

REVIEW AND APPROVALS

LITCHFIELD WETLAND MANAGEMENT DISTRICT
LITCHFIELD, MINNESOTA

ANNUAL NARRATIVE REPORT

Calendar Year 1994

<u>Sam Waldsten</u>	<u>3/6/95</u>	<u>Robt. Lynd</u>	<u>3/15/95</u>
Refuge Manager	Date	Wildlife Associate Manager (WAM) Review	Date

<u>Jim Hyman</u>	<u>5/3/95</u>
Regional Office Approval	Date

TABLE OF CONTENTS

	<u>Page</u>
A. <u>HIGHLIGHTS</u>	4
B. <u>CLIMATIC CONDITIONS</u>	5
C. <u>LAND ACQUISITION</u>	
1. Fee Title	8
2. Easements.....	9
3. Other.....	10
4. Farmers Home Administration Conservation Easements.....	13
D. <u>PLANNING</u>	
1. Master Plan.....	13
2. Management Plan.....	14
3. Public Participation.....	Nothing to Report
4. Compliance with Environmental and Cultural Resource Mandates.....	14
5. Research and Investigations.....	14
E. <u>ADMINISTRATION</u>	
1. Personnel.....	19
2. Youth Programs.....	20
3. Other Manpower Programs.....	20
4. Volunteer Program.....	20
5. Funding.....	21
6. Safety.....	23
7. Technical Assistance.....	24
8. Other.....	Nothing to Report
F. <u>HABITAT MANAGEMENT</u>	
1. General.....	28
2. Wetlands.....	29
3. Forests.....	34
4. Croplands.....	34
5. Grasslands.....	34
6. Other Habitats.....	38
7. Grazing.....	38
8. Haying.....	39
9. Fire Management.....	39
10. Pest Control.....	41
11. Water Rights.....	Nothing to Report
12. Wilderness and Special Areas.....	Nothing to Report
13. WPA Easement Monitoring.....	42
14. Farmers Home Administration Conservation Easements.....	42

15.	Private Lands.....	Nothing to Report
16.	Other Easements.....	Nothing to Report

G. WILDLIFE

1.	Wildlife Diversity.....	43
2.	Endangered and/or Threatened Species.....	44
3.	Waterfowl.....	44
4.	Marsh and Water Birds.....	45
5.	Shorebirds, Gulls, Terns, and Allied Species.....	46
6.	Raptors.....	46
7.	Other Migratory Birds.....	46
8.	Game Mammals.....	47
9.	Marine Mammals.....	Nothing to Report
10.	Other Resident Wildlife.....	61
11.	Fisheries Resources.....	Nothing to Report
12.	Wildlife Propagation and Stocking.....	47
13.	Surplus Animal Disposal.....	Nothing to Report
14.	Scientific Collections.....	Nothing to Report
15.	Animal Control.....	48
16.	Marking and Banding.....	Nothing to Report
17.	Disease Prevention and Control.....	Nothing to Report

H. PUBLIC USE

1.	General.....	49
2.	Outdoor Classrooms - Students.....	50
3.	Outdoor Classrooms - Teachers.....	Nothing to Report
4.	Interpretive Foot Trails.....	Nothing to Report
5.	Interpretive Tour Routes.....	Nothing to Report
6.	Interpretive Exhibits/Demonstrations.....	50
7.	Other Interpretive Programs.....	50
8.	Hunting.....	51
9.	Fishing.....	52
10.	Trapping.....	53
11.	Wildlife Observations.....	Nothing to Report
12.	Other Wildlife Oriented Recreation.....	53
13.	Camping.....	53
14.	Picnicking.....	Nothing to Report
15.	Off-road Vehicling.....	53
16.	Other Non-Wildlife Oriented Recreation.....	Nothing to Report
17.	Law Enforcement.....	53
18.	Cooperating Associations.....	Nothing to Report
19.	Concessions.....	Nothing to Report

I. EQUIPMENT AND FACILITIES

1.	New Construction.....	54
2.	Rehabilitation.....	55

	<u>Page</u>
3. Major Maintenance.....	55
4. Equipment Utilization and Replacement.....	55
5. Communications Systems.....	Nothing to Report
6. Computer Systems.....	56
7. Energy Conservation.....	56
8. Other.....	Nothing to Report

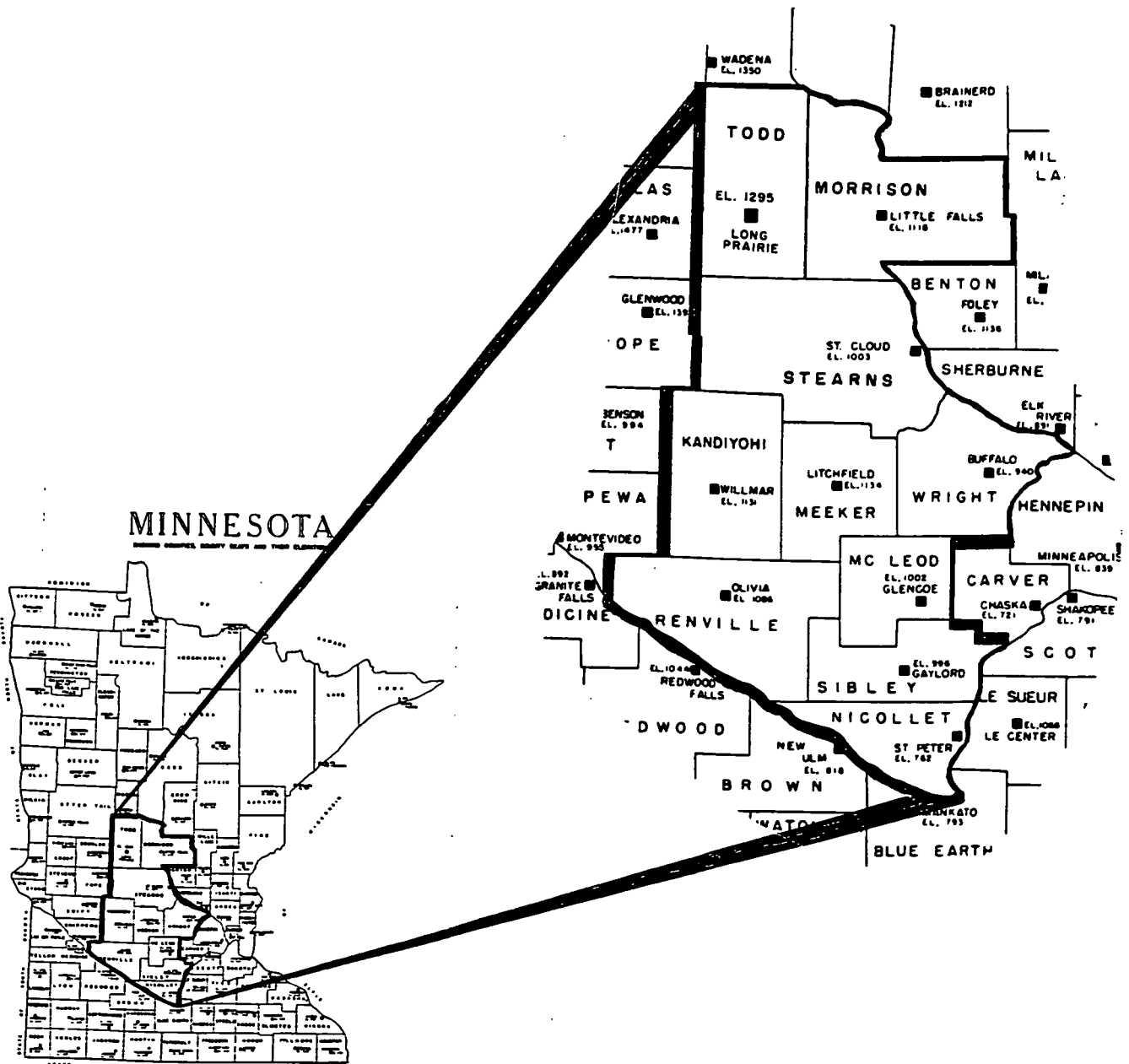
J. OTHER ITEMS

1. Awards.....	Nothing to Report
2. Cooperative Programs.....	56
3. Items of Interest.....	Nothing to Report
4. Credits.....	57

K. FEEDBACK 58

INTRODUCTION

The Litchfield Wetland Management District (District) was established in 1978 to manage tracts purchased under the Small Wetlands Acquisition Program. The District manages 130 Waterfowl Production Areas (WPAs) covering over 29,237 acres of fee title and 378 Waterfowl Production Easements encompassing over 30,823 acres. These tracts are scattered throughout the 10 central counties of Minnesota as shown below:



Within these counties rolling woodlands to the north and east...



10/93

#93-1SE

SME

gradually change to flat, fertile, prairie farmlands to the south and west.



4/91

#91-04A

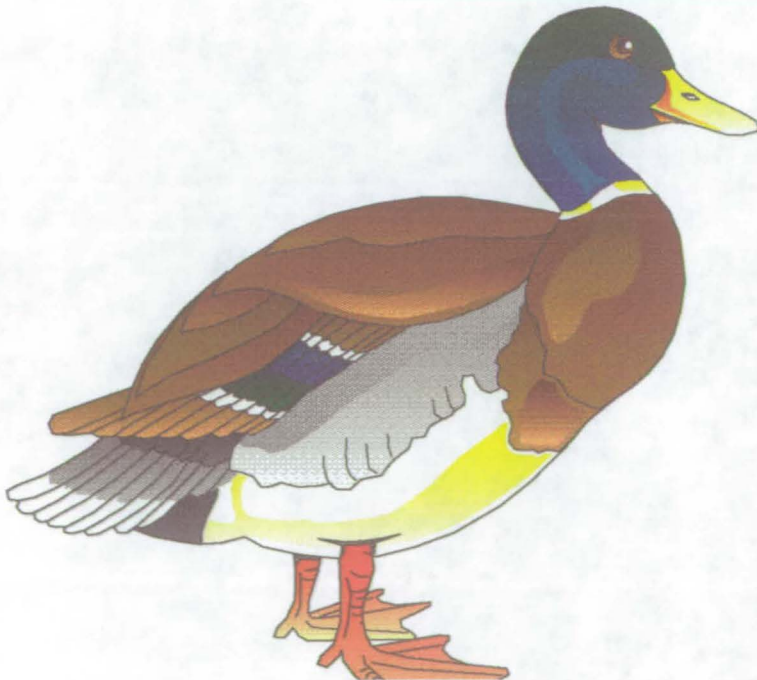
RMB

District lands include portions of the Northern Mixed Forest, Eastern Hardwood Forest, Oak Savanna, and Tall Grass Prairie biomes. Soils, precipitation, climate, water quality, and land use vary greatly but essentially all areas have been significantly altered and degraded by the activities of man.

The Litchfield District staff works with the Litchfield Acquisition Office to acquire the best wetland and upland habitat possible from willing sellers. Potential purchases are carefully screened and a mix of fee title and easement purchases are made in an effort to protect wetland complexes.

Once a new tract of land is purchased, restoration of drained wetlands and establishment of permanent nesting cover on the uplands are given top priority and usually completed within two years.

The District's wetland restoration efforts on private lands coupled with U. S. Department of Agriculture and State of Minnesota regulations and programs have at least temporarily slowed the historic trend of wetland drainage in the District, but low breeding populations and extremely high predation rates continue to hamper waterfowl production.



A. HIGHLIGHTS

Over 1,370 acres of wetlands in 420 basins were restored.

Six hundred five acres of uplands were seeded to grass nesting cover.

Private donations for District wetland restorations, habitat improvements, and predator removal exceeded \$32,400.

Moderate temperatures and timely precipitation provided ideal habitat conditions on District WPAs.



7/94

#94-1A

BGM

Purple coneflower on an unbroken prairie remnant - Freese WPA.

B. CLIMATIC CONDITIONS

Weather in the District during 1994 was generally cooler than normal with average amounts of precipitation. The table below lists temperature and precipitation for 1994 and Normal* years.

1994 Weather Summary

	NORMAL*	1994
AVERAGE MAXIMUM TEMPERATURE °F	55.2	51.7
AVERAGE MINIMUM TEMPERATURE °F	33.5	34.4
AVERAGE MEAN TEMPERATURE °F	44.4	43.1
PRECIPITATION (INCHES)	27.63	28.73

*Normal = 30 year averages (1961-1990.)



4/94

#94-2B

SME

A late April snowstorm caught many species by surprise.

The year began with above-average snowfalls and considerably below average temperatures. For a 10-day period (January 10th to 20th) temperatures never rose above 0°F. The lowest temperature of the year, -31°F, occurred on January 17th. Numerous days of drifting snow obliterated winter cover habitats and covered wildlife food sources. Most resident wildlife species were severely stressed by the winter's harsh conditions and some populations experienced significant weather mortality. The latter part of the winter provided more moderate conditions but a freak snowstorm on April 28th dumped a foot of snow across much of the District.



Heavy spring snowmelt filled all area lakes and wetlands. Spring habitat conditions for waterfowl and other wildlife were excellent throughout the District. Weather conditions during the nesting season were fair to good. Although April was cool and wet; May and June were relatively warm and dry. Overall, the nesting season's weather was one of the best in recent years.

The last frost of the year occurred on May 4th, about one week earlier than normal. The growing season was cooler than normal with near normal precipitation. The highest temperature of the year occurred on June 14th when the mercury hit 93°F. This was the only 90° day of the year compared to a normal of a dozen or so. A major hail storm caused severe crop damages in a long swath through the District on June 25th. This storm's impact on wildlife is unknown because no significant mortalities were observed or reported. Wetland habitat conditions remained excellent throughout the summer.

Moderate weather conditions persisted into the Fall season. October was particularly mild with the season's first frost occurring on the 8th, about 10 days later than normal. The season's first hard, killing frost did not occur until October 25th. The District's fall waterfowl migration was essentially over by the first week in November but the larger wetlands and lakes maintained open water until later in the month. At freeze-up time, wetland conditions were very good throughout the District.

The first significant snowfall occurred on November 28th when 8"-10" blanketed the entire District. Light snowfalls and mild temperatures were the norm for the remainder of the year. At year's end it appeared that the District would continue to experience a pattern of warmer and/or drier conditions which may be related to the El Nino conditions occurring in the Pacific Ocean.

Additional weather data for the District's headquarters area is given in the following table.

Litchfield Monthly Weather Data
Normal (N*) versus 1994

	TEMP °F	AVERAGE MAX °F	AVERAGE MIN °F	AVERAGE MEAN °F	PRECIP. INCHES
JAN	N	21.0	0.9	11.0	0.70
	94	7.3	-8.1	-0.4	1.51
FEB	N	27.1	6.7	16.9	0.72
	94	17.8	0.5	9.2	0.87
MAR	N	39.6	20.4	30.0	1.56
	94	39.6	25.0	32.3	0.32
APR	N	57.5	34.4	46.0	2.41
	94	53.5	34.0	43.8	5.49
MAY	N	71.4	46.4	58.9	3.24
	94	71.5	49.4	60.5	1.86
JUN	N	80.3	56.1	68.2	4.70
	94	77.8	58.0	67.9	4.97
JUL	N	84.7	61.2	73.0	3.79
	94	77.3	59.5	68.4	3.09
AUG	N	81.7	58.4	70.1	3.31
	94	74.2	56.2	65.2	3.51
SEP	N	72.3	48.5	60.4	2.98
	94	71.3	53.4	62.3	2.92
OCT	N	60.5	37.8	49.2	2.18
	94	58.3	42.6	50.4	2.70
NOV	N	40.7	23.4	32.1	1.26
	94	43.2	28.8	36.0	1.10
DEC	N	25.1	7.8	16.5	0.78
	94	28.5	13.7	21.1	0.39

* Normal = 30-year average, 1961-90

C. LAND ACQUISITION

1. Fee Title

Purchase of new WPAs was limited by a lack of acquisition funds.

