TEWAUKON NATIONAL WILDLIFE REFUGE

Cayuga, North Dakota

ANNUAL NARRATIVE REPORT

Calendar Year 1983

U.S. DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
NATIONAL WILDLIFE REFUGE SYSTEM

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8 5 2 3 1

Personnel

1.	David G. Potter, Refuge Manager	GS-11, PFT
2.	Christ R. Schuler, Biological Technician.	GS-08, PFT
3.	Barbara E. Hoflen, Refuge Assistant	GS-05, PPT
4.	Robert W. Hoflen, Maintenance Helper.	WG-05, PFT
5.	Donald J. Bozovsky, Biological Aid, 5/23/83 to 11/25/83 .	GS-04, TMP
6.	Harris J. Hoistad, Biological Aid, 5/2/83 to 11/10/83 . .	GS-04, TMP
7.	Cynthia L. Sperling, Biological Aid, 5/31/83 to 9/2/83. .	GS-03, TMP
8.	Ann L. Odor, 6/20/83 to 9/8/83.	YCC
9.	Thomas A. Jund, 5/31/83 to 8/10/83.	YCC
10.	Orville J. Silseth.	Volunteer

Review and Approvals

David G. Potter 2/13/84
Submitted by Date

ND Supervisor Date

Tewaukon NWR
Refuge

Regional Director Date

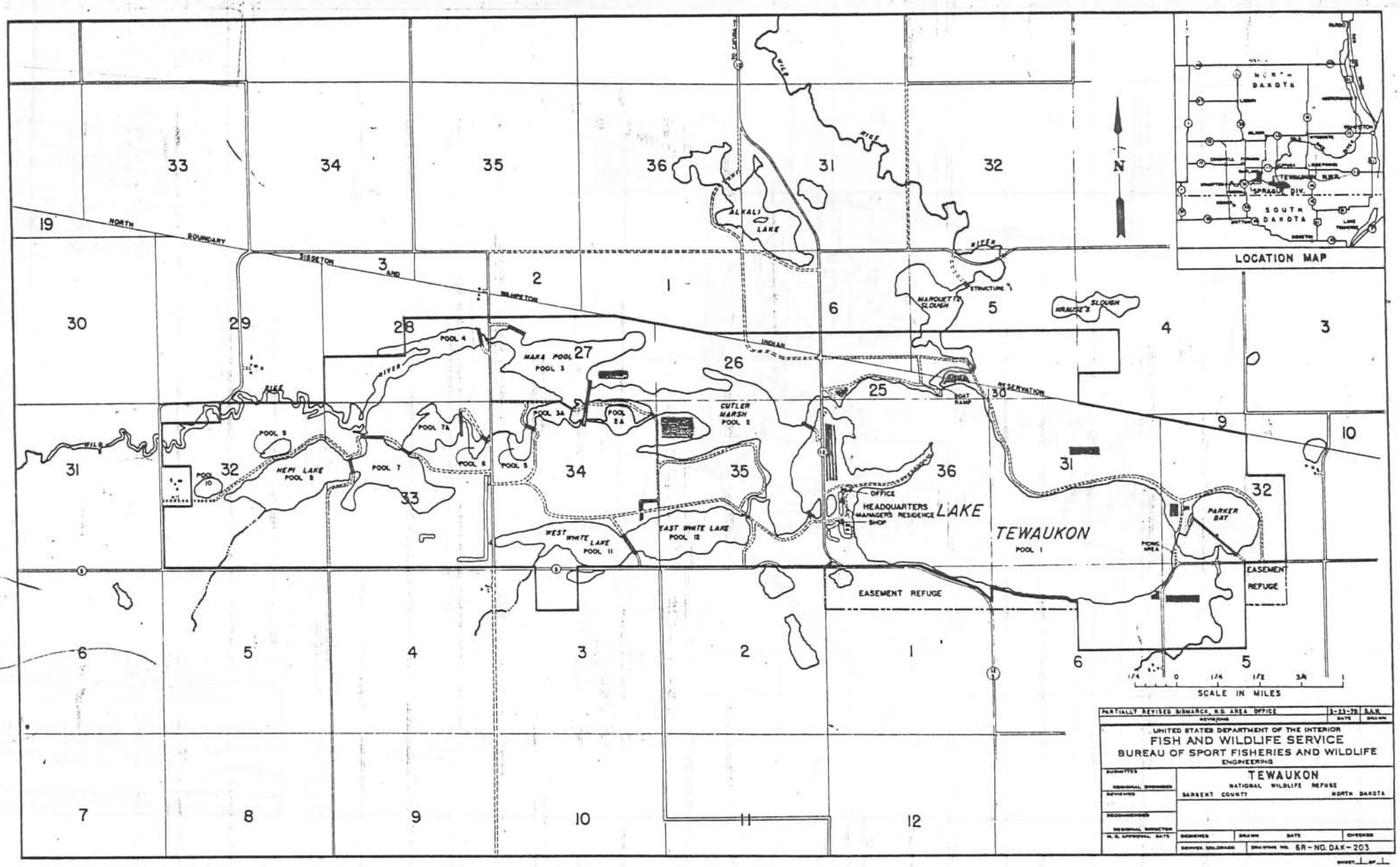
Introduction

Tewaukon Refuge is five miles south of Cayuga in the far southeastern corner of North Dakota. The Refuge is 8,444 acres and serves as a major migration stop for waterfowl and a duck production area. There are 26 water management pools totaling 2,919 acres and 137 acres of natural wetlands within the Refuge.

Three easement refuges to control hunting and trapping are also under our management. Wild Rice in Sargent County totals 778.8 acres; Lake Elsie in Richland County is 634.7 acres and Storm Lake in Sargent County totals 728.3 acres. All are closed to hunting to provide waterfowl rest areas and trapping is by permit only. The Wild Rice Refuge has been mothballed and the boundary signs removed; see Section F.12.

The Tewaukon Wetland Management District is also managed from this office. It includes 11,893 acres in 55 Waterfowl Production Area clusters and 30,628 acres of wetland easements in three counties. The WMD is covered in a separate narrative report.

TEWAUKON NWR



PARTIALLY REVISED BISMARCK, N.D. AREA OFFICE — 3-23-78 — B.A.M.

UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE
ENGINEERING

TEWAUKON
NATIONAL WILDLIFE REFUGE
SARGENT COUNTY NORTH DAKOTA

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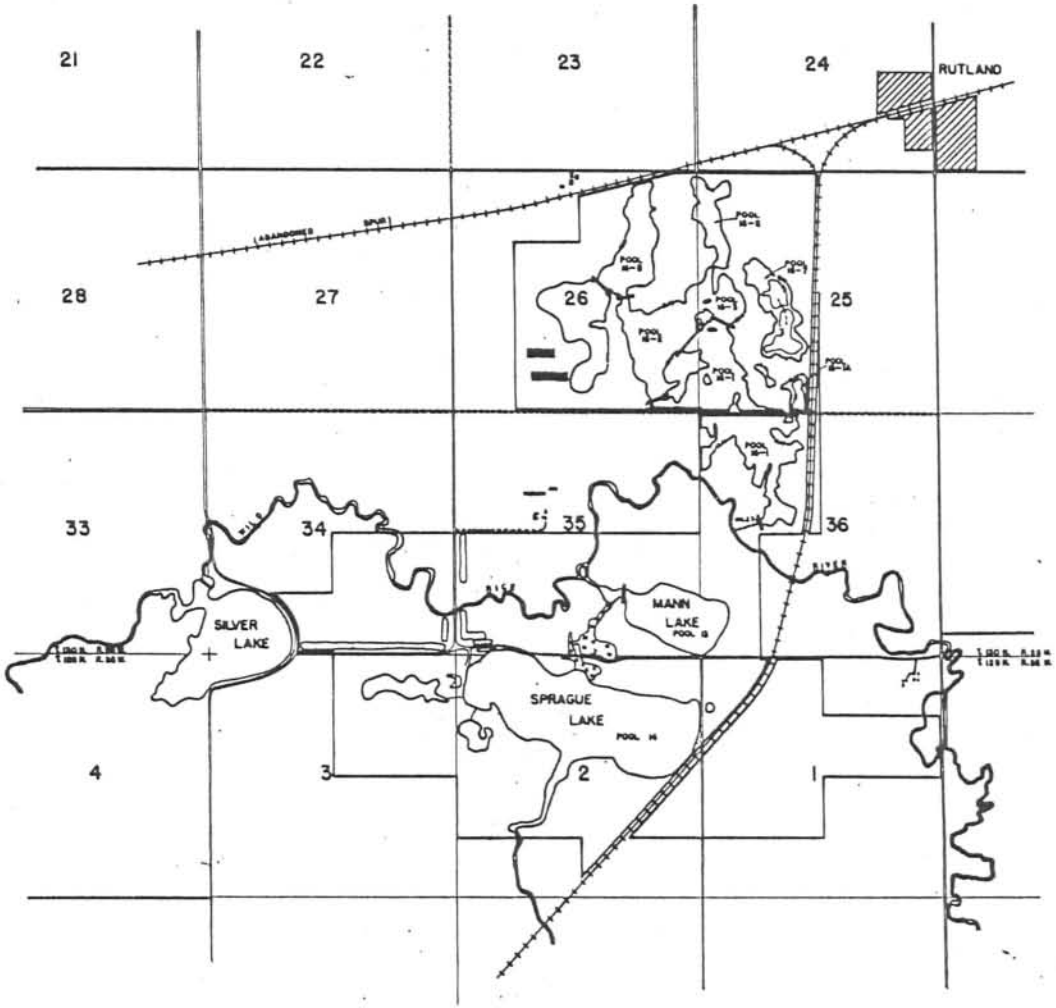
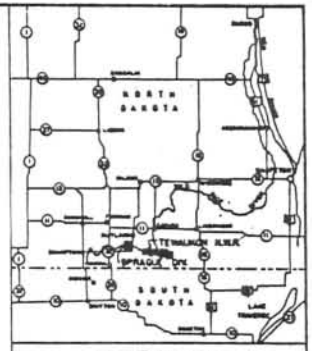
SHEET 1 OF 1

SPRAGUE LAKE UNIT





LOCATION MAP

SCALE IN MILES

UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
ENGINEERING

TEWAUKON
NATIONAL WILDLIFE REFUGE
SARGENT COUNTY NORTH DAKOTA
SPRAGUE LAKE DIVISION

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H. PUBLIC USE

I. EQUIPMENT AND FACILITIES

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A. HIGHLIGHTS

Robert Hoflen was converted to PFT and was selected to receive law enforcement training at FLETC, Georgia. He tied with two non-FWS students for top score in the 9-week course. Dave Potter received a $200 suggestion award. (Section G.8)

The drought continued with no spring runoff and virtually all but the deepest wetlands dry. Taking advantage of this, a long-term goal of dewatering Hepi Lake was achieved. (Section F.2)

Good progress was made on prescribed burning, seeding of cropland back to native grass and increasing Refuge no-till farming acreages. (Section F.4 and F.5)

The Fall Open House and Tour, Archery Deer Hunt and Special Pheasant Hunt all went smoothly with good crowds out each day. (Section H.7 and H.8)

Revenue sharing payments were compared with taxes in the four Townships neighboring the Refuge. Despite the standard complaint about loss of tax revenue, the neighbors paid less taxes per acre than the Refuge. (Section E.5)

Pheasant and deer reproduction was excellent and total numbers were very high. The first ever wood duck brood was observed June 24. Snow goose use hit a record high at 58,000 on November 10. A bull moose was at headquarters September 27. (Section G)

B. CLIMATIC CONDITIONS

Mr. Leon Justesen officially recorded the local weather from his farm 1½ miles west of the Sprague Lake Unit and 8½ miles west of headquarters. Generally, winter did not hit this year as very little snow and above average temperatures occurred. Lake Tewaukon opened March 31. Summer saw good rainfall but late summer was very hot so crops and grassland growth were reduced. Late fall brought the winter missed earlier with Lake Tewaukon freezing over November 23 and December being tied with 1886 as the coldest in 100 years.

Total rain and melted snow was 17.31 inches compared to 20.77 inches average and 17.99 last year. Early moisture was low with only .39 in January, .10 in February, 2 inches in March and .44 in April. The growing season saw average rains of 10.57 inches from May-August but this was too late for waterfowl and wetlands. Hot winds in July and August put vegetation under stress. Fall moisture was average and the soil was wet at freeze-up, which should increase next spring's runoff.

