preparation of designs for the Blunt dam, reservoir and supply canals and the Cresbard dam.

Provided for is the purchase of land and rights for the Blunt dam and reservoir and the Pierre canal and continuance of pre-construction activities on west lake plain service canals, irrigation facilities, James River channel improvement and fish and wildlife facilities in the main supply system.

Robert McCaughey, administrative assistant to Sen. Karl Mundt, R-S.D., said the start of construction authorized for Oahe irrigation project puts South Dakota into a special category.

McCaughey said Oahe is one of only a few new construction starts recommended in the nation for Bureau of Reclamation programs.

Rep. James Abourezk, D-S.D., sent Nixon a personal letter thanking him for including construction funds for Oahe in the 1973 fiscal budget.

The letter said:

"Your willingness to stand behind the Oahe system now at a time when South Dakota desperately needs the economic boost that the project will provide is much appreciated. You have my personal thanks and my pledge of cooperation to move the Oahe project to a successful conclusion."

LONG CAMPAIGN WAGED FOR IRRIGATION IN S.D.

AFTER 28 years of hopes and delays, the vital Oahe irrigation unit in South Dakota is about to become a reality.

Funds for a construction start on the first phase of the project were included in President Richard Nixon's budget message.

Development of the Oahe Unit was originally authorized in the Flood Control Act of 1944 and 1946. The act brought visions of diversion of Missouri River water to irrigate 750,000 acres in eastern South Dakota.

Further studies over the years reduced the area deemed capable of sustaining irrigated farm production to 495,000 acres including the 190,000 acre Phase One in Spink and Brown counties. The overall project will involve land in 15 and one-half counties.

Although, first authorization came nearly 30 years ago, it was 1965 before feasibility planning reports were completed by the Bureau of Reclamation for

both the initial and ultimate plans of the unit. Those reports were published in the House Document No. 163 in 1967. Public Law 90-453, authorizing the 190,000 acre initial stage of the Oahe Unit, was signed by President Johnson Aug. 3, 1968.

The Oahe Conservancy Sub-District was established by voters in 1970 to sponsor development of water resources in east-central South Dakota.

The West Brown Irrigation District and Spink County Irrigation District were organized in 1965. These districts comprise the initial stage development area.

A master contract between the Oahe Conservancy Sub-District and the United States was signed in Aberdeen Jan. 8, 1969. Participating contracts between irrigation districts and the Oahe Conservancy Sub-District and security contracts between the irrigation districts and the United States, were signed Dec. 23, 1969.