An exchange was completed on the Messer WPA. A two-acre right-of-way access was acquired on the Zehrer WPA.

The District increased by 303.86 acres with the acceptance of four new tracts. The table below summarizes information for fee lands.

FEE LANDS MANAGED BY LITCHFIELD WMD - 1994

County & Goal <u>Acres</u>	<u>Acquisition During 1994</u>		<u>Acquisition As of 12/31/94</u>		Total
	<u>New Tracts</u>	<u>Total Acres</u>	<u>Units</u>	<u>Tracts</u>	<u>Acres</u>
Kandiyohi (16,800)	1	160.0	54	165	12,113.75
McLeod (5,380)	0	0		4	5
Meeker (15,440)	0	0		13	44
Morrison (6,320)	0	0		1	1
Renville (3,000)	1			1	1
Stearns (14,900)	1	64.79		39	104
Todd (6,560)	0	0		5	8
Wright (17,140)	<u>1</u>	<u>79.07</u>		<u>13</u>	<u>31</u>
Total (85,540)	4	303.86		130	359
					29,237.72

2. Easements

Whenever possible, high-quality wetlands close to WPAs or other large brood marshes are placed under easement. The easements are purchased from willing sellers. In exchange for a one-time payment, the Service obtains the rights to control the burning, draining, leveling, and filling of specified wetland basins. Easement acquisition emphasis during the past year was shifted toward restored wetlands. Nearly all of the wetlands protected with easements this year were restored wetlands. Twenty new easement tracts totaling 270 wetland acres were purchased in 1994. The following table summarizes information for easement lands.

EASEMENT LANDS MANAGED BY LITCHFIELD WMD

County & Goal <u>Acres</u>	<u>Acquisition During 1994</u>			<u>Easement Status As of 12/31/94</u>		
	<u>No.</u>	<u>Acres</u>	<u>Wet Acres</u>	<u>No.</u>	<u>Acres</u>	<u>Wet Acres</u>
Kandiyohi (32,660)	2	300.22	60	139	14,443.85	4,047
McLeod (5,093)	0	0	0	35	1,983.78	617
Meeker (14,700)	4	212	43	120	8,200.66	2,157
Morrison (4,900)	0	0	0	0	0	0
Stearns (15,810)	12	795.16	154	50	4,380.66	1,051
Todd (4,800)	0	0	0	1	112.00	16
Wright (7,515)	<u>2</u>	<u>100.5</u>	<u>13</u>	<u>33</u>	<u>1,703.01</u>	<u>389</u>
Total (85,478)	20	1,407.88	270	378	30,823.96	8,277

3. Other

a. General

A prioritization system has been developed to add objectivity to the acquisition process. The system uses seven criteria to rank each willing seller tract: presence and diversity of wetlands on the tract, percent of area in wetlands within a one mile radius, numbers of wetlands per square mile within a one mile radius, soil capability of farmed uplands, size of the tract, solution to management problem, and proximity to other managed wildlife areas of significant size and value. Acquisition priorities between fee, wetlands, and grassland easements will also need to be established.



9/94

#94-3C

SW

Our staff works hard to insure that within the Litchfield WMD scarce acquisition dollars are spent wisely on high-quality WPAs and easements.

During 1994, we continued to operate under a procedural agreement between the U. S. Fish & Wildlife Service and the Minnesota Department of Natural Resources (MN-DNR). This agreement requires that each fee and easement tract be presented to respective county boards for certification. Through this process county boards have up to 60 days

to consider the Service's acquisition proposal and offer their input into the acquisition process. Final approval, however, still rests with the Minnesota Land Exchange Board comprised of the Governor, Auditor, and Attorney General of the State of Minnesota.

In 1994, the State Land Exchange Board continued to rely heavily on the recommendations of county boards, township officials, and adjacent landowners. Some county boards have required the Service to present acquisition proposals to townships as well as county planning and zoning boards. We have willingly complied with this extra step because ease of acquisition has been directly proportional to the support given us by the local governments and neighbors. These steps have led to increased opportunities for communication and contact with these local officials and have significantly improved our image in local communities. We continue to have an excellent relationship with local governments and adjacent landowners.

All acquisition is handled through the Litchfield Wetland Acquisition Office (WAO) which is supervised by Lowell Marsolek. Realty Specialists with whom we worked during the year included David Lindberg, Hector Hernandez, Bill Resman, Steve Durkee, and Richard Johnson. The cooperation and excellent working relationships with the acquisition staff were much appreciated and have resulted in the acquisition success we experienced.

b. Refuge Revenue Sharing

Loss of taxes continues to be the most significant complaint about our acquisition program. Most local governments accept the acquisition program as long as it does not put a hardship on local taxpayers when public lands are taken from the tax rolls. In recent years our percentage of calculated payment has ranged from 100% in 1980 to 59% in 1987 with 77.9% paid in 1993.

Our ability to purchase land under the Small Wetlands Acquisition Program has been hampered for the past 15 years because shared revenue payments to Minnesota counties have generally been less than the revenue generated by real estate taxes from those same tracts under private ownership. In recent years, township and county boards and the State Land Exchange Board have not certified some tracts for Service purchase as WPAs solely because of this "loss of tax revenue" issue. To address this problem the Service recently implemented a "County Trust" program that will be funded by the purchase of each new WPA tract in Minnesota. Although the Service has had the authority to exceed appraised value by 10% when purchasing property for WPAs, the appraised value was rarely exceeded. Under the "County Trust" program the Service uses the money generated by this extra 10% to make a lump-sum payment directly to the county board at the time the tract is purchased. Although the Service encourages the counties to invest these funds for an appropriate return, the counties have full discretion to utilize the trust payment and interest earnings as they choose.

A summary of Refuge Revenue Sharing information for the District is presented in the following table.

REFUGE REVENUE SHARING - LITCHFIELD WMD

<u>Fiscal Year</u>	<u>Kandiyohi</u>	<u>McLeod</u>	<u>Meeker</u>	<u>Stearns</u>	<u>Todd</u>	<u>Wright</u>	<u>Total Revenue</u>	<u>% Calc. Payment</u>
1967	3147.17	0	0	966.03	0	0	4113.20	0
1968	3430.94	0	0	1240.02	0	0	4670.96	0
1969	3928.62	0	0	1240.02	0	0	5168.64	0
1970	4870.65	0	0	1883.71	0	0	6754.36	0
1971	7121.58	0	0	4307.12	0	0	11428.70	0
1972	7487.58	0	0	5116.63	0	0	12604.21	0
1973	7877.58	0	0	5576.03	0	0	13453.61	0
1974	8771.82	0	0	7355.83	0	0	16127.65	0
1975	10664.81	0	0	7337.22	0	0	18002.03	0
1976	21281.55	0	0	15351.72	0	0	36633.27	0
1977	18495.00	0	0	12723.91	0	0	31218.91	0
1978*	13600.57	0	0	8878.92	0	0	22479.49	52
1979	20329.00	0	2601.00	12996.00	500.00	426.00	36852.00	75
1980	27638.00	0	5627.00	17130.00	1751.00	1851.00	53997.00	100
1981	24877.00	0	5479.00	15035.00	1535.00	1634.00	48560.00	87.6
1982	48177.00	0	7660.00	31854.00	1587.00	2059.00	91337.00	90.6
1983	40296.00	2482.00	7460.00	27583.00	1812.00	2221.00	81854.00	77
1984	38777.00	2388.00	8227.00	26452.00	1743.00	2137.00	79724.00	74
1985	34422.00	2073.00	11241.00	24730.00	1688.00	1855.00	76009.00	64
1986	35683.00	2295.00	11664.00	23088.00	1661.00	1731.00	76122.00	60
1987	15061.00	2253.00	13179.00	17834.00	1630.00	1699.00	51656.00	59
1988	18159.00	766.00	8374.00	21657.00	765.00	1011.00	50732.00	71
1989	20634.00	839.00	10588.00	23720.00	1385.00	1925.00	59091.00	78
1990	25613.00	1008.00	13668.00	28702.00	1664.00	5132.00	75787.00	93.5
1991	24521.00	1306.00	13085.00	28523.00	1593.00	5366.00	74394.00	89.5
1992	52442.00	1191.00	11929.00	26765.00	1453.00	6393.00	100173.00	81.65
1993	50423.00	2451.00	15167.00	27164.00	1652.00	8422.00	105279.00	77.9

*Prior to the establishment of the Litchfield WMD, lands in these counties were managed by the Benson/Morris WMD.

4. Farmers Home Administration Conservation Easements

The District has proposed 94 Conservation Easements covering 6,554 acres in 16 counties. Forty-five of these easements totaling 3,081.1 acres have been recorded.

The table below summarizes FmHA Conservation Easement progress to date:

FmHA Conservation Easement Summary

	<u># of</u> <u>Proposed</u> <u>Tracts</u>	<u>Acres</u> <u>Proposed</u>	<u># of</u> <u>Recorded</u> <u>Easements</u>	<u>Acres</u> <u>Recorded</u>	<u>FWS</u> <u>Management</u> <u>Responsibility</u>
Brown	1	307.2	0	-	Windom
Cottonwood	1	32.0	0	-	Windom
Freeborn	3	187.2	1	43.4	Windom
Jackson	1	140.0	0	-	Windom
Kandiyohi	5	368.5	3	342.2	Litchfield
Martin	2	178.0	0	-	Windom
McLeod	2	73.9	2	73.9	Litchfield
Meeker	19	1133.9	13	636.1	Litchfield
Morrison	22	1960.1	12	1148.6	Crane Meadows/Sherburne
Nicollet	1	32.6	0	-	Litchfield
Renville	12	335.9	3	68.9	Litchfield
Sibley	1	114.3	0	-	Litchfield
Stearns	6	533.1	0	-	Litchfield
Todd	15	964.6	10	768.0	Litchfield
Watonwan	1	16.9	0	-	Windom
Wright	<u>2</u>	<u>175.7</u>	<u>1</u>	<u>-</u>	Litchfield
Totals	94	6553.9	45	3081.1	

D. PLANNING

1. Master Plan

Litchfield WMD is composed of 130 WPAs widely scattered throughout central Minnesota. These WPAs vary greatly in size, vegetation, soil, and productivity. A single master planning document for the District could not possibly address all these differences so individual "unit management plans" are written for each WPA.

2. Management Plans

Individual management plans are written for each WPA. These plans contain aerial photos, survey information, soil and topographic maps, land use reservations, previous wildlife observations, past development, current habitat descriptions, and the future development needs. The plans are amended as work is completed and rewritten if roundouts are purchased.

4. Compliance with Environmental and Cultural Resource Mandates

Vision, Station Profile (GAP Analysis), Goal-Setting Rationale, and Objectives, Priorities, and Strategies documents were reviewed and updated.

Review by State and Federal historic preservation officers is obtained on all new fee title purchases regarding probable archaeological, historical, and architectural resources that might be affected by acquisition, development, and use. Cultural resource assessments are then performed on those sites recommended by the preservation officers.

Right-of-way requests are carefully considered and strong mitigation proposals are usually worked out before the packages are submitted to the Regional Office for approval. We have developed an excellent working relationship with most of the county engineers in our District. Minor impacts to wetlands are usually mitigated at a 5:1 (or greater) ratio (wetland acres created : wetland acres impacted).

Staff members attended a Cultural Diversity seminar in October.

Compatibility determinations were completed in response to the lawsuit settlement initiated by various conservation organizations.

5. Research and Investigations

a. Concluded in 1994:

5.1 Minnesota Cooperative Fish & Wildlife Research Unit

"Direct and Indirect Impacts of Esfenvalerate on Wetland Biota" (32588-5.1)

William F. McCarthy and Mary G. Henry

Researchers studied the direct impacts of the pyrethroid esfenvalerate on aquatic invertebrates and the indirect effects of a reduced invertebrate forage base on ducklings. Results from 1991 showed a correlation between esfenvalerate-induced reduction of invertebrate numbers and short-term weight changes in mallard (*Anas platyrhynchos*) ducklings following controlled forage bouts. Duckling mortality was significantly higher at 15 days post-treatment in 1992 for birds reared on treated wetlands ($t = 3.83$, 8 df, $P = 0.005$). The aquatic invertebrate community was monitored to assess the direct effects of esfenvalerate; invertebrates were sampled

using benthic cores, artificial substrates, activity traps, and emergence traps. Researchers found that amphipods were the most sensitive to esfenvalerate of any invertebrate sampled, including chironomids. Treated sites were still void of amphipods one year post-treatment. The sensitivity of cultured *Hyaella azteca* and *Chironomus tentans* larvae to esfenvalerate was demonstrated using in-situ bioassays. The use of imprinted ducklings facilitated the study of indirect impacts and enabled investigators to frequently measure short term weight change and growth. In addition to physical measures, behavioral observations were collected. This research was conducted on semi-permanent wetlands in western Minnesota, where the primary land use pattern is agricultural. Wetlands on four of the District's WPAs (Trisko, Weber, Arctander, and Irving) were used in the study. Accidental introduction of chemicals into wetlands via overspray or drift has occurred in the past and is still of concern. The researchers' results indicate that when esfenvalerate enters wetlands it has both direct and indirect impacts on associated biota. The indirect food chain mediated effects on mallard ducklings can result in mortality.



5.2 U. S. Fish & Wildlife Service - Ecological Services

"Prairie Pothole Pesticide Use Study" (32588-5.2)

Karen Ensor and Stan Smith

The second year of a multi-year "Prairie Pothole Pesticide Use Study" will attempt to determine whether and to what extent isolated and co-owned WPA wetlands may be receiving input of herbicides commonly used in the production of agricultural crops in the Prairie Pothole Region of Minnesota.

Data will be used to estimate the extent of herbicide contamination of wetlands in the Prairie Pothole Region. Concentrations of agricultural herbicides in water samples may provide an indication of potential toxicity problems. The study will provide wetland managers with information concerning the relative water quality of wetlands under their management which are influenced by landowners use as compared to those wetlands which are isolated on Service land. The overall goal is to provide wetland managers, private landowners, and the public with an assessment of the degree to which wetland ecosystems are receiving agricultural pesticide inputs under a range of geographic, cultural, physical, and institutional settings.

During the 1994 field season, FWS-ES collected water samples for use in the study from the District's Weber, Burr Oak Lake, Sunburg, Norway Lake, Greenleaf, Lindgren Lake, and Bjur WPAs. The samples will be analyzed for triazines, alachlors, and 2,4-D using the ELISA method. Select samples will be chemically analyzed to identify specific compounds and to detect several herbicides that cannot be detected using ELISA.