Temperatures were very mild January-March with only six sub-zero lows and the "worst" at -13°. February and March continued the warm trend with no below zero lows after February 7, very unusual. Temperatures were seasonal until turning hot with 94° and 93° on June 25 and 26. July and August saw 30 days above 90° with 103° the warmest on July 15. Fall was seasonal until December brought record cold from December 16 (-20°) on. Lows from December 16 to December 25 were -20° to -34° and four nights saw -30° or worse. Blizzards were recorded for December 15 and December 24 also - cruel "fall" conditions for both man and beast.

C. LAND ACQUISITION

1. Fee Title

After many years of Refuge interest in acquiring the Nickeson bottom land 79 acres immediately north of Pool 3 (for waterfowl use and to solve the yearly flooding problem due to subing from Pool 3) the land was purchased this fall by the Bureau of Reclamation as mitigation for the Garrison Diversion Project. Mrs. Nickeson also sold an additional 9.1 acre tract immediately northwest of the bottoms containing several good wetlands. Both the Refuge and State Management Area adjoin these tracts so it is unknown if the land will come under Service management or not. Since the State personnel are located 45 miles away and the water source for this new, 52 acre type 4 marsh will be from the Refuge, it seems appropriate that the land be managed by the Service similar to a Waterfowl Production Area - open to public hunting and trapping.

The continuing Refuge attempt to gain full management control of six acres purchased in 1973 on the east side of the Sprague Lake Unit failed again as the former owner continued to maintain he never intended to sell the land. He threatened to write his Congressman. The Regional Office is negotiating with him for a trade of the Refuge strip for a wetland easement on other land he owns. At year's end negotiations were snarled as he wanted the right to dump rocks in the wetlands after they are under easement.

D. PLANNING

2. Management Plans

Routine yearly management plans such as for prescribed burning or water level management were written. Also, the full Fire Management, Prescribed Burning and Fire Dispatch Plans were rewritten.

E. ADMINISTRATION

1. Personnel

Again, this was a quiet year with no vacancies occurring. The only changes were the normal ebb and flow of temporary and youth workers.

Rob Hoflen received a permanent full-time appointment in February. This provided security for him and the Refuge benefited by his expected long-term stay at this station.

Dave Potter received a $200 Suggestion Award on October 27 for the problem animal trapping credit ("skunk rebate") idea. It's in the third year of operation here (see Section G.8) and has been adopted by at least 3-5 other Refuges.

Staffing

Year	Permanent Full-Time	Permanent Part-Time	Temporary	Youth	Volunteer	TOTAL
1983	3	1	3	2 (YCC)	1	10
1982	2	2	4	2 (YCC,CETA)	1	11
1981	2	2	3	2 (YACC,CETA)	-	9
1980	2	3	3	1 (YACC)	-	9
1979	2	3	3	-	-	8
1978	2	3	3	-	-	8
1977	2	2	2	-	-	6

2. Youth Programs

Like last year, field work benefited greatly by having all three temporary personnel returning from working previous years on the Refuge and being well experienced with the operation.

The second year of the YCC program came with funding attached and some easing of work restrictions. It was a success as two hard working 18 year old college students were hired. They worked on many projects but mainly on fence construction and junk fence removal. One was a forestry major from NDSU Bottineau and the job was her first experience with field work.

4. Volunteers Program

Volunteer heavy equipment mechanic Orville Silseth worked in the shop January 10-21 teaching and assisting on clutch repairs, carburetor work, a diesel tractor check and other engine work. His help was very valuable. He said he'd be back when there was more work to be done.

5. Funding

FY-83 was another good year especially as a result of the previous BLHP years which left behind a strong equipment and facilities base. FY-84 also has started well as good ARMM and CAF funds have been scheduled for the Refuge and Wetland Management District.

"In Lieu" payments to the counties were again short at only 90.6% of full entitlement. This makes the Service image in North Dakota just so much more negative.

To counter this, the Sargent County Treasurer was asked for and supplied the tax rates for each of the four neighboring Townships. It was gratifying to note that in 1982 the Refuge payment, even at 90.6% of entitlement, was greater than the neighbor's tax payments. This fact was presented by letter to each Township prior to their annual meeting and was run in a newspaper article. Several people expressed surprise at this.

1982 Tax Comparison per Acre

FWS Sargent County:	$2.84 (including non-productive sloughs)
Rutland Township:	$2.44 or $2.48/acre (different fire districts)
Weber Township:	$2.39 or $2.42 or $2.36
Tewaukon Township:	$2.39
Marboe Township:	$2.65 or $2.62

Funding Comparison

	FY-79		FY-80		FY-81	FY-82		FY-83	FY-84
FUNDS	O&M	Cyclic Maint.	O&M	Cyclic Maint.	O&M	O&M	Cyclic Maint.	O&M	O&M
1210	$112,800	$16,900	$104,000	$25,000	$156,000	$123,000	$25,000	$163,000	--
1220	1,000	1,200	--	--	--	--	--	5,000	--
1240	4,000	1,000	10,000	--	9,000	8,000	--	12,000	--
1260	--	--	--	--	--	--	--	--	$180,000
1994	--	--	--	--	--	--	--	1,000	2,500
6810	--	--	--	--	--	--	--	3,000	--
6860	--	--	--	--	--	--	--	--	3,000
Sub-Total	$117,800	$19,100	$114,000	$25,000	$165,000	$131,000	$25,000	$184,000	$185,500
TOTAL BDGT.	$136,900		$139,000		$165,000	$156,000		$184,000	$185,500
BLHP	$154,000		$123,000		$ 36,000	$ 62,400		--	--
ARMM	--		--		--	--		--	$ 39,000
CAF	--		--		--	--		--	$ 74,000

6. Safety

Monthly safety meetings were held.

Mr. Marshall Fox, RO (EN), inspected the four Wild Rice River dams from a dam safety design viewpoint. Substantial funding is scheduled in FY-85 to correct deficiencies listed in the 1982 Dam Safety Report. The work will include emergency spillways, riprap and other items with the exact work to be done still being planned.

One lost time accident occurred August 25 when Bio. Aid Harris Hoistad was struck on the forehead when a steel fence post he was trying to straighten slipped from his hands and snapped back. No major damage occurred but he received six stitches and was kept in the hospital overnight for observation.

The Station Safety and Health Checklist was conducted with eight problem areas identified. Five items have been rectified including enlarging the residence back porch to eliminate the drop-off onto the stairs right at the door. The Station Safety Plan will be rewritten in February 1984. Further guidance was requested on installing ground fault circuit interrupters in the office and raising the new shop water heater 18" above the floor.

Routine purchases of protective gear were made such as steel-toed boots, gloves (leather and rubber), vehicle fire extinguishers, air splints, safety glasses and a canvas stretcher (donated by Sargent County).

Rob Hoflen and Dave Potter received refresher CPR training. Rob repeated it at FLETC this fall. All employees progressed on their Defensive Driving refresher training requirement as four driving safety films were shown at the monthly safety meetings.

8. Other Items

Barb Hoflen was in Jamestown for administrative training May 9-10 and in Bismarck during October 12-14 for an administrative workshop. Barb Hoflen and Dave Potter received 30 hours of training on small computer operation during November and December. Chris Schuler attended a pre-retirement seminar in Denver from November 21-22. Dave Potter and Rob Hoflen were at FLETC for one week follow-up law enforcement training in August; Hoflen returned for the nine week Basic Training in October and November.

During a routine visit, Realtor Al Lund conducted a surprise imprest fund audit. No problems were found and only one minor correction was needed.

F. HABITAT MANAGEMENT

1. General

The mild, dry winter was good for the critters but very poor for habitat as all small sloughs continued dry and most medium and larger sloughs rapidly dried out. Lake Tewaukon continued low and was 3' (out of a maximum depth of 9½') down at year's end. Woodlands, crops and grasslands all were below average due to lack of moisture and mid-summer high temperatures. Generally, it was a poor year for habitat.

Across the county, shelter belts continued to be dozed out, sloughs drained, fence rows stripped out and fields plowed black in the fall as some farmers continue to ignore soil erosion. The results were inevitable and damage not just the farmer but society as a whole. Below is quoted from the Lidgerwood, ND newspaper:

> "Farmers and City dwellers alike remember May 9th, 1983 as one windy day. Some old timers described it as something similar to their memories of the 1930's when clouds of dust introduced the morning as the winds picked up and street lamps and house lights were lit.
>
> According to Jim Johnson, District Conservationist with the Richland Soil Conservation Service soil losses due to wind erosion that day, and other days the wind blew preceeding it, are estimated to be four

to five times the tolerable annual solid loss acceptable. Acceptable soil losses range from two to five ton per acre depending on the soil involved. "Some of the eroded soil disappeared from our use forever" Johnson said, "some of it was stopped in road and drainage ditches, fence rows and shelter belts, farmsteads and city dwellers home sites where it cost time and dollars to remove", he added.

The Conservationist said that soil erosion would not have occurred if farm operators had used the soil conservation practices available for their land. Those practices include field shelter belts, crop residues and adjusting the width of fields based on the amount of residues to be left on the soil surface."

Old timers said the clouds of blowing soil on May 9 were similar to the Dust Bowl days. High winds caught large, private fields cultivated clean and fine preparatory to planting and stripped away up to 10-25 tons of soil per acre (4-5 times the tolerable annual loss) as estimated by the Richland County S.C.S. A private field south of the Refuge blew north (to the left) across Lake Tewaukon. 5/83 - DGP.

2. Wetlands

None of the four watersheds (Wild Rice River, Frenier Dam outlet, Sprague Lake ditch, LaBelle Creek) flowed to any significance this spring. Heavy, localized thunderstorms in June and July provided the only inflows as LaBelle Creek flowed into Lake Tewaukon.

Lake Tewaukon (Pool 1): The Lake was frozen 1.7 feet low at 1146.3 MSL until ice out on March 31, 18 days earlier than last year. No inflows occurred until minor flow was received from LaBelle Creek due to thunderstorms in June and July. Since it has become a major drainage ditch, no doubt this farm field runoff was loaded with fertilizer and pesticides as well as silt. So the poor water quality in the Lake was further degraded. Heavy and nearly continuous algae blooms told the story but, luckily, no fish kills were observed. Sago production was average thanks, no doubt, chiefly to the very low carp population. Freeze-up occurred November 23 and 24 at 1144.96 MSL, 3.04 feet low in a lake with a maximum depth of 9.5 feet.

Parker Bay finally dried completely last year and emergent vegetation boomed in on what had been a completely open lake. This year several shallow floodings were made. Emergents continued an excellent increase and muskrat houses appeared soon after this September photo. #20-9/83 - DGP

Parker Bay (east end of Lake Tewaukon): After four years of excluding water the Bay finally dried up the spring of 1982 and an excellent cattail, bulrush and sedge response occurred that summer. On April 4, 1983 the structure supplying the Bay was cleaned by backhoe and 9" of water gravity flowed in from West Parker Bay (causing it to drop about 2'). Excellent waterfowl use of the flooded plants occurred and the West Parker Bay draw down was beneficial to increase the cattail-sedge edge and promote a fish kill this winter. By late July the Bay was dry again and the emergent vegetation was booming so about 4" of water was turned in. By early fall levels again were very low and about 18" of water was added before the supply ran out. Duck, goose and swan use was excellent. Muskrats moved in and 6-10 houses were built. Another 12-18" of water is needed next spring to put the finishing touches on this new, 95 acre marsh - which used to be an open lake.

Cutler Marsh (Pool 2): This marsh began the year below gauge level and received only minor inflows from Pool 4 via Pool 3. It froze in November very low at 1147.5 MSL with the west end dry and the deeper, south end only 2.5 feet deep. About one foot of water was dumped into East White Lake to save it for waterfowl nesting in April. The Wild Rice River channel was so low in June that two men in a canoe couldn't wade and push through. It continued becoming 100% choked by cattails. To cut some openings in the dry west end and as training for Rob Hoflen, the dragline was worked there a week or so this fall.

Pool 2A: This marsh was dry all year. Taking advantage of this, the corroded CMP riser board control structure was replaced and the dike broadened for extra strength against muskrat burrowing. In anticipation of next spring's inflows, irregular openings were cut in the center of the pool and, hopefully, the mowed cattails will flood out.

Maka Pool (Pool 3): No inflows were received except for water flowed out of Pool 8. The pool started the year at 1155.2 MSL, was 1154.95 MSL on April 1 and continued down all year. By fall it was extremely low with rapid cattail encroachment of the open areas becoming a major problem.

