

REVIEW AND APPROVALS

VALENTINE NATIONAL WILDLIFE REFUGE

Valentine, Nebraska

ANNUAL NARRATIVE REPORT

Calendar Year 1991

 3/9/93
Refuge Manager Date

Refuge Supervisor Review Date

Regional Office Approval

Date

INTRODUCTION

Valentine National Wildlife Refuge (NWR) was established August 4, 1935, pursuant the Migratory Bird Conservation Act by Executive Order 7142 "as a refuge and breeding ground for migratory birds and other wildlife." The refuge is part of a complex administered from Fort Niobrara NWR.

Valentine NWR lies in the heart of the Nebraska Sandhills; a unique region which contains the largest remaining stands of mid and tall native prairie in North America. Of the 71,516 acres in the refuge, approximately 49,000 acres are grassy, undulating sand dunes; 10,000 acres are shallow lakes and marshes; and 13,000 acres are sub-irrigated meadows. The total acreage provides habitat for migrating and nesting waterfowl, other migrating birds and native/resident wildlife. The refuge headquarters is located on Hackberry Lake, 18 miles south of Valentine, Nebraska, on U.S. Highway 83 and 13 miles west and south on State Spur 16B.

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A. HIGHLIGHTS

- D.5 Dr. Henry Sather author of WILDLIFE MONOGRAPH #2 returned to Valentine NWR after 34 years.
- E.7 A "heat burst" was experienced on June 25th.
- D.5 Biological diversity study initiated within the Ft. Niobrara-Valentine NWR Complex by the National Ecological Research Center.
- G.10a. Prairie chicken breeding population continued upward population tread.

B. CLIMATIC CONDITIONS

A weather station has been maintained at Hackberry Headquarters in cooperation with the National Weather Service for the past 54 years. Monthly observations for 1991 are summarized in Table 1 and historic annual precipitation in Figure 1. The effects of eight years of above average annual precipitation (1981-88) followed by the driest year on record (1989) are still obvious during 1991. However, net moisture (annual precipitation minus net evaporation) was extremely low in both 1988 and 1989 (Figure 2); and with the exception of May and June, 1991 was another dry year. Total precipitation for 1991 was 22.30 inches with the highest amount of precipitation received in May - 5.44 inches. Net open-pan evaporation during April- September was 24.54 inches resulting in a negative balance of 2.24 inches net moisture for the year (Figure 3).

Winter weather was relatively mild as were summer temperatures which resulted in good conditions for survival of wildlife populations and growth of native vegetation.

Table 1. 1991 Weather records - Valentine NWR.

Month	Inches	Inches	Inches	Temp. (°F)		Historic Record Temp			
	Precip.	Snow	Evap.	Min.	Max.	Low	Year	High	Year
JAN	.20	4.5	N/A	-6	55	-38	1894	70	1974
FEB	.59	5.0	N/A	1	64	-37	1899	76	1982
MAR	1.82	14.0	N/A	4	75	-28	1948	87	1946
APR	1.95	N/A	1.58	28	85	- 8	1936	96	1980
									1989
MAY	5.44	-	1.25	28	86	17	1909	102	1934
JUNE	4.39	-	3.82	53	94	30	1887	107	1937
							1969		
JULY	1.49	-	7.11	51	102	38	1971	111	1990
AUG	2.32	-	6.36	55	99	34	1935	108	1937
									1938
									1947
SEP	1.12	-	4.42	28	95	12	1926	103	1952
OCT	1.45	-	N/A	4	91	- 6	1925	96	1922
NOV	1.53	12.0	N/A	-1	67	-36	1887	82	1941
									1965
DEC	-	-	N/A	1	56	-34	1907	76	1936
TOTAL	22.30	35.5	24.54						

* Average annual precipitation for Valentine NWR Weather Station is 20.46 inches for the past 47 years; evaporation is the net open-pan evaporation.

ANNUAL PRECIPITATION - VALENTINE NWR

(1945 - 1991)

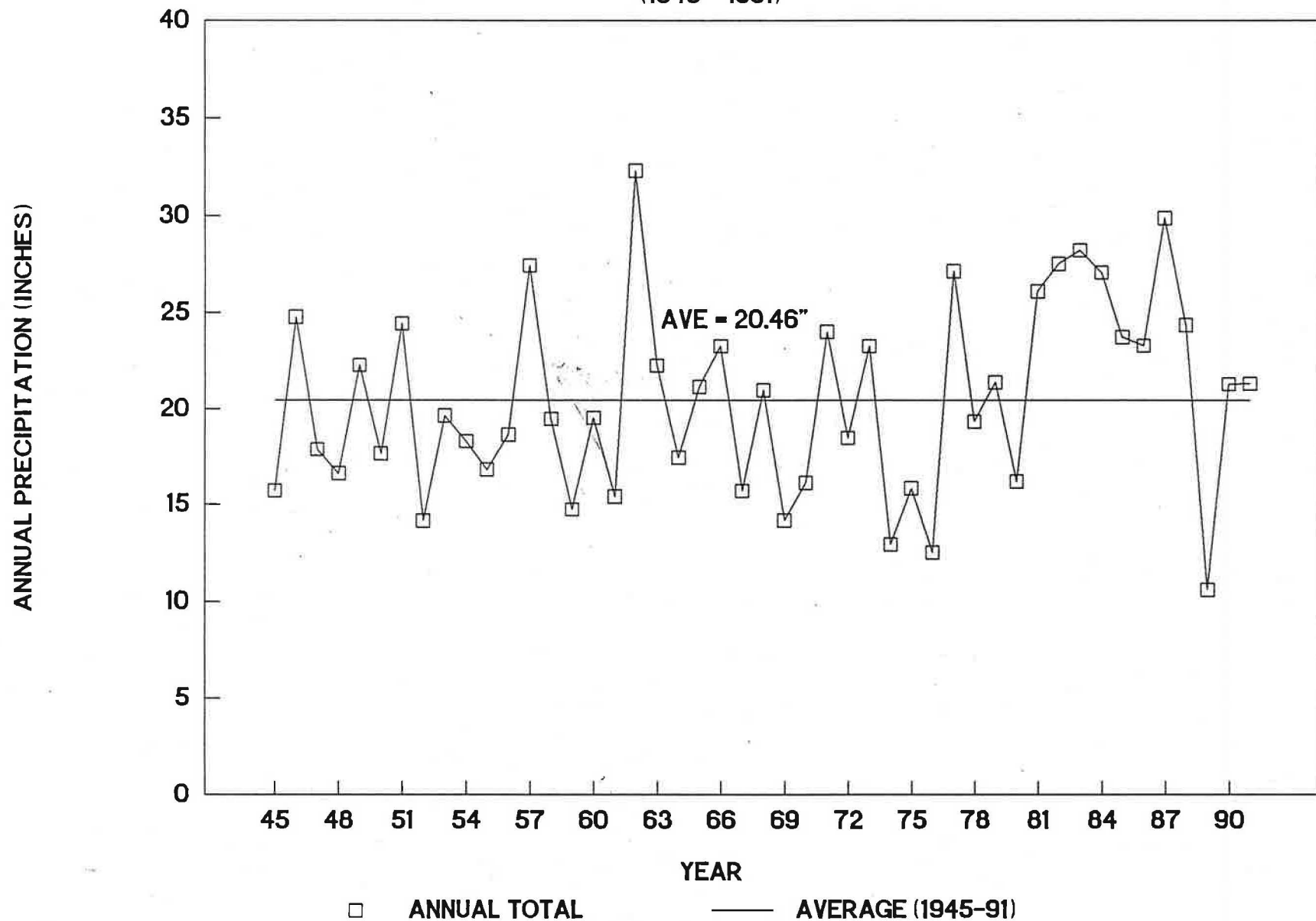


Figure 1.

HISTORICAL NET MOISTURE & PRECIPITATION

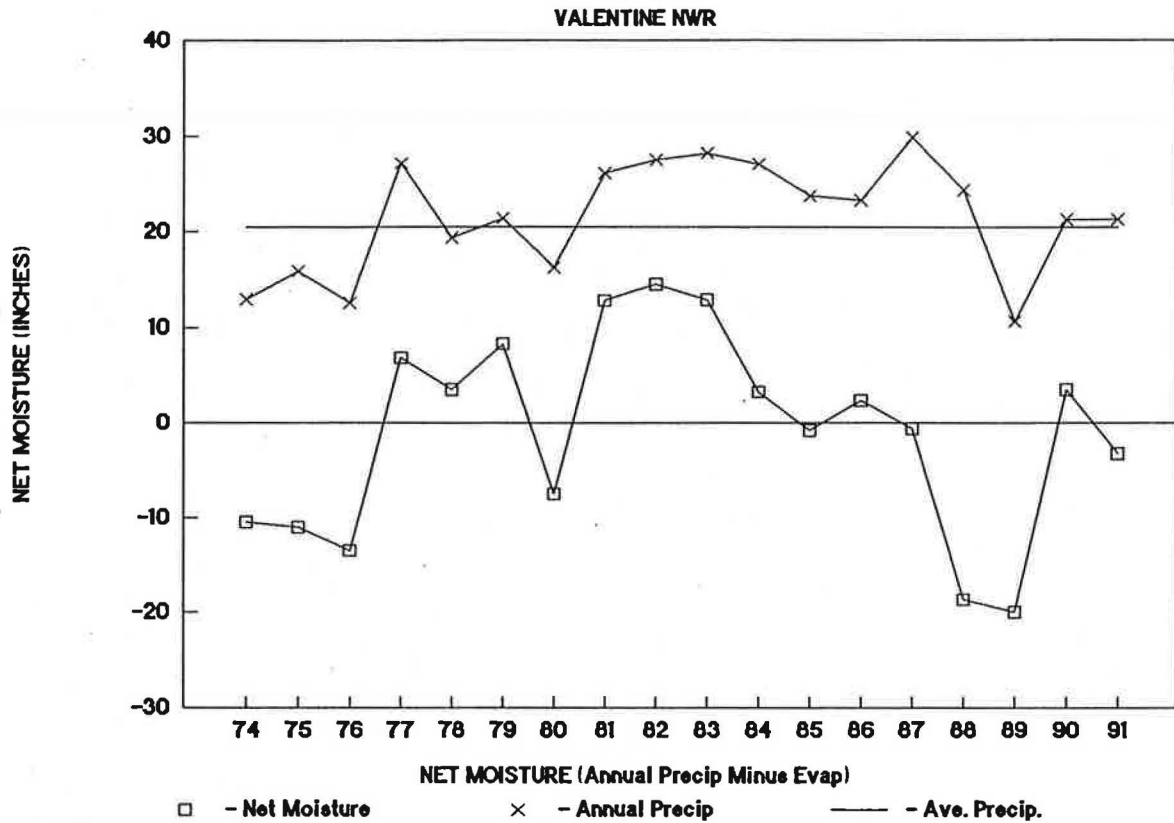


Figure 2.