Results: Herbicide concentrations ranging from below detection to significantly elevated were found in the April water samples. Analysis of May, June, and July samples indicated that several wetlands contained potentially biologically significant concentrations of various herbicides throughout the period, with numerous wetlands containing multiple herbicides.

Recommendations:



1. The individual and interactive effects of herbicides in concentrations likely to be encountered in natural wetlands is largely unknown. Thus, a better understanding of the chemical "soups" and their interactions to which wetland biota in west central Minnesota are being exposed needs to be addressed.
2. Insecticide and herbicide mutual presence and their interactions in wetlands are largely unknown and should be measured in the future. Concurrent contamination of wetlands by more than one agricultural pesticide may alter the persistence of

compounds, and thus, their potential toxicity to wetland wildlife.

3. Great care should be given to future purchases of "co-owned" wetlands where potential negative impacts to water quality of wetlands adjacent to croplands is likely. Stronger attempts should be made in future acquisitions, where possible, to purchase complete wetlands with bordering uplands in order to preserve the water quality of the wetland ecosystem.
4. Comparisons of ELISA and analytical chemistry determinations of triazine and alachlor-related compounds showed measurement differences at low and high concentrations in some wetlands. Dr. Jim Zajicek (Chemist, Immunochemistry Research Section) of the National Biological Survey at the Midwest Science Center, reviewed the differences and provided a detailed discussion to explain the discrepancies. His review, addressed in Appendix I, will be extremely beneficial in future ELISA studies for the Environmental Contaminants (EC) Program of the Service. Dr. Zajicek's findings should be dispersed throughout the EC program in order to inform other Environmental Contaminants Specialists on appropriate interpretations of such data.
5. A study to examine the effects of habitat and agricultural practices on birds breeding on farmland in Ontario determined that the most important variable affecting total bird species abundance was herbicide use. The comparative field study on organic farms and chemical farms indicated that sites that were sprayed with herbicides had fewer birds (Freemark and Csizy 1993). This finding has importance to Midwest agroecosystems, where the intensification of agriculture and extensive use of herbicides have significant implications for not only aquatic-dependent but also farmland wildlife and their habitats. A similar study in Minnesota may be warranted.

5.3 U. S. Fish & Wildlife Service, Patuxent Wildlife Research Center

"Concentrations of Organochlorines & Mercury in Great Blue Herons Nesting on the Upper Mississippi River (32588 5.4a)

Tom Custer

The objective is to evaluate levels of contaminants on great blue herons nesting on the Upper Mississippi River National Wildlife and Fish Refuge. Sub-objectives are: 1) to measure contaminant (organochlorines including PCB congeners and mercury) concentrations in great blue heron eggs at selected colonies; 2) to determine liver enzyme activity (abbreviated P450S) in embryos of great blue heron eggs.

Thirty eggs were collected from a heron colony located on Lovell Lake WPA in central Minnesota by Tom Custer, USFWS-PWRC LaCrosse, WI; John Eisemann USFWS-PWRC, Laurel, MD; and Wess and Clif Wolfe, Onalaska Tree Service. The eggs were used as positive controls in the study. Results will be available in approximately three months.

5.4 South Dakota State University, Department of Wildlife and Fisheries

Avian Biodiversity of Minnesota Waterfowl Production Areas 32588-5.4b

Sherry Niesar and Daniel E. Hubbard

In Minnesota, WPAs act as refugia for many species because the area is intensively drained and cultivated. Former habitats are fragmented into small remnants and surrounded by agricultural landscape. Neotropical migratory birds were sampled on 24 WPAs in Minnesota from May 15th through August 15th, 1993. The study sites were located within the physiographic regions of the Border Prairie, Agassiz Lake Plain, Prairie Coteau, and Sioux Drift Plain-Minnesota River Plain. Samples were collected from the District's Cosmos, Arcander, and Swan Lake WPAs. Birds were sampled using belt transects from sunrise to late morning. Bird populations

were estimated and diversity was determined for each WPA within regions. Populations and diversity were combined within regions and compared. Species were also associated with specific environmental attributes such as wetland and upland plant communities. Managers may use this information for management of specific habitat types and associated avian species in Minnesota.

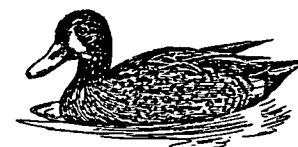
b. ongoing:

5.5 Kansas Biological Survey

"Impact of *Bacillus thuriengensis israelensis* (Bti) on Chironomids" (32588-5.5)

Leonard C. Ferrington, Jr.

The objective is to evaluate potential effects of *Bacillus thuriengensis israelensis* (Bti) application on non-target aquatic invertebrates. The study will specifically look at the effect of Bti on chironomids as some laboratory studies have shown certain species of chironomids to be sensitive to Bti.



Preliminary work in 1994 included selection of appropriate sites and characterization of the chironomid communities and variability of sampling. One wetland on Arctander WPA is being evaluated as a possible site for the study. Preliminary evaluation of this site included collection of six dip-net samples of invertebrates and five plate samplers.

5.6 USFWS, Litchfield WMD

Using Robel Pole Transects to Evaluate Management (32588-5.6a)

Robel pole transects have been determined to be a simple, yet effective tool for evaluating the density and height of grassland cover. These surveys were conducted on many grasslands in the District and since 1980, 203 transects have been completed on 46 WPAs and one FmHA tract. In 1993, a District history of Robel surveys was completed. From this information three Robel-based projects were initiated to evaluate different management techniques.

- a) Time: Evaluating the effects of time on grass height and density by repeating Robel surveys completed 10-15 years earlier
- b) Fire: Evaluating the effects of fire on grass height and density by repeating Robels before and after burning
- c) Grazing: Evaluating the effects of cattle on grass height and density by repeating Robels before and after grazing

All of these projects are in different stages of completion. During the last two years (1993-94) 60 Robel transects have been completed. In 1996, enough data will be compiled to complete the fire and grazing studies. The "over time" study may take longer.

5.7 U.S. Fish & Wildlife Service, Litchfield Wetland Management District

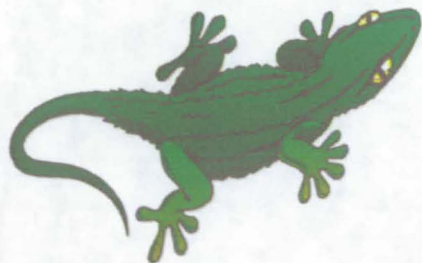
"Survey of Biodiversity on WPAs in Minnesota" 32588-5.6b

The objectives of the study are to:

1. Inventory the species of amphibians, reptiles, birds, and small mammals on selected WPAs.
2. Determine the presence or absence of amphibians, reptiles, and mammals.
3. Estimate densities of breeding birds.
4. Determine diversity of breeding birds.
5. Determine associations between species, communities, and regions.

Breeding bird counts will be analyzed to determine population densities and species richness for study sites within the physiographic regions of the Border Prairie, Agassiz lake Plain, Prairie Coteau, and Sioux Drift Plain-Minnesota. Small mammal, reptile and amphibian results will be compiled for a species list of occurrence within each habitat/cover type and region.

During 1994, samples were collected from the District's Cosmos, Arctander, and Swan Lake WPAs. Breeding birds were censused using belt transects. Small mammals were trapped using baited snap traps. Reptiles and amphibians were captured with pit and funnel traps. Results will be analyzed and reported in 1995.



E. ADMINISTRATION

1. Personnel



1/95

#95-4E

DHL

Permanent staff: (left to right)

1. John T. Haffley, Biological Science Technician, GS-7, PFT
2. Steve M. Erickson, Refuge Operations Specialist, GS-9, PFT
3. Rick J. Schutz, Tractor Operator, WG-6, PFT
4. Mortie P. Berg, Biological Science Technician, GS-7, PFT
5. Robert M. Bruesewitz, Refuge Operations Specialist, GS-12, PFT
6. Darla M. Freyholtz, Refuge Operations Specialist, GS-5, PFT
7. Sam Waldstein, Refuge Manager, GM-13
8. Beverly Meyer, Refuge Operations Specialist, GS-7, PFT
9. Craig W. Lee, Refuge Operations Specialist, GS-9, PFT
10. Elaine B. Lindquist, Administrative Technician, GS-6, PFT

Temporary staff:

1. Michelle Burt, Social Service Aid, GS-4, TFT
2. David Burt, Bio-Science Technician (Wildlife), GS-5, TFT
3. Rebecca Lewis, Student Trainee (Biology), GS-4

Transfers:

Wildlife Biologist C. Gregory Esslinger transferred from the District to the Region 2 Joint Venture Office in Albuquerque, New Mexico on February 20, 1994.

2. Youth Programs

Private Industry Council 5-Summer Youth Employment Program:

This program was funded by the State of Minnesota Job Training Partnership Act and was administered locally by Private Industry Council 5 of Annandale, Minnesota. It is a training program designed to assist economically disadvantaged youth ages 14 to 21 in finding summer employment and developing proper work skills, habits, and attitudes. Juan Jimenez and Hadrian Franco were hired under the program and assisted with noxious weed and brush control (mechanical treatment), removing old interior fence, placement of rip-rap on wetland restoration projects, and buildings and grounds maintenance. Unfortunately, one participant was terminated and the other dropped out mid-way through the program.

3. Other Programs

Summer Field Experience Program, Vermilion Community College, Ely, Minnesota:

The Fish & Wildlife Service signed a College Work Study Agreement with Vermilion Community College for placement of Jim Kotten at the District for the summer. The agreement was made under the provisions of both Federal and State work-study programs and required the District provide 50% of the student's salary. The purpose of the work-study program is to provide work related to a student's educational objective. Jim was especially interested in law enforcement and worked with law enforcement personnel from the District and the local MN DNR. Jim was also involved in activities such as enhancement and restoration of wetland habitat, boundary posting, WPA parking lot maintenance, and grounds maintenance.

4. Volunteer Program

Twenty-one volunteers donated 1,016 hours of labor to the District. Volunteers from a wildlife class at Willmar Community College spent 50 hours checking and replacing signs on Florida Slough WPA boundaries, cleaning up parking areas and road ditches, and removing old fence lines.

5. Funding

During FY94 the District received \$264,046 for operations (1261), \$163,125 for maintenance (1262), \$5,630 for acquisition (3110), and \$5,650 for fire management (9120).

Private lands and wetland restoration funds in the 1121 Activity totaling \$149,000 and in the 1230 Activity totaled \$13,000.

The table on the following page shows funding allocations for the District for the past 16 years.

Private funds donated for wetland restoration in 1994 included: \$4,000 from Ducks Unlimited (Bismarck, North Dakota), \$1,966.66 from Hadley Companies, \$1,998 from Stearns County Pheasants Forever, \$996 from Kandiyohi County Pheasants Forever, \$2,000 from Renville County Pheasants Forever, \$2,000 from Wright County Deer Hunter Association, and \$5,000 from Wright County Soil & Water Conservation District.

Additionally, Minnesota Waterfowlers Association provided \$4,948 for wetland restoration in Meeker and Stearns Counties, \$7,500 for wetland restoration in Wright County, and \$2,000 for removal of predators on islands.



9/94

#94-5E

SME

Local sportsman clubs and conservation organizations donated over \$32,000 to the District in 1994. To help provide public recognition for these funds we allow the donor to erect an approved sign at a project location.

LITCHFIELD WMD YEARLY FUNDING (\$1,000s)

Year	1121	1210	1230	1260	3110	4672	4673	9120	BLHP	ARMM	RPRP	Total Funds	FTE
1979				177.7	6.0				334.8			518.5	6.72
1980				245.0	10.0				166.0			421.0	10.93
1981				398.0	10.0				56.6			464.6	9.74
1982				309.5	6.7							316.2	7.25
1983		10.6		330.5	5.0							346.1	7.48
1984		9.7		238.4	5.0					33.0		286.1	8.07
1985		8.9		209.1	5.0					144.0		367.0	8.73
1986		9.8		227.7	5.0					105.0	55.0	402.5	8.98
1987		7.1	5.0	275.3	5.0					157.5	24.4	474.3	9.99
1988				532.6	5.0							537.6	9.60
1989	59.6			424.7	4.8							489.0	10.60
1990	63.8		59.9	355.7	5.0			0.4				484.8	9.98
1991	40.9		64.3	411.9	14.8			6.1				538.0	10.29
1992	42.0	6.0	120.0	461.4	5.6			12.8				647.8	10.86
1993	39.9		116.0	497.5	5.6			3.2				662.2	10.49
1994	149.0		15.3	427.0	5.6	300.0	56.0	5.2				958.1	10.66

6. Safety

The District's safety program is operated jointly with the Litchfield Acquisition Office with whom we share office space. Staff members take turns serving on the Station Safety Committee which is responsible for conducting monthly meetings and inspecting buildings and grounds.

We are in a high-risk area for Lyme disease and employees are frequently reminded of its symptoms. Test kits are available and the Station will pay for a test at any time. Insect repellents are supplied to all staff members and temporary employees.

Staff members are required to complete the National Safety Council's self-instructional Defensive Driving Course.

Members of the fire crew were given physicals by a local physician prior to taking the "step test".

The Station safety plan was reviewed and updated.

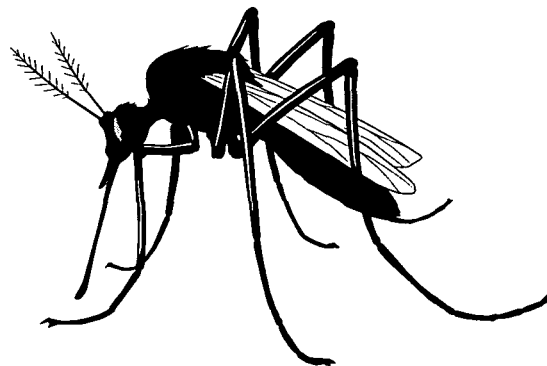
Eye wash bottles were purchased for personnel using ATVs to control noxious weeds. The bottles are carried on the uniform belt.

Larger eyewash stations were installed in all chemical handling/mixing areas.

Containers used for pesticides were labeled "Chemical Use Only".

Material Data Safety Sheet notebooks were assembled and placed in several areas for easy employee access.

A potential fire hazard was discovered on a 1992 Dodge Dakota 4x4 pickup. A gasoline odor was noticed and gasoline was observed dripping from the vicinity of the fuel pump. A local service technician found that one of the gas lines from the fuel pump had been worn through, apparently caused by the line rubbing on the undercarriage. Other 1992 Dodge Dakota 4-wheel and 2-wheel drive trucks were checked, revealing various degrees of abrasion to the gas lines. The Regional Safety Officer was notified and he provided all Stations with a Safety Alert on the subject. Chrysler Corporation was also contacted. Representatives from their Recall Division visited the Station and inspected the vehicles but we have heard nothing from them since.



All vehicle windshields were inspected for rock chips and necessary repairs were made. Spreading did not occur following the repairs and at an average cost of \$30.00 each, repairing the windshields was considerably cheaper than replacing the windshields. We are very pleased with the repairs.

7. Technical Assistance

a. Farm Bill

A major portion of our total staff effort was directed to Farm Bill responsibilities. District staff work closely with local U. S. Department of Agriculture (USDA) offices and Soil & Water Conservation Districts (SWCD) in many different programs and roles. Although differences of opinion sometimes occur, we work hard to keep the lines of communication open and our relationships positive and professional.