River Pool (Pool 4): Began the year low at 1159.05 (April 3) but high enough to "steal" water starting April 4 for the lower pools - since Hepi Lake water would soon be available for refilling. By April 19 it was down to 1156.9. After removing an upstream beaver dam, the pool refilled from the Hepi Lake dewatering to 1157.45 by May 20 and 1158.25 by June 1. It was drawn down to about 1158.0 and left for the year. By fall it had dried down to below the gauge again.

Pool 3A: Was the best pool this year. It was low but held good water all year.

Pools 5,6,7,7A: No inflows were received and these units were dry all or nearly all year.

Hepi Lake (Pool 8): Taking advantage of low water levels and no inflows, a long-term goal was reached as this pool was dewatered to increase cattail, bulrush, sedges and aquatics. This was accomplished by lowering and enlarging the north outlet structure to drain the Lake north into Pool 9. Also a 575' length of 12" PVC pipe was laid in a backhoe trench (maximum depth of the cut was 14') northeast through a hillside so Pool 9 would fill only to a desirable depth before spilling through the pipe and downhill to the Wild Rice River. Chris Schuler and Rob Hoflen did an excellent job planning out and accomplishing the project.

Dewatering began May 17; the lake was down to a small 1" deep puddle by about June 15 and was totally dry by early July. Due to logistics, the work couldn't be completed sooner as would have been preferred to reduce possible damage to duck nesting but the pair counts indicated a very low breeding population this spring. Heavy shorebird use occurred, as expected, with 30 American avocets, 250 marbled godwits and many hundreds of small sandpipers observed on June 20. Vegetative response to the draw down was excellent with smartweeds, wild millet, a low sedge and dock all coming on very strongly by mid-August. By late September a good scattering of small cattail and bulrush

(and cottonwood) plants were established. Like Parker Bay, we may be able to shallowly (6" or so) flood the Lake this spring for both duck and vegetative benefit.

Pool 9: Used as a drainway for Hepi Lake as above, it became over-full by about one foot because the long 12" culvert did not run full due to friction and the 16" short culvert out of Hepi Lake supplied water very rapidly. (The 16" culvert was used because it was on hand and because it was judged desirable to build a good head in Pool 9 to push through the long culvert. I would make both pipes 16" if doing another such project.) The over-filling was not relieved until about the end of June and all but the outer edge of cattails were killed. They should recover in one or two seasons. Judging from the large numbers present, a black tern nesting colony took advantage of the floating mats of dead cattail debris.

Pool 10: This small marsh is too high to back-fill from the drawn down Hepi Lake. Spring runoff was insignificant so it remained dry again this year (as did nearly all other similar cattail sloughs).

Pool 11 (West White Lake): Started the year low with water only in the east end. Unfortunately it dried up rapidly as a Canada goose incubated her clutch on a nesting grass bale. She lost the race; her nest was broken up after water dried to mud.

A project was initiated this fall to divert some of the Frenier Dam spring outflow down the old channel into this pool. The major landowner involved agreed and RO (EN) approval was received. Just prior to meeting with the Sargent County Water Management Board, which owns the Dam, the landowner changed his mind and objected to the project for several nebulous reasons. So the plan was dropped. Only in the rare years of above average moisture will this pool reach the depth needed to drown back encroaching vegetation and promote muskrat re-establishment. Pumping from Pool 12 may be resorted to this spring.

Pool 12 (East White Lake): To salvage the nesting season, one foot of water was flowed in between April 4-12. By late June the water depth was dropping rapidly and it was decided to not fight Nature, "go with the flow" and allow dewatering to occur. According to Chris' memory, the pool hasn't been dried out since about 1973. By about late July it was dry and rapid cattail and sedge edge increase and some open area invasion occurred. Since the pool can be flooded as deep as necessary in a normal year, any unwanted encroachment should present no significant problem.

Pool 14 (Sprague Lake): As covered last year, considerable work and diesel fuel was invested to pump this 183 acre lake down so it would "surely" freeze out the heavy carp infestation. The heavy, steel carp barrier was welded and installed in February. Along came a record mild winter and no carp kill occurred. But no inflows were received either. So the lake evaporated down all season and froze at a maximum depth of 17". A good increase in shoreline cattails and sedges developed as a benefit to this draw down. By year's end, no doubt, it was frozen to the bottom thanks to the bitter December weather. Hopefully it will refill and be restocked with northern and walleyed pike next spring.

Pool 13 (Mann Lake): This unit continued dry by plan (though flooding was impossible anyway) to encourage cattails, bulrush and sedge establishment. As an experiment to cultivate and aerate the bottom, a cooperative farmer was allowed to grow millet, using no herbicides. He had a good crop with plenty of waste for wildlife. No further farming will be done and the effects on establishment of the natural plants will be monitored in 1984.

Pool 16 (Horseshoe Slough Group): These eight large marshes received no inflows and were dry all year, like 1982.

Mr. Berle Meyers and Sand Lake NWR's dozer worked a week cutting openings in vegetation choked wetlands. The spoil was pushed to the edges where it will be farmed in next spring. 10/83 - DGP

Like last year, many of the dry, cattail choked prairie wetlands northeast of Lake Tewaukon were cut open by Sand Lake's TD-18 with Mr. Berle Meyers operating. He worked here October 17-21. By cutting away the roots and increasing the water depth (in a normal year), cattails will close these open water areas very slowly if at all.

Irregular openings were mowed in the bottoms of six cattail choked, dry pools by Don Bozovsky. Hopefully decent inflows will occur next spring so the short stalks will be flooded deep enough to die out. 10/83 - DGP

Another attempt to open cattail choked wetlands was fall mowing the deepest areas of several pools in hopes that next spring's inflows will cover them deep enough to kill many of the plants. Portions of pools 2A, 2, 6, 7, 7A and West Mann Lake Slough were mowed.

Rob Hoflen and Chris Schuler backhoed a trench and gravity flowed water to fill two small and one larger dry wetland (beyond road). A 4" PVC pipe with control valve was installed for use when water is needed in the future. (Refuge residence in left background and shop in right background.) 4/83 - DGP

Another wetland enhancement project was the backhoeing in of a 4" PVC pipe with control valve through the Pool 2 east dike and gravity flowing water into a small wetland along the roadside opposite headquarters. A small plug was put in to trap water there before overflowing south into the west side of the headquarters pool. The west side pool dumped into the larger, main headquarters pool via a road culvert. Between April 19 and about May 15 these three dry wetlands were filled full.

This small wetland had been dry since 1979. It and two others were flooded as in the other photo after a prescribed burn April 21. To open the rank cattails, cuts had been bulldozed the previous fall. The cattails rapidly grew back this spring. Use by waterfowl and three pairs of black terns was excellent. 4/83 - DGP

The previous fall the small wetland had openings dozed into it as above. This spring the pool was included in a prescribed burn (using the backhoe scar as a fire break). After the burn, it was filled as above and duck response was excellent (3-5 pairs bluewings, 2 pairs mallards, 1 pair gadwall, 1 pair shovelers). Three pairs of black terns took over the area and a wading inspection on June 17 disclosed two nests each with three eggs.

To facilitate water management planning and operation by new employees, Chris Schuler mapped the location of every Refuge water control structure on a master map. He also described each of the 42 concrete or steel structures and marked the direction of water flow.

3. Forests

Again this year, no tree plantings were made but several days were spent repairing blank sections of existing plantings using 124 chokecherry and 125 caragana shrubs received free as left-overs from North Dakota Forester Bob Harsel, Lisbon. Also about 50 lilac suckers were dug around headquarters and planted in several rows. The dry and hot weather resulted in apparent poor survival.

All previous tree plantings were weeded three times down the rows. Simazine was not used this fall due to the carry over benefits from last fall's spraying and drought stress on the small trees.

Since YCC Enrollee Odor was a forestry major, she and Don Bozovsky spent one afternoon looking over the 27 acre, 1930's era green ash and American elm planting, the Big Woods, with an eye to possible wildlife improvements. Don submitted a report with several management recommendations. Dave Potter reviewed it and submitted it to North Dakota State Forester Bob Harsel for his review and recommendations.

The Big Woods is in poor, stunted condition due, apparently, to a planting spacing of 6' by 6' computing to 1,210 trees per acre compared to a recommended 450-750 trees per acre. Siberian elm are present (1.3% of the population) and are growing better than the other two species. Honey locust also occur (3.2%) and are reproducing successfully; their wildlife value is good according to Forester Harsel. Russian olive (.5%) were planted on the east end at an old building site, are doing well and are good for wildlife. The green ash averaged only 4.5 inches dbh and appeared to be in the worst condition. The understory was nearly 100% smooth brome with virtually no tree reproduction or shrub growth due to grass competition and heavy browsing by deer. Continued efforts to improve this woods are planned: tree species diversification, thinning, Dutch elm disease inspections and shrub establishment.

4. Cropland

The details of the farming program are shown in the chart on page 16. Seven cooperators farmed on a 1/3-2/3 share basis except for no-till winter wheat in which the goose browse and farmer's crop were the same acreage. Then the designated wildlife share was 50% so if wildlife-caused crop loss occurred the farmer had no complaint. The herbicide part of the farming program caused a real paperwork blizzard and the requirements for paper are even greater in 1984.

We continue to produce more crop than is needed by wildlife. It is not an objective to hold geese and ducks inside the Refuge getting fat (literally) on standing grain, especially when producing the grain conflicts with the primary objective of duck production. Therefore, the past few year's effort of retiring cropland to grassland was continued with 44 acres dropped from farming and arrangements made to retire 169 acres in 1984 (see Grasslands). This and the "alfalfa" plan (see below) should get the farming acreage in line with that needed for wildlife feed.

In September, the "alfalfa plan" was approved by the Regional Office. It has been accepted by all three Refuge farmers. It's objectives are to produce more ducks, benefit other wildlife and to stop herbicide/fertilizer use on croplands. Selected fields (4 fields, 122 acres) will be planted in 1984 to alfalfa (supplied by the Refuge) and the farmer's nurse crop if he wishes. A full 33% wildlife share will be taken elsewhere for the nurse crop. In 1985, the resulting alfalfa field will be 33% wildlife share left standing and 67% hayed by the farmer with a delayed cutting date of July 15. Only one cutting will be taken to provide regrowth for the next spring's nesting. The farmer gets his alfalfa with no herbicide, fertilizer, seeding, plowing or other farming type expense. In 1986, the same thing happens except the 1985 wildlife share will be hayed off by the farmer and a "fresh" 33% acreage left for wildlife food and cover. This continues for 4-7 years until the alfalfa declines too far. Then 100% haying occurs (wildlife share is taken

elsewhere on the Refuge) and the alfalfa is plowed down. The land is farmed the next two seasons using the green manure nitrogen value. It is seeded with alfalfa again the third spring to start the rotation again. As with a DNC breakout, no wildlife share will be required the plow-down year to allow for the extra cultivation required with tough alfalfa root systems.

Due to the low rainfall and hot winds, herbicides worked poorly and Refuge crop yields were very low in most fields. By year's end much of the small wildlife share had been consumed thanks to record snow goose use and a high pheasant and deer population.

The one no-till farmer's crops (251 acres) appeared to average better than the neighboring conventional farmer's again this year. Since moisture conservation is one of no-till's strengths this could be expected in this drought year. The farmer put on "probation" in 1981 for poor weed control and poor wildlife crops decided to retire so a second no-tiller was recruited to farm this 89 acres. RO Agricultural Specialist Terry Cacek reviewed this program May 5.

The six acre test field of perennial grain planted September 27, 1982 grew well, produced good seed heads relative to the drought and was a success. One improvement in future years would be to seed it at a greater rate than 50 pounds per acre rate which was used in order to stretch the seed. The grain stand appeared to be thin. Of great interest will be how it regrows next spring without any manipulation.

One field of wildlife share millet was swathed by the farmer and the Refuge paid to have it baled - grain and all. A total of 22 bales were then scattered on the Refuge behind tree and brush shelter as winter wildlife feed. By the bitterly cold days in late December, they were being well used with 30 pheasants on two bales east of Headquarters on December 18. At the Sprague Lake Unit, Mr. Orvis Silseth volunteered to move stacks of wildlife millet to scattered locations.

5. Grasslands

Refuge grasslands range from native grass-forb communities to seeded natives of 1-3 species to dense nesting cover (alfalfa, sweet clover, wheatgrass) to smooth brome or crested wheatgrass monotypes. Each species responds to manipulation differently. In this specific area, we try to spring burn natives and late hay the other grasses. Due to lack of cattle locally and lack of manpower to handle grazing, spring crowd grazing is a lesser used technique.