1991 MONTHLY NET MOISTURE

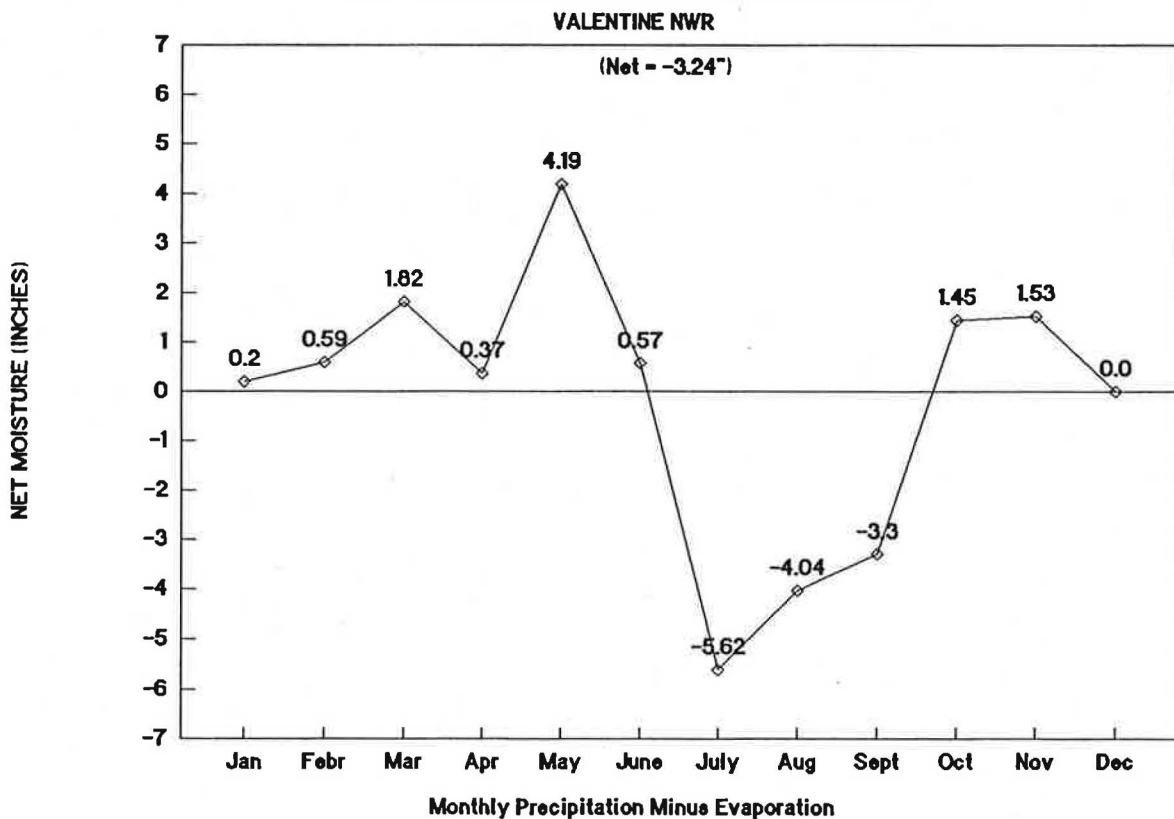


Figure 3.

C. LAND ACQUISITION

1. Fee Title

The Tower Property, a former FmHA easement, was transferred to the Fish and Wildlife Service this year. The 480 acre area is an excellent addition and will be either a wildlife management area or a waterfowl production area. Activities on the area are described in section F-13 of this report.

3. Other

State Senator Lamb has introduced a bill in the legislature to sell all school lands in the State of Nebraska. Some of these lands contain wetlands and one section would be a nice addition to Valentine NWR. No action was taken on this bill during the year.

Gene Mack, Acquisition Biologist, from Kearney visited the refuge throughout the year to get our ideas on wetland preservation in the Sandhills. Gene is preparing a plan for wetland preservation in the Sandhills area of Nebraska.

D. PLANNING

2. Management Plan

Wildlife Biologist McDaniel participated in the review of the Refuge portion of BEST at the Rocky Mountain Arsenal in Denver and in cooperation with FWE-Grand Island completed a Contaminant Monitoring Plan for Valentine NWR.

4. Compliance with Environmental and Cultural Resource Mandates

The museum property survey was completed. Quite a few items that may be museum property were counted including bullets, sabres, bottles, a rifle, and other items from old Ft. Niobrara. At Valentine, the only articles of interest were old CCC records and photos.

Section 7 Consultations for the hunting programs at Valentine NWR were reviewed. The only change in the hunting program for the year was the addition of a muzzle loading deer season in December. Hunting programs are listed in the public use section. Endangered species considered were the bald eagle, peregrine falcon, least tern, whooping crane, and piping plover.

5. Research and Investigations

In May, Dr. Henry Sather, author of WILD MONO #2 re: muskrats on Valentine NWR, and his family (two daughters and husbands, all of which are biologists) spent nearly a week on Valentine NWR checking up on the muskrats' progress since the early 1950's. Historical rat-house count information was provided to Dr. Sather as well as scanty information re: "Tizzer's Disease" documented during muskrat declines. The occasion was documented by Nebraska Public Television.

Hatching physiology field experiments of painted turtle nests conducted by Drs. M. and G. Packard and Dr. K. Miller were continued re: testing if environmental conditions or genetics influenced the size of hatchling painted and snapping turtles. Fifteen nests were protected from predatory mammals, including pocket gophers, via enclosing them in wire mesh. The nests also were "wired" to record temperature and water potential during the incubation period. Eight of the 15 nests were still destroyed by mammalian predation (four by a very persistent badger and four by pocket gophers or other burrowing animals). The nests were excavated on August 14 and the eggs taken to the laboratory for the final days of hatching/weighing of hatchlings. The field experiments were similar to the previous laboratory tests in that smaller sized hatchling turtles were hatched in drier, warmer substrates while the larger hatchlings were from wetter, cooler substrates. This was true both within nests as well as among nest sites.

A biological diversity study was initiated within the Ft. Niobrara-Valentine NWR Complex under the direction of Dr. Mike Bogan, Curator and

Chief, National Ecological Research Center (NERC), Ft. Collins, CO. On October 22, a Progress and Evaluation Meeting on Biological Surveys of Ft. Niobrara-Valentine NWR Complex was held at Ft. Niobrara NWR. In attendance were M. Bogan, B. Bury and J. Sedgwick - from NERC; R. Rauch, J. Cornely and W. King from the Regional Office; B. McCue - FWE; W. Stancill - Valentine FAO and Len McDaniel, Kathy McPeak, Bob Ellis, and Mark Lindvall from the refuge staff.

Graduate student Anderson, University of Nebraska-Omaha, completed his M.S. thesis field work re: breeding bird populations on short-duration grazed grasslands on Valentine NWR v.s. privately grazed grasslands adjacent to the refuge.

Biological Diversity Study of Valentine and Ft. Niobrara NWRs.

The National Ecology Research Center, Ft. Collins, began a 2-year research effort to develop and verify vertebrate data bases for Valentine and Ft. Niobrara Refuges. The intent of the research is to provide us with the information necessary to manage for "faunal integrity"; i.e., managing for species that were part of a naturally evolved ecosystem rather than for invading species (either natives or exotics) in an altered landscape.

Objectives:

1. To the extent possible, using historic accounts and photographs, summarize vegetation that existed prior to landscape alterations initiated by European settlers (circa 1850) and vegetation trends since then, including a current summary of refuge habitats. End Products: maps and written summary of historic vegetation and significant changes up to the present.
2. Compile a database of all vertebrates (including fish) that historically inhabited the refuge area and those believed to live there today. End Products: lists of fish, amphibians, reptiles, birds, and mammals inhabiting the refuge historically and at present.
3. Conduct a biological survey of the refuge to confirm the presence or absence of those species defined in Objective 2 (excluding fish). The surveys will permit an evaluation of the refuge as a preserve representing the faunal integrity of the region. They also will provide information on relative abundance of species, which will facilitate monitoring future trends in biological diversity. End Products: maps and lists of vertebrates that occur on, have been extirpated from or have invaded, the refuge.
4. Prepare a final report that uses the above information to (a.) compare how well the current fauna of the refuge represents the native vertebrate assemblage that was present in the area circa 1850; (b.) identify changes in vegetative associations, management actions, or other regional phenomena that may have caused extirpation or invasion

of species; and (c.) suggest actions to restore or enhance the native fauna. Appendices (hard and electronic copies) will include an annotated bibliography of all pertinent references, both published and unpublished; current and complete listings of herptiles, birds, and mammals occurring on the refuge, both historically and at present; vegetation summaries for the refuge area; and costs per unit effort for the surveys as a guide for future work.

E. ADMINISTRATION1. Personnel

Figure 4. 1991 Staff Members

ME-VAL-3106

Standing: 1, 4, 9, 7, 11, 8, 12, 3, 10.

Sitting: 13, 14, 5

1.	Robert M. Ellis	Refuge Manager	GM-13	PFT	XXX
2.	Vacant	Deputy Refuge Manager	GS-12	PFT	XXX
3.	Leonard L. McDaniel	Wildlife Biologist	GS-11	PFT	X
4.	James L. Sellers	Supvy Refuge Opns Spec	GS-11	PFT	XXX
5.	Mark L. Lindvall	Refuge Opns Spec	GS-11	PFT	XXX
6.	Kathleen M. McPeak	Refuge Opns Spec	GS-09	PPT	XX
7.	Larry E. Vaughn	Biological Tech.	GS-08	PFT	X
8.	Mark V. Purdy	Engrng Equip Optr	WG-10	PFT	XXX
9.	David F. Kime	Maintenance Worker	WG-08	PFT	X
10.	William L. Turner	Maintenance Worker	WG-08	PFT	XX
11.	Glen H. Beman	Maintenance Worker	WG-08	PFT	XX
12.	Casey G. McPeak	Maintenance Worker	WG-08	PFT	X
13.	Mary L. Ayers	Refuge Assistant	GS-06	PFT	XXX
14.	Kristen A. Kesterson	Office Auto. Clerk	GS-04	PFT	XXX
15.	Roger S. Foster	Range Technician	GS-06	TFT	XX
16.	Dean N. Mostad	Range Technician	GS-05	TFT	X
17.	Richard I. Sterry	Range Technician	GS-05	TFT	X
18.	Terry L. Nelson	Range Technician	GS-04	TFT	XX
19.	Todd A. Eichenberger	Range Technician	GS-04	TFT	X
20.	Kevin R. Kvame	Range Technician	GS-04	TFT	XXX

21.	Jeffrey J. Fields	Range Technician	GS-04 TFT	XXX
22.	Alan J. Kasper	Range Technician	GS-04 TFT	XXX
23.	William W. Waln	Range Technician	GS-04 TFT	XX
24.	David E. Prasch	Maintenance Worker	WG-06 TFT	XX
25.	Tim H. Langston	Range Aid	GS-02 TFT	X

X PRIMARY WORK SITE VALENTINE NWR, SECONDARY FT. NIOBRARA NWR
 XX PRIMARY WORK SITE FT. NIOBRARA NWR, SECONDARY VALENTINE NWR
 XXX PRIMARY WORK SITE COMPLEX HEADQUARTERS

The complex worked closely with Regional Office Personnel getting the drug testing criteria completed for those individuals selected for Range Aid/Technician (Firefighter) positions.

Dean N. Mostad was hired as a Range Technician, GS-5 on March 7, 1991. Dean had worked for the National Marine Fisheries Service in San Diego, CA, where he was a tuna and porpoise observer. Dean also worked for the Long Lake NWR in Moffit, ND as a Volunteer until October 1990. Dean has a BS in Fisheries and Wildlife Biology. Dean resigned effective September 9, 1991 to seek permanent employment in his home state of North Dakota.

Terry L. Nelson reported to duty as a Range Technician, GS-4, effective March 10, 1991. Terry is a self-employed rancher in Sparks, NE. Terry's employment was terminated due to lack of work on November 2, 1991.

Todd A. Eichenberger was rehired as a Range Technician, GS-4, effective March 10, 1991. Todd worked for the Ft. Niobrara-Valentine NWR Complex as a Range Technician, GS-4 from May-August 1990. Todd is a student at the Chadron State College, Chadron, NE. Todd resigned effective August 23rd to return to college at Chadron State College in Chadron, NE.

Kevin R. Kvame was rehired as a Range Technician, GS-4, effective March 10, 1991. Kevin also worked last April-October 1990 for the complex as a Range Technician. Kevin is a student at the Sinte Gleska College in Rosebud, SD. Kevin's employment was terminated due to lack of work effective November 2, 1991.

Jeffrey J. Fields came from Tilden, NE. He was hired as a Range Technician, GS-4, effective March 18, 1991. He received his BS in Natural Resources from the University of Nebraska in May 1990. He had previously worked for the Alaska State Parks in Homer, Alaska as a Ranger Assistant. Jeffrey's employment was terminated effective November 2, 1991 due to lack of work.