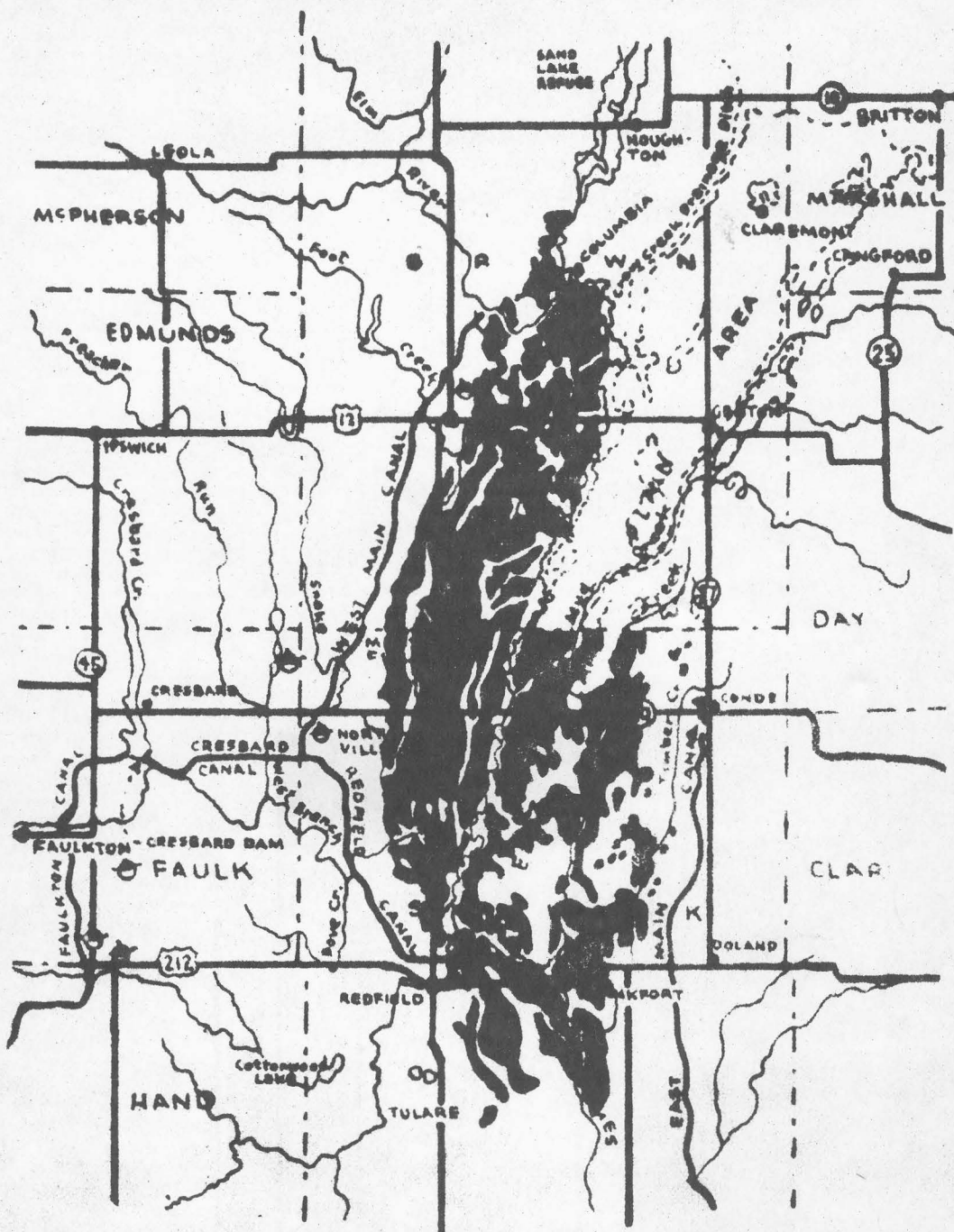
When it appeared that a long-standing nonresident migratory waterfowl hunting ban would hinder congressional action on the Oahe Unit, the South Dakota Legislature in the 1970 session, repealed that ban. This was in compliance with a provision of the authorizing federal legislation.

After years of fieldwork, complicated by changing ground rules as work progressed, the Bureau of Reclamation completed the definite plan report on the initial stage of 190,000 acres and released it in November 1970.

The \$650,000 fund that had been appropriated for the unit was placed in budgetary reserve making it unavailable for expenditure.

Of that amount, \$350,000 was appropriated in fiscal 1971 for acquisition of right-of-way. The remainder was appropriated for fiscal 1972.

These funds were released by President Nixon last week.



KEY SITES in the Oahe diversion irrigation project which will be a boon to farming and industry in South Dakota are shown on this map. The project, for which 1973 construction funds are being provided by Congress, will pro-

vide for irrigation of 190,000 acres of land on either side of the James River in Spink and Brown counties. The map shows the features of the multi-million dollar development.

Livestock Value Gains

In Dakota Midland

THE TOTAL value of livestock on farms (includes all cattle and calves, hogs, sheep and lambs, and chickens) in the Dakota Midland area of 14 counties shows substantial gains during the past several years.

Since 1960 the total value of livestock in the 14 counties has increased from \$100,214,000 to an estimated \$207,695,000 on Jan. 1, 1971.

In South Dakota the dollar total value of livestock stood at an estimated \$935,560,000 on Jan. 1, 1971, compared with the 1960 total value of \$517,560,000.

Source: N. D. and S.D. Crop & Livestock Reporting Service.