It is discouraging to see the large amount of drainage which is still occurring in Central Minnesota. Even though "new" projects are restricted by Federal and State regulations the numerous loopholes regarding "maintenance activities" have allowed the drainage of many wetlands.



4/94

#93-6E

SME

Tiling machines and backhoes are still common sights in the Prairie Pothole Region.

Wetland Appeal Determinations

We field checked 277 wetland appeal areas in seven counties and furnished written documentation of our determinations to the Natural Resources Conservation Service (NRCS). Local offices concurred with all of our recommendations.

The following table shows the number of field checks done by District staff during the last seven years:

<u>Year</u>	<u>Wetland appeal field checks</u>
1987	280
1988	1,256
1989	902
1990	559
1991	596
1992	628
1993	303
1994	<u>277</u>
Total	4,801

A decrease in the number of wetland appeals occurred in 1989 when Windom Wetland Management District assumed responsibility for six counties formerly covered by our staff. The declines which occurred in 1993 and 1994 are due to an NRCS moratorium on sending out unsolicited wetland determinations.

Other Farm Bill Assistance

During the year we reviewed 211 responses to maintenance requests, drainage system worksheets or AD-1026 forms, and 19 converted-wetland non-ag requests.

We concurred with three minimal effect and four third-party exemption requests. We refused to concur with three minimal effect requests. We assisted with restoration agreements for 11 good faith exemptions and concurred with 1 late-filed commenced exemption request.

We submitted 21 Wetland Impact Reports describing possible wetland alterations on private lands, and helped develop restoration plans for 14 restoration-with-violation sites. We refused to concur on five mitigation proposals for wetland drainage.

District staff also helped screen and rank over 200 applications for Water Bank and Reinvest in Minnesota (RIM) programs and 22 Emergency Wetland Reserve and Wetland Reserve Program tracts.

b. Private Land Wetland Restoration



During the 1994 field season, we assisted landowners with the restoration of 213 wetlands covering over 859 acres. The wetlands were restored with a combination of force account and private contractors.

The biological response to these restorations can be dramatic. Aquatic plant and invertebrates populations usually explode as soon as water starts to fill the basins. Nesting waterfowl pairs and broods seem to be especially drawn to the restored wetlands.

The one-acre pond pictured below was home for three mallard broods. The ducklings very much appreciated the stack of tile excavated from the basin during the restoration and used it as their preferred loafing site.



6/94

#94-7E

SME

Mallard broods frequently used the tile excavated from the restored basin as a loafing site.

c. Other Training and Assistance

Because of the amount of Farm Bill and wetland restoration activity at the District we received numerous requests for comments, assistance, information and material. Copies of our USDA wetland mitigation guidelines, FmHA "mini-management plans", computer databases, contact letters, file systems, survey and design forms, and restoration procedures and equipment suppliers were distributed to stations from every Service Region.



We receive many visitors each year who are interested in seeing our wetland restoration program in action. Many individuals and groups from the Service, Natural Resources Conservation Service, Farm Service Agency, Environmental Protection Agency, Corps of Engineers (COE), Minnesota Department of Transportation, Bureau of Reclamation, National Academy of Science, news media, and several legislative offices requested and were given guided tours of our wetland restoration activities.

A few of our more notable visitors in 1994 included State Senator Steve Dille who asked for our comments on the state wetland protection legislation he co-sponsored; Donald J. Berry, Counselor to the Assistant Secretary for Fish and Wildlife and Parks, and a group of Russian administrators, planners, and biologists who are developing conservation and land use plans for the huge Lake Baikal region.

A Truax grass drill purchased by the Willmar Sportsman's Club in 1977 and maintained by the District was loaned to Kandiyohi and Meeker SWCDs. The drill was used to seed native warm season grasses on Waterbank, Reinvest in Minnesota (a State-run wildlife habitat program), and Conservation Reserve Program (CRP) lands.

District staff worked closely with the COE and Stearns County on a joint mitigation project involving the restoration of Halverson Slough. The restoration is scheduled for 1995 and once completed the COE will transfer an easement to the Service which permanently protects the 300-acre wetland.

ROS Erickson devoted a great deal of time working on a proposed restoration of the 1,200 acre Grass Lake in central Kandiyohi County. This project involves numerous partners including 15 landowners, the City of Willmar, and several Kandiyohi County departments and boards.

District staff assisted Boy Scout Troop 353 throughout the year. We provided worksites, tools, and equipment for two Eagle Scout projects and for construction of 18 mallard hen houses and 30 bluebird houses.

We also assisted the Troop with their winter campout on January 28-30th. Temperatures dipped to -22° F. but the group claimed to have slept comfortably in the five "quincys" (small snow caves) they hand dug out of snow piles on a frozen lake. Chef "Julia Child" Lindberg (Realty Specialist/Scoutmaster) claimed that his gourmet meals of venison stew and fire roasted "Cancun Raccoon" allowed the group to enjoy their exercise in winter survival and avoid injury and frostbite.



Biological Technician Berg helped the Koronis Eager Beaver 4-H Club build and place 50 bluebird houses and 25 woodduck boxes.

ROS Erickson was invited to serve as a discussion panelist at the Minnesota Division/Izaak Walton League of America Spring Convention April 24th and 25th. He also made a presentation on the Station's wetland restoration program.

F. HABITAT MANAGEMENT

1. General

The District is located along the eastern edge of the U. S. Prairie Pothole Region. Since white settlement in the mid-1800s, the District's natural landscape has been drastically altered. Virtually all of the native prairie has been converted to cropland and hundreds of thousands of wetland acres have been drained. Despite the massive extent of land conversion, there still remains a good base of natural habitats and considerable acreages of land which have been enrolled in State and Federal conservation programs.

The primary objectives of the District are to protect, preserve, and restore the wetlands and prairie grasslands which historically dominated our landscape and to maintain and enhance populations of the native plant and animal species which utilize these habitats.

2. Wetlands

a. General

The decline in wetland habitats caused by an extensive network of public and private drainage projects in the Prairie Pothole Region has been well documented and highly publicized. Wetland drainage commenced with the first settlers and continues to the present. Recent changes in Federal and State regulations and programs have slowed the draining and filling of wetlands in the District but wetland losses continue through Department of Agriculture program exemptions, urban expansion, and homesite development activities.



9/94

#95-8F

BGM

Even WPA wetlands are susceptible to drainage when governmental units maintain or improve roads and ditches within legal rights-of-way.

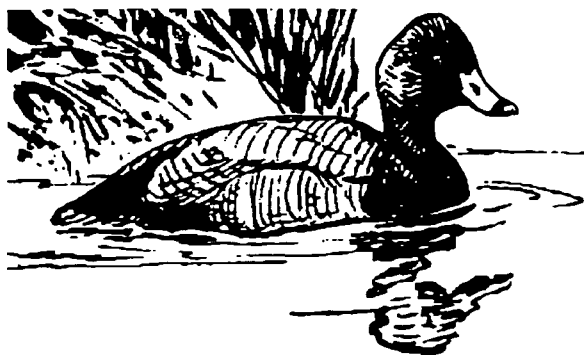
b. Wetland restoration

Wetland restoration is a major component of the District's habitat management efforts. In recent years, many central Minnesota landowners have developed a more positive attitude toward wetlands and conservation programs. Declines in the rural economy, economic stress on farmers, and urban sprawl have combined with an increased acceptance of wetlands and wildlife habitat and produced tremendous opportunities to restore previously-drained basins.

District staff actively pursue these opportunities and during 1994, 420 wetlands covering over 1,370 acres were restored. The tables below and on the following page list District wetland restoration activity by year and land type.

LITCHFIELD WMD WETLAND RESTORATION TOTALS 1987-94

YEAR	BASINS	APPROX. ACRES
1987	119	358.2
1988	375	1,128.8
1989	719	2,169.9
1990	740	2,073.9
1991	634	2,060.3
1992	641	2,238.3
1993	572	1,859.6
1994	420	1,371.1
TOTALS	4,220	13,260.1



LITCHFIELD WMD WETLAND RESTORATION ACTIVITIES BY LAND TYPE

Year	WPA		FmHA		CRP/Private	
	Basins	Approx Acres	Basins	Approx Acres	Basins	Approx Acres
1987	38	114.4	14	42.1	67	201.7
1988	43	129.4	86	258.9	246	740.5
1989	120	775.8	83	136.6	516	1,257.5
1990	154	326.0	79	345.5	507	1,402.4
1991	209	717.8	13	22.2	412	1,320.3
1992	183	596.0	2	10.3	456	1,632.5
1993	238	504.8	6	15.5	328	1,339.3
1994	198	501.8	9	10.0	213	859.3
TOTAL	1,183	3,666.0	292	841.1	2,745	8,753.5

c. Water Management

The District has constructed approximately 4,220 water control structures since 1987. The overwhelming majority of these structures are earthen dikes about 150 feet long with an average depth of fill of about 3.5 feet. Although some of the wetlands restored with these dikes are over 200 acres in size most projects are in basins of less than 5 acres. Watersheds average less than 25 acres and most restoration projects are designed with simple vegetated spillways around one or both ends of the dike. In places where continual flows are anticipated, culverts sized to the normal flow rates or a filter cloth and field rock overflow structure are used to augment the vegetated spillways. Driven sheet pile structures with poured concrete or rip-rapped spillways are used for projects involving basins with large watersheds.

Over 1,500 structures are on Service-owned land (some constructed prior to 1987). Thirteen structures have fixed-crest mechanical outlets. Six WPA wetlands are managed by stoplog water control structures at their outlets. In response to aquatic vegetation changes these levels are manipulated under the District's annual Water Management Plan in an effort to produce desirable wetland habitat conditions. Outstanding wetland habitat conditions eliminated the need for any water level manipulation in 1994.

Of the 3,000 structures on other lands, 2,745 are on or adjoin CRP, RIM, or other private lands. Management and maintenance of these wetlands are controlled through either Wildlife Management or Wetland Development Agreements. At the end of the agreement period, usually 10 years, the structures will become the sole property of the landowner. We work closely with the Litchfield Acquisition Office to acquire perpetual Waterfowl Production Easements on the most productive restored basins.

Two hundred ninety-two structures have been constructed on FmHA Conservation Easements or proposed Conservation Easements.

With the exception of the six basins with stop log structures, water levels and vegetation in District wetlands are dependent upon natural climatic fluctuations and animal activities. No attempt is made to regulate individual basins unless problems occur.

In October the 25-year old stop log structure on Weber WPA was replaced with a fixed crest structure. The original structure was badly corroded and leaked in several places. Heavy equipment and operators for the project were graciously provided by the Kandiyohi County Highway Department at no charge. They even hauled away and disposed of the old structure.



10/94

#95-9F

SME

The 25-year old stoplog structure on Weber WPA was replaced due to the generosity of the Kandiyohi County Highway Department.

Three landowners with previously documented third-party rights were issued Special Use Permits authorizing them to maintain historic ditches and tile lines on WPAs. These Permits were developed with Department of Agriculture and Minnesota State wetland regulation offices and closely monitored for compliance.

A few dikes and spillways constructed on private land through our wetland restoration program were adjusted to keep peace between neighbors or to reduce impacts to croplands, private roads, or driveways. Several others damaged by muskrats or washouts were repaired.

Most high-water problems related to beaver activity on WPAs and easements were referred to Minnesota Conservation Officers for resolution by the affected landowner in accordance with state law and, if necessary, a Special Use Permit from our office.

A new beaver-resistant "Clemson Leveler" spillway tube was installed just before ice-up on the new Ella Lake WPA tract. The Clemson Leveler is a low cost (\$250) device which allows water to flow through a beaver dam or plugged culvert. The intake device (a 10-foot section of 10" diameter PVC pipe with 2-inch holes and surrounded by woven wire) is submerged upstream of the dam. An 8"-diameter flexible PVC pipe is attached to the intake device and placed through the dam and at least 20 feet beyond the dam. Beaver are able to maintain their dam but are no longer able to control water levels.



10/94

#94-10F

CWL

A "beaver resistant Clemson Leveler" was installed on Ella Lake WPA. More details on the Leveler are provided in a brochure attached to the back cover. For details on the beaver resistance, see next year's narrative.

1. Forests

Oak Savanna

The oak savanna plant community was once a dominant feature of Central Minnesota. Like prairies and prairie wetlands, however, oak savannas were drastically affected by human settlement. Most savannas containing only scattered trees were converted to cropland. Savannas that weren't cleared became building sites or were heavily grazed by cattle. A lack of fire caused virtually all of the few surviving savannas to lose their prairie understories and become woodlands. Oak savannas are now considered to be an endangered plant community in nearly all of their historic range.



Many District WPAs are located within or near historic savanna areas and a few still exhibit good savanna characteristics. We have begun to document and map existing and historic savanna habitat occasionally using copies of the plat maps and field notes of early surveyors which describe the prairie forest borders that were present during the middle to late 1800s. We intend to take a more active role in managing and restoring oak savanna communities in the future.

4. Croplands

No District lands were farmed in 1994.

5. Grasslands

a. Seeding

A total of 605 acres were seeded to grasses in 1994.

District personnel seeded 408 acres. One hundred thirty-one acres of this total involved the interseeding of four previously seeded areas that showed poor stand development. A 30-acre field on Greenwald WPA was dormant seeded in November.

One hundred ninety-seven acres were seeded through Cooperative Farming Agreements. Cooperators seeded the prescribed grass mixture with an oat nurse crop. The nurse crop was either clipped and removed as hay or the grain was harvested at maturity and the straw removed. The use of oats provides secondary benefits as it produces substances which retard the growth of broadleaves.

Fifty-one acres were seeded to nesting cover on four FmHA Conservation Easements. All but two acres were seeded through the use of Cooperative Agreements.

Grass seedings (with the exception of the dormant seeding) exhibited excellent germination. Abundant soil moisture at the time of seeding along with timely precipitation throughout the growing period provided for successful nesting cover establishment.

Most seedings were mowed at least once during the summer to reduce competition from annual grasses and broadleaf weeds.

Grasses seeded included big bluestem, Indiangrass, switchgrass, tall wheatgrass, intermediate wheatgrass, and smooth brome. A native cool season grass (slender wheatgrass) was added to the WPA grass seeding mixture. The tables on the following pages summarize the areas and acreage seeded, seed mixtures, and seeding rates.

A few seedings of various mixtures and ages were inspected this year to determine the general health, distribution, and longevity of the cool season grasses planted. It appears that in older stands, differences in topography seems to have the greatest effect on species distribution. Tall and intermediate wheatgrasses seem to maintain themselves longer than we had originally expected-6 years plus and still going strong.

b. Grass Seed Harvest

To reduce nesting cover establishment costs we try to harvest our own seed or obtain seed from other Stations. In 1994 Big Stone NWR generously provided us with seed they harvested from native prairie sites. The seed was cleaned by Detroit Lakes WMD and yielded 5,140 pounds.

Pure live seed tests indicated 37% big bluestem, 19% switchgrass, and 4% Indiangrass. This calculates out to 1,902, 977 and 206 pounds of pure live seed. The mix also contains many other prairie grass and forb species which will add diversity to our seedings.