Tim H. Langston was hired as a Range Aid, GS-2, effective March 24, 1991. Tim was a resident of North Platte, NE until he moved to Valentine in December 1990. Tim resigned effective August 17th to attend school at the Norfolk Community College in Norfolk, NE.

Richard I. Sterry from Presho, SD was hired as a Range Technician, GS-5,

effective March 24, 1991. Rich received his BS in December 1986 in Wildlife Management. Rich has work experience with the Nebraska Game & Parks Commission as a wildlife researcher. Rich's employment terminated effective November 2, 1991 due to lack of work.

Roger S. Foster was rehired effective March 24, 1991, as a Range Technician, GS-6. Roger had worked previously for the Ft. Niobrara-Valentine NWR Complex in 1986, 1988, 1989, and 1990, in the capacity of a Range Technician. Roger's employment was terminated due to expiration of appointment effective November 16, 1991.

Patricia A. Schemmer, Clerk Typist, resigned effective April 12, 1991. She accepted a job with the Keyapaha-Cherry County Developmental Services in Valentine. Her new position enables her to use her Art degree more fully.

Alan J. Kasper from Brookings, SD was hired effective April 1, 1991, as a Range Technician, GS-4. Alan reported to work on April 1 to complete his personnel paperwork and then returned to Brookings that evening. Alan worked intermittently until his spring 91 semester was completed, then he worked full time. Alan's major field of study at SD State University is Wildlife and Fisheries Science. Alan resigned effective August 24th to return to college in Brookings, SD.

Kristen A. Kesterson was hired under a 30 day special needs appointment as a full time Office Automation Clerk, GS-4. Kristen is working on her M.S. in Agricultural Economics and is married to a local veterinarian. Effective July 14, 1991 Kristen's appointment was converted to Career Conditional.

Maintenance Worker McPeak was converted from seasonal full time to permanent full time effective May 5, 1991.

William (Bill) W. Waln of Kilgore, NE reported for work on May 20 as a Range Technician (Firefighter). Bill has previously worked for the complex in a Range Technician (Firefighter) position during 1988, 1989 and 1990. Bill's appointment expired effective November 2, 1991.

David E. Prasch was hired as a Maintenance Worker WG-6, effective April 26, 1991. David's job during the school year is physical education teacher for the 6th, 7th, and 8th grades in the Valentine Middle School. David resigned effective August 21st to resume his permanent job with the Valentine school system.

A new employee orientation program was presented to the Range Aid/Technicians (Firefighter) on March 28.

The certificate for the Fire Management position for the Ft. Niobrara-Valentine NWR Complex was received. Candidates were interviewed and recommendations were submitted to the Regional Office.

John Segar of the National Park Service from Tupelo, Mississippi was selected for the Fire Management Officer for the Ft. Niobrara-Valentine NWR Complex. He is scheduled to report to duty in February 1992.

2. Youth Programs

This is the 16th year that the Ft. Niobrara-Valentine NWR Complex has operated a Youth Conservation Corps (YCC) program. The 8 week program ran from June 3 through July 26, 1991. Recruiting activities accomplished in March included a press release, radio interview, periodic announcements at Valentine High School, and slide/talk presentations to ~125 Valentine High School students. Seventeen applications (9 male, 8 female) were received with 3 males and 3 females chosen by a lottery drawing to participate in the program.



Figure 5. 1991 YCC crew and work leaders. (KMM)

NE-VAL-3107

The 1991 program was coordinated by Refuge Operations Specialist K. McPeak and work crews were supervised by Seasonal Firefighters Fields and Kasper. Assistance and periodic crew supervision on various projects were provided by other permanent and seasonal staff. Work crews ranged in size from 1 to 6 enrollees depending upon the project and availability of work leaders. Enrollees were rotated as often as possible to provide a diverse work/learning experience.

Twenty-five major projects were accomplished by the YCC this summer. Forty-two percent of their time was spent on public use facilities, 25% on biological/environmental education, 12% on administrative facilities, 9% on grazing facilities, 7% on habitat improvement, and 5% on

administration. Improving and maintaining the public use facilities on both refuges was a never ending job. Enrollees assisted with the installation of Geoweb supported crushed rock canoe launch sites. They completed the annual maintenance of the Ft. Falls Nature Trail, wilderness area river access and the parking lots at Valentine fishing lakes. Litter patrol was accomplished twice a week. These projects provided a good lesson on how public use affects the refuges.



Figure 6. YCC crew working on the canoe launch sites.
(KMM)

ME-VAL-3/08

Environmental education was an important part of all work projects. At least one project a week was accomplished solely for environmental education. For example, enrollees captured and banded Canada geese. They also conducted wildlife surveys and range transects. Big game management was discussed and demonstrated during a bison roundup. The Valentine Fisheries Assistance Office gave the enrollees a demonstration on fishery biology and management. The crew spent a day touring LaCreek NWR and assisting its YCC with a small work project. Enrollees floated the Niobrara River twice to cleanup trash and a talk on the controversial wild and scenic river designation was given.



Figure 7. Valentine FAO conducted a fisheries technique demonstration for YCC participants. (KMM)

Other projects completed by the YCC included clearing vegetation along a horse trail, mulching a blowout, cleaning autogates, posting the boundary and picking leafy spurge.

The YCC program is an asset to the Ft. Niobrara-Valentine NWR Complex and fosters good public relations in the community. For enrollees, the program is an introduction to job expectations and work ethics as well as an opportunity to learn more about the refuges.

4. Volunteers

In FY-91, 9 local volunteers contributed 456 hours of service to Ft. Niobrara and Valentine NWR's.

No Student Conservation Association (SCA) volunteers were recruited for this year.

Ronn McDaniel assisted a "frantic" refuge fisherman (who could only talk with a mechanical device) obtaining emergency hospitalization for his fishing partner. The victim was a diabetic and was unconscious at the time he arrived at Hackberry Headquarters. Since it was not known whether or not the victim's condition was due to lack of or too much insulin in his blood, he was rushed to the Valentine Hospital. Peg McDaniel alerted the physician and hospital that the victim was enroute.

The victim recovered after blood testing and a shot of insulin--then returned to the refuge to continue fishing.

Volunteers Afton Ellis, Peggy McDaniel, and Betty Sellers, throughout the year maintained radio and telephone communications during wildfire suppression activities.

Volunteer Annie Kime assisted in keeping an eye out for potential violators during deer season on the Valentine NWR.

5. Funding

The funding base for the year continues to erode. We were short of funding in the base operations and maintenance but still completed most projects thanks to the funding in the fire management accounts. The fire crew's assignments to refuge collateral duties continues to keep most of our projects on schedule.

Table 2. Funding Status, Ft. Niobrara-Valentine NWR Complex

<u>Fiscal Year</u>	<u>Operations</u>	<u>Maint.</u>	<u>Flex</u>	<u>Sales</u>	<u>YCC</u>	<u>Farm Bill</u>
1992	312,000	168,000	197,000	60,000	7,000	5,000
1991	312,000	168,000	71,000	55,000	9,300	1,100
1990	305,000	173,000	64,000	65,000	13,500	1,100
1989	439,900			65,000	16,000	
1988	468,400			65,000	16,000	
1987	469,000			65,000	16,000	
1986	452,000			65,000	33,000	

Table 3. Five Year Comparison of On-Board Strength.

<u>FY</u>	<u>Permanent</u>		<u>Temporary</u>	
	<u>Number</u>	<u>Staff Days</u>	<u>Number</u>	<u>Staff Days</u>
91	14	3394.4	11	1349.84
90	13	3236.5	9	1012.25
89	14	3248	7	677.4
88	14	3441.2	6	590.0
87	14	3438.5	9	599.5

6. Safety

Safety meetings were held monthly. Films, handouts, and discussions were provided on all topics.

Chosen topics covered accidents that had occurred in past years or covered work commonly accomplished on the refuge. Topics for 1991 are given in Table 4.

Table 4. Monthly Safety Meetings 1991.

<u>DATE</u>	<u>SUBJECT</u>	<u>FILM</u>	<u>VOLUNTEER</u>
Jan 91 held 02-01-91	Ice Safety & Rescue	The Trouble With Ice	C. McPeak
Feb 91 held 03-01-91	Underground Storage Tank Closures	Closure w/o Tears	Vaughn
03-29-91	Spring Roundup		Turner
04-26-91	Good Body Health	Taking Care of Your Eyes & Jogging for Health	Beman
05-24-91	Ticks, Snakes, Spiders & Ivy	Poisonous Insects/Plants	Lindvall
06-28-91	Accident Prevention & Attitudes	Safe Side Clyde	YCC
07-26-91	Fire Tool Safety	Wildlife Hand Tools & Your Fire Shelter	Seasonal Firefighters
08-30-91	Fall Round-up		Ellis
09-27-91	Heating Systems (Friend or Foe)		K. McPeak
Oct 91 held	Promote Wellness Not		Sellers
11-01-91	Sickness		
11-22-91	Safe Winter Driving		McDaniel
12-20-91	Drugs (Good & Bad)	Know Your Enemy-Drugs of Abuse	Beman

Range Technician Kvame hit his left hand with a sledge hammer on June 20 while hammering in wooden stakes at the Cornell canoe launch site. No bones were broken but there were plenty of bruises and his hand was quite sore, stiff, etc. Kevin sought medical assistance.

A DI-134 Accident Report was completed for YCC Enrollee Heather Wilson. Heather broke out in a rash after working in a poison ivy infested area. The dermatitis was restricted to her arms and legs. She practiced good personal hygiene, used poison ivy cleanser and ointment. No medical attention was sought.

YCC enrollees Heather Wilson and Michelle Larson were struck on the back of their heads and backs by old fence lumber while taking down an old corral at LaCreek NWR. Both enrollees suffered headaches and Heather Wilson sought medical attention.

Enrollees were not wearing hard hats at the time of the accident.

One of the new Dodge trucks was damaged to the cost of \$2,600 when it hit a cow on Highway 83 just north of Valentine NWR. The cow lived! A fence was down which allowed the cow to get out on the road. There was no injury to the driver of the truck. The insurance company of the cow's owner refused to pay for damages to the government truck. The solicitors office was contacted and they advised us to write three demand payment letters to the cow's owner. If they refused to pay, the solicitor's office would then write three letters and should they still refuse to pay, the case will be referred to a justice court which may or may not file on it. The government truck was finally repaired and repairs were paid out of force account funds.

Two accidents/incidents occurred during the month of August. Tim Langston, Range Aid, attempted to lift a 15' stock tank off a trailer and strained his back. No time was lost and he did not seek medical aid. Dean Mostad, Range Technician, contacted poison ivy in July and with personal first aid eliminated it, but on the 15th of August the poison ivy broke out again. He had no lost time and did not seek medical aid other than using over the counter remedies.

Arrangements were made with the State Fire Marshall for a complete electrical and fire inspection to be done on both the Ft. Niobrara and Valentine refuges. Assistant Fire Marshall Pat Gould from the Chadron office made the inspection during the month of September. All noted deficiencies on the Nebraska State Fire Marshall's Review have been addressed or corrected. Neutralizing actions on uncorrected problems were as follows: 1) Valentine Trapper's Shack -the propane bottles were disconnected/winterized and the line will be rerouted when weather permits, 2) Valentine Flammable Cabinet - parts were purchased, and will be installed in November, 3) Valentine Quonset - barrels of oil and aviation gas were moved into corner of quonset per regulations -no room for spares in oil shed as planned.

7. Technical Assistance

Wildlife Biologist McDaniel met with Nebraska Game & Parks Land Management personnel, Ben Rutton, Mark Feeney, and Wetland Specialist Dick Gersib, on two occasions to discuss management being contemplated on Nebraska Game & Parks Wildlife Management Areas. Ballard Marsh Special Use Area was inspected and then different land use treatments were inspected on Valentine NWR. A special effort was made to show various treatments proposed by Nebraska Game & Parks personnel, on Valentine NWR, and let them make up their mind.