County	1960	1971 (est.)
Brown	\$ 11,153,000	\$ 24,643,000
Campbell	5,169,000	11,626,000
Corson	8,231,000	13,164,000
Day	5,752,000	11,938,000
Dewey	7,014,000	11,945,000
Dickey, N.D.	4,728,000	13,069,000
Edmunds	7,328,000	17,362,000
Faulk	6,134,000	14,686,000
McPherson	7,463,000	16,363,000
Marshall	6,895,000	15,038,000
Perkins	10,842,000	17,491,000
Potter	5,483,000	11,502,000
Spink	8,877,000	20,427,000
Walworth	5,145,000	8,441,000
Area Totals	\$100,214,000	\$207,695,000

Per Capita Income

Up In Trade Area

(From Sales Management Magazine)

PER CAPITA income in the Aberdeen trade area in 1970 as determined by Sales Management has increased above figures for 1969. The following table shows the per capita income of Dakota Midland counties.

County	1968	1969	1970
Brown	\$2,554	\$2,859	\$3,277
Campbell	2,171	2,565	2,400
Corson	1,522	1,694	1,938
Day	1,876	2,081	2,441
Dewey	1,800	1,986	2,065
Dickey, N.D.	2,121	2,262	2,527
Edmunds	1,843	2,079	2,416
Faulk	1,993	2,232	2,402
McPherson	1,776	1,985	2,265
Marshall	1,872	2,319	2,372
Perkins	2,318	2,587	3,038
Potter	2,081	2,340	2,721
Spink	2,020	2,254	2,524
Walworth	2,526	2,877	3,344
County Avg.	\$2,160	\$2,416	\$2,580
State Avg.	\$2,375	\$2,649	\$2,962

Pollock Begins To Expand In New Area -- Recreation

By E. L. MacKAY

Pollock Pioneer

POLLOCK — For most of its 16-plus years of existence, the new town of Pollock has been struggling to hold its own in an era when small county towns are gradually falling behind.

Basically an agricultural town, Pollock is beginning to expand in another field — recreation. Both have rather bright prospects for improvement in the coming few years.

Hopes for farming advances

are in the Pollock-Herreid Irrigation District, now awaiting approval and funding, a project which would involve more than \$15 million in construction alone.

In the field of recreation, prospects are more immediate. A big step was the construction of one of the first segments of the new perimeter scenic road along Lake Oahe. An 18 mile stretch south from Pollock was constructed in 1970 and bids for oiling this road are to be let this month by the State Highway Commission. The project also includes oiling of the causeway — the dam forming Lake Pocasse. Adding to this, Campbell county has set up its first road oiling project, the two miles north from the causeway to the North Dakota state line.

Also planned this year is a 12-mile extension of the scenic road to connect with Mobridge. This will cut the distance from Pollock to Mobridge by about 20 miles, and open up a long stretch of the Oahe for recreational development.

The Corps of Engineers is planning further improvements and development in the Pollock area.

A good omen for the coming year came at the end of 1971, when a fisherman caught a 24-pound northern, second largest ever caught here, in Lake Oahe on the shore of the Pollock park — only four blocks from Main street.

For most of its existence the unofficial slogan of the town has been that appearing under the nameplate of the Pollock Pioneer — "A City That's Built On A Hill Cannot Be Hid". Now it has a new one — Queen City. Last year Pollock set what is surely a record for the state — two state queens. A year ago Sharon Reiersen was chosen South Dakota's 1971 Snow Queen. Then Ruth Langeliers, who lived just over the line in North Dakota, but to whom Pollock was home, was selected the North Dakota State Dairy Princess.

Co. One business was lost early in the year with the closing of the Pocasse Launderena, a coin-op laundry.

A new venture was recently set up by three enterprising high school seniors, Dean Wittmeier, Greg Langeliers and Danny Fischer. They have set up a youth center in an empty building, offering young people a pool table, pinball games, juke box and a place to congregate during the cold winter evenings. It is proving a popular attraction.

The Pollock Independent School District is continuing to operate the Mound City school, with grade students at Mound City and high school pupils coming to Pollock by bus. An appeal over court decisions to place Mound City in the Pollock district, as approved by Mound City voters a couple of years ago, is still pending in the state Supreme Court.

Although the 1970 census put Pollock's population at 341, down slightly little in the past 10 years, the people generally have an air of optimism. The new roads, plans for a bridge over the Oahe not far north of Pollock, and that 24 pound fish are indications of a brighter time ahead.