The harvest and cleaning operation represents Service cooperation at its best. **Thank you again Big Stone and Detroit Lakes!**

SEED MIXTURES USED BY LITCHFIELD WMD DURING 1994

Species (variety)lbs. PLS/acre

#1 Switchgrass (Forestburg 90432)	1.0
Big bluestem (local mix)	4.5
Indiangrass (Big Stone NWR*)	1.2
Intermediate wheatgrass (Oahe 91006)	2.0
Tall wheatgrass (Alkar 90061)	4.0
Slender wheatgrass (Revenue 92055)	1.0
#2 Big bluestem (89 Detroit Lakes harvest)	7.0
Intermediate wheatgrass (Oahe 91006)	2.0
Tall wheatgrass (Alkar 90061)	4.0
Switchgrass (Ashmore)	0.8
Slender wheatgrass (Revenue 92055)	1.0
#3 Oats	
Intermediate wheatgrass (Oahe 91147)	5.0
Tall wheatgrass (Alkar 92141 or 92083)	5.0
Switchgrass (Forestburg 91183)	2.0
#4 Barley	
Switchgrass (Forestburg)	2.0
Tall wheatgrass (Alkar)	6.0
Intermediate wheatgrass (Oahe)	6.0
#5 Intermediate wheatgrass (Oahe 91006)	2.0
Tall wheatgrass (Alkar 90061)	4.0
Switchgrass (Forestburg 90432)	1.0
Big bluestem (92 Big Stone mix)	4.5
Indiangrass (92 Big Stone mix)	1.0
#6 Intermediate wheatgrass (Oahe 91147)	2.0
Tall wheatgrass (Alkar 92083)	2.0

* 1994 Big Stone native prairie mix contains trace amounts of the following species:
switchgrass, purple prairie clover, smooth brome grass, Canada wildrye, sweet clover,
milkweed, tall dropseed, green and yellow foxtail, barnyard grass, and common
ragweed

1994 Grass Seeding

WPA	Acres Seeded	Seed Mixture ¹
Areas Seeded by FWS		
Priam (Kd-54)	80	#1
Roscoe (Sr-40)	74	#1 & #5
Brownton (ML-4)	61	#1
Brownton (ML-4)	6 ²	#2
Eden Valley (Sr-37)	30	#1
Rice Lake (Sr-39)	90 ²	#1
Harvey (Mk-5)	25 ²	#1
Hanson Lake (Mk-3)	10 ²	#1
Greenwald (Sr-38)	30 ³	#1
Berg FmHA (Mk-21C)	2	#6
Areas Seeded by Cooperators		
Roscoe (Sr-40)	69	#4
Brownton (ML-4)	57	#3
Angus Lake (Wr-8)	15	#3
Zehrer (Sr-27)	7	#3
Funk FmHA (RN-21C)	22	#3
Kloster FmHA (MK-25C)	7	#3
G. Larson FmHA (MK-12C)	20	#3

¹ Seed mixtures are listed by number on the previous page.

² Interseeding

³ Dormant seeding

6. Other Habitats

Reviews of MN-DNR and Natural Heritage Program literature indicate that 34 plant communities occur or historically occurred within the 10 counties covered by our District. Some of these communities are very rare and others may not be found on WPAs (our acquisition goals emphasize waterfowl habitat) but all of the communities are listed below to provide an indication of the richness of the habitat diversity found in the District.

<i>Oak forest (big woods and central sections)</i>	<i>Floodplain forest (silver maple subtype)</i>
<i>Northern hardwood forest (northern section)</i>	<i>Mixed hardwood swamp</i>
<i>Maple-basswood forest (big woods, east central and west central sections)</i>	<i>Tamarack swamp</i>
<i>Lowland hardwood forest</i>	<i>Willow swamp</i>
<i>Red pine forest</i>	<i>Cattail marsh</i>
<i>White pine forest (central section)</i>	<i>Mixed emergent marsh (forest and prairie sections)</i>
<i>Jackpine forest (central outwash plain section)</i>	<i>Wet brush-prairie</i>
<i>White pine-hardwood forest (north-central section)</i>	<i>Wet prairie (southeast, southwest, and central sections)</i>
<i>Oak woodland-brushland (big woods and central sections)</i>	<i>Poor fen</i>
<i>Mesic oak savanna (southeast, southwest, and central sections)</i>	<i>Calcareous seepage fen (southeast and southwest sections; prairie subtype)</i>
<i>Dry oak savanna (southeast, southwest, and central sections)</i>	<i>Rich fen (transition section)</i>
<i>Mesic brush-prairie</i>	<i>Wet meadow</i>
<i>Mesic prairie (southeast, southwest, and central section)</i>	<i>Seepage meadow</i>
<i>Dry prairie (southeast, southwest, and central section)</i>	<i>Rock outcrop (northeast and southwest sections)</i>
<i>Open sphagnum bog</i>	<i>Mudflat</i>
	<i>River beach</i>
	<i>Lake beach (inland section)</i>
	<i>Riverbed</i>
	<i>Lakebed</i>

7. Grazing

Whenever possible we use short-duration, intensive grazing to revitalize seeded nesting cover and to control brush and tree invasion. Opportunities to establish grazing programs are limited however. Only a few farms raise beef cattle and dairy operations prefer higher-quality forage.

The 1994 rainfall patterns (timeliness and amounts) produced above-average forage for grazing. Cattle are selective grazers and predictably preferred the warm season native grasses (except switchgrass) over the introduced cool season grasses. In some areas, invading woody species were set back temporarily. Overall results were good.

WPAs

A total of 172 upland acres on 5 WPAs were grazed during 1994. Brockway, Collegeville, Freese, Lovell Lake, and Whitney WPA were grazed from July 5th to August 31st. Lake Henry WPA was not grazed even though we had prepared a grazing permit with an adjacent landowner.

FmHA Conservation Easements

Grazing was permitted on 304 acres of three FmHA Conservation Easements: Grinstead - 133 acres, June 3 to September 15; Schwieger - 134 acres, July 1 to August 31; and Rick - 37 acres, June 25 to September 15.

8. Haying

Twenty-five acres of Harvey WPA were hayed by a permittee to prepare the area for interseeding. A two-acre patch on Lake Henry was hayed illegally by our grazing permittee thinking that it would have the same effect as grazing. His thought process was corrected.

9. Fire Management

Prescribed Burning and Wildfires

The prescribed burning program is used to increase the vigor of established grass stands, remove competition, stimulate grass seed production for harvest, set back tree and shrub invasion of grass stands, and prepare an area for seeding or interseeding.

Most prescribed burns are scheduled from April to mid-May. Burning after the middle of May is beneficial to the native prairie plant species but most burns are made earlier to reduce smoke, impacts on ground nesting birds, and complaints from neighbors and local officials.

Ten burns totaling 716 acres were completed in 1994. The following table provides more specific information on the burns.

1994 PRESCRIBED BURNS

Date	WPA	Acres	Cost/Acre	Crew Size
April 19	Olson Lake	54	\$14.05	4
April 20	Swanson	45	13.30	5
April 22	Irving	37	23.85	5
May 3	Casey Lake	91	5.91	4
May 4	Litchfield	106	3.14	4
May 5	Florida Slough	68	10.73	5
May 6	Swan Lake West	101	6.10	4
May 6	Swan Lake East	42	7.79	4
May 10	Dengerud	54	14.90	4
May 13	Peifer School	118	4.94	5

The burn season was wetter than average with heavy snowmelt, frequent rain and then more SNOW (10 inches during the last week in April.) The wet conditions made some normally difficult burns easier but severely limited our use of pumper trucks. Most burns were conducted using four-wheeled ATV spray units. As usual un-forecasted high winds would come up during burns and we used lots of backing fires to increase safety margins.

Eight groves containing over 150 burr oaks were burned in an attempt to set back the invasion of other tree species and restore the area to an open savannah plant community.

A local fire department expressed an interest in assisting us with burning to gain grassland fire experience. Contact was made but their services were not utilized in 1994.



4/94

#94-9F

BGM

ATV spray units allow us access to most areas of WPAs during prescribed burns.

Wildfires

Four wildfires occurred during 1994.

A five-acre wildfire occurred on Cokato WPA on May 3rd. The fire was the result of a trash fire escaping from an adjacent residence. The fire was put out by the Cokato Fire Department.

A 43-acre wildfire on Swan Lake WPA occurred on May 13th. The fire was started by a landowner who was attempting to burn off a tract of land that had not been accepted into the Water Bank program. The fire was extinguished by the Pennock Fire Department.

The third wildfire occurred on Rosendale WPA on June 16th, during thistle spraying operations. A faulty muffler system on our 1981 stakebed truck caused the vehicle to backfire and started the blaze. The blaze was extinguished through the use of our "nurse" tanks (water only) in about 45 minutes. A total of three acres were burned.

Another wildfire occurred on Rosendale WPA on November 3rd. This fire was caused by an arsonist who lit bags of leaves soaked in a flammable liquid. All property owners in the area were extremely fortunate because one of the neighbors happened to drive by just after the fire was lit. He was able to put it out with the 20 pound fire extinguisher he carried in his tractor. The fire was set at a perfect location to take advantage of a brisk wind and dry, heavy cover. Several hundred acres of WPA and standing corn crops could easily have been burned. Both the Kandiyohi and Meeker County Sheriff Departments investigated this fire because of the several suspicious fires in the area during the past four or five years.

10. Pest Control

District weed control efforts are primarily directed at Canada thistle, a state-listed noxious weed. In 1994, 2,175 acres were treated. The following table summarizes the effort.

1994 - CANADA THISTLE CONTROL

Treatment	Treatment Site and Acreage
2,4-D amine (Hi-Dep)* 2 lb. A.I./acre ground application (force account)	Established grass seedings and problem thistle areas. 1364 acres.
2,4-D lv-4 ester 1 lb. A.I./acre aerial and ground application (contracts)	Established grass seedings and problem thistle areas. 756 acres.
Mowing (contract and force account)	Problem thistle areas. 55 acres.

* Hi-Dep is a 2,4-D formulation containing two amine salts.

District staff provided information and have made several contacts with the USDA regarding the release of insects on WPAs for the biological control of thistle, leafy spurge, and knapweed. A bacterial disease, whitetop, is decreasing Canada thistle productivity in some areas of the District.

Wild marijuana is occasionally found on WPAs. Chronic problem sites on Yarmon and Cosmos WPAs were monitored and all plants found were treated with 2,4-D herbicide.

Mechanical and chemical treatments were used to control green ash, boxelder, and red cedar invading nesting cover on Murray Lake, Olson Lake, Raymond, Quinn, and west Lindgren Lake WPAs. Trees were either cut down or treated with Garlon 3A herbicide (applied with a hypohatchet). The trees had reached a height where controlled burns would not suppress them and the quality and vigor of the nesting cover was being seriously reduced.

13. WPA Easement Monitoring

The waterfowl management easement program in western Minnesota started in the early 1960s. Since then, over 8,200 wetland acres in the Litchfield District have been protected by easements. Purchasing easements is another way of preserving the wetlands which are needed for waterfowl habitat. In exchange for a one-time payment, willing landowners transfer the rights to drain, fill, level, or burn certain wetlands. This perpetual easement is recorded and applies to all future landowners.

Easement basins are aerially inspected at least once each year.

14. FmHA Conservation Easements

Conservation Easements have been proposed on 6,554 acres (94 tracts) of FmHA inventory lands. Forty-five of these easements totaling 3,015 acres have been recorded.

Over 840 acres in 292 basins of wetland habitat and 2,700 acres of grassland habitat have been restored since 1986.

In 1994, on-line markers were placed on many tracts to help prevent agricultural trespass. Signs were placed on newly-recorded easements to identify permanent boundaries.

Annual informational letters were sent out to the owners of all recorded easements.

15. Private

Since 1987, we have been fortunate enough to have the opportunity to restore over 2,700 wetlands on private lands. Many of these wetlands were either on or adjacent to uplands seeded to nesting cover under various conservation programs.

These wetlands were restored at no cost to the landowner. To qualify for the program the landowner must sign a one-page Wetland Development Agreement. The Service agrees to construct and maintain the structures and the landowner agrees to leave them in place for at least 10 years.

In order to maintain the high level of public support we have received, we try hard to respond immediately to problems or complaints. Occasionally, dikes must be rebuilt or repaired. Common causes necessitating repair include erosion and muskrat burrowing. Less than 1% of all dikes have required rebuilding or repair.

Other aspects of our wetland restoration activities are described in Section F.2.

G. WILDLIFE

1. Wildlife Diversity

The diverse habitats found on District WPAs provide homes or life cycle requirements for many of the species of plants and animals found in central Minnesota. Although waterfowl production is emphasized, we try to make management decisions that benefit all species native to the area.



7/94

#94-4-11

BGM

WPAs provide diverse (and beautiful) habitat throughout Central Minnesota

2. Endangered, Threatened, and Species of Special Concern

a. Number of State and Federal Species

Thirty Federally-listed species are located (or potentially located) within the District, including seven birds, four butterflies, two mussels, nine plants, two fish, four mammals, and two reptiles. Lists of these species and their status are located in the back cover of this Annual Narrative.



b. American Bald eagle

American bald eagles are frequently seen in the District.

In 1994, the first successful nest in many decades was observed in Kandiyohi County in the central portion of the District.

A turkey-killing incident in northeastern Meeker County may indicate another possible nest site along the Crow River. During August, a local turkey grower reported that a large number of his six to nine pound (open range) turkeys were being killed by a pair of mature bald eagles. He said that the eagles had been present since early spring and had grown increasingly bold. The grower liked having the eagles around and didn't mind losing a few birds to the eagles but the losses were getting unbearable. Apparently the turkeys were hard for the eagles to kill outright and after some attacks up to seven wounded turkeys would die within 24 hours. During other attacks the terrified turkeys would bunch up against a fence and suffocate. The grower was exceptionally good natured about the loss and is working with Regional Office staff.

3. Waterfowl

Habitat conditions for nesting and migrating waterfowl were excellent. Most wetlands were 100% full during early spring and held water until freeze-up. Extensive tracts of CRP, State, and Service grasslands adjacent to all types of marshes provided optimum nesting and brood conditions. For the first time in several years moderate precipitation and temperatures persisted through the entire nesting season.

MN-DNR waterfowl nesting estimates (for the entire state, excluding scaup) increased 33% over 1993. They reported blue-winged teal numbers were up 48% and mallard up 39%. Even though other duck numbers were the same as 1993, the figures represented an 80% increase in nesting pairs over the 30-year average.

No relevant data for nesting pairs or production is available for the District. The quarter-section breeding pair counts which were run for many years and provided an index of the number of pairs using WPA wetlands are no longer made. These counts were abandoned when the four-square mile surveys were initiated.



5/94

#94-11W

BGM

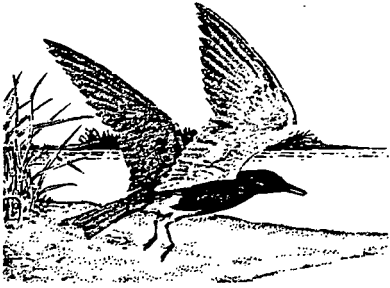
Pond 67, Four Square Mile Plot 309. Data from each pond is forwarded to HAPET for computer entry and analysis and used to obtain annual waterfowl population and production estimates. (Yes, this is the right photo.)