Wildlife Biologist McDaniel also met with Wetland Specialist Dick Gersib re: waterfowl research projects in the Sandhills.

Wildlife Biologist McDaniel met with Nebraska Game & Parks District Biologist Bill Vodenhal, and USDA-Forest Service Biologist Greg Schenbeck, to discuss summarization of the Prairie Grouse Research

Project field data collected on Halsey National Forest - this also included short review of the "piggy-back" research by Bart Prose, National Ecology Research Center.

Wildlife Biologist McDaniel discussed muskrat population history on Valentine NWR with Nebraska Game & Parks Fur Bearer/Disease Specialist Chuck McCullough. McCullough is working with Dr. Bill Clark, Iowa State University, on Tizzer's Disease. Tizzer's Disease has been documented on Valentine NWR, as well as muskrat population and harvest data, wetland evaluation and climatological information. They are interested in having a graduate student follow up on the muskrat research previously accomplished by Dr. Henry Sather and Richard Coon.

Wildlife Biologist McDaniel provided information on reptile sampling/trapping techniques to Chris Gordon, Range Conservationist, DOD-Ft. Carson, CO.

Wildlife Biologist McDaniel reviewed a draft article for future publication in Nebraskaland Magazine re: "Birds of the Marsh", as requested by Jon Farrar, Senior Editor, Nebraska Game & Parks. Wildlife Biologist McDaniel also provided technical assistance re: an article on fens in the Nebraska Sandhills.

Wildlife Biologist McDaniel provided information re: Williamson's sapsucker observation in South Dakota as requested by Dr. Paul Springer, Patuxent Migratory Bird Office. The information is being considered for inclusion in a publication of birds for South Dakota.

Wildlife Biologist McDaniel provided information re: nest dragging and monitoring procedures to Glen Moravak, Wildlife Biologist, USDA-Ft. Pierre National Grasslands.

Wildlife Biologist McDaniel met and discussed grassland management and habitat management documentation with Nebraska Game & Parks land management personnel Nelson, Nason, Rochford, and Wingfield.

Wildlife Biologist McDaniel discussed natural re-vegetation of wetland range sites with Tom Turner, EPA re: a feedlot mitigation project in Wheeler County.

Wildlife Biologist McDaniel responded to a request from Ron Wagnitz, Nebraska Public Power, Columbus, NE re: bullsnake trapping on an island in the Platte River where piping plovers and least terns nest. Mr. Wagnitz was invited to Valentine NWR to observe the trapping techniques and advised of potential problems with possibly trapping the endangered species. FWE-Grand Island (Farnes and Jobman) was later involved in this proposal.

Wildlife Biologist McDaniel responded to a request from Scott Miller, National Parks Coop Unit, GA re: deer browsing of endangered species of plants.

Wildlife Biologist McDaniel provided recommendations re: shorebird management to former summer temporary Tim Krumwiede. Tim is presently employed by a private consulting firm specializing in reviewing ecological impacts of various types of construction projects.

Wildlife Biologist McDaniel provided information re: woodchuck observation on Valentine NWR to Frank Andelt, Non-Game Specialist, Nebraska Game & Parks.

A sample of the visual obstruction pole (VOR) pole developed by Wildlife Biologist McDaniel and Maintenance Worker Kime was sent to the Nebraska National Forest so they could use it as a pattern to construct poles for their use. The VOR pole was a modification of a pole presently in use by the U.S Forest Service and Nebraska Game & Parks in prairie grouse studies/grazing management; however, "our" VOR pole is a one-person operation.

Wildlife Biologist McDaniel provided information to George Young, Assistant Professor of Meteorology, Penn State University re: the "heat burst" experienced on June 25th. Dr. Young was in the area to observed severe thunderstorms, but, he was in bed and didn't know the "heat burst" had occurred until the following morning--he was "beside himself!"

Wildlife Biologist McDaniel provided technical assistance to Nebraska Game & Parks personnel G. Slecktemeier and H. Sutsuga, Alliance District Office re: grassland species.

Wildlife Biologist McDaniel met with Huber and Fernandez, Crescent Lake NWR, to discuss duck breeding pair and brood count activities, grazing treatments, nest dragging, and VOR documentation. Wildlife Biologist McDaniel also received some computer tips from Brad Johnson.

Wildlife Biologist McDaniel forwarded grassland slides to Greg Schenbeck, US Forest Service for the National Society For Range Management meeting to be held in North Platte in July.

Wildlife Biologist McDaniel provided Lotus programs to both Crescent Lake and LaCreek NWR's re: a fast and accurate means to calculate the waterfowl duckling production index employing brood/pair ratios, Hammond, 1970.

Suggestions were provided on the George Lake renovation project accomplished by Rainwater Basin WMD. Also Maintenance Worker Kime and the station airboat were detailed to the project.

Wildlife Biologist McDaniel forwarded Valentine NWR prairie grouse lek count data, for the period 1978-91, to Dr. John Toepper, Little Hoop Community College, Ft. Totten, ND. The data only included prairie grouse leks (4 prairie chicken and 3 sharptail) that were involved in transplant programs with Crescent Lake NWR, Arrowwood NWR and Colorado

DOW. The effects of spring trapping and transplant projects were discussed at the Prairie Grouse Technical Council Meeting in Billings, MT and Dr. Toepfer specifically requested the data for possible inclusion in a publication.

Wildlife Biologist McDaniel was contacted by Habitat Biologist Kruse and discussed management practices that may discourage invasion of crested wheatgrass and biological monitoring of grasslands.

Wildlife Biologist McDaniel was called by Joyce Boe, Ph.D., re: eared grebe nesting activity and site selection on Valentine NWR.

Wildlife Biologist McDaniel forwarded photo documentation slides of grazing treatment results and grazing treatment history since 1985 to Wetland Acquisition Biologist Gene Mack at his request.

8. Other

Ft. Niobrara-Valentine NWR Complex hosted tours of both refuges for Ray Rauch, Wayne King, and Milt Suthers.

A tour for Mitch King, Supervisory Wildlife Administrator/North American Waterfowl Management Plan Coordinator, Region 6, was conducted on the Ft. Niobrara and Valentine Refuges and a discussion with Mr. King on the Niobrara Scenic River and finance management followed.

a. Meetings

Refuge Manager Ellis and Wildlife Biologist McDaniel served as wildlife resource "tour guides" for the National Meeting of the Society for Range Management in July.

Wildlife Biologist McDaniel attended the Prairie Grouse Technical Council Meeting in Billings, MT while on annual leave.

Biological Technician Vaughn and Assistant Refuge Manager Lindvall attended a meeting of the Nebraska Chapter of Holistic Resource Management in February. The Chapter is attempting to revive management clubs throughout the state.

Wildlife Biologist McDaniel attended the Walleye Management Public Hearing sponsored by Nebraska Game & Parks in Valentine on February 17. The meeting was not limited to walleye and Merritt Reservoir. The public did not hesitate to "get in their shots" on the general mismanagement of fishing waters in this area of Nebraska and in particular the loss of economic revenues to businesses in Valentine. The general management theme of the public was no more regulations, no northern pike, more pan fishing opportunities, and more stocking. There was no consideration from the public's standpoint re: habitat and water quality and that was addressed by Nebraska Game & Parks. Also, the public was advised of the proposed planning process re: fish management plan

for Valentine NWR and development of the document within the legal mandates establishing the refuge.

Refuge Manager Ellis attended the Annual Spring Nebraska Coordination Meeting between Fish & Wildlife Service and the Nebraska Game & Parks Commission, held in Lincoln, on February 7 and 8.

Gene Mack from Kearney was the guest speaker at the Valentine Rotary meeting, on February 28, where he discussed his proposed plans for working with private landowners to preserve wetlands within Nebraska.

On March 7, USDA-APHIS-ADC, USDA Nebraska National Forest Service and South Dakota ADC personnel met at Ft. Niobrara NWR to discuss animal damage control coordination. Refuge staff also met with USDA-APHIS-ADC personnel to discuss aerial hunting of coyotes on Valentine NWR and the reported demonstration of the coyote control effort by the "Fund for Animals". USDA-APHIS-ADC Director Charlie Brown was given an orientation tour of both refuges.

Dean Colburn contacted the Ft. Niobrara refuge in March with regard to buying and trading lands. This brought out the need to find out officially what the exact boundaries of the Valentine NWR are.

Refuge Manager Ellis met with the Nebraska Congressional staffers in Lincoln on March 22. He also briefed them on the various programs being carried out by personnel in the Valentine area.

A planning meeting was held with Gene Mack, Lynn Schlueter, and Elvin Adamson to organize the Fisheries Management Demonstration at Pelican Lake on Valentine NWR. The Fisheries Management Demonstration started at 2:00 p.m. on September 13 and was attended by Nebraska Game & Parks Commissioners, Nebraska Game & Parks personnel (administrative and field staff), and Fish & Wildlife Service personnel (administrative from Denver and field staff). Opening remarks were by Refuge Manager Ellis along with a brief history of the Valentine National Wildlife Refuge and the objectives of the refuge; Wildlife Biologist McDaniel talked about the response of waterfowl to renovation of lakes; Refuge Operations Specialist Lindvall spoke of the public use of the area; and past and current fisheries management and strategies and techniques were expounded on by Gene Mack, Wildlife Biologist with Fish & Wildlife Service along with Lynn Schlueter, Biologist with the Nebraska Game & Parks Commission out of Bassett, Nebraska. A tour was then conducted by boat and all personnel participated in the survey demonstrations.



Figure 8. Biologist Gene Mack leading discussion on fish management on Valentine NWR. (RME)

WE-VAL 3109

On July 14 the representative from the Nebraska State Soil Conservation Office and the local project leader with the soil surveys, Roger Hammer, visited the Ft. Niobrara NWR office and invited us to participate in soil surveys now being conducted in Cherry County. They explained all the benefits to the refuges if we would finance a soil survey. In view of the value of updated information for planning purposes and our involvement in the use of computers to expedite the use of this data; we made the recommendation, if funds could be made available from Regional Office, that we participate in the soil surveys scheduled through fiscal years 92 and 93.

The Project Leader's meeting was held in Martin, SD (Lacreek NWR hosting) from August 13-15. This meeting was attended by Refuge Manager Ellis, Supervisory ROS Sellers, ROS Lindvall, ROS Kathleen McPeak, and Wildlife Biologist McDaniel.

Engineering Equipment Operator Purdy flew to the Boise Interagency Fire Center to participate in a TAPS (Tractor and Plow Safety Course) review. The review and discussion on the relevance and effectiveness of heavy equipment courses for FWS use was held August 13-15.

Refuge Operations Specialist Lindvall attended the annual meeting of the Nebraska Chapter of The Wildlife Society held in Aurora on September 19 and 20. Mark was elected to the executive board. The Nebraska Chapter will emphasize a more active membership for the coming year.

Refuge Manager Ellis attended the Forest Service sponsored range

management program trail ride at the Halsey National Forest.

A Fisheries Management Seminar was held on November 7 at the Ft. Niobrara NWR Visitor Center for refuge staff and Bill Rhodes and Mick Gray from Nebraska Game & Parks Commission. That same date, at 7:00 p.m., also at the Ft. Niobrara NWR Visitor Center, by special invitation, several local personnel attended this seminar.

Refuge Operations Specialist McPeak gave a program on eagles to the Valentine Rotary Club on November 21.

ROS McPeak attended the Nebraska Private Lands Coordination Meeting in North Platte on December 13.

Refuge Manager Ellis attended the "Workforce Diversity Retreat Information and Logistics" workshop held at the Aspen Lodge Conference Center in Estes Park, Colorado from December 2 through December 4.

b. Training

Biologists McDaniel and McPeak attended the Biological Diversity Workshop in Denver.

Supervisory Refuge Operations Specialist Sellers, Biological Technician Vaughn, and Maintenance Worker Kime, completed their Law Enforcement training at Marana, Arizona (January 23-29).