Industrially, Pollock's main business is the Twin Dakota Dairy Corp. cheese factory, operating under various owners for the past 10 years. In 1971 a large addition was built for storage. There is a prospect for expansion in a new process for removing protein from whey being developed by the company's president, Frank Thomas. A pilot plant was set up during the year, and if kinks are ironed out and markets secured it could mean an enlargement of the present work force of 10.

The Pollock Farmers Elevator at its recent annual meeting reported the best year in its history both in income and volume of grain handled.

There were three business changes during the year. The Pollock Lumber and Implement Co., operated since the final days of old Pollock by a local corporation, was sold to Harold Meyer, who had been its manager for several years.

The Pollock cafe, operated for seven years by Mrs. Hilmer Larson, was taken over by Mr. and Mrs. John Van Vugt.

In another business move the Wittmeier Oil Co., operator of the Texaco bulk station under the late Mrs. Lillian Wittmeier, was taken over by Mr. and Mrs. Vernon Meyer as the Meyer Oil

Sand Lake WMD

71

Refuge _____

Year 19 _____

Botulism

Lead Poisoning or other Disease

Period of outbreak _____

Period of heaviest losses _____

Losses:

	Actual Count	Estimated
(a) Waterfowl	_____	_____
(b) Shorebirds	_____	_____
(c) Other	_____	_____

Number Hospitalized	No. Recovered	% Recovered
(a) Waterfowl	_____	_____
(b) Shorebirds	_____	_____
(c) Other	_____	_____

Areas affected (location and approximate acreage) _____

Water conditions (average depth of water in sickness areas, reflooding of exposed flats, etc.) _____

Condition of vegetation and invertebrate life _____

Remarks _____

Kind of disease _____

Species affected _____

Number Affected Species	Actual Count	Estimated
_____	_____	_____
_____	_____	_____
_____	_____	_____

Number Recovered _____

Number lost _____

Source of infection _____

Water conditions _____

Food conditions _____

Remarks No disease noted in 1971.

3-1757
Form NR-7
(Rev. June 1960)

NONAGRI TURAL COLLECT 3, RECEIPTS, AI PLANTINGS

Refuge Sand Lake W.D.

(1)

Year 1971

	Collections and Receipts (Seeds, rootstocks, trees, shrubs)						Plantings (Marsh - Aquatic - Upland)						
Species	Amount (Lbs., bus., etc.)	(2) C or R	Date	Method or Source	Cost	(3) Total Amount on Hand	Location of Area Planted	Rate of Seeding or Planting	Amount Planted (Acres or Yards of Shoreline)	Amount and Nature of Propagules	Date	Survival	Cause of Loss
				McPherson Co.			May	67/acre	35 acres	Native Grass Seed Mix #1	Oct.	Too early to tell	
				McPherson Co.			Eureka	87/acre	5 acres	Native Grass Seed Mix #1	Oct.	Too early to tell	
				McPherson Co.			Neuharth	71/acre	20 acres	DNC	May	Excellent	
				McPherson Co.			Lamelle-L. L.	71/acre	8 acres	DNC	May	Excellent	
				McPherson Co.			Eureka	71/acre	9.5 acres	DNC	May	Excellent	
				McPherson Co.			Hoffman /299	71/acre	70 acres	DNC	May	Excellent	
				Campbell Co.			Fischer	71/acre	10 acres	DNC	May	Excellent	
				Brown Co.			Kruse	71/acre	30 acres	DNC	May	Excellent	

- (1) Report agronomic farm crops on Form NR-8
- (2) C = Collections and R = Receipts
- (3) Use "S" to denote surplus

Total acreage planted:

Marsh and aquatic 217.5 acres
Hedgerows, cover patches _____
Food strips, food patches _____
Forest plantings _____

Remarks: Native Grass Seed Mix #1 - 20% Big Bluestem, 20% Little Bluestem, 15% Switchgrass, 10% Indiangrass, 15% Green Headgrass, and 20% Western Wheatgrass.

DNC Mixture - 1/2 Intermediate Wheatgrass, 2/ Yellow Blossom Quackgrass, 1/ alfalfa, and 6 1/2 oats.