The short-term goal is to rejuvenate all grass stands to the greatest degree possible to benefit duck nesting. Lack of trained manpower has prevented us from doing systematic evaluations of the grassland manipulations beyond random walk-throughs. Studies and information from other similar prairie areas is used, however.

The longer term goal is to maintain vigorous stands of DNC or natives and convert the exotic grass stands to them, perferrably a mix of warm and cool season natives. This goal will benefit duck nesting as well as all other native prairie wildlife. A significant consideration is that noxious weeds, such as leafy spurge, can be sprayed in native grasses without significantly

REFUGE COOPERATIVE FARMING SUMMARY

	CORN		OATS		WHEAT		BARLEY		RYE		MILLET		WINTER WHEAT		MILO		TOTALS
PERMITTEE	P	R	P	R	P	R	P	R	P	R	P	R	P	R	P	R	
Breker, J.	25	24			127	84			43	43	13	14					373*
Freeman, L.	19	29							0	13	66	0					127
Glarum, R.	0	15							23	15	51	6					110
Hoistad, Q.	25	23	21	0	33	0						-	0	16			118
Kiefer, D.	0	10			154	0	0	29	0	37							230
Lee, T.	0	25			68	0	8	27	25	28	51	0			23	8	263
Silseth, O.	52	32							27	17	42	8					178
	121	158	21	0	382	84	8	56	118	153	223	28	0	16	23	8	1399
	279		21		466		64		271		251		16		31		1399

P - Permittee share
R - Refuge share

*122 acres were double cropped

damaging them. Another consideration is that native grasses can be maintained virtually forever by using only a prescribed burn every 4-10 years. In contrast, the legumes in DNC are wiped out by weed spraying.

Seeding: Switchgrass was seeded on two fields (44 acres) to establish future seed sources. A mixture of native grass seed (mainly big bluestem, Indian and switchgrass) was reseeded on 30 acres as in the table below. The seed (also for WPA seeding) came from three sources. Six hundred pounds of Pawnee variety big bluestem ($3,540) and 1,150 pounds of Holt variety Indiangrass ($4,550.15) were purchased from Sharp Bros., Healy, Kansas. The Valley City WMD provided 340 pounds PLS of NDG-4 variety big bluestem; 300 pounds PLS of SD-149 variety switchgrass and 400 pounds of ND-96598 variety switchgrass. About 100 pounds of mixed seed was from Tewaukon's 1981 combining.

Two Truax grass drills were used to spring seed into millet stubble from which the straw had been taken for hay. This provided a good firm seed bed. All fields were herbicided with Roundup to kill all plants prior to seeding.

Native Grass Seeding

Date	Field	Acres	Herbicide*	Remarks	Initial Catch
5/17 & 18	5-b,c,d (Loren)	23	atrazine/2,4-D	ND switchgrass only (seed source)	poor
5/19	15c (M.Breker)	21	atrazine/2,4-D	SD switchgrass only (seed source)	poor
6/22	40a(Roy)	10	atrazine/2,4-D	interseeded with mixture into poor earlier seeding	good
6/23	49c(Banish)	20	atrazine/2,4-D	interseeded with mixture into poor earlier seeding	fair
9/6-7	5-b,c,d	23	none	reseeded with left-over switchgrass	
9/7	15c	21	none	reseeded with left-over switchgrass	
9/8	14c,d	26	none	reseeded with left-over switchgrass	
9/9	38a,37a	20	none	reseeded with left-over switchgrass	
9/10	8d	13	none	reseeded with left-over switchgrass	

*all received roundup

Last year's drought caused many neighboring farmers to have seeding failures and, initially, it appeared that most of the 1982 native grass seedings also would not catch. But, to give them a fighting chance since it's too early to tell for sure, most of them were hayed off in mid-July to remove the "weed" competition such as volunteer millet, foxtail and wild oats.

8. Haying

Haying is a good method of rejuvenating decadent, thatch bound, non-native grasslands. Based on information from Northern Prairie Wildlife Research Center on hatching dates, the start date was again kept late at July 20 for paid haying or August 1 for free, roadside mowing. Since most wetlands were dry and breeding duck numbers were very low, this was a good year to treat many scattered acreages with haying. The response of last year's hayed areas was good considering the drought conditions.

Again this year, drought had cattlemen really scratching to find hay and many requests were received. Nearly everyone received or at least was offered a small tract to mow. Also, the previously established systematic, haying rotation in which the farmer agreed to cut hay in good hay years as well as in bad was continued.

For use in 1984, a haying and grazing rate survey was done (four interviews each) and submitted to the Regional Office for blending with other Refuge's data. The 1984 grazing rate was set at $6.95/AUM which, locally, is somewhat too low in Richland and Sargent Counties but right on for Ransom County which has drier, thinner soil.

A summary of the refuge haying is below. The charge ranged from $5-12 per ton based on forage quality.

1982 Refuge Haying

Cooperator	Location	Grass Type	Acres	Tons	Paid
D. Bladow	Twk/Sprg	natives*	60	55.00	$275.00
Q. Hoistad	Sprague	sloughs/DNC**	20	10.00	--
D. Anderson	Tewaukon	smooth brome***	18	25.00	154.00
L. Freeman	Tewaukon	old DNC**	26	33.75	249.00
W. Hrdlicka	Tewaukon	smooth brome and blue**	10	9.00	45.00
D. Standley	Tewaukon	smooth brome/alfalfa	12	4.00	50.00
A. Hoflen	Sprague	slough/DNC**	18	65.00	226.00
L. Brash	Sprague	slough/DNC**	5	10.00	74.00
R. Pherson	Tewaukon	old DNC**	20	28.66	223.92
L. Gaukler	Tewaukon	slough/DNC**	20	36.38	316.56
O. Silseth	Sprague	old DNC**	14	25.00	218.00
J. Breker	Tewaukon	natives*	10	15.00	320.00
L. Gaukler	Tewaukon	natives*	33	32.20	161.00
R. Pherson	Tewaukon	natives*	31	26.66	133.30

*to remove weed competition from a seeding
**also scratched the old thatch with straight points
***also scratched the old thatch with straight points and pulled/piled invading Russian olive trees

9. Fire Management

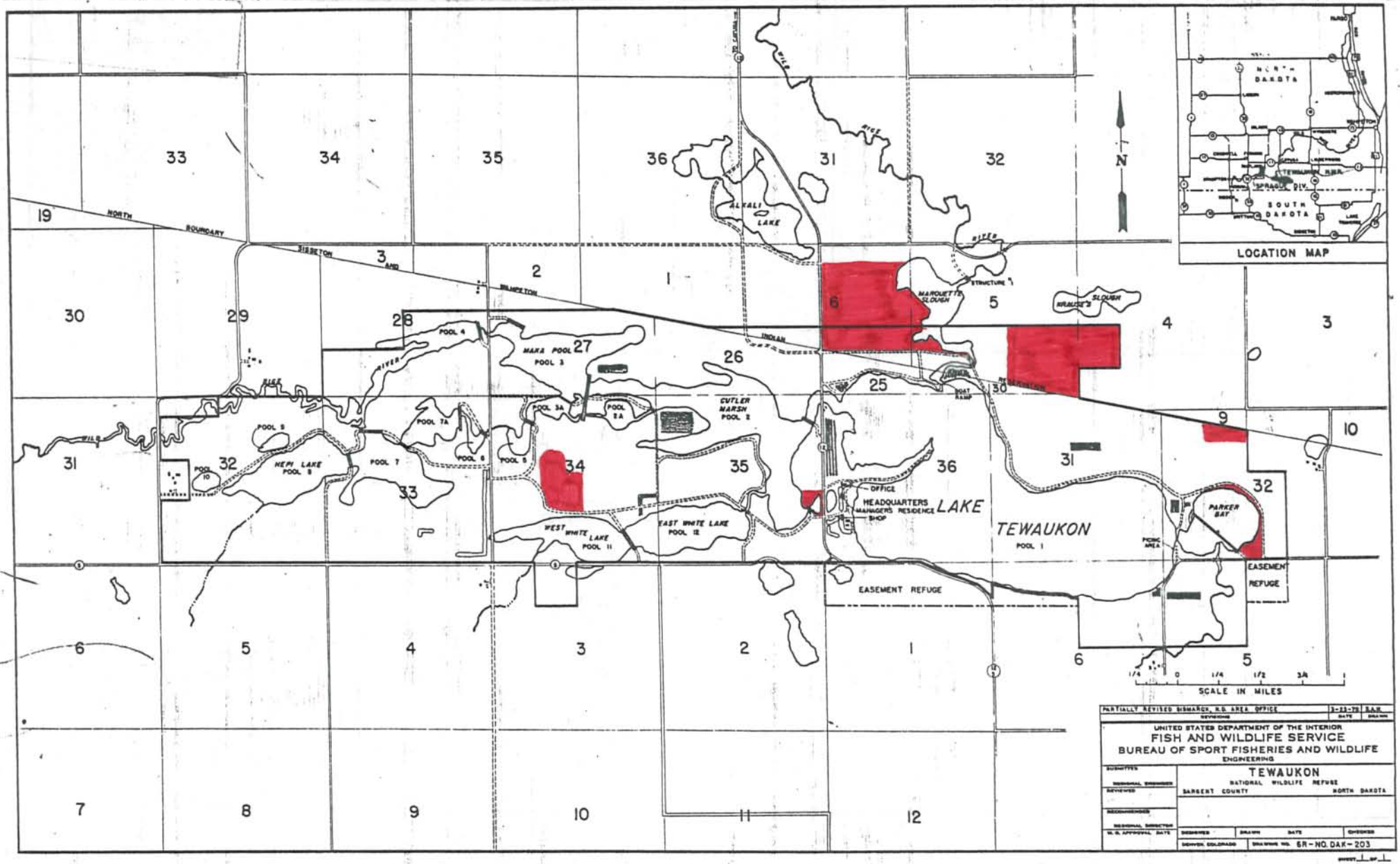
No wild fires occurred this year on Tewaukon.

Average burning weather occurred and the first prescribed burn was accomplished April 7 compared to April 21 in 1982 and March 4 in 1981. The date on which to terminate burning is a tough decision based on the desire to not destroy duck and other bird nests, to not receive excessive local criticism for "burning out the critters" and yet get maximum benefit for the warm season native grasses. May 3 was the last burning day this year and was a typical compromise decision - it did not fully accomplish any of these goals.

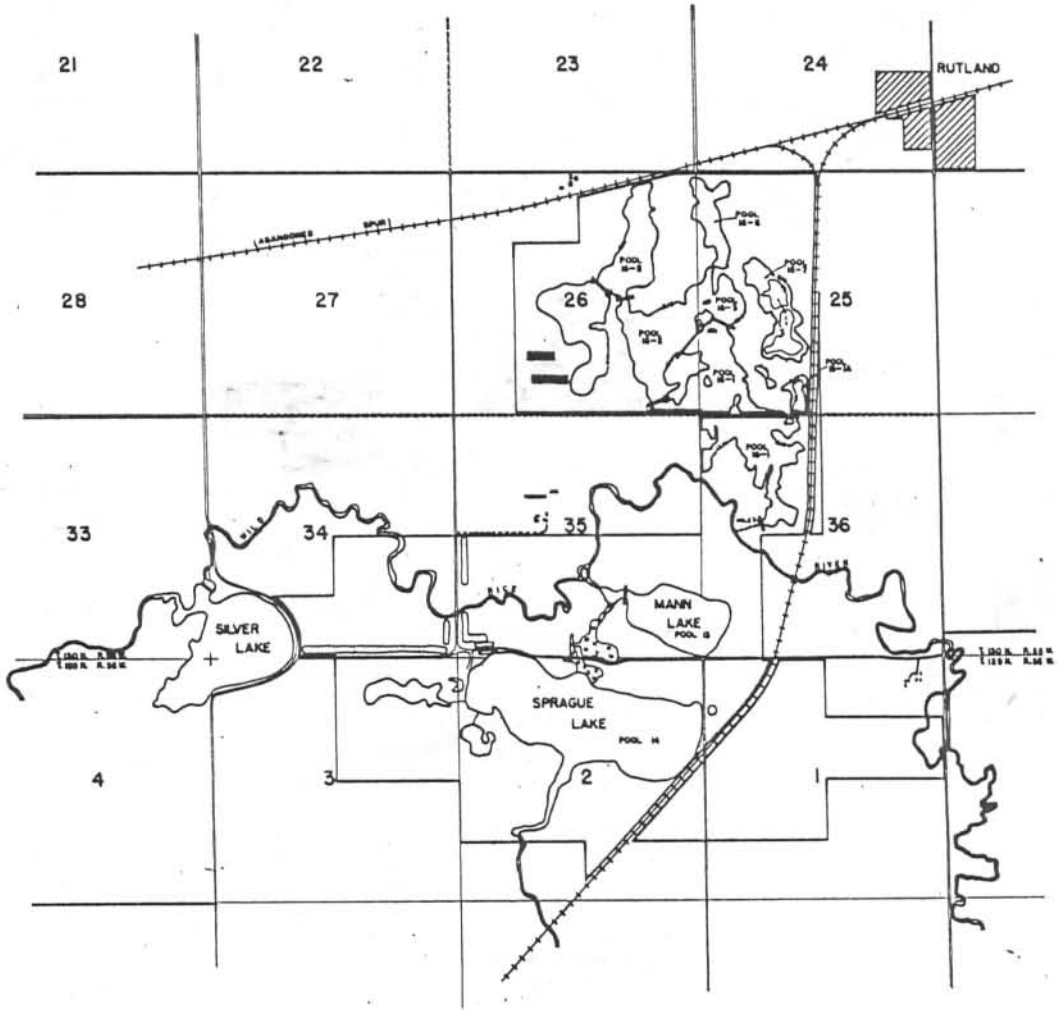
A total of 481 acres in six tracts were burned. The many black farm fields in and outside the Refuge greatly simplified the burning program. Due to the drought, response generally was below average but acceptable. Burn locations are shown on page 20.