Refuge Manager Ellis, Refuge Operations Specialists Lindvall and Refuge Operations Specialist McPeak completed their Law Enforcement training at Marana, Arizona (February 20-26).

Supervisory Refuge Operations Specialist Sellers instructed a FWS Basic Fire Management Training Course at Minnesota Valley NWR, Minneapolis on April 21. He took one of the 3/4 ton 4X4 pickups with the new 125 gallon slip on for use/demonstration by the students and staff.

Refuge Assistant Ayers attended the Budget Tracking System and administrative workshop held in Lakewood, CO from May 20 through May 23.

Maintenance Worker Prasch and Range Technician Kasper attended S-130/S190 fire training in Jamestown, ND from June 4 through 6.

From June 18-20, Wildlife Biologist McDaniel and Refuge Operations Specialist Lindvall attended MapInfo training in Ft. Collins, CO.

Kim Hanson, Kearney Wetland Management District, conducted Private Lands Training at Ft. Niobrara NWR on August 28. Refuge Operations Specialist McPeak and Royce Huber, Project Leader at Crescent Lake NWR, participated.

Biological Technician Vaughn and Refuge Operations Specialist McPeak attended the Nebraska Leafy Spurge Conference in Broken Bow on August 1. Speakers represented the major groups, institutions and agencies working on solving the problems associated with leafy spurge control.

Ft. Niobrara NWR hosted the Law Enforcement refresher training session on August 28-29.

A training session entitled Section 504 Accessibility was taught at Ft. Niobrara NWR on October 30 and 31 by Carol Hunter from PAWS and Frank Bryce from the Regional Office. They presented a lot of good ideas on how we can make our work place and outdoor recreation programs more accessible for differently abled individuals.

F. HABITAT MANAGEMENT

2. Wetlands

There are 37 major wetland/lake areas on Valentine NWR comprising 13,000 acres. Refuge lakes historically have operated as a closed system except for the high precipitation cycle period 1981-88 (Table 5). Drought conditions during 1988-89 have had a drastic effect upon refuge water management related activities, wetland levels and wetland vegetation. Permanent gauges to monitor lake elevations are established on eight lakes; however, wetland elevations have been below the permanent gauges on Hackberry, Willow and Clear Lakes the past three years (Table 6).

Elevations of wetlands continued to increase into June when Dewey Lake began overflowing into Clear Lake; Duck Lake overflowed into Rice Lake; and West Long Lake began running out into the dry pothole area in the west end of Sawyer Meadow (Figure 9). There were no water discharges from the refuge onto private land this year.

Wetland elevations continued to decrease through October when wetlands froze over. Wildrice was common on many refuge wetlands; however, the receding water levels left most of the mature wildrice high and dry for the second year in succession. Refuge wetland levels generally appeared low when compared to the recent years of high levels that eliminated aquatic vegetation and modified lake banks/shorelines. But, wetland elevations were actually within historical levels.

Table 5. Catalog of refuge lakes (modified from McCarraher, 1977).

Lake	Normal Surface Acreage	Depth (ft.)		Type of Drainage
		Max.	Mean	
Baker	16	-	-	Closed
Center	80	4.6	2.9	Closed
Clear	424	11.5	5.6	Open
Coleman	46	4.6	3.0	Closed
Cow	30	4.6	2.6	Closed
Crooked	32	-	-	Closed
Dad's	1,025	11.2	9.5	Closed
Dew	28	-	-	Closed
Dewey	550	8.9	4.6	Open*
Duck	66	7.9	3.9	Open*
East Long	638	5.9	3.6	Closed
East Twin	67	5.9	3.6	Closed
Hackberry	680	5.9	3.3	Open
Homestead	23	4.9	3.9	Closed
Lost	68	5.9	3.9	Closed
McKeel	48	5.2	2.9	Closed
Marsh	2,300	7.8	3.9	Closed
Mule	348	9.8	6.6	Closed
Pelican	798	5.5	3.3	Open*
Pony	153	5.9	3.6	Open
Punch Bowl	30	7.5	4.9	Closed
Rice	48	5.6	3.9	Closed
School	84	4.9	2.9	Closed
Tom's	23	4.9	2.9	Closed
Twenty-one	250	4.9	2.9	Closed
Watts	230	5.9	4.3	Open
West Long	62	-	-	Open*
West Twin	98	5.9	3.9	Closed
Whitewater	600	6.6	3.9	Open
Willow	354	7.9	4.6	Open

*Lakes that overflowed into another lake and/or into another drainage in 1991.

Table 6. Lake Elevations 1985 - 1991.

<u>Lake</u>	<u>January</u>	<u>December</u>	<u>Minimum (Month)</u>	<u>Maximum(Month)</u>
<u>1991</u>				
Dewey	2923.90	2922.68	2922.68 (Oct)	2924.40 (Jun)
Clear	N.A.	N.A.	N.A.	N.A.
Hackberry	N.A.	N.A.	N.A.	N.A.
Pelican	N.A.	N.A.	N.A.	2942.42 (Jun)
Watts	2922.90	2923.26	2922.90 (Jan)	2923.74 (Jun)
Whitewater	2927.30	N.A.	N.A.	2927.86 (Jun)
Willow	N.A.	N.A.	N.A.	N.A.
Marsh Lakes	2889.51	2889.39	2889.39 (Oct)	2890.51 (May)
<u>1990</u>				
Dewey	2922.80	2923.90	2922.80 (Jan)	2924.22 (Jun)
Clear	2914.82	N.A.	2914.68 (Aug)	N.A.
Hackberry	2922.66	N.A.	2922.46 (Aug)	N.A.
Pelican	N.A.	N.A.	N.A.	N.A.
Watts	2922.11	2922.90	2922.11 (Jan)	2923.06 (July)
Whitewater	2926.38	2927.30	2926.38 (Jan)	2927.64 (June)
Willow	N.A.	N.A.	N.A.	N.A.
Marsh Lakes	2889.93	2889.51	2889.51 (Dec)	2890.31 (June)
<u>1989</u>				
Dewey	2922.64	2922.80	2922.28 (Oct)	2924.08 (Mar)
Clear	2915.80	2914.82	2914.82 (Dec)	2926.24 (Apr)
Hackberry	2923.86	2922.66	2922.66 (Dec)	2923.86 (Jan)
Pelican	2941.71	2941.50	2941.36 (Sept)	2942.78 (Mar)
Watts	2923.00	2922.11	2922.05 (Sept)	2923.73 (Mar)
Whitewater	2927.60	2926.38	2926.38 (Oct-Dec)	2927.84 (Mar)
Willow	2914.73	2911.25	2910.97 (Oct)	2914.73 (Jan)
Marsh Lakes	2891.30	2889.93	2889.93 (Dec)	2891.40 (Mar)
<u>1988</u>				
Dewey	2923.86	2922.64	2922.02 (Sept)	2924.90 (Feb)
Clear	2917.42	2915.80	2915.80 (Dec)	2918.24 (Feb)
Hackberry	2924.10	2923.86	2923.86 (Dec)	2924.40 (Feb-Mar)
Pelican	2942.98	2941.71	2941.26 (Aug)	2943.50 (Feb)
Watts	2923.92	2923.00	2922.60 (Oct)	2924.62 (Feb)
Whitewater	2928.38	2927.60	2927.26 (Oct)	2929.26 (March)
Willow	2913.53	2914.73	2914.61 (July)	2916.80 (Mar-Apr)
So. Marsh	2892.25	2891.30	2891.30 (Oct-Dec)	92.90 (May)

*0.0 on Hackberry/Dewey ditch control structure is 2920.68 msl.

In cooperation with USDI - Geological Survey, ground water elevations are monitored (January and August) by 35 ground water wells that were established during the 1950's. Thirty-two of these wells are located within the boundary of the refuge. The other three wells are on private land adjacent to the refuge on Trout Lake - immediately downstream from Willow Lake (Figure 9). These ground water levels basically track the annual precipitation cycle (N.R., 1989).

5. Grasslands

Valentine NWR was designated as a Registered Natural Landmark by the USDI Heritage Conservation and Recreation Service in 1979.

The refuge is within the Sandhills Prairie--an area between the Tall and Mixed Grass Prairies in which the lower range sites are dominated by switchgrass, big bluestem, Indiangrass and associated forbs. The predominant warm season native grasses provide excellent upright residual cover for upland nesting birds. The higher range site grasses include of prairie sandreed, sand bluestem, little bluestem, sand lovegrass, needle-and-thread, porcupine grass, prairie June grass with an interspersed of native forbs.

Management of 327 habitat units comprising 61,861 grassland acres is generally maintaining refuge grasslands in excellent range condition. Grassland management is accomplished by periodic treatments of rest; spring, summer short-duration, fall and winter grazing; and mowing depending upon rationale of management objectives. However, excellent range condition and/or good grassland management practices do not necessarily imply that vegetative cover is available, in adequate quality, quantity and during critical times, to maximize upland nesting bird production potential.

Documentation on refuge indicates that upland bird nest density and success are higher on "undisturbed cover" - cover with a minimum of one growing season of rest and in particular "preferred cover" - cover that has been in rest two or more years. However, by the end of May, 1991 after spring grazing was completed, >55% of the total refuge grassland acreage was in disturbed and <20% in preferred cover treatment; by July 10 (the end of the nesting season) 73% of the total grassland cover had been disturbed by grazing and/or mowing and 16% was in undisturbed cover (Figures 10 and 11).

During 1991 a higher ratio of undisturbed to disturbed grassland cover acreage was available when compared to 1990; and upland nesting bird productivity responded positively to the improved ratio (Sec. G.3.a. and G.3.10.a.). The improved ratio was still lower than achieved during the dry years of 1988 and 1989 (Figures 12). Annual AUM utilization has been stabilized since 1986 and is presently at its lowest level since prior to 1950. Therefore, planning for undisturbed nesting cover needs to be addressed, to a greater extent, to insure that AUM utilization does not result in an undesirable ratio of disturbed to undisturbed upland nesting cover in subsequent years (Figure 13).

AVAILABLE COVER ACREAGE VIA TREATMENT

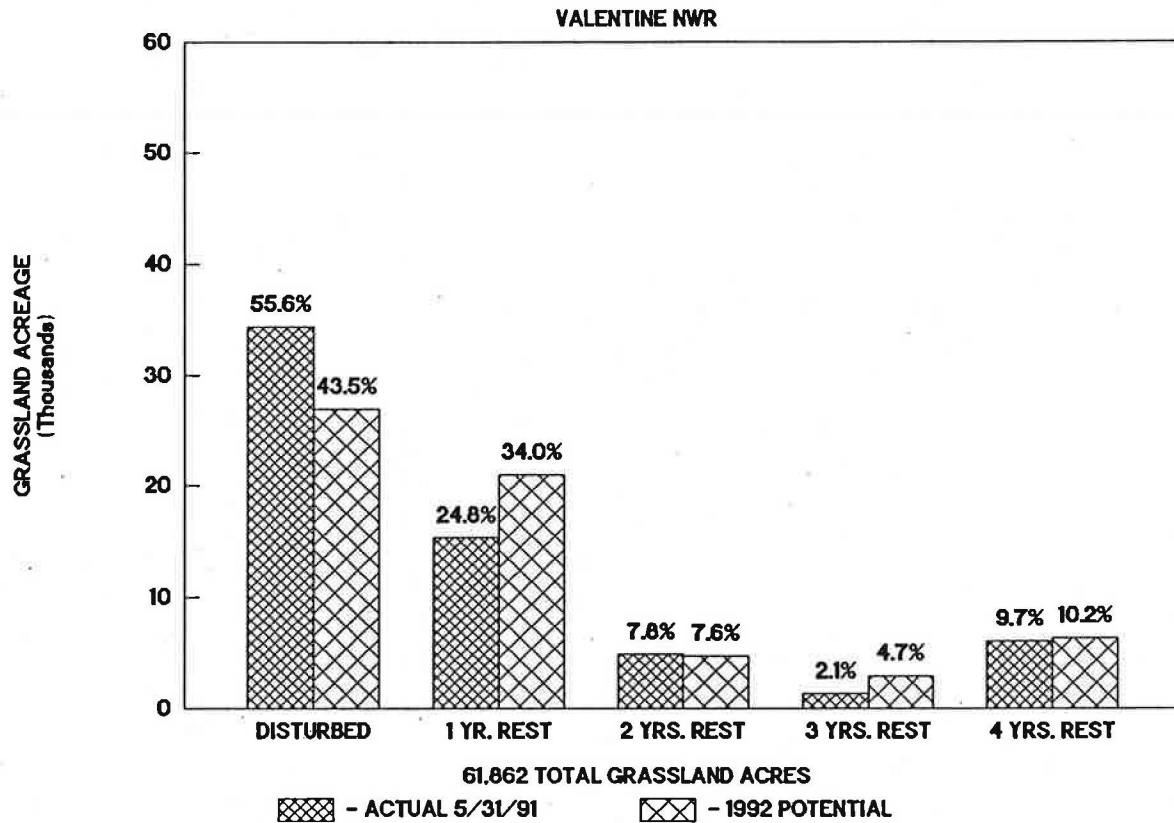


Figure 10.