Refuge Sand Lake WMD County Brown State South Dakota

No. of Permittees:	Agricultural Operations	<u>3</u>	Haying Operations	<u>0</u>	Grazing Operations	<u>0</u>
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Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	Grazing	Number Animals	AUM'S	Cash Revenue	ACREAGE
				1. Cattle				None
				2. Other				
				1. Total Refuge Acreage Under Cultivation				
Hay - Wild			2. Acreage Cultivated as Service Operation					None

CULTIVATED CROPS - HAYING - GRAZING

Refuge Sand Lake WND County Campbell State South Dakota

Cultivated Crops Grown	Permittee's Share Harvested		Government's Share or Return				Total Acreage Planted	Green Manure, Cover and Water- fowl Browsing Crops Type and Kind	Total Acreage
	Acres	Bu./Tons	Harvested Acres	Bu./ Tons	Unharvested Acres	Bu. /Tons			
Oats	30	1,200			10	400	40		
								Fallow Ag. Land.	

No. of Permittees: Agricultural Operations 1 Haying Operations 0 Grazing Operations 0

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	Crazing	Number Animals	AUM'S	Cash Revenue	ACREAGE
				1. Cattle				None
				2. Other				
				1. Total Refuge Acreage Under Cultivation				40
Hay - Wild				2. Acreage Cultivated as Service Operation				None

CULTIVATED CROPS - HAYING - GRAZING

Refuge Sand Lake WND County McPherson State South Dakota

Cultivated Crops Grown	Permittee's Share Harvested		Government's Share or Return				Total Acreage Planted	Green Manure, Cover and Water- fowl Browsing Crops Type and Kind	Total Acreage
	Acres	Bu./Tons	Harvested		Unharvested				
			Acres	Bu./ Tons	Acres	Bu. /Tons			
Oats	121	4,840			40	1,600	161		
Rye	5.3	286			1.7	59	7		

No. of Permittees: Agricultural Operations 4 Haying Operations 0 Grazing Operations 0

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	Grazing	Number Animals	AUM'S	Cash Revenue	ACREAGE
				1. Cattle				None
				2. Other				
				1. Total Refuge Acreage Under Cultivation				168
Hay - Wild				2. Acreage Cultivated as Service Operation				None

CULTIVATED CROPS - HAYING - GRAZING

Refuge Sand Lake WID

County Spink

State South Dakota

Cultivated Crops Grown	Permittee's		Government's Share or Return				Total Acreage Planted	Green Manure, Cover and Water- fowl Browsing Crops Type and Kind	Total Acreage
	Share	Harvested	Harvested		Unharvested				
			Acres	Bu./ Tons	Acres	Bu. /Tons			
Corn	23	1,150			8	400	31		
								Fallow Ag. Land.	

No. of Permittees: Agricultural Operations 1 Haying Operations 0 Grazing Operations 0

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	Grazing	Number Animals	AUM'S	Cash Revenue	ACREAGE
				1. Cattle				None
				2. Other				
				1. Total Refuge Acreage Under Cultivation				31
Hay - Wild				2. Acreage Cultivated as Service Operation				None

3-1979 (NR-12)
(9/63)

Bureau of Sport Fisheries and Wildlife

ANNUAL REPORT OF PERSTICIDE APPLICATION

Refuge
Sand Lake Wetland Dis et
Columbia, South Dakota

Proposal Number

Reporting Year

2-71

1971

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395.

Date(s) of Application	List of Target Pest(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
June 14	Leafy Spurge	Boehring WPA Campbell County	2	Tordon 212	6 lbs.	3#/acre	Water - 10 Gal./ acre	Broadjet Ground Sprayer
June 14	Leafy Spurge	Fischer WPA McPherson County	5	Tordon 212	10 lbs.	3#/acre	Water - 10 Gal./ acre	Broadjet Ground Sprayer
June 15	Leafy Spurge	Hagle WPA Brown County	3	Tordon 212	9 lbs.	3#/acre	Water - 10 Gal./ acre	Broadjet Ground Sprayer

10. Summary of results (continue on reverse side, if necessary)

Results were good in controlling spurge, but does not inhibit plants from growing the following year.