ND Game & Fish and Refuge personnel burned 130 acres of State Wildlife Management Area native prairie (left side of the fence) and 70 acres of Refuge mixed natives and tame grasses on April 27. This was the first manipulation of the State land in 10-12 years and 6-8 years on the Refuge. Response was excellent considering low rainfall and degraded native vegetative conditions. #21-9/83 - DGP

TEWAUKON NWR



SPRAGUE LAKE UNIT



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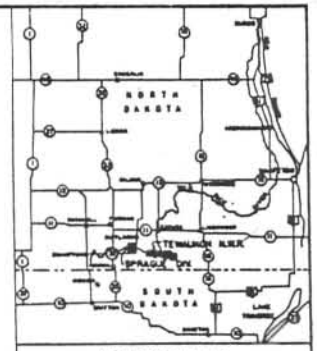

LOCATION MAP

SCALE IN MILES

UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
ENGINEERING

TEWAUKON
NATIONAL WILDLIFE REFUGE
SARGENT COUNTY NORTH DAKOTA
SPRAGUE LAKE DIVISION

DRAWN DATE 2-14-75

No problems occurred and a high point was April 27 when the local ND Game and Fish District Biologist and Technician joined in to burn off 200 acres of native prairie (70 acres Refuge, 130 acres State WMA) and 30 acres of WMA grass in a second tract. This project was a Refuge suggestion and Biologist Vollink was very positive about it and asked that more burning be done. This was deferred to 1984 due to lack of advanced planning and lack of time.

1983 Prescribed Burns

Date	Location	Acres	Target	Comments
4/7	LTL-NE Rectangle	15	heavy bluegrass thatch	poor-too early too damp
4/7	E. Parker Bay triangle	16	invaded native prairie	acceptable
4/8	N. LTL Prairie	160	invaded native prairie	excellent-good back burn
4/21	W. of Pool 2	12	invaded native prairie	acceptable
4/22	E. of old HQ	78	mixed brome & natives	acceptable
4/27	NWR&WMA Prairie	130/70	invaded native prairie	excellent*

*first manipulation of the WMA since grazing stopped 12 or more years ago

10. Pest Control

Predator and problem beaver trapping is covered under "Game Mammals", section G-8.

Noxious weed control required by State law concentrated as usual on leafy spurge. This weed cost the Refuge big bucks and much scarce manpower. Happily, no significant Canada thistle or other weed problems developed beyond those addressed by early haying the native grass seedings.

As in last year's report, NDSU research is showing that a Tordon 22K/2,4-D Amine tank mix kills spurge nearly as well as higher rates of only Tordon 22K and is much less costly. Our observations from 1982 suggest that on previously unsprayed spurge, the tank mix worked well. However, pure Tordon was much more effective on patches which had been sprayed in earlier years. The travel and labor expenses involved in the Refuge and a three county Wetlands District are very high so the decision was to go for maximum kill and use straight Tordon 22K at two pounds per acre.

Nearly all Refuge spurge spraying was spot treatments of many small areas. The total acreage treated from June 7-15 was estimated at 48.94 acres versus 31.9 acres in 1982. The more time spent looking for spurge; the more was found. Again this year, extra effort was put in on the Lake Tewaukon bank (as was also requested by a neighbor) which in earlier years had been ignored. As required by State law, detailed records were kept concerning each day's spraying.

Again this year, no formal weed complaints were received. It seemed accepted in the community that the Refuge spurge was being controlled and most neighbors had an equal or greater spurge problem. Again, a spraying cost sheet was compiled for a newspaper article and mailing to the County Commissioners and Weed Board. Approximately $3,700 was spent on Refuge spurge spraying counting in labor, herbicide and truck costs.

All herbicides used on the Refuge by Service or cooperative farmers were approved in advance and actual useage was reported in September in the Pesticide Use Report. Most commonly used chemicals were 2,4-D; Roundup; Atrazine; Tordon and Fargo.

11. Water Rights

Water use under the three water rights permits (#1261, 1262, 1263) was documented and reported in the Annual Water Management Report and ND State Water Commission's Annual Report of Water Use.

Of concern were statements in two Dam Safety Inspection Reports from the ND State Water Commission received September 17, 1982 that the Maka Pool (Pool 3) and River Pool (Pool 4) did not have water storage permits. In checking the files, these statements were found to be in error as Permit #1261 listed Pools 3 and 4, among other areas.

Regional Office (EN) was contacted as to the status of permits covering the 1979 Horseshoe Slough Development at Sprague Lake. They confirmed that Permit #1263 covered the Development and was in good standing even though the State Water Commission had not completed a final inspection or issued perfected permits and certificates.

12. Wilderness and Special Areas

Three easement refuges are managed from Tewaukon. As in the 1980 Report, the Wild Rice Easement Refuge (778 acres) continued in "mothballed" status due to extreme habitat degradation. The other two easement refuges, Lake Elsie (634.7 acres) and Storm Lake (728.3 acres plus 1.7 acres fee title), continued to function as good waterfowl resting areas. Management efforts were confined to an occasional visit, law enforcement checks, trapping permits and posting maintenance.

From spring on, little-by-little this debris dumping on the far southeast corner of the Storm Lake Easement NWR increased. Finally Dave Potter tracked it down to Milnor City and private trucks. The City Maintenanceman/Policeman said it began as a roadside strengthening project but guessed it "had gotten out of hand". He agreed to stop the dumping and pull what material he could up against the roadside. (Note the very low water levels and City dump in background. This is legal on this Easement Refuge - along with homes, a cemetary and golf course - as the Service controls only hunting and trapping rights). 10/83 - DGP

The Refuge also benefited from two additional tracts of private land under hunting and trapping easements immediately adjacent to our boundary south of headquarters and southeast of Parker Bay (see Refuge map following personnel page). The crops grown on them by the owners fitted in well with our management. The Harry Kiefer easement land (25.25 acres) was opened for trapping at Mr. Don Kiefer's request in order to apply additional pressure on predators but was closed to archery deer hunting at his request.

G. WILDLIFE

1. Wildlife Diversity

The major factor in increasing wildlife diversity in the prairies appears to be the planting of tree and shrub shelter belts, see Section F-3.

2. Endangered and/or Threatened Species

Observations of migrating bald eagles were up substantially this year. See the below table. The first sighting was an adult on March 23 and the last was an adult on December 2. From 1981-1983, the number of observers has remained the same so this increase in sightings is felt to indicate actual increasing use.

Bald Eagle Sightings

	1981		1982		1983	
	Adult	Imm	Adult	Imm	Adult	Imm
Spring	2	2*	1	7	6	5**
Fall	1	0	3	0*	4	3

*one additional eagle unidentified as to age
**1 adult and 4 imm in one group beside Lake Tewaukon on April 9

3. Waterfowl

As in the table of First Arrival Observations (Section G.7), waterfowl arrived "on time" with Canada geese the first species seen on February 18. Spring migration was very quiet with only a "bulge" in Canada goose numbers worthy of note. No doubt the extreme lack of wetlands and uneventful spring weather produced this lack of waterfowl.

Spring Peak Waterfowl Numbers

	1983	1982	1981	1980
Canada geese	3,200	2,700	350	60
snow geese	75	9,500	3,000	150
mallard	944	36,500	1,500	1,200
pintail	130	2,300	360	900
blue-wing teal	522	1,526	1,400	2,000
redhead	350	1,250	600	200
canvasback	40	200	2,600	40
lesser scaup	4,000	2,500	3,500	1,600

Like 1981 and 1982, water conditions were very poor and even more of the larger sloughs were dry or nearly dry. Breeders were concentrated on the largest Refuge pools - not a desirable situation but better than nothing. Again this year, water conditions just to the north and throughout the rest of North Dakota were generally excellent so, no doubt, many breeders overflew the Refuge. The estimated production for mallards and wood ducks was calculated from the standard formula (pairs x .45 (% of pairs breeding) x 5.9 (young/breeding pair)) based on pair count data but was felt to be incorrectly high due to large numbers of single males moving in early on the larger water units or creek bottom. Since 1976, Chris Schuler has conducted the breeding pair census of all Refuge wetlands.

The three serviceable wood duck boxes were checked out and, like last year, were not used except for a tree swallow nesting in the West Parker Bay box with seven eggs on June 17. On June 24, Chris Schuler saw the first wood duck brood ever recorded on the Refuge, six ducklings at Parker Bay.

Estimated Refuge Waterfowl Production

	1983*	1982*	1981*	1980	1979	1978	1977*	1976	1975
coot	257	343	312	624	268	1280	2500	1240	1000
Canada geese	19	21	10	3	-	-	-	-	-
mallard	1253	435	2538	1200	488	700	2470	1209	762
gadwall	404	419	523	427	146	460	1120	707	504
pintail	82	151	146	401	101	400	500	281	198
gw teal	29	74	3	48	26	5	7	10	12
bw teal	693	2026	544	2137	714	1400	916	2708	1134
wigeon	21	84	45	24	19	20	35	25	-
shoveler	106	265	37	215	133	155	466	236	90
wood duck	88	24	56	21	72	-	110	-	54
redhead	255	226	207	141	74	430	576	200	132
ring-neck	-	-	-	-	-	5	-	-	-
canvasback	37	18	5	5	24	30	21	30	-
lesser scaup	29	104	32	8	135	6	-	-	36
ruddy	50	358	77	69	265	130	305	206	162
bufflehead	-	5	3	-	-	-	-	-	-
TOTAL DUCKS	3047	4189	4216	4696	2197	3741	6526	5612	3084

*very dry years - few wetlands around country so ducks concentrated on refuge.

One Canada goose brood of 10 goslings (only 9 visible here) showed up on a private pasture and wetland next to the south boundary. They soon joined the two other known broods on the large Refuge wetlands. Relative to the drought, this was good production from the modest 1979 transplant. 5/83 - DJB

As in last year's report, the work started in 1979 to re-establish Canada geese as breeders continued slowly taking hold with Refuge production as below. The drought caused at least one nest failure when an incubating female in West White Lake had her nest broken up after the water became mud.

Year	Broods Observed	Goslings Observed	Estimated Production
1980	1	3	3
1981	2	3	10
1982	4	18	21
1983	3*	16	19

*including one brood of ten goslings seen on an isolated, small wetland

Waterfowl, especially Canada geese, make good use of artificial muskrat houses for nesting. This year 24 big round cattail bales were given extra nylon strapping and set out on the ice. Come spring, they fall through on end into shallow water to provide good and aesthetically acceptable nest sites.

A record peak of 58,000 snow geese used the Refuge for 3-4 days in early November. A large proportion of them roosted on the 186 acre Sprague Lake Unit and many fed to the southwest in the Kulm WMD or Sand Lake NWR country. 11/83 - DJB

Fall migration was very disappointing for swans and ducks, average for Canada geese and a record for snow geese. There were no obvious weather effects to match with this pattern. Declining duck numbers, unfortunately, are a long-term trend resulting from North Dakota and Canadian wetland drainage so the future doesn't look good for them.