4. Marsh and Water Birds

Great blue herons, black-crowned night herons, great egrets, green-backed herons, white pelicans, American coot, double-crested cormorants, western and pied-bill grebes, and common loons were sighted during the 4-square mile counts this spring.

Although loons are occasionally sighted in the northern and western portions of the District, successful nesting on a WPA has never been documented. We believe it is occurring, however, because of several mid-summer sightings of paired birds.

Some state species of special concern utilize District habitats. They include the American bittern, yellow and king rails, common moorhen, sandhill crane, and American white pelican.



5. Shorebirds, Gulls, Terns, and Allied Species

Black terns, a Federal candidate species, are fairly common in the District. During a 1991 count, over 220 birds were sighted nesting on or near WPAs. Forster's terns, a state species of special concern, are seen less frequently.

Sora rail, lesser yellowlegs, common snipe, and killdeer commonly reside on our WPAs. Marbled godwit, upland sandpiper, and Wilson's phalarope, another state species of special concern, utilize District habitat.

6. Raptors

Great-horned owls, red-tailed hawks, and American kestrels are common residents. Marsh, Cooper's, and sharp-shinned hawks, short-eared, barred, and screech owls, and bald and golden eagles are less common. Occasional sightings of turkey vultures, osprey, and rough-legged, red-shouldered, Swainson's, and ferruginous hawks are reported.

7. Other Migratory Birds

Woodcock are uncommon breeders throughout most of the District. Portions of some WPAs provide limited breeding habitat for the species and nests are found on rare occasions.

Common nesters on WPAs include the tree swallow, common yellowthroat warbler, house wren, marsh wren, sedge wren, meadow lark, mourning dove, robin, Eastern kingbird, bobolink, yellow-shafted flicker, common grackle, American crow, red-winged blackbird, and yellow-headed blackbird. Dozens of other species are less common nesters or stop-over visitors to the District's WPAs.

The District completed its first Breeding Bird Survey Point Count on WPAs in 1994. A local birder, Joanie Robinson, was contracted to complete 61 point counts on native prairie habitat on WPAs in northern Kandiyohi County. A total of 79 bird species were counted. A couple of unexpected species turned up. The veery and the olive-sided flycatcher are considered to be out of their ranges in Kandiyohi County. A similar count on seeded grassland habitat will be conducted in 1995.

A yellow-throated warbler (Dendroica dominica) was seen on a number of occasions in Sibley State Park. This is the first recorded observation of the species in our District and drew in quite a few birders to the Park. According to Peterson's Guide, this species rarely breeds north of Missouri. The sighting also represented the only June record and the only male defending territory observation in Minnesota.

8. Game Mammals

District WPAs provide a variety of habitat types and are used by most game mammals common to central Minnesota.

Although mule deer, moose, and even black bear occasionally wander through the area, white-tailed deer are the only big game species typically found in the District. In many locations, high numbers of deer depredation complaints from farmers, orchard owners, and gardeners coupled with significant levels of vehicle collisions indicate that deer populations have exceeded their "social carrying capacity". In an effort to reduce the population the MN-DNR has increased the number of antlerless deer and "bonus deer" permits issued for the firearms hunting season.

Cottontail rabbit populations remain stable but at low levels due to modern farming practices and predation. Jackrabbit populations continue to decline.

Fox, gray, and red squirrels are present throughout the District but their numbers are limited on most WPAs since these areas are dominated by grasslands and wetlands.

Most furbearer populations remain relatively high in the District. Beaver numbers (and nuisance complaints) are especially high. Because of low fur prices, beaver trapping has usually been limited to the removal of nuisance colonies by paid trappers.



Muskrat numbers have rebounded from the low levels caused by the 1987-89 drought. High muskrat populations coupled with high water levels during the last two years have significantly reduced emergent vegetation in some wetlands. Low fur prices have drastically reduced muskrat trapping efforts.

Although still abundant, red fox populations appear to have declined slightly from their 1992 peak. "Hot spots" of sarcoptic mange were first reported in late 1992. Mange became more prominent and widespread during the winter of 1993-1994 and is causing some mortality.

Coyotes, once rare, are now widespread and common.

Raccoon populations remain very high but fur prices are low. Hunting and trapping pressure on the species is light.

12. Wildlife Propagation and Stocking

The MN-DNR Fisheries Division used one wetland on Crosier WPA to raise walleye fingerlings. Because of possible conflicts with migratory waterfowl, we have gradually reduced the number of ponds the MN-DNR is authorized to use. This is the last year walleye rearing will be allowed on WPA wetlands.

15. Animal Control

Mammalian nest predation is one of the major factors limiting waterfowl production in the Prairie Pothole Region. Numerous studies indicate that the success of ground-nesting ducks is typically less than 20% in most areas but 90% or higher in predator-free environments. Because widespread predator control is not economically, socially, or biologically acceptable, District efforts are concentrated on islands and peninsulas where short duration predator removal efforts can greatly improve nest success.

In 1991, the District began a limited-duration trapping program on 19 islands. In 1992 and 1993, the program was expanded to 102 islands. Thanks to the financial support of local sportsman clubs in 1994, we were able to trap 99 islands and a 29-acre peninsula cut off with a short electric fence.

The program involves professional trappers setting small numbers of traps and removing all predators from the islands as soon as possible after ice-out.

Significant numbers of waterfowl utilize the islands and the peninsula for nesting. Few "new" predators swim to the islands during the nesting season and predator recruitment/replacement rates appear to be low. Islands that were trapped for two or three consecutive years show rapidly decreasing numbers of predators and have significantly fewer predators than similar islands that are trapped for the first time.

Other bird species also benefit from the program as nine of the islands contain nesting colonies used by great blue, green-backed and black-crowned night herons, great egrets, and cormorants. A good deal of over-water nesting by grebes and terns also occurs adjacent to the islands and many species of neotropical migratory birds have been observed.



A total of 150 nest predators including raccoon, woodchuck, mink, and striped skunk were removed from the islands and the fenced peninsula. Landowner permission and State permits to take red fox, raccoon, and mink, out of season were obtained prior to initiation of trapping in April. The following table provides additional information about the 1994 program.

Litchfield WMD Predator Management Program - 1994

COUNTY	RACCOON		WDCHUCK		MINK		FOX		SKUNK	
♂/♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀
KANDIYOHI	48	18	5	2	1	-	-	-	2	-
MC LEOD	1	1	1	2	-	-	-	-	-	2
MEEKER	17	6	1	-	-	-	-	-	-	-
STEARNS	2	1	1	-	-	-	-	-	-	-
WRIGHT	24	13	2	-	-	-	-	-	-	-
SUB-TOTAL	92	39	10	4	1	-	-	-	2	2
TOTAL	131		14		1		0		4	

H. PUBLIC USE

1. General



With the exception of the hunting seasons, public use of WPAs is generally light. Occasionally, visitors use WPAs as sites for wildlife observation and photography. District WPAs are widely scattered and most of the non-consumptive public use occurs outside of normal staff working hours and is not accurately monitored.

Although our "storefront" headquarters has very limited interpretive material on display, District staff provide considerable information to visitors

and telephone callers. Many people have no idea where to obtain answers to their questions or problems and we can usually refer them to the appropriate agencies. Photocopies of maps which show WPA locations are provided to the public free of charge. Various brochures and other printed material describing Service initiatives and other agencies conservation programs are available.

The District maintains a video, film, and slide/tape library of about 39 titles. The items are loaned free of charge to schools, sportsmen's clubs, and other groups. Subjects include waterfowl identification, shooting instructions for steel shot, waterfowl calling and decoying tips, and many conservation and wildlife topics. During 1994, library users reported that nearly 3000 people viewed materials borrowed from the District.

2. Outdoor Classrooms - Students

Ben Thoma, biology instructor at Willmar Community College, frequently uses the District's WPAs for outdoor environmental education purposes. Subjects which are readily observed and discussed during his field trips include wetland functions and values, prairie ecology, water level manipulation, and wildlife management. Mr. Thoma requires community service from his students and they frequently assist District staff with WPA management. During 1994, volunteers from the college assisted with boundary posting, old building site clean-up, placement of waterfowl nesting structures, and interior fence removal.

6. Interpretive Exhibits/Demonstrations

In March, District staff set up a "Partners for Wildlife" display and tended a booth at the annual Willmar Sportsman's Show. Information on all District programs was provided but the private lands wetland restoration program was emphasized. Several contacts were made which resulted in wetlands being restored.

In August, the District participated in the Kandiyohi County Fair by setting up a display illustrating the Private Lands and WPA programs. Handouts and brochures were provided.

7. Other Interpretive Programs



During April, the District provided over 200 National Wildlife Week packets to area schools. ROS Bruesewitz and Erickson presented Earthday programs to Litchfield and Willmar elementary students.

In September, ROS Erickson developed and staffed several exhibits at "Prairie Pothole Day", a huge outdoor fundraising fair put on by the Prairie Pothole Chapter of the Minnesota Waterfowl Association. Over 4,000 people viewed the exhibits which included collecting and identifying aquatic invertebrates and displays on nesting structures and wetland restorations.

District staff gave several talks to various sportsmen's clubs. Although the main thrust of the presentations was to enlist the clubs' support and financial assistance for wetland restorations under the Service's "Partners for Wildlife Program", these meetings also provided the opportunity for an exchange of information. Lengthy, in-depth discussions on Service programs and wildlife-related issues often ensued. Through these meetings and the highly-visible positive results of our cooperative restoration projects, excellent public relations are maintained with these community groups.

The District is participating in a coalition of natural resource agencies, private conservation groups, and municipal departments in establishing an environmental learning facility on the Kandiyohi County fairgrounds in Willmar, Minnesota. Currently, the coalition is renovating a log structure which will be used by coalition members, educators, and students for environmental education.

8. Hunting

All of the District's WPAs are open to public hunting. All hunts are in accordance with applicable State regulations and seasons with no special Federal permits required. WPAs generally receive heavy hunting pressure, particularly during pheasant season and deer seasons.

Ring-necked Pheasant

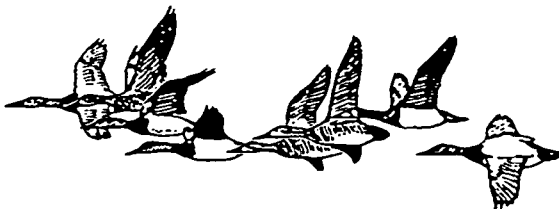
Pheasant numbers may have been up slightly compared to last years low levels. Despite promising pheasant season predictions by MN-DNR biologists, hunter success was low.

White-tailed Deer

Many of the District's WPAs provide excellent cover in areas of intensive agriculture and receive heavy use from archery and shotgun slug hunters. Success is generally good, but many whitetails respond to heavy hunting pressure by moving into wet, cattail-choked marshes where they become almost impossible to locate without good ice and tracking snow.

Waterfowl

Although waterfowl numbers were good, hunter success rates on WPAs were only fair. Many local birds migrated south before the waterfowl opener and long spells of warm, sunny weather delayed the movement of northern birds into the area. Lots of water and only light hunting pressure allowed the ducks that were in the area to find undisturbed marshes to feed and loaf in.



The number of Canada geese and Canada goose hunters continues to climb. Several towns and cities within the District have established refuges containing large lakes and grass loafing areas. As could be expected heavy hunting pressure occurs on the lands surrounding these refuges. Some 40-acre fields located over feeding-flight routes rent for \$1,000 or more. Although there is a considerable amount of goose production and goose use on WPAs, no firing line situations have developed.



5/94

#94-21SW

SW

Canada goose and goose hunter numbers continue to climb.

Small Game Hunting

Ruffed grouse can be found in low numbers on some WPAs in northern Kandiyohi, Stearns, and Todd counties. Squirrels and rabbits are present on most of the District's WPAs but hunting pressure is generally light.

9. Fishing

All WPAs are open to fishing; however, due to freeze-out and winter kill, populations of game species are virtually non-existent.

10. Trapping

All WPAs are open to trapping. Trapping activity continues to be down due to low fur prices.

12. Other Wildlife Oriented Recreation

Birdwatching, photography, hiking, and cross-country skiing occur on WPAs. Some people also utilize WPAs for berry and mushroom picking.

13. Camping

Camping on WPAs is not allowed.

15. Off-Road Vehicling

WPAs are closed to motorized vehicles.

17. Law Enforcement

The goal of our law enforcement program is the prevention of major violations on District WPAs and easements. We try to maintain an active presence on the resources we are charged to protect through frequent communications with neighbors and prompt detection and resolution of violations.



5/93

#93-22RB

RMB

Illegal ditch construction on a newly acquired WPA. Prompt, firm, face-to-face, contacts usually resolve initial problems and prevent others from occurring in the future.

Ownership changes in Waterfowl Production and FmHA Easement tracts are picked up by following courthouse tax records. New owners are sent registered letters informing them of the provisions of the easements. Annual letters to Waterfowl Production Easement owners thank them for their contribution to wildlife and water quality. Annual letters to FmHA owners and renters provide information on the allowable methods of weed control and attempt to gently remind them of the restrictions on land uses.

District employees check all accessible boundaries of all WPAs and recorded FmHA easements at least once a year. Signs, posts, and on-line markers are replaced or added as needed. Any problems are recorded on a copy of an aerial photograph and referred to the law enforcement officer for resolution.

Whenever possible a prompt contact is made with the parties involved. Tickets are not usually issued for minor first time violations but certified letters documenting the offense and stating that future violations will result in legal action are sent.

Incidents resolved in 1994 included: boundary disputes (3), machinery storage (1), rock dumping (2), farm trespass (5), storage of personal property (7), garbage dumping (2), tree cutting (1), and problems involving hunters disturbing WPA neighbors and their livestock (2).

Migratory Bird Treaty Act

Our lone enforcement officer checked hunters on opening weekend and periodically throughout the remainder of the waterfowl season. Because there were no major concentrations of hunters or waterfowl, the thrust of these enforcement efforts was high visibility hunter contacts. About 65 hunters were contacted. No citations were issued.

Posse Comitatus and Tax Protestors

Several tax protest and quasi-military organizations are active in portions of our District, particularly in Stearns County. We have had no serious confrontations even though some of our WPA neighbors and easement holders are members of these groups.

I. EQUIPMENT AND FACILITIES

1. New Construction

Over 450 earthen dikes were constructed on WPAs, FmHA easements, and privately-owned lands during the year. Materials used to build the dikes were taken from the immediate area, usually just upstream from the dike. Most dikes had 10-foot wide tops and 3:1 sideslopes. Average size of the dikes was about 150 feet long with 3.5 feet of fill (height). Lengths ranged from less than 20 feet to over 500 feet. Depth of fill ranged from less than 1 foot to 6.5 feet.

2. Rehabilitation

The District staff completed boundary inspections on all of the District's WPAs and FmHA Conservation Easements. Where necessary, signs and posts were repaired or replaced. Wildlife, habitat condition, and trespass observations were recorded.

Building Sites

Building sites, old trash dumps, and other problem areas were cleaned up on Tyrone Flats (Meeker) and St. Martin (Stearns) WPAs. Fifteen white enamel appliances were removed from a FmHA Conservation Easement area. The debris was buried or disposed of in accordance with State and local regulations. Any disturbed sites were seeded to grasses.