1991 GRASSLAND COVER TREATMENT

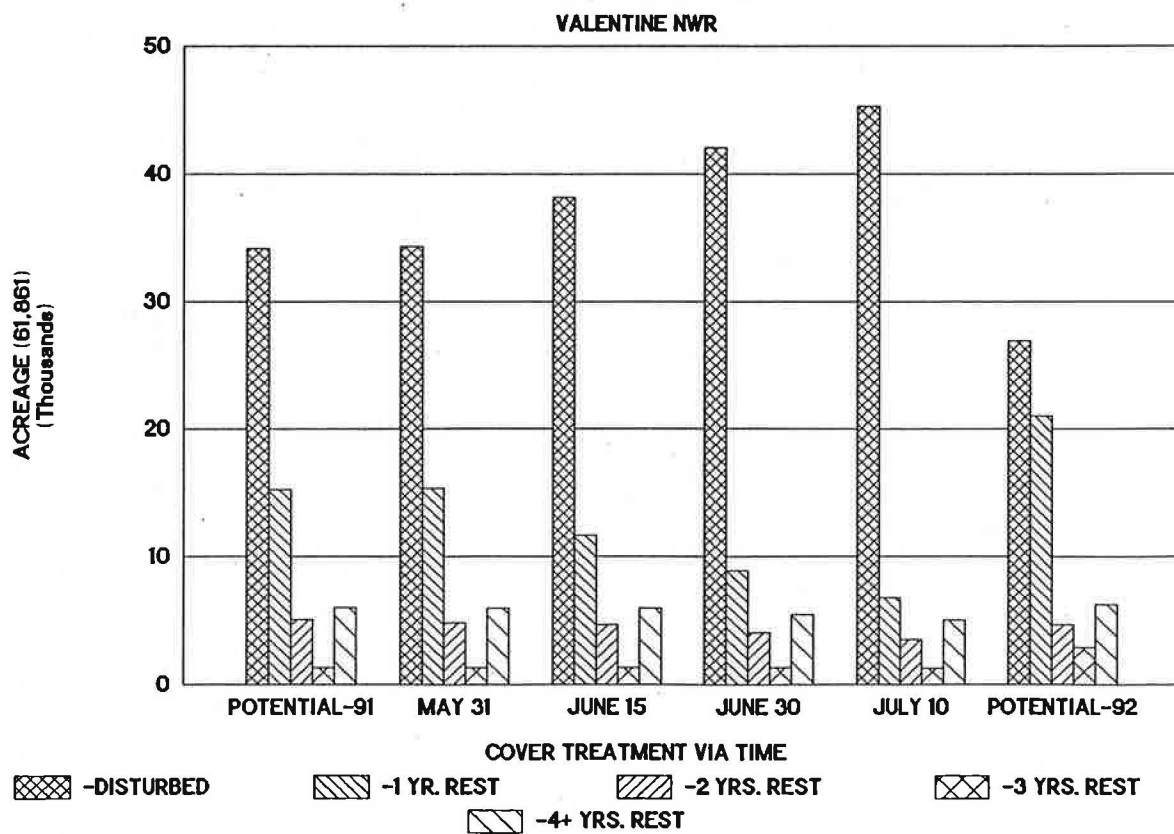


Figure 11.

GRASSLAND TREATMENT - 1988-1991

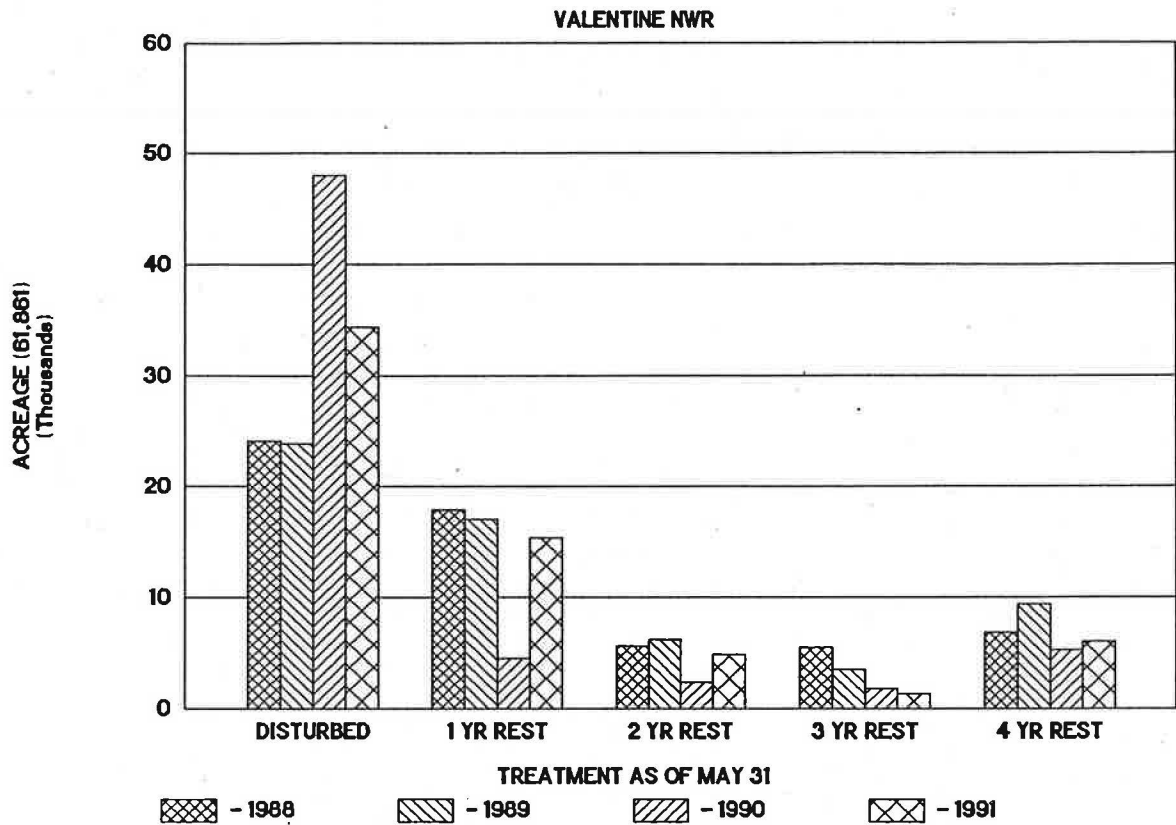


Figure 12.

ANNUAL AUMS vs DISTURBED COVER ACREAGE

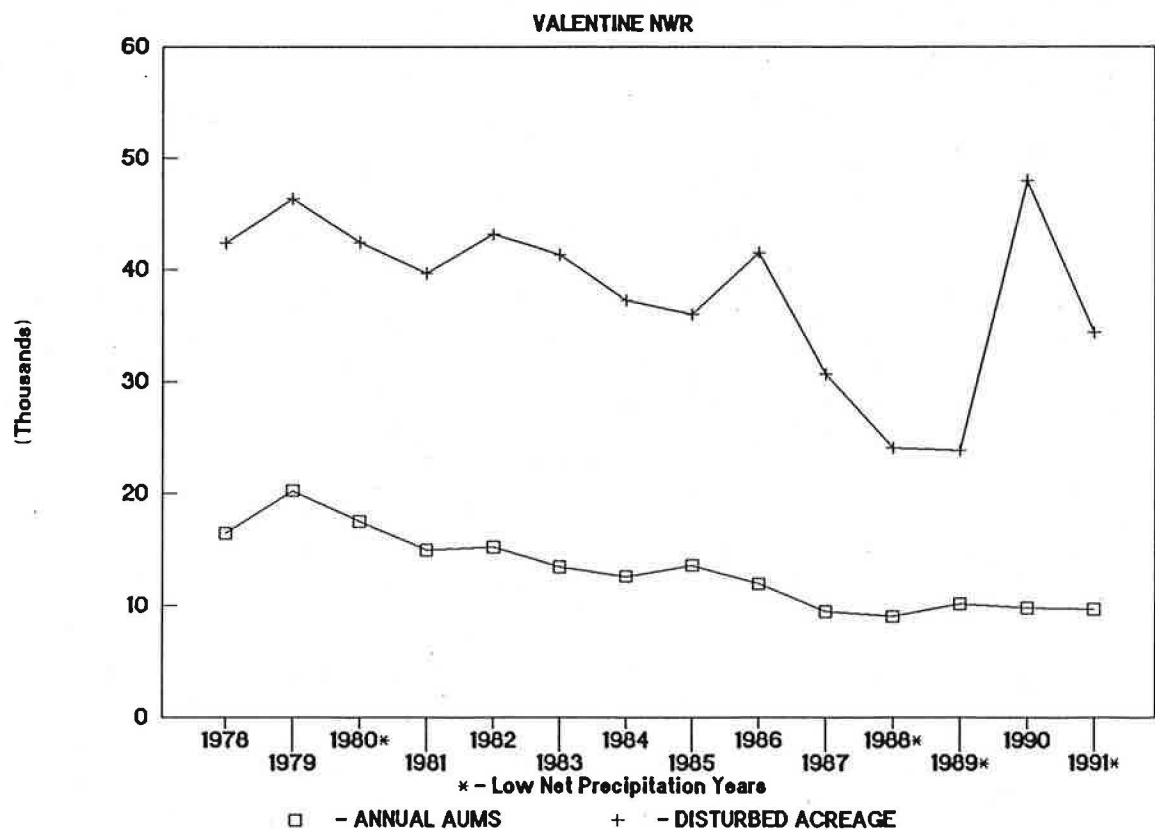


Figure 13.

A technique for monitoring and evaluating native grassland vegetative trend condition and its effectiveness for providing attractive and secure nesting cover for upland birds has been an on-going process on Valentine NWR. Of prime importance is a simple technique that has application for a variety of grassland management treatments, obtains meaningful data, minimizes data collection and analysis inputs simultaneously with establishing a means to duplicate future efforts.

The technique being employed is essentially that described by Robel, et al, 1970 and modified by Leo Kirsch (unpublished); but, is a repeatable cover mapping process that combines a graphic frequency of occurrence of both visual obstruction readings (Figures 14 and 15) and vegetation composition. Specific transect data is being correlated to similar data obtained during nest monitoring activities--specifically nest site, density and success. Data processing is accomplished with standard computer software (dBASE and Lotus 123) and visually presented in graphics. Photopoint documentation is also obtained simultaneously (Figures 16 and 17).