Fall Refuge Waterfowl Peaks

	1983	1982	1981	1980
tundra swans	800	5,200	8,500	250
snow geese	58,000	42,000	40,000	34,000
Canada geese	3,500	5,400	2,060	1,500
mallard	9,700	6,000	25,000	35,000
redhead	800	1,650	1,200	1,400
canvasback	600	90	2,200	600
lesser scaup	300	3,000	6,400	13,500

American black ducks (peak of 50), wood ducks (40), greater white-fronted geese (34) and hooded mergansers (6) were again seen regularly and have been dropped from the "unusual" list. Two red-breasted mergansers were seen April 14. Common mergansers and goldeneye were conspicuous by being 100% absent this fall.

As requested by the Office of Migratory Bird Management, Chris Schuler spent October 26 conducting a snow goose adult-juvenile ratio count. He was able to get a good observation site and turned in two pages of data.

Don Bozovsky traveled north for a week in September to assist the J. Clark Salyer NWR crew in cannon netting and banding ducks. This was excellent training for him since Tewaukon doesn't band.

4. Marsh and Water Birds

Observations of these species were made incidental to other work and represent "best guess" level data. White pelican and double-crested cormorant (both non-breeders) use increased greatly with, no doubt, the drought lowered pools and exposed sand bars being major causes. With existing islands and future planned artificial nesting poles for cormorants, hopefully breeding populations will become established.

White Pelican and Cormorant Peak Numbers

	1983	1982	1981	1980	1979
White pelican	1550	625	550	75	100
Cormorant	1500	250	325	200	-

White pelican use hit a record peak of 1,550 birds this fall. Lower water levels provided attractive loafing beaches and made fishing easier. 10/83 - DJB

Loons again stopped during migration with two observed October 17 and calls heard several other times - which were really enjoyed. Great egret numbers again began increasing from mid-summer on with 46 observed roosting in Pool 2 cattails the evening of August 27 and more elsewhere in the Refuge.

A first ever Refuge observation of a snowy egret was made May 12 at close range by Dave Potter. The bird list didn't even carry this species as an accidental. The Regional Audubon bird observations report had a snowy egret seen at several eastern South Dakota locations this spring also.

Green-backed herons are common but are usually difficult to see. 8/83 - DJB.

5. Shorebirds, Gulls, Terns and Allied Species

As usual, the very large fall flocks of gulls roosted on Lake Tewaukon. A rough estimate was that 50,000 to 80,000 were present, mostly Franklin and some ring-billed gulls.

As would be expected, the mud flats of the dewatered Hepi Lake were very heavily used by shorebirds. On June 20, 250 marbled godwits and 30 American avocets were counted there - both listed as "uncommon" in the Refuge bird-list.

6. Raptors

By far, the great-horned owl was again the most common raptor with an estimated peak population of 60. The several efforts to find Refuge owl nests for the Cornell University Nest Record Card Program were failures this year compared to two nests found in 1982, zero in 1981 and three in 1980. Other notable raptor observations were:

Unusual Raptor Sightings - 1983

Species	Date(Number)	Observer
northern goshawk*	1/12(1),2/5-6(1),10/26(1),11/6(1), 12/18(1),12/28(1)	DGP,DJB,CRS
golden eagle	1/26(1),9/28(1),10/8(2)	DGP
sharp-shinned hawk	2/26(1),9/7(1),9/30(1)	DGP
rough-legged hawk	3/16(1)	DGP
short-eared owl**	4/8(2)	DGP
snowy owl	4/12(1)	DGP
osprey	5/6(1),9/27(1)	DGP,DJB
cooper hawk	5/10(1),9/3(1),9/11(1),9/14(1),9/30(1), 12/13-15(1)	DGP,CS

*not on bird list
**rarely seen, were attracted to a prescribed burn in progress

7. Other Migratory Birds

A five year listing of first arrival observations is on page 32.

Again this year Dave Potter and Don Bozovsky recorded data for the Cornell University Nest Record Card Program. A total of 112 cards (nearly all from the Refuge or WPA's) were submitted compared to 101 in 1982.

1983 Cornell University Nest Record Cards Submitted
(number in parenthesis is Bozovsky's)

mallard	7 (2)	mourning dove	20 (2)
blue-wing teal	4 (2)	eastern kingbird	8
ruddy	1	western kingbird	2
red-tailed hawk	2	western meadowlark	3 (1)
Swainson's hawk	3	bobolink	1
coot	1 (2)	house wren	- (1)
killdeer	4	tree swallow	2
spotted sandpiper	1	barn swallow	18
upland sandpiper	- (1)	grey catbird	4
American avocet	1	brown thrasher	2
ring-neck pheasant	1	robin	6
common grackle	5	American goldfinch	1
black tern	2 (1)	chipping sparrow	- (1)
		TOTAL CARDS:	99 (13)

Cornell University Nest Record Cards were submitted on 112 bird nests in 1983. Dave Potter's children look at a goldfinch nest which fledged three young September 24 from a deer browsed Siberian elm sapling. #15-9/83 - DGP

For the third year, the Christmas Bird Count centered on the Refuge was run December 29. Despite very cold, windy weather the count was "average" as listed below. The only unusual observations were of a flock of 400 Lapland longspurs and one white-breasted nuthatch.

Christmas Bird Count Observations

	1983 (12/29)	1982 (12/30)	1981 (12/28)
Number of Observers	3	3	3
northern goshawk	1	1	1
great-horned owl	12	7	10
pheasant	153	101	257
grey partridge	21	-	25
rock dove	-	19	13
hairy woodpecker	1	1	5
downy woodpecker	7	4	5
bluejay	6	5	16
tree sparrow	92	28	108
house sparrow	318	78	178
starling	25	101	59
northern shrike	4	1	1
snow bunting	4	-	12
horned lark	3	34	6
black-crowned chickadee	5	-	7
white-breasted nuthatch	1	-	1
American goldfinch	-	99	3
dark-eyed junco	3	-	6

Five Year First Arrival Observations

	1983	1982	1981	1980	1979	1983 OBSERVER
Canada geese	2-18	3-12	2-17	1-22	3-12	Potter
mallard	3-03	3-12	2-16	3-18	3-12	Potter
pintail	3-03	3-12	3-10	3-25	--	Potter
common merganser	3-03	3-13	3-03	3-25	--	Potter
common goldeneye	3-03	3-17	3-03	3-24	--	Potter
killdeer	3-03	3-27	3-17	3-19	3-28	Potter
northern harrier	3-12	2-28	3-02	3-19	--	Potter
red-wing blackbird	3-12	3-15	3-03	3-20	3-22	Potter
snow geese	3-12	3-29	2-25	3-18	4-03	Potter
bald eagle	3-13	3-23	2-26	1-22	--	M.McLaen
golden eagle	--	--	3-18	4-04	1-11	--
western meadowlark	3-17	3-20	3-12	3-18	--	Potter
kestrel	3-26	3-29	3-03	3-14	3-20	Potter
tundra swan	3-29	3-30	4-01	3-29	--	Potter
coot	3-31	4-02	3-23	3-28	4-11	Potter
pied-billed grebe	3-31	4-02	3-25	4-10	4-19	Potter
gw teal	4-04	3-12	3-10	3-25	--	Schuler
kingfisher	4-08	4-12	4-04	4-12	4-17	Potter
short-eared owl	4-08	3-16	2-06	3-23	--	Potter
great-blue heron	4-11	--	4-07	4-12	4-11	Schuler
white pelican	4-15	4-11	4-08	4-15	4-13	Potter
marbled godwit	4-15	4-13	4-16	4-24	4-12	Potter
western grebe	4-23	4-19	4-17	4-30	5-03	Potter
American avocet	4-26	5-11	4-10	5-04	--	Potter
western kingbird	5-05	5-07	5-02	5-15	--	Potter
upland sandpiper	5-06	--	--	--	--	Potter
great egret	5-08	5-01	4-28	5-07	--	Schuler
Harris sparrow	5-12	5-04	5-10	5-11	--	Potter
house wren	5-14	5-14	4-28	5-11	--	Potter
Northern oriole	5-14	5-15	5-06	5-11	--	Potter
bobolink	5-16	5-05	5-07	5-13	--	Potter
golden plover	5-16	--	--	--	--	Potter
eastern kingbird	5-17	5-18	5-09	5-13	--	Potter
common loon	5-23	4-24	4-17	5-12	--	Potter

8. Game Mammals

Despite the mild, snow free winter large numbers of deer again stacked in to over-winter on the standing crops, especially east of Lake Tewaukon. The annual deer census was flown March 10; lack of snow allowed the deer to remain scattered and made viewing difficult so, no doubt, the count was low. A total of 264 deer were counted compared to the severe 1982 winter which pushed a record 343 deer in on count day. At Sprague Lake 82 deer were seen versus 106 in 1982, Hepi Lake 22 versus 44, East Lake Tewaukon 147 versus 135 and other areas 13 versus 58. A real "welfare" clientele of deer has developed on the east side over the last few years.

Deer reproduction was excellent and observations of twins were very common. As requested by the Refuge, the ND Game and Fish Department increased the number of anterless deer permits for this unit by 40% (Refuge requested 30%

increase) to harvest them before an average winter occurred and did the job. To harvest more deer and save feed for later into the winter, the whole Refuge (except for headquarters area) was opened for the late archery season. This worked well, see section H.8, but the hunt could be run only 1½ days due to the pheasant hunt and by December 29, 100 deer were counted in one area on the east side.

A bull moose was seen September 27 during the day at headquarters by several personnel.

Trapping was again conducted not as a recreational activity but as a management effort to increase duck nesting success and reduce specific beaver damage problems. This was the third year for the bid-with-credit system; a $7.00 per animal credit against the bid was allowed for each Refuge skunk and problem beaver taken. This system has been adopted by several other refuges and Dave Potter received a $200 suggestion award for it.

Four trappers bid a total of $986 for the five units. Heavy, blowing snow by mid-December resulted in tough working conditions but the trappers kept at it. Also heavy theft loss of traps and foxes by Refuge pheasant hunters necessitated one trapper receiving a $72.50 credit against his bid. Credits for problem animals taken this fall totaled $434 for skunk and $49 for beaver; no credit for the one non-target beaver accidentally killed. Of note was the very high skunk harvest in a year when the Refuge skunk population was judged well below average. At $7 credit for each, the trappers stated that they were actively working to take skunks. Two trappers plan to trap raccoons and skunks next spring because they enjoy the trapping so additional credits will be applied later.

Generally skunk, raccoon, beaver, rabbit and muskrat populations were down. Mink numbers were average. Despite years of heavy hunting and trapping pressure, the fox population continued high. Long-tailed weasels were also common judging by their tracks. A dead least weasel was found (killed by a house cat?) in June on the Peninsula; it is unknown what their status is on the Refuge.

Since the fall and spring trapping efforts were done by different cooperators under different rules, separate tables are presented to show this work.

FALL TRAPPING HARVEST

Species	1983	1982	1981	1980	1979	1978	1977	TOTALS
fox	54	51	21	25	16	10	8	185
mink	20	31	37	47	24	25	-	184
skunk	62	56	21	48	59	6	-	252
raccoon	22	28	25	20	31	14	10	150
weasel	-	1	1	6	2	4	-	14
beaver	7	3	15	7	22	-	-	55
muskrat	-	-	-	769	-	-	-	769

1979 reported accidents: 1 pheasant, 2 muskrats, 3 badger
1980 reported accidents: 6 pheasants, 1 rabbit, 1 Hungarian partridge
1981 reported accidents: 8 pheasants, 5 rabbits, 9 muskrats, 1 cat, 1 beaver
1982 reported accidents: 5 pheasants, 1 rabbit, 1 muskrat, 2 gophers
1983 reported accidents: 1 beaver, 1 badger, 1 coyote, 10 muskrats, 1 cat

SPRING TRAPPING HARVEST

Species	1983	1982	1981	1980
skunk	7***	24**	-	7
raccoon	8	1	9	12
beaver	2***	-	8*	-

*includes two taken by refuge personnel
**includes 18 trapped & 1 killed with a shovel (rabid) by refuge personnel
*** includes 5 skunk & 1 beaver taken by Refuge personnel

In an effort to boost duck nesting success, for the second spring Refuge personnel set out live traps baited with smelt at the onset of warm weather when skunks became active and were ravenous. All traps were set in sight of well traveled Refuge roads and were generally checked from the vehicle while in the course of other business. The only drawback to this method was that the public stole several traps. Twenty-five traps were purchased from Tomahawk Live Trap Company for $352.