3. Major Maintenance

The maintenance shop septic system required repairs including the replacement of the septic pumps and the wiring.

4. Equipment Utilization and Replacement

The Ford tractors received regular maintenance checks and other repairs, including replacement of a blower fan motor, a battery, and repair of a fuel tank fillerneck and mounting hardware.

We stopped using the Gravely sickle-bar mower to cut parking areas and fire breaks. It required extensive and costly repairs after every attempted use. The power plant seems fine but the cutting attachment cannot handle even sparse patches of warm season native vegetation.

As the District's staff travels numerous miles on gravel roads, rocks chipping the windshields are a frequent occurrence. To avoid costly replacement of the windshields, rock chips on seven windshields were repaired.

The District took delivery of a trash plow attachment for a Truax seed drill, a utility trailer, one Chevrolet pickup, and a Honda ATV.

Transferred to other Stations: Truax 816 seed drill to DeSoto NWR; boat, outboard motor, and boat trailer to Detroit Lakes WMD; boat, outboard motor and boat trailer to Sherburne NWR; Truax 812 seed drill to Leopold WMD; pesticide sprayer to Windom WMD.

6. Computer Systems

A Dell 466/L computer system was purchased and the Regional Office transferred an IBM dot matrix printer to the Station. The Regional Office also purchased a Hewlett Packard PaintJet 300 printer for us as the first step in a proposed GIS system implementation. The color graphics in this narrative were printed with the PaintJet 300.

7. Energy Conservation

The maintenance shop and office are heated with wood. Electric heaters serve as a backup. Wood is obtained from WPAs in conjunction with application of management practices, i.e., removal of seed trees to protect established grassland, clearing of boundaries for fencing projects and removal of dead trees for visitor safety. The electrical systems are hooked up to a peak load device which reduces our electrical rate.

All gas-operated vehicles are burning an ethanol-blended fuel. By burning gasohol we can reduce our dependence on imported oil by using a product produced from renewable agricultural commodities grown in the United States. Other benefits include cleaner air from reduced carbon monoxide emissions and natural gas line de-icer.

J. OTHER ITEMS

2. Cooperative Programs

Predator Survey

The District has participated in the MN-DNR coordinated "Predator Scent Post Survey" since 1984. This population index survey is conducted each September to assess the abundance, distribution, and population trends of various mammalian predator and furbearer species including domestic dogs and cats.

The technique involves constructing numerous "stations" along road rights-of-way throughout the countryside. A station consists of a 1-meter diameter area of sifted sand with a specially processed 3 cm scent disk (the attractant) placed in the center for one overnight period. The following morning the stations are revisited and animal tracks within the circular area are identified and recorded. Although this technique does not attempt to produce hard data on actual predator populations, it does provide annual indices of populations and trends that are useful for management purposes.

The District's indices for red fox, striped skunk, raccoon, dog, and cat are similar to the state-wide indices for these species. Red fox, our major upland nest predator, appears to have peaked in 1992. Sarcoptic mange reduced their numbers in 1993 but according to 1994 indices, red fox populations appear to be on the rise again. Scent station indices for raccoon continue to rise and are setting some record highs. These trends are supported by general observations and reports from the public.

U.S. Fish & Wildlife Service, Habitat and Population Team (HAPET), Fergus Falls, Minnesota

The District participated in the annual 4-square mile waterfowl pair count. The counts are conducted on private lands, WPAs, Service easements, and county holdings on eight 4-square mile plots. The following information is determined from field checks and recorded on data cards: water levels, vegetative cover conditions, waterfowl counts, and non-game water-related species counts. The data collected by the District's personnel is forwarded to HAPET for computer entry, analysis, and final reporting. This census is used to obtain annual waterfowl population and production estimates. We have been less than pleased with the expense and results of the counts.

The District also participated in a migratory bird point count survey. The counts were conducted on WPAs with tall grass prairie habitat. The point count survey is started by identifying and selecting sample points. Census routes are then determined by using selected sample points. The observer spends 10 minutes at each point. Individual birds detected at a point are separated into two time categories-0 to 5 minutes and 5 to 10 minutes. Species, number of birds, distance from the point, and weather conditions are all recorded. The information is forwarded to HAPET for computer entry, analysis, and final reporting. This census is used to determine frequencies and averages by species and habitat.

Wetland Restoration

The District often cooperates with other agencies to restore wetlands. Ducks Unlimited provided funding for the restoration of 14 wetlands totaling over 49 acres.

The Wright County Soil and Water Conservation District received a \$7500 matching grant from the Minnesota Waterfowlers Association and the North American Waterfowl Management Plan. The District assists the SWCD with technical assistance and supplies such as sheet piling.

Cooperation by the MN Waterfowler Association allowed the District to restore a 48-acre basin on the Big Kandiyohi WPA and a 26-acre basin on private land. In each case, the MN Waterfowl Association provided a \$500 flowage easement to private landowners adjacent to the project.

The Hadley Corporation, in conjunction with the MN Waterfowler Association, contributed funds to restore four basins totaling about 150 acres on private land. One of these basins was over 100 acres and required the placement of a water control structure on a county ditch.

4. Credits

This narrative is a result of a team effort by District staff.

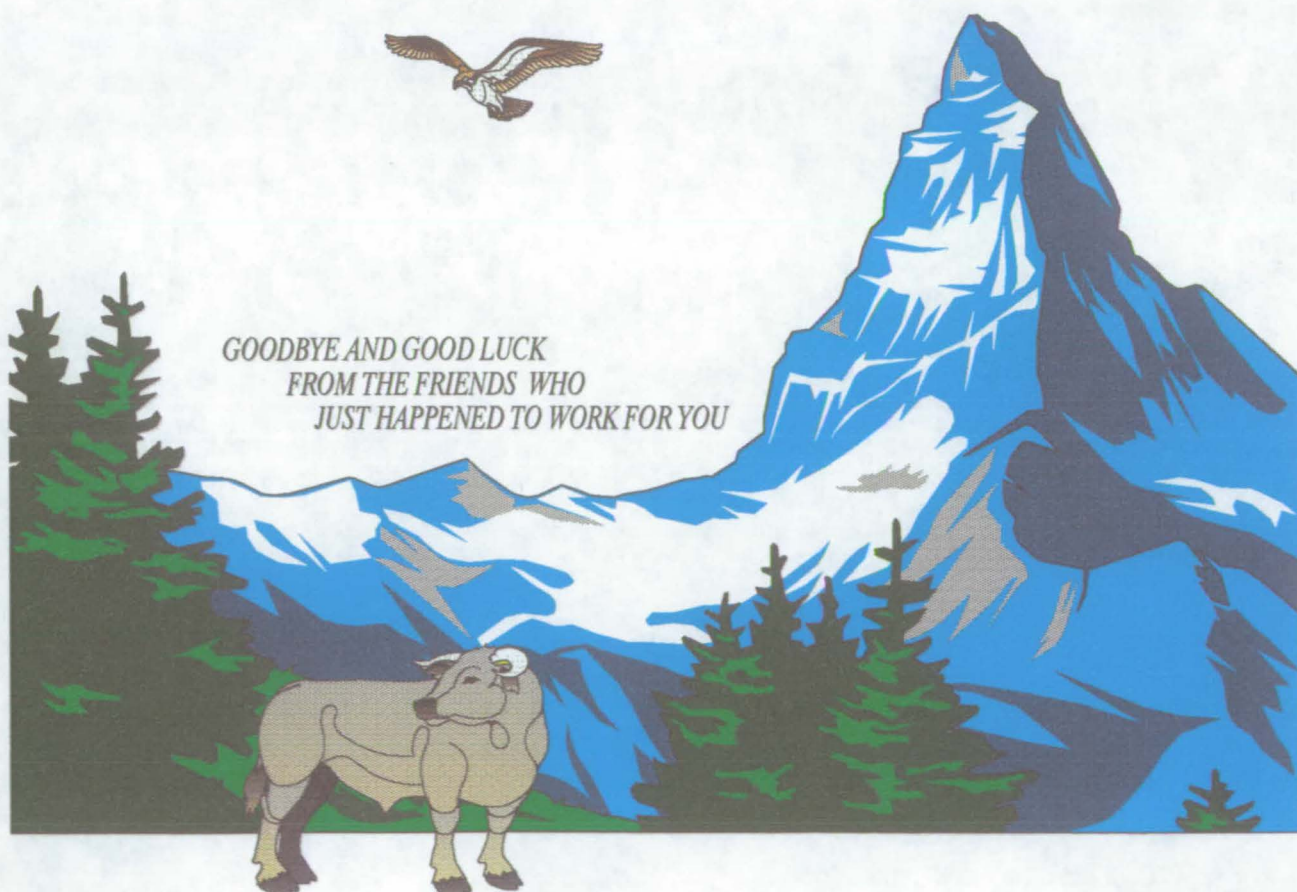
K. FEEDBACK

Impending Departures.

Project Leader Waldstein has accepted the position of Refuge Manager at Wichita Mountains NWR in Oklahoma. He will be leaving in mid-March to take up his new duties. The remaining staff will miss his integrity and dedication to the resource.

IF THE MOUNTAINS WON'T COME TO SAM

THEN SAM WILL GO TO THE MOUNTAINS!



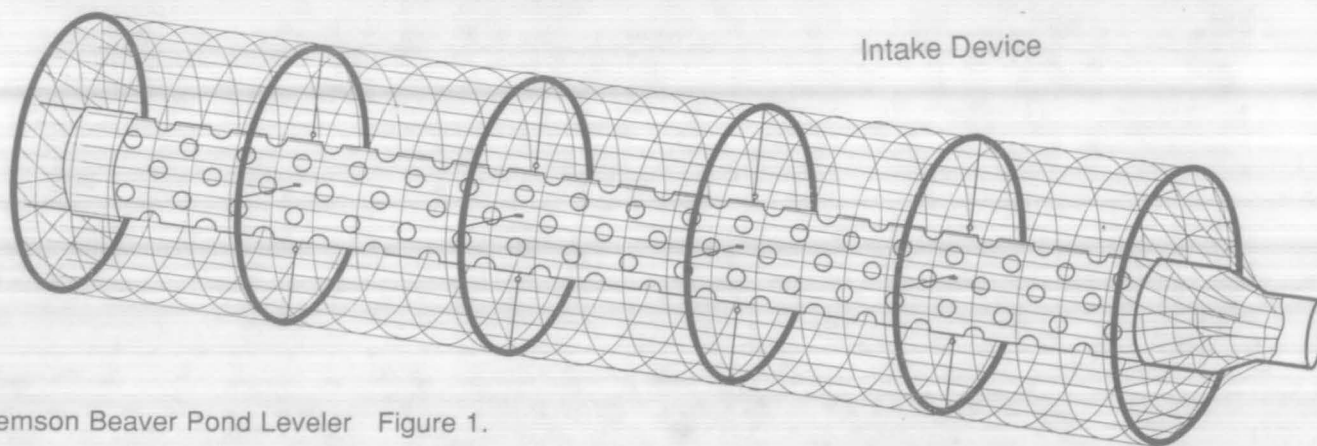
Appendix
Litchfield Wetland Management District
Calendar Year 1994

- 1. Clemson Beaver Pond Leveler**
- 2. Endangered, Threatened Species List**

The Clemson Beaver Pond Leveler



MINNESOTA DEPARTMENT OF NATURAL RESOURCES



Clemson Beaver Pond Leveler Figure 1.

The Clemson beaver pond leveler is a simple, low-cost device that allows water to flow through a beaver dam or plugged culvert. It is made largely from PVC pipe. It was developed at Clemson University in South Carolina. The Minnesota Department of Natural Resources has field tested the leveler and determined it can be very effective in reducing flooding in certain situations, such as a beaver dam built in a culvert or a dam constructed at the outlet of a small pond.

The leveler does not work all situations. The leveler is not a substitute for situations that require beaver population control. In some cases, the leveler provides the opportunity to live with, and occasionally derive benefits from the presence of beavers.

How the Leveler Works

Beavers repair dams in response to the sight, sound, and feel of running water. The Clemson leveler transports water through a dam in such a way that beavers can't see, hear or feel it and as a result, beavers don't attempt to plug the dam.

The intake device is the key component of the leveler (Figure 1). It is placed on the bottom of the pond, ditch or stream upstream from the dam (Figure 2). The intake device consists of a 10' long piece of 10" diameter PVC pipe with about 160 2" holes drilled along its length (Figure 3). The PVC pipe is suspended in the center of 30" diameter woven wire tube (the wire keeps beavers away from the pipe and therefore the source of the leak in their dam). The intake device is connected with a reducer to a section of 8" diameter PVC pipe that runs through the dam. Attached to this pipe is flexible PVC pipe

that carries water at least 20' below the dam.

Beavers usually maintain their dam after a leveler is installed but their efforts are no longer effective in controlling the water level. One Clemson leveler will handle water flows up to 1.5 cubic feet per second. This equals about 700 gallons per minute or 3 acre-feet per day.

Where the Leveler Works

The leveler works best at road culverts, beaver dams on small streams or ponds, and water level control structures. In these situations, flooding is often the result of a dam being built at a critical location rather than the presence of beavers in general. Once installed, the leveler is virtually maintenance free. The initial cost of a leveler can be recovered in months or even days, depending upon labor costs associated with repeated efforts to unplug beaver dams.

A leveler will not solve all flooding problems. The leveler is unsuited for situations when the normal water flow exceeds the capacity of one or more levelers; in large watersheds; where multiple beaver dams exist and the drop in elevation is slight; where water surges violently; or at the outlet of a lake where moving ice in the spring will damage the intake device. Likewise, a leveler may not work where there are extensive drainage ditch systems and large agricultural fields. In most beaver flooding situations, the most effective way to reduce flooding is to remove the beaver and then the dam or culvert plug.

Contact your DNR Area Wildlife Office to determine if a Clemson leveler will work for you.



How to Obtain a Leveler

You may construct a Clemson leveler intake device from the plans and specifications in this brochure with common tools and basic shop skills. Or, you may order a pre-built Clemson leveler intake device from MINNCOR Industries by using the order blank in this brochure. The installer is responsible for buying the outlet pipe and fittings to complete the installation. Materials are available through larger plumbing supply and drain tile outlets. The cost of outlet pipe hookups for most applications is \$100-140.

To Build a Leveler

The Clemson leveler consists of 2 basic parts, the intake device (Figure 1), and an outlet pipe. If you choose to construct your own intake device, carefully follow the plans and specifications in this brochure (Table 1, Figures 1 and 3). Variation from these plans and specifications will decrease the effectiveness of the Clemson leveler. If you have questions or for additional information contact the Wildlife Damage Extension Program at 218-828-2427.