VORS - PRE-POST SD-S GRAZING TREATMENT

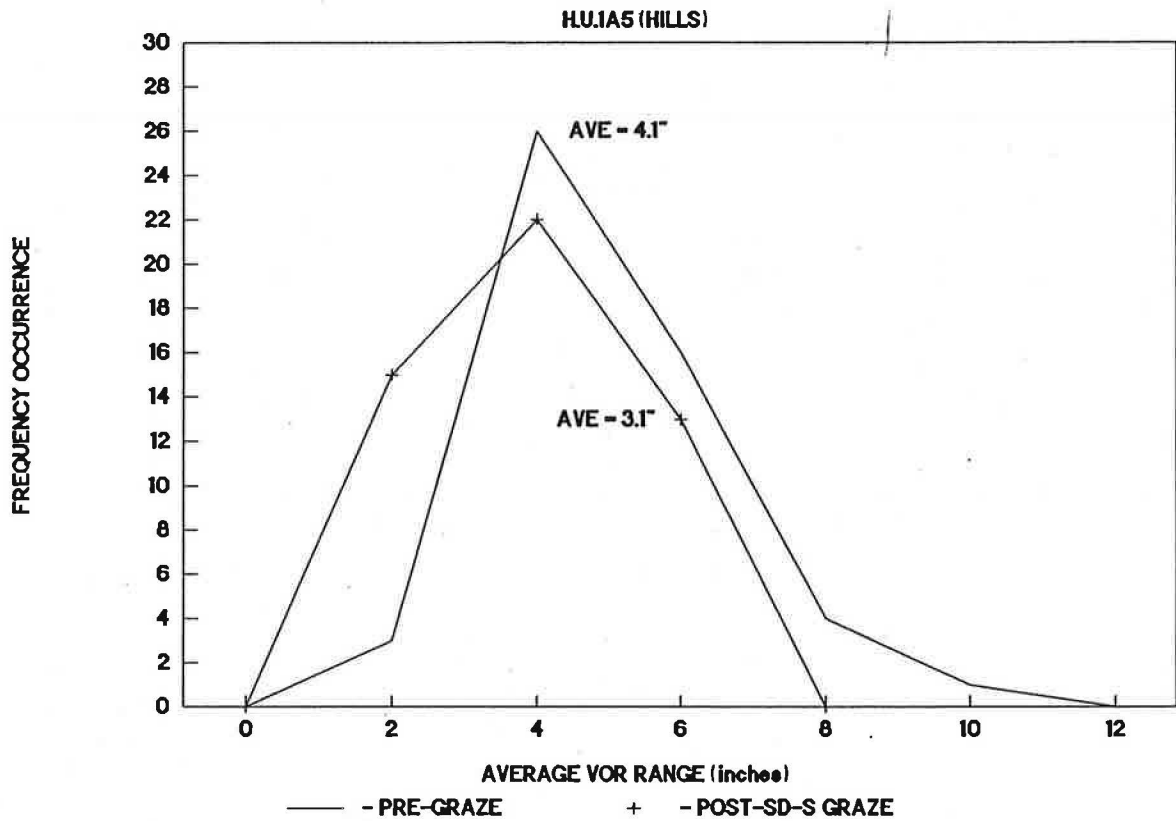


Figure 14.

REPLICATION OF A VOR TRANSECT

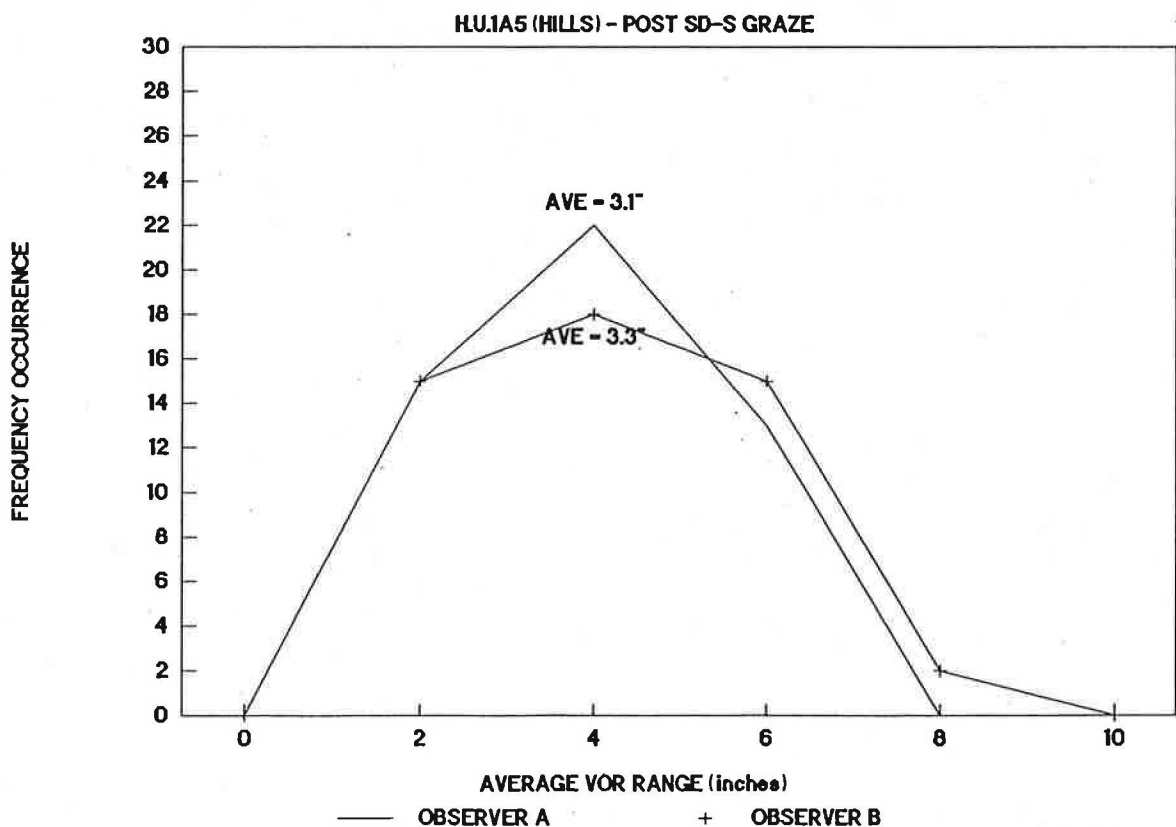


Figure 15.



35

Figure 16. H.U. 1A5 before SD-S grazing (7/18/91 RS)



Figure 17. H.U.1A5 After SD-s graze at 0.18 aums/ac. (7/24/91

RS)

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7. Grazing

In 1985 the refuge habitat management program was changed and short-duration grazing started. Prior to 1985, much of the refuge grasslands were grazed on 6 week rotation. Refuge permittees initially resisted the change to short-duration grazing. We have however seen a gradual acceptance of it over the past few years. Acceptance has come through reduced grazing fees for the extra work involved in moving cattle and the obvious improvement in refuge grasslands. Several ranchers have even started using short-duration grazing on their own ranches.

Grazing fees for 1991 were:

spring grazing treatment	\$6.00/AUM
short-duration grazing	
1 day in unit	no charge
2 days in unit	\$4.50/AUM
3 days in unit	\$5.50/AUM
4 days in unit	\$7.50/AUM
5 days in unit	\$8.50/AUM
6 days in unit	\$9.50/AUM
7 days in unit	\$10.50/AUM
8 or more days	\$11.40/AUM
in unit	
feed hay and graze in unit	\$11.40/AUM
feed hay in feed lot	\$6.00/AUM
feed hay on road	\$6.00/AUM

The full rate of \$11.40 is an increase of \$.50 over the 1989 fee and is set by the Regional Office based on a grazing rate survey and reflects an increase in cattle prices. Permittees also had their grazing bills reduced for improvements such as wells, fence, and tanks installed. In 1991, \$13,147 was spent on improvements and deducted from final billings. Total collections for the 1991 grazing season were \$49,757. This total does not include the value of the refuge share of hay.

The methods and expected results for the different grazing strategies are explained below. The acreage of grassland treated with each type of grazing is listed in Table 7 and shown in Figure 18.

a. Spring Grazing Treatment

Spring grazing treatment (SGT) is done before the end of May on sub-irrigated meadow sites. The cattle are in the unit for greater than 2 weeks. Cattle eat or trample almost all of the residual cover. They also overgraze and thus reduce undesirable cool season exotic grasses. Cattle can be placed in a unit to remove residual and then brought back in later to hit the cool season exotics. In some instances, cattle are brought back in at several later dates for the same purpose. Because much of the feed is in the form of old mat, this treatment is best done

by fall calving cows and not by lactating spring calving cows.

Dramatic results occur with this treatment. Exotic cool seasons, as Kentucky bluegrass, are suppressed and native warm seasons, as switchgrass, increase in vigor and density. The disadvantage is the loss of the unit for nesting in the year of treatment and a lower waterfowl nesting density in the following year. Often the unit can however be rested for up to 5 years following treatment. In 1991, 14 habitat units totaling 2186 acres received a spring grazing treatment. This year in some units, spring grazing treatments were done before the growing season. This was done in areas without Kentucky bluegrass problems and on some areas to be hayed later. The grazing of areas to be hayed is designed to add some fertilizer and thus increase hay quality and quantity.

b. Spring Short-duration Grazing

Spring short-duration grazing (ES-SD) is grazing a unit for less than 2 weeks during May. Generally the cattle are in the unit for only 3 to 5 days. This type of grazing is generally done in hill units to stimulate growth of grasses, especially cool seasons. The short exposure times eliminate overgrazing. In 1991 38 habitat units totaling 7,666 acres had spring short-duration grazing. Also 17 habitat units totaling 3,684 acres were grazed with ES-SD and a followup treatment of summer short-duration graze, winter graze, or haying.

c. Short-duration Summer Grazing

Short-duration summer grazing (SD-S) is done from June 1 through September 1. Cattle are in a unit for less than 2 weeks. Most units are grazed only 3 to 5 days and the cattle moved on to the next unit. Electric fences are used to break up larger units and increase stock density. Most short-duration summer grazing was completed by the first week in August. This allows for good regrowth, especially in units grazed in June and early July. In 1991 126 habitat units totaling 27,626 acres were short-duration summer grazed.

d. Fall Grazing

Fall grazing is done from September through November. Fall grazing can reduce mulch accumulations, add fertilization, and maintain grouse leks. If done at the proper time cattle will also graze out small wetlands and leave the surrounding upland vegetation alone. Generally the wetlands have green in them while the uplands have only cured grasses. Grazing in the wetlands recycles nutrients and provides pair habitat for ducks in the spring. Generally we have moved away from fall grazing except for pothole grazing. Fall grazing eliminates both winter cover and nesting cover in the following year. In 1991 1 habitat unit of 110 acres was fall grazed.

e. Winter Grazing

Winter grazing (W) is done during the November through April period. In winter grazing, cattle are fed hay on a feed ground in a unit. The hay comes off the refuge. When the weather is harsh the cattle feed on hay but when it is nice they graze away from the hay ground. Winter feeding creates dense weed patches for several years following the treatment. These weed patches provide winter food for deer, pheasants, and other resident wildlife. Resident wildlife also utilize waste grain from the feeding operation. Presently two feeding areas are maintained in Calf Camp and Little Hay Valleys. Each feeding area has three habitat units in it of which only one is used each year. Winter feeding can also be used to stabilize blowouts and roads. In one unit, 19A, we established a new feedlot this year. The intent was to feed the cattle in the feedlot and have them graze out in the unit adding fertilization and eating the yucca plants. We had an open winter so the cattle had no impact on the yucca plants. In 1991, 2 habitat units totalling 1,071 acres were winter grazed.

8. Haying

Nine hundred and thirty four acres of sub-irrigated meadow, wetlands, or sand sites were mowed and hayed by four permittees. The haying was done in 26 different habitat units and yielded 1781 tons of hay. Units hayed are listed in Table 8 and shown in Figure 18. A program was continued to improve the quality and quantity of hay produced. Meadows to be hayed are in a rotation with a spring grazing treatment prior to the growing season and have hay fed back on them. Cattle will provide fertilization and remove old growth from the hay.