Between February 22 and April 12, up to 44 live traps were out but only five skunks were taken compared to 18 last year, with fewer traps. They were shot in the trap and left to "cool down" several days before removal. The live traps allowed release of one muskrat and one weasel and precluded any chance of injury to the public.

10. Other Resident Wildlife

The very mild winter resulted in a booming pheasant population with an estimated fall population of 750. The special late pheasant season (see Section H.8) was very successful. The two Refuge personnel on routine, random patrols plus what they bagged while off-duty saw 64 Refuge rooster pheasants taken of which 50 (78%) were hatched this spring - just like the text books say.

In cooperation with the ND Game and Fish, three Refuge pheasant crow counts were again run. Numbers of crows were up substantially. A pheasant brood count was run and random brood observations were recorded and mailed to ND Game and Fish. ND Game and Fish pheasant wing-and-leg envelopes were distributed to hunters this fall.

A very mild winter and dry hatching weather resulted in very high pheasant numbers this fall. #19-9/83 - DGP

As an indicator of how early "spring" was the following observations were made: February 26 - tree squirrel, February 25 - shrew, February 10 - mouse, March 3 - muskrat and ground squirrel and March 4 - pocket gopher.

Usually one or two Refuge sightings of sharp-tail grouse and prairie chickens are made each year. No chickens were seen but sharpie observations were up with eight seen November 23 south of Pool 3 and one seen December 12 near Mann Lake, Sprague Lake Unit.

11. Fisheries Resources

Sprague Lake was in draw down status for carp eradication all year. It should freeze to the bottom this winter as there was 11" of ice over 6" of water on December 13 and December lows to -34°.

Lake Tewaukon held good oxygen levels with open, clear water on February 24 so no fish kill occurred. Each spring the Valley City National Fish Hatchery stocks the Refuge and this year 685,000 walleye fry were dumped in Lake Tewaukon May 19; 110,000 fingerlings on June 30 and 29,000 northerns on June 3. By fall the Lake was 3' low and built ice rapidly in December. Winter-kill on the excellent northern and walleyed pike population is a grim possibility.

On May 5 Fisheries Biologist Frank Pfeifer test netted Lake Tewaukon using four hoop nets. No fisheries problems were reported; notable observations were only one carp was taken, a 7½ pound northern was caught and a 3½ pound northern was sacrificed to learn it had a 5 oz. carp in it's stomach. On August 3, Frank placed four 125' gill nets in the Lake for one night and 291 fish were caught: walleye - 226 (average 3.3 lbs), northern pike - 11 (3 lb),

yellow perch - 8 (1.3 lb), white suckers - 42 (2.5 lb), bullheads - 3 (.7 lb) and carp - 1 (2.6 lb). The suckers are a native fish, do not compete significantly with game fish and provide bird and fish forage so are not considered a problem. In the future, the carp population will grow to the the problem but for the next few years should do no significant damage.

Some good sized northerns showed up from somewhere (or escaped the 1978-79 winter kill) as 9, 11 and 13½ lb'ers were caught this fall. Large bullheads were caught again this year with two 2½ lb'ers hooked May 22.

14. Scientific Collections

In order to put to good use the various dead birds and mammals routinely found in the field each year or from law enforcement cases, several Fargo area Universities were contacted. Dr. Oscar Johnson at Moorhead State University was interested and the below specimens were donated to the school.

4 - great horned owls	1 - shoveler
1 - northern harrier	1 - common flicker
1 - least bittern	1 - dark-eyed junco
1 - unidentified gull	1 - gold-crowned kinglet
3 - double crested cormorants	1 - rough-winged swallow
2 - pectoral sandpipers	1 - western meadowlark
1 - western grebe	1 - long-tailed weasel

After receiving the okay from SRA Dave Kraft as to their permit status, members of the Wahpeton Zoo were invited out onto the Lake Tewaukon ice in November to gather crippled waterfowl for display in the zoo's pond. (One Service person broke through into about 3' of water trying to recover cripple snow geese for them last winter - not the Refuge Manager, however!!). In two tries and pushing a duck boat ahead for safety, they recovered one tundra swan, one lesser Canada goose and three snow geese.

15. Animal Control

Trapping is covered under "Game Mammals", Section G.8. No depredation problems were received.

17. Disease Prevention and Control

Luckily, Tewaukon has never experienced disease outbreaks so far as we can find out.

H. PUBLIC USE

1. General

This rural area is sparsely populated. The nearest "large" town, Wahpeton, is 60 miles away and has a population of 9,065. Like earlier times in most parts of the country, the great majority of the public interest in the Refuge is in consumptive uses such as fishing, hunting and trapping. While doing much in these areas, we are also working actively to stimulate non-consumptive public uses.

7. Other Interpretive Programs

On a hot, humid June 21, 38 kids and adults participated in the 4th annual 4-H Youth Day at Refuge Headquarters. The kids rotated through 20 minute sessions on rocks and collecting by Arnold Fedje, upland game birds by Lowell Tripp, life on a tree by Bob Hientz, bugs in a pond by Dennis Kopp and bird adaptations by Dave Potter (as a fill in speaker). A film "Watching Wild Wings" was shown and a fishing derby held. The prizes donated by local sportsmen's clubs were distributed later by drawing names as no fish were caught.

The annual Fall Open House and Tour was held October 23, a week later than last year. Finally, we lucked out with a bright, sunny day and good flocks of geese. Over 200 people stopped in compared to 140 last year. The film "Chain of Life" was shown and the local 4-H Girls sold refreshments. Two guided tours and a self-guiding drive were provided.

To keep the public informed as to Refuge programs, the weekly press release work was expanded this year to 2-5 articles per month with 40 columns or interviews printed/aired this year. A sample copy is attached as an example. Local newspapers in Wahpeton, Hankinson, Lidgerwood, Milnor and Lisbon and radio KBMW in Wahpeton were known to run them regularly. The large Fargo daily paper often used the material from these columns also. New media contacts made this year were Fargo radio station KFGO and TV stations KXJB and WDAY. On December 23, a WDAY reporter and cameraman drove the 100 miles to shoot Refuge scenes of wintering deer and pheasants. This interview was picked up by the network news and reports about it were received from Portland, Oregon and St. Louis, Missouri. Expanded efforts were the result of Barb Hoflen moving into this work area and rapidly developing proficiency in writing articles and talking with the media.

Refuge personnel routinely attended meetings of the Cayuga Legion, Lakes Region Wildlife Club, Geneseo and Rutland Sportsmen's Clubs and the local Ducks Unlimited Banquet. Dave Potter attended meetings with the Sargent, Richland and Ransom County Commissioners, Cogswell and Fort Ransom Wildlife Clubs and Lidgerwood J.C.'s. He spoke on the Refuge's objectives to the Wahpteon Rotary Club and Hankinson High School biology class this spring. He attended one day of the ND Chapter of the Wildlife Society Meeting in Jamestown and the ND Game and Fish Advisory Meeting in Kulm, April 11. Potter taught a local hunter safety class on the subject of "Hunter Ethics" in Milnor this fall.

Barb and Chris gave the Sargent Central High School sophomore biology class a tour on May 5. On May 17, Barb and Dave showed the Havana School 4th graders some of the Refuge.

8. Hunting

After the rifle deer season closed, the Refuge again opened for archery deer hunting and all went smoothly. To increase the harvest of the very large herd, the east side was also opened so that only a few acres around headquarters (including the Peninsula) were closed. Secondary benefits of this opening were to reduce crippling loss into the closed area and to push the deer away from the standing crops to save winter feed. However, in order to accomodate the special late Refuge pheasant hunt, the Refuge archery hunt was run only 1½

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U.S. FISH & WILDLIFE SERVICE

Tewaukon Refuge Notes

By David Potter,
Refuge Manager

September through November are the Tewaukon National Wildlife Refuge's busy months. This fall was surely no exception.

In September the office was caulked and restained. Rock was hauled and placed around several water structures. A short dike was rebuilt for added strength and a new water control structure installed. Native grass combining on 60 acres and extra seeding on 88 acres was done. Twenty-four heavily wrapped Canada goose nesting bales were moved in for placement on the ice this winter. One man travelled to Salyer NWR near Upham to assist their duck banding crew.

Unusual September wildlife observations were the bull moose at headquarters and 34 white-fronted geese here on 9-24.

In October, advantage was taken of the dry conditions to cut openings in dense cattail stands for next spring's water (hopefully) using mowing. The annual Open House and Tour hit excellent weather and saw a fine turnout of 200 visitors. Two problem culverts were replaced. Two Waterfowl Production Area's (WPA's) were surveyed prior to fencing next spring. The WPA's were very heavily trampled by pheasant hunters. Routine law enforcement patrols were conducted and on into November with excellent assistance received from the public on violations from swan shooting to hunting in the Refuge.

Waterfowl numbers increased slowly until 10-28 when snow geese increased rapidly to 40,000. The build-up increased to a record peak of 58,000 on 11-10, mostly on Sprague Lake.

November was hunting month. The Refuge hunts went smoothly. The 1½ day archery hunt saw an estimated 42 deer harvested by 395 hunter visits. Opening day of the pheasant hunt saw an estimated 360 hunters with many limits taken. Pressure continued strong through Thanksgiving day weekend. A total of 62 roosters have been checked to date with 77 per cent being hatched this spring (which confirms their high natural mortality rate - pheasants cannot be "stockpiled"). Using a conservative estimate that no more than 25 per cent of the birds shot have been checked by the two Refuge personnel available gives an estimated 248 roosters taken. This saves a lot of winter food (and feeding time at the millet bales) for the hens.

Other important items are the trapping program (more in later reports) and the satisfactory resolution of three wetland easement problems. Four Refuge people have been to training classes. Wildlife feed millet bales were set out; Mr. Orvis Silseth placed millet wildlife stacks around the Sprague Lake Unit. And, importantly, a very heavy load of paperwork has been pushed through - especially associated with the September 30 end of the fiscal year.

It's been busy!

days so these goals were not fully reached. But it is planned to repeat this in future years so the deer will be better dispersed by a longer archery season.

As usual, very few archers (estimate 18) worked the over 2,000 acres available at Sprague Lake. Most jammed into the Big Woods south of Pool 2 or the newly opened East Side. Many of the locals had negative comments about this opening day crowd of "city people". But the archers had a good time, no accidents occurred and a good harvest was accomplished. Out of 35 deer checked, three were bucks, 13 does, 12 young males and 7 were young females.

Archery Deer Season

	1983	1982	1981	1980
Hunt length (days)	1½	40	46	45
Visits	395	320	275	510
Activity hours	1880	1415	1350	2840
Est. deer killed	42	16	30	14
Biggest buck (all points)	10	10	12	13

The rifle hunters again worked the Refuge boundary heavily. No problems occurred. As usual, several men requested and were given permission to enter the Refuge to retrieve deer.

A special, late pheasant hunt is held after nearly all waterfowl have departed in the years of high pheasant numbers such as 1978, 1981 and this year. Like the archery hunt, no noteable problems occurred and many hunters worked the cover. The large opening day crowd of 1981 (565 hunters) was reduced to 360 this year by opening the same day as the rest of the State, by having a mid-week opener and by a pre-hunt snow storm that hit Fargo keeping some hunters home. Like 1981, a storm closure provision was incorporated into the hunt so hunters would not push the hens out during windy and severly cold or snowy weather. When wind chills hit -40° on December 15 and with 12 inches or more of snow down, this Refuge hunt was terminated. Radio, newspaper and signs were used to inform the hunters, cooperation was excellent and no problems occurred.

Many limits were shot the first day and pressure continued surprisingly heavy through the Thanksgiving weekend. An estimated 900 visitors spent 2,500 activity hours to bag an estimated 250 roosters. Removing these surplus roosters will save quite a bit of food (and feeding time) at the millet bales for the hens as deep snows and record bitter cold arrived by mid-December.

9. Fishing

Ice fishing was very slow at Tewaukon as well as all over this area. Spring open water fishing saw a good opening day crowd but poor fishing. In May and June fishing improved to "average" with 2 lb walleye and 3-5 lb northerns

taken. But, apparently, people were discouraged because use was light even though northerns of 13½, 11 and 9 lbs reportedly were taken in late May - early June. The anticipated pre-freeze, fall walleye fishing also didn't materialize. It wasn't a year to "write home about" for the fishermen.