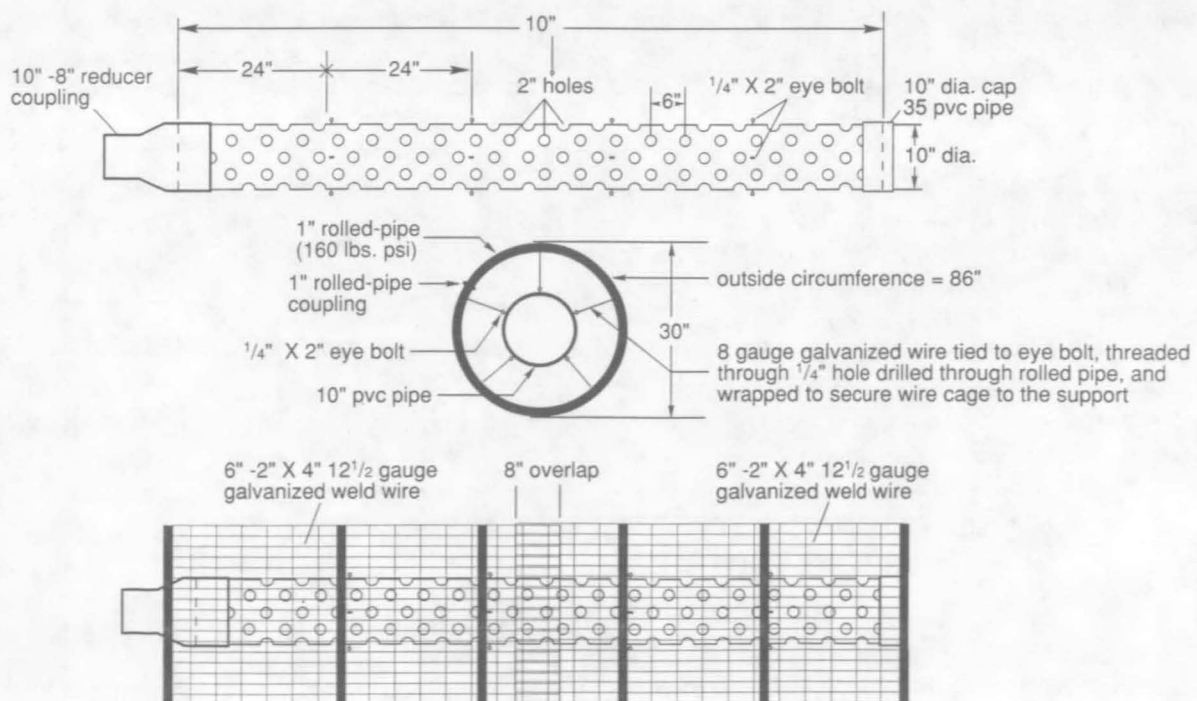
How to install a Leveler

- The three basic applications are 1) a beaver dam (Figure 2), 2) a waterlevel control structure (various applications), and 3) a plugged culvert (Figure 4). The intake device may be installed parallel to a road or dike using an elbow to connect with the outlet pipe.

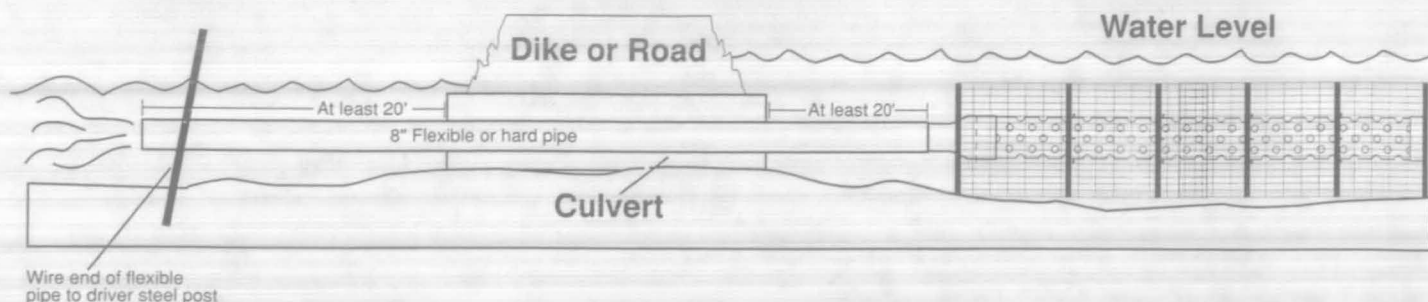
- To install the leveler in a beaver dam, open a small notch in the dam large enough to accept the outlet pipe. This is frequently easier than it appears, using a axe, mattock or ice chisel. Before installing a leveler in a culvert or waterlevel control structure, all debris must first be removed.

- Lowering of the water level 1 or 2 days before installation will make installation easier.

- The intake device should be assembled prior to delivery to the site. The completed intake device will measure about 10' long and 2 1/2' wide and will fit in a full-size pickup truck. Two people should be able to load and unload it.



Design of Intake Device Figure 3.



Typical Installation in a Road or Dike Culvert Figure 4.

- Connect the first pipe off the intake device to the leveler before placing it in the water. Use Schedule 35 8" diameter PVC pipe as the first attachment to the intake device. This comes in 10' and 13' lengths. Sections come with a male and female end that fit together; fitting is made easier by cutting out the rubber gasket.

- The intake device may be carried by 2 people or dropped from a boat. The intake device must be placed at least 20' upstream from the beaver dam, plugged culvert, or control structure, preferably in 3-5' of water. The intake device will continue to work even if it is not completely submerged.

- The intake device is placed on the bottom of the pond streambed, or ditch. In a high siltation area, the intake device maybe suspended off the bottom by wiring to steel fence posts driven into the bottom, otherwise there is no need to secure the device to the bottom of the stream or pond.

- A second piece of Schedule 35 8" diameter PVC pipe may be added if necessary. The discharge pipe is then connected to the 8" black flexible PVC outlet pipe routed through the dam, culvert, or control structure to a discharge point at least 20' downstream from the dam or culvert discharge. In culvert applications, if the beaver have not plugged the downstream end of the culvert, the outlet pipe does not have to protrude out of the culvert.

- Do not glue pipe sections together. Instead, use lag bolts (1/4" x 1 1/2") or wire pins to hold section coupling together.

- Flexible 8" black non-perforated PVC pipe comes in 20' lengths. Sections are joined with a snap coupling. Flexible pipe is attached to the PVC with either a snap coupling for flexible pipe or a rubber

collar coupling. Schedule 35 8" PVC although more expensive, may also be used as the outlet pipe.

- Avoid having a pipe coupling in the dam. When coupling occur in a culvert or control structure, make sure that joints are securely bolted together.

- To pass through control structure stop logs, either pre-cut 2 half-circles in 2 adjoining stop logs, or cut a circle to accept the 8" pipe in a stop log replacement insert.

- Flexible pipe tends to float until all air is expended. To sink the pipe either drill several small (1/16") holes in the top of the ribs or (preferably) weight down the pipe with rocks or sandbags.

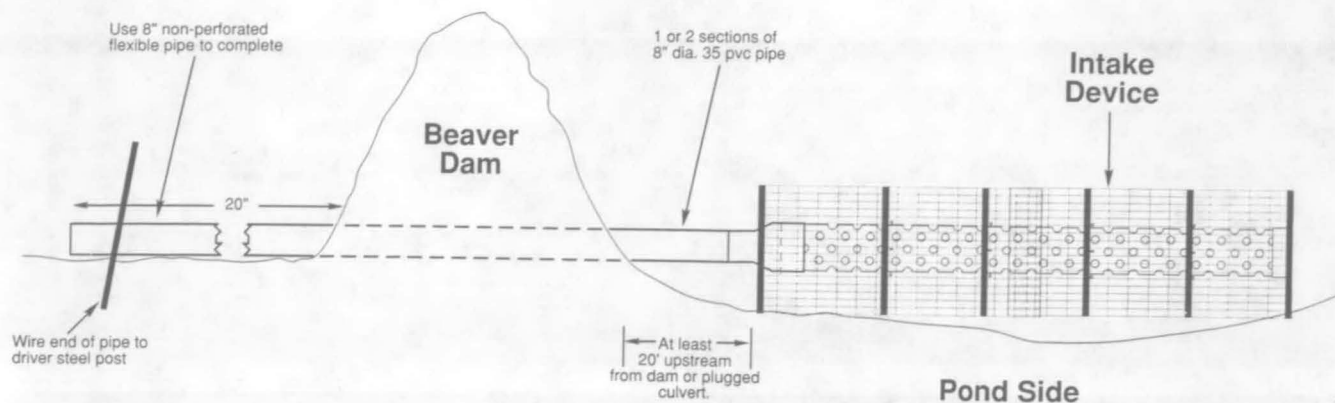
- Upstream water levels can be maintained using a variety of methods. For more information on this, contact the Wildlife Damage Extension Program at 218-828-2427.

- The outlet pipe should discharge water on the bottom of the creek or ditch. Flexible pipe should be wired to a steel fence post driven into the stream or ditch bed.

- The following tools are required for installation:

- cordless drill and bits (1/16", 1/8" and 1/4")
- socket wrench and ends, or open and box end wrenches
- slip-joint pliers
- wire cutter
- saw to cut pipe (cross-cut saw)
- maul, sledge hammer or post driver
- wire (14 ga. or larger)
- mattock, pickaroon, ice chisel or pulaski
- axe
- leather gloves are recommended





Typical Installation in a Beaver Dam. Figure 2.

Table 1. Materials List for Intake Device

Quantity	Item
1.....	10' section, 10" dia. PVC pipe (Schedule 35)
1.....	PVC cap for 10" dia. PVC pipe (Schedule 35)
1.....	10" x 8" PVC pipe reducer coupling (Schedule 35)
6.....	86" sections, 1" dia. plastic roll pipe (water pipe)
6.....	1" nylon couplings for roll pipe
30.....	1/4" x 2" galvanized eyebolts
30.....	1/4" galvanized nuts
30.....	1/4" galvanized flat washers
30.....	1/4" galvanized lock washers
30.....	16" sections, 8 ga. galvanized wire (medium hardness)
2.....	96" sections, 2" x 4" 12 ga. galvanized welded wire
.....	"C" fasteners or hog rings

The above materials are required to assemble the intake device for the Clemson Beaver Pond Leveler.

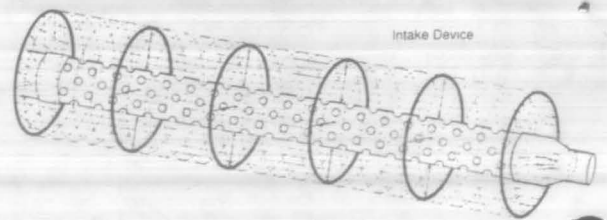


This information is available in an alternative format upon request.

© Copyright 1994, State of Minnesota, Department of Natural Resources.

Equal opportunity to participate in and benefit from programs of the Minnesota Department of Natural Resources is available to all individuals regardless of race, color, creed, religion, national origin, sex, marital status, status with regard to public assistance, age, sexual orientation or disability. Discrimination inquiries should be sent to MN-DNR, 500 Lafayette Road, St. Paul, MN 55155-4031; or the Equal Opportunity Office, Department of the Interior, Washington, D.C. 20240.





ORDER FORM

CLEMSON BEAVER POND LEVELER INTAKE DEVICE

Name: _____

Organization/Agency: _____

Address: _____

P.O. Box: _____

City/State: _____

Zip Code: _____

Phone: _____

Quantity	Amount
_____ Clemson Beaver Pond Leveler Intake Device	_____ @ \$250 ea.

_____ Purchase Order
_____ Check or Money Order * (U.S. Funds)

* Orders from non-government entities must be accompanied with a check or money order drawn from a U.S. bank. C.O.D. and credit orders cannot be accepted.

Units may be picked up at M.C.F. Moose Lake, or shipped F.O.B.. For shipping information, call 612-627-6030 or 1-800-MINNCOR (646-6267).

Cut along the dotted line, fold, place in an envelope and mail to:

MINNCOR Industries
2855 Anthony Lane South
Suite 200
St. Anthony, MN 55418

Postmaster will not deliver without correct postage.

b. Federal Species

The 30 Federally-listed species that are located (or potentially located) within the District are given below.

Birds		
Scientific Name	Common Name	Status
<u>Falco peregrinus anatum</u>	American peregrine falcon	endangered
<u>Haliaeetus leucocephalus</u>	American bald eagle	threatened
<u>Chlidonias niger</u>	Black tern	candidate
<u>Lanius ludovicianus</u>	Loggerhead shrike	candidate
<u>Dendroica cerulea</u>	Cerulean warbler	candidate
<u>Ammodramus henslowii</u>	Henslow's sparrow	candidate
<u>Accipiter gentilis</u>	Northern goshawk	candidate

Butterflies		
Scientific Name	Common Name	Status
<u>Phyciodes batesi</u>	Tawny crescent butterfly	candidate
<u>Hesperia dacotae</u>	Dakota skipper	candidate
<u>Oarisma powesheik</u>	Powesheik skipper	candidate
<u>Speyeria idalia</u>	Regal fritillary	candidate

Plants		
Scientific Name	Common Name	Status
<u>Platanthera praeclara</u>	Western prairie fringed orchid	threatened
<u>Lespedeza leptostachya</u>	Prairie bush clover	threatened
<u>Cirsium hillii</u>	Hill's thistle	candidate
<u>Eleocharis wolfii</u>	Wolf's spike-rush	candidate
<u>Juglans cinerea</u>	Butternut	candidate
<u>Woodsia oregana</u>	Oregon woodsia	candidate
<u>Agalinis auriculata</u>	Eared gerardia	candidate
<u>Poa paludigena</u>	Bog bluegrass	candidate
<u>Carex bicknellii</u> var <u>opaca</u>	Bicknell's sedge	candidate

Reptiles		
Scientific Name	Common Name	Status
<u>Emydoidea blandingii</u>	Blanding's turtle	candidate
<u>Graptemys pseudogeographica</u>	False map turtle	candidate

Fishes		
Scientific Name	Common Name	Status
<u>Acipenser fulvescens</u>	Lake sturgeon	candidate
<u>Polyodon spathula</u>	Paddle fish	candidate

Mammals		
Scientific Name	Common Name	Status
<u>Felis concolor schorgeri</u>	Eastern cougar	candidate
<u>Canis lupus</u>	Gray wolf	threatened
<u>Spilogale putorius</u>	Spotted skunk	candidate
<u>Lynx canadensis</u>	Canada lynx	candidate

Mussels		
Scientific Name	Common Name	Status
<u>Alasmidonta marginata</u>	Elktoe	candidate
<u>Quadrula fragosa</u>	Winged mapleleaf mussel	endangered

COMMENTS

Don Bullen 4/14/95	Your wetland restoration efforts remain beyond praise. What a legacy to leave. An excellent narrative beautiful photos, well written
Dan Stinnett 4/28/95	What fun! Magnificent accomplishments from a staff that has enjoyed the highlights of a biologist's career. We must learn from success stories like Litchfield to achieve agency mission and employee satisfaction. Thanks
Allyt Kendall 5.1.95	Hi to a great crew. Glad I was a part of it! Your RESTORATION work sets a high standard. (u)
Jim Rymer	The Quality of your narrative is only exceeded by the quality of the work you do. I'm sure that your PE restorations was once again tops in Reg 3. When 277 determination
5/3/95	appeals are 100% agreed upon your relationships w/ SES is great. Sounds like the same positive relationships w/ counties + townships. You are truly amazing folks. My only suggestion is to push the substandard in pond 67 deeper. No duck will even consider nesting in a Chevy that far out of water!