10. Trapping

There is no recreational trapping and this topic is discussed under "Wildlife", Section G.8.

11. Wildlife Observation

Generally, very little wildlife observation use occurs. One noteable occurance was an estimated 680 people driving around Lake Tewaukon this spring to view the several hundred deer wintering on the east side. This use was the result of a standard press release which was followed-up by a very positive report from the local newspaper editor about his deer watching drive. This fall the editor's wife had deer pictures in the paper from the East Side which no doubt also resulted in additional use. Upon request, four or five car loads of visitors were allowed to drive through the closed area for wildlife viewing.

14. Picnicking

As agreed when the refuge was established, a small picnic area with tables, garbage barrels, grills and toilets was maintained among the oak trees on the east end of Lake Tewaukon. Most use was associated with the adjacent fishing beach. Since the fishing was slow, use was low.

15. Off-Road Vehicling

Thanks to the scant snow, hardly a snowmobile track was seen. The one track observed crossed the Refuge via a road right-of-way which was no problem.

17. Law Enforcement

From three officers in 1981, we continue to "limp along" in 1983 with only one officer for the Refuge and WPA's scattered over three counties. The result was that, as in 1982, the WPA's were shorted. But, thanks to no water, they received much reduced hunter use. Improvement is in sight now, as Rob Hoflen completed one week of follow-on basic law enforcement training at FLETC in August (as did Dave Potter) and the nine week basic in November. Potter also requalified with the .38 pistol in September.

Like last year, Potter worked nearly every weekend from October 1 to November 15 and continued observing hunters more than just driving around "showing the flag". Don Bozovsky patrolled many weekends driving around, answering questions, handing out maps and watching for violations - to be radioed to the Refuge Officer. Twenty Refuge cases were written compared to 24 in 1982, 11 in 1981 and 13 in 1980. As usual, many more warnings than tickets were issued.

Since the Township decided in 1981 to upgrade the road passing through the Refuge east of Lake Tewaukon (contrary to our requests to downgrade this road to reduce human disturbance during the fall and winter) there has been a steady level of complaints from neighbors concerning deer and pheasant

shooting in the Refuge. In November, a neighbor saw a vehicle stop on this road in the Refuge, heard a shot and heard the sound of the bullet striking a deer. He called Dave Potter who spent several hours sitting in the dark waiting for the shooters to return but was unsuccessful.

As usual, ND Game and Fish Warden Violett worked closely with the Refuge and patrolled the area at times. He handled all juvenile or State law cases. Close working relations and radio contact were developed with the new Sargent County Sheriff and Deputy. They conducted many routine night time patrols through the Refuge especially this summer while Dave Potter was gone on leave. Special Agent Gelvin and Senior Resident Agent Kraft provided good support on enforcement questions and paperwork details.

To reduce the illegal hunting of the railroad track right-of-way inside the Sprague Lake Unit, five new signs were purchased from the Sign Shop and mounted in slip-in frames for the hunting season. (The railroad ROW was closed years ago by agreement). To generally upgrade the public use signing, a total of 22 signs were ordered from the Sign Shop ($967, including some vehicle emblems).

In preparation for the additional law enforcement position a second radio on the State law enforcement frequencies was purchased, $2,556. To provide vehicle use flexibility, mounting kits were purchased and installed in 4x4 and 4x2 light pickup trucks. Authorization was requested and received to run magnetic decals or no decals on a second pickup truck. Another "second chance" vest was purchased, $295.

A hunter fired his double-barrelled shotgun twice and dropped two tundra swans. It was a foggy day but visibility was not that bad as an adjacent deer hunter, Sgt. Litton of the Cando Police Department, observed the violation and recovered this swan. He escorted the individual to Dave Potter. The second, crippled swan was later recovered by Wahpeton Zoo representatives for transfer to and display in their pond. 11/83 - F. Potter

1983 Refuge Violations Cited

Violation	# of Viol	Disposition	Employee Observer	
Trespass in NWR	1	$25	Bozovsky	archers entering Refuge 1½ hours early
Hunt in NWR closed to hunting - adults	2	$100 ea	Potter	pheasant hunters in wrong area-shoot & hide rabbit
	7	$100 ea	Potter(4) Schuler(3)	before refuge season, pheasant hunting, one in Storm Lake NWR
Hunt in NWR closed to hunting - juvenile	2	State Juv system	Potter	parents appeared before juvenile referee
Attempt to take - tundra swan (2)	1	$125	from Sgt. Litton, Cando PD	shot two swans
Attempt to take - cormorant	1	reduced fm $100 to $25 by court	Potter	claimed this was his 1st hunting trip
Attempt to take - cormorant (Juv)	1	State Juv system	Potter	parents appeared before juvenile referee
Improperly plugged shotgun	1	$50	Potter	
Hunt waterfowl with no "Duck" stamp	2	$50 ea	Potter	one 38 year old man said he'd never bought a duck stamp, ever
Hunt waterfowl - loaded firearm in vehicle (State Viol)	1	dropped (by Warden Violett, no proof of hunting game)	Potter	fully loaded shotgun and .22 in car
No fishing license in possession (State Viol)	1	$30	Potter	claimed he'd lost his license-bragging earlier in the bars he didn't buy a fishing license at all

I. EQUIPMENT AND FACILITIES

1. New Construction

In an effort to save electricity and reduce the very high office electricity bills, a 4 x 10' hot air solar panel was purchased and installed by New Era Energy, Mina, South Dakota at a cost of $1,350. This unit was recommended very highly by a neighbor and, so far, has performed well. Plans were made to install two on the shop and two on the residence next year.

A small, low 220' dike and 24" culvert with riser board structure were constructed to trap high waters in a small wetland along the Lake Tewaukon outlet channel. In addition to improving this small wetland, the dike will allow future pumping over it to raise a depth of water which will allow gravity filling of two larger wetlands and the very large Krause WPA Slough.

2. Rehabilitation

The short 2A dike was originally built during wet years, always had been narrow in the base and was damaged by muskrat burrowing. Taking advantage of the drought, both sides of the dike were bulldozed thicker. The original, corroded culvert and drop log water control was replaced with a 24" culvert and 48 " stop log structure.

As a spare time, winter project Barb Hoflen spruced up the office by painting the four gray metal desks black and topping them with wood grain contact paper. She also similarly did two book shelves, two tables, four files, one map case and three waste cans. The appearance of the three offices was much improved.

Thanks to the drought, the Lake Tewaukon boat launch channel was very difficult to negotiate this spring. On May 27, a contractor attempted to clean the channel with explosives but only got down 1-4 feet. The shallow spots remaining kept it tough going for the fishermen and use rapidly fell off as the walleye "bite" quit.

Also to aid fishing access, the lower end of the Lake Tewaukon concrete plank boat launching ramp was cleaned of rocks and 12 planks were added. This extended it to the water's edge.

As approved by ND Game and Fish Management Biologist Dave Vollink, two small projects were done on the State Wildlife Management Area just north of the Refuge. A ditch plug was dozed in across a small wetland drain. And, a channel was cut to supply water to a large wetland during periods of high water in Marquette Slough.

In an apparent attempt to get in on "free" government money, a farmer located along the paved county road which crosses the Refuge began a campaign this summer for the Refuge to pay for a resurfacing job. It was claimed that the hunter and fishermen traffic was breaking up the road rather than the commercial grain hauler and gravel/rock trucking company which both routinely drove this pavement. Both Senator Andrews and the County Commissioners became involved. At a fall Commissioner's session, Dave Potter explained that the Refuge had paid $36,000 in 1968 to have the paving done. Since the Refuge hadn't damaged the road, it didn't seem appropriate to pay for it's repair. The Commissioners said they'd continue their efforts. A couple months later, the original cooperative agreement between the Regional Director and the Commissioners about this road was found in some old files sent from the Regional Office for disposal. The agreement said that future maintenance costs were to be the County's. A copy of this agreement was mailed to the Commissioners on December 20 for their consideration.

The Sprague Lake Unit boundary fence was relocated east of the railroad tracks onto the correct boundary line for approximately ½ mile in the Refuge's northeast corner. Six miles of fence were repaired and ½ mile of interior junk fence was removed.

Work continued to upgrade the Refuge roads. Crandall Construction tailgate spread 36 yards of pit run gravel at various locations. A low, wet spot in the Peninsula fishing access road was raised slightly, shaped to shed water and gravelled.

3. Major Maintenance

The Refuge house interior was painted by contract, $840. The office exterior was caulked and stained by Harris Hoistad. The scruffy, unused weather station was removed to the boneyard.

To protect wildlife habitat, prime fishing sites and archeological resources, the steeply eroded tip and south bank of the Peninsula were rip rapped. Crandall Construction dumped 1,220 yards ($5,856) along the edge and Chris Schuler placed the rock with the D-6. Later this fall, several lake-side washouts were noticed along a second fishermen access road. To prevent an accident and possible further erosion next spring an emergency purchase of 520 yards ($2,496) of mixed size rip rap was similarly hauled in and placed.

A maintenance controversy developed in 1982 when a neighbor wanted the half mile of unimproved, dirt trail bisecting the Sprague Lake Unit to be mowed open. The Refuge wanted the grass cover left for wildlife habitat and to not encourage "tourist" driving (in wet years the road is impassible). This winter this was discussed at the local Township Board meeting. Since similar trails are not mowed elsewhere in the Township, they passed a motion stating it did not have to be kept mowed. It wasn't mowed in 1983.

4. Equipment Utilization and Replacement

Items bought and disposed of for the Refuge were:

Items Bought

drop log structures (3)	NW Sheet & Iron Works	$2,068
culverts (100')	Empire Steel Mfg.	$ 583
12" PVC pipe (580')	Rutland Plumbing & Heating	$2,156
truck air conditioner*	Kensal Lumber	$ 900
winch*	Warn Industries	$ 717
bag sewer*	Seedburo Equipment Co.	$ 843
binoculars	Jewelmont Corporation	$ 150
metal detector	Schonstedt Inst. Co.	$ 629
chop (metal) saw	Acme Electric	$ 207
steam cleaner	Sioux Steam Cleaner Corp.	$1,831

*for Valley City WMD as assistance to the native grass seed harvesting operation which provided Tewaukon with seed.

Items Disposed Of

1977 AMC station wagon - to Valley City WMD
Nesbitt grass drill - to Lostwood NWR
riding lawn mower - to ND State Agency Surplus Property
portable trailer heater - to Kulm WMD
calculator, Casio - to Kansas State University
photographic dark room supplies - to Fisheries Assistance, Lander, WY and Jackson FWS Project, Jackson, WY

5. Communications System

The radio system was invaluable but like last year it did give us some challenges. The serviceman had to be called this winter when the whole system was dead. He found the electricity to the tower had been cut (by gophers?) and rigged a temporary line. Chris dug in a permanent repair this summer. In late November, the base went dead again but when the serviceman arrived, it was working fine. He did correct a problem with a vehicle antennae.

In December, two pickup trucks were driven to their Milbank, South Dakota service shop for installation of the State law enforcement radio bases.

6. Energy Conservation

Efforts were continued to reduce energy consumption. A compact pickup truck was received and another ordered. As in Section I.1 a solar panel was purchased and four more were AWP'd. The office and shop were given a check over this winter by RSR Electric Cooperative Manager Elmer Brauer with suggestions as to how to reduce consumption and peak period use. His chief idea was to junk the three year old heat pump for a hot water transfer heat pump using the nearby artesian well.

On December 13 with the 8:00 am temperature at -31^{o}, the three year effort to find out why the three year old York heat pump ran up excessively high electric bills (as evaluated by RSR) without heating the office above $60\text{-}63^{o}$ may have achieved success. After several failure visits by the original contractor, electric company people and others, a local plumbing and heating specialist "tore into" the layout. He quickly found that the old duct drawing cold air from the attic (for the original oil boiler) had not been closed off so very cold air was being drawn in. This duct was closed and the building jumped rapidly in temperature. Also he found the duct returning inside air for reheating was of a much too small capacity so additional openings were planned.

J. OTHER ITEMS

3. Credits

Dave Potter wrote this report. Barb Hoflen dug out the file information and typed and assembled the report.

K. FEEDBACK

All things considered, it was another challenging and good year. The usual range of surmountable problems and survivable headaches reared their heads but the job continued to be fun most of the time. A person can still see the sunset over the tall grass prairie and cattail sloughs. What else could you ask for? Our thanks to the staff people from the various offices for their help this year.