Haying is used to provide browse areas for Canada geese, sandhill cranes, prairie grouse, and deer. Mowing also provides leks for grouse and opens up small wetlands. The haying is done under cooperative farming agreements on a 40/60 (refuge-permittee) split and on a feed back on the refuge program. The permittee delivers the refuge share to Fort Niobrara NWR for winter feed for Texas longhorns or to areas on Valentine NWR for road hay. Road hay is used to stabilize sand trails used by the public. This year, 499 tons were delivered to Fort Niobrara NWR and 48 tons placed for road hay. Four hundred and eleven tons were fed in winter grazing to create weed patches as described in section F7e. Permittees share under farming agreements was 823 tons of hay. Of this they fed back 148 tons on refuge meadows to improve hay quality and quantity.

This year haying areas were searched for the endangered prairie white-fringed orchid and areas where plants were found were marked and not mowed.

Table 7. Grassland management treatment summary - 1991

<u>Treatment</u> <u>Acreage</u>	<u>Habitat</u> <u>Units</u>	<u>Acres</u>	<u>AUMs</u>	<u>Average</u> <u>AUM/Ac</u>	<u>%Total</u>
Rest	106	16,660			
Rest (portion hayed)	12	<u>1,597</u>			
		<u>18,257</u>			29.5
Spring Grazing:					
SGT	14	2,186	817.61	.37	35
ES-SD 1-7 days	36	6,516	1169.93	.18	10.5
ES-SD 8-13 days	2	1,150	269.67	.23	2
ES-SD SD-S	12	2,655	738.77	.28	4
ES-SD W	2	258	248.17	.96	<1
ES-SD H	<u>3</u>	<u>771</u>	<u>114.31</u>	.15	<u>1</u>
	69	13,536	3358.46		22
Short Duration-Summer:					
1-3 days	85	14,355	2676.66	.19	23
SD-S & SD-S	8	714	214.33	.30	
4-7 days	25	8,122	1246.67	.15	13
SD-S & SD-S	1	289	47.96	.16	<1
8-14 days	5	3,124	479.87	.15	5
SD-S & SD-S	1	929	167.67	.18	15
SD-S & W	<u>1</u>	<u>93</u>	<u>306.58</u>	3.30	<u><1</u>
	126	27,626	5139.74		45
Fall	1	110	81.31	.74	<1
Year Round*	2	257	70.56	.08	<1
Winter	2	1071	578.20	.54	2
Feed back	2	446	462.87	1.04	<1
Hayed	12(14)	325(609)	<u>1781 tons</u>		
ON-OFF	3	233			
Totals		61,861	9641.14		

*Includes Gov't Horses

9. Fire Management

The Service has a Mutual Aid Agreement with the Valentine Rural Fire Protection District (VRFPD), whereas we assist them in suppressing fires off Service lands while the District will, in turn, assist the Service in suppressing fires within the Complex. The agreement has been drawn up such that neither agency will seek expense reimbursement from the other regardless of fire location. Under the departmental and refuge cooperative

Table 8. 1991 HABITAT MANAGEMENT by HABITAT UNIT

HABITAT UNIT	ACREAGE BY RANGE SITE				TOTAL # ACRES	TREATMENT	S T O C K		U S E	D A T E	#	AUMS/	ANIMAL	ACRES	TONS	DATE	PERMITTEE
	CHSA	SA	SB	WL			C/C	ADULT	YEARLING	INDATE	OUTDATE	DAYS	AUMS	ACRE	/ACRE	HAYED	HAYED
"A"	24	96	0	0	120	R											
"B"	0	40	0	0	40	ON-OFF	(UNFENCED LANDS OUTSIDE REFUGE BOUNDARY)										GALLINO
"C"	0	113	0	0	113	ON-OFF											ANDERSON/GRABHER
"E"	0	80	0	0	80	ON-OFF											MCGINLEY
01A1	0	104	1	0	105	R											
01A2	100	10	0	0	110	SD-S	156	6		07/22/91	07/25/91	3	19.77	0.18	2.89		BALLARD
01A3	0	0	10	0	10	R											
01A4	68	142	5	0	215	R											
01A5	0	57	17	0	74	SD-S	156	6		07/20/91	07/22/91	2	13.18	0.18	4.30		BALLARD
01B1(NW)	18	27	0	0	45	R											
01B1(W-E)	2	25	32	4	63	ES-SD		329		04/05/91	04/09/91	4	43.15	0.68	5.22		REECE
01B2	202	28	139	7	376	R											
01C	20	60	48	60	188	ES-SD		329		04/09/91	04/15/91	6	64.72	0.34	1.75		REECE
02A	140	294	60	12	506	R											
02B1	170	523	143	6	842	ES-SD		329		05/09/91	05/22/91	13	140.23	0.17	0.39		REECE
02B1(FDL)	0	5	0	0	5	R											
02B2	0	8	37	0	45	R											
02B3(A)	0	123	6	11	140	R											
02B3(B)	28	78	8	15	129	R											
02B3(C)	0	42	50	58	150	ES-SD		329		04/19/91	04/25/91	6	64.72	0.43	2.19		REECE
02B3(D)	0	3	60	2	65	ES-SD		329		04/25/91	04/27/91	2	21.57	0.33	5.06		REECE
03A	16	12	64	14	106	R											
03B	60	130	50	0	240	R											
03C1	164	100	25	0	289	ES-SD		329		04/15/91	04/19/91	4	43.15	0.15	1.14		REECE
03C1DIKE	5	24	0	0	29	R											
03C2	82	55	0	0	137	R											
03D	350	72	72	22	516	R											
04	105	200	35	10	350	R											
05B1	120	396	11	0	527	R											
05B2	0	30	0	0	30	R											
06	90	188	30	0	308	ES-SD		329		04/27/91	05/09/91	12	129.44	0.42	1.07		REECE

HABITAT	ACREAGE BY RANGE SITE				TOTAL		S T O C K			D A T E			AUMS	AUMS/	ANIMAL	ACRES	TONS	DATE	
UNIT	CHSA	SA	SB	WL	# ACRES	TREATMENT	C/C	ADULT	YEARLING	INDATE	OUTDATE	# DAYS		ACRE	/ACRE	HAYED	HAYED	HAYED	PERMITTEE
07A1(N)	18	204	1	2	225	SGT	90	8		05/10/91	05/25/91	15	59.26	0.26	0.84				BALLARD
07A1(S)	2	10	70	3	85	R													
07A2	0	14	6	0	20	R													
07B1	45	67	0	0	112	SD-S	156	6		07/16/91	07/20/91	4	26.36	0.24	2.84				BALLARD
07B2	45	104	3	0	152	SD-S	156	6		07/12/91	07/16/91	4	26.36	0.17	2.09				BALLARD
07B3	0	19	72	0	91	R													
07C	0	65	40	0	105	SGT	66	6		05/10/91	05/25/91	15	43.52	0.41	1.31				BALLARD
08A1	70	96	0	0	166	SD-S	156	11		06/30/91	07/04/91	4	27.02	0.16	1.95				BALLARD
08A2	93	62	0	0	155	SD-S	156	14		06/08/91	06/11/91	3	20.56	0.13	2.10				BALLARD
08A3	108	40	12	0	160	SD-S	156	6		07/04/91	07/08/91	4	26.36	0.16	1.99				BALLARD
08B1	82	110	0	0	192	R													
08B2	116	65	0	0	181	SD-S	156	11		06/23/91	06/27/91	4	27.02	0.15	1.78				BALLARD
08B3	130	55	0	0	185	R													
08B4	138	47	0	0	185	R													
08C1	115	160	0	0	275	SD-S	156	6		07/08/91	07/12/91	4	26.36	0.10	1.16				BALLARD
08C2	115	60	0	0	175	SD-S	156	11		06/14/91	06/17/91	3	20.26	0.12	1.85				BALLARD
08C3	0	115	55	0	170	SD-S	156	14		06/11/91	06/14/91	3	20.56	0.12	1.92				BALLARD
08D1	0	68	50	2	120	SD-S	156	11		06/20/91	06/23/91	3	20.26	0.17	2.69				BALLARD
08D2	63	175	12	0	250	SD-S	156	11		06/17/91	06/20/91	3	20.26	0.08	1.29				BALLARD
08D3	0	12	65	57	134	R													
08E1	0	42	74	36	152	R													
08E2	3	36	70	28	137	R													
08E3	0	100	90	97	287	R													
08E3(N)	0	0	14	15	29	R													
08E3(S)	0	4	14	6	24	R													
08F1	91	82	17	0	190	ES-SD	203	10		05/29/91	06/01/91	3	25.94	0.14	2.19				LORD
08F2	99	100	12	0	211	SD-S	203	10		06/01/91	06/04/91	3	25.94	0.12	1.97				LORD
08G	70	84	52	0	206	R													
09A1	8	74	37	0	119	SD-S	156	11		06/27/91	06/30/91	3	20.26	0.17	2.71				BALLARD
09A2	4	51	48	30	133	R				04/01/91	05/06/91	35	68.85	0.52	0.45				
09A3	0	2	63	3	68	R				04/01/91	05/01/91	30	59.02	0.87	0.88				
09B1	0	96	0	57	153	ES-SD	198	43		05/30/91	06/01/91	2	19.05	0.12	2.87				SHERMAN
09B2	0	57	0	66	123	R													
09C1	0	75	0	0	75	SD-S	198	43		06/04/91	06/05/91	1	9.52	0.13	5.85				SHERMAN
09C10	0	40	0	0	40	SD-S	198	43		06/05/91	06/07/91	2	19.05	0.48	10.97				SHERMAN
09C2	0	85	0	0	85	SD-S	198	43		06/18/91	06/21/91	3	28.57	0.34	5.16				SHERMAN
09C3	0	80	0	0	80	R													

HABITAT	ACREAGE BY RANGE SITE				TOTAL	S T O C K				U S E D A T E		#	AUMS/	ANIMAL	ACRES	TONS	DATE	PERMITTEE	
UNIT	CHSA	SA	SB	WL	# ACRES	TREATMENT	C/C	ADULT	YEARLING	INDATE	OUTDATE	DAYS	AUMS	ACRE	/ACRE	HAYED	HAYED	HAYED	
09C4	0	80	0	0	80	SD-S	198	43		06/16/91	06/18/91	2	19.05	0.24	5.49				SHERMAN
09C5	0	110	0	0	110	SD-S	198	43		06/12/91	06/16/91	4	38.10	0.35	3.99				SHERMAN
09C6	0	90	0	0	90	SD-S	198	43		06/09/91	06/12/91	3	28.57	0.32	4.88				SHERMAN
09C7	0	90	0	0	90	R													
09C8	0	70	0	0	70	SD-S	198	43		06/07/91	06/09/91	2	19.05	0.27	6.27				SHERMAN
09C9	0	80	0	0	80	R													
10A1	142	472	6	20	640	SD-S	156	14		05/29/91	06/08/91	10	68.52	0.11	0.51				BALLARD
10A2	0	218	22	0	240	ES-SD	156	14		05/25/91	05/29/91	4	27.41	0.11	1.36				BALLARD
10A3	0	156	2	2	160	SD-S	198	43		06/01/91	06/04/91	3	28.57	0.18	2.74				SHERMAN
10B(C)	220	40	0	0	260	SD-S		304		06/05/91	06/08/91	3	29.90	0.11	1.17				COLBURN
10B(E)	75	30	0	0	105	SD-S		304		06/20/91	06/23/91	3	29.90	0.28	2.90				COLBURN
10B(W)	391	528	10	0	929	SD-S		304		05/23/91	06/05/91	13	129.57	0.14	0.33				COLBURN
10B(W)	391	528	10	0	929	SD-S	198	43		07/05/91	07/09/91	4	38.10	0.04	0.47				SHERMAN
*****SUBTOTAL*****												17	167.67	0.18	*****				
11A1	0	123	0	3	126	ES-SD	198	43		05/27/91	05/30/91	3	28.57	0.23	3.48				SHERMAN
11A2	0	126	0	0	126	SD-S	198	43		06/25/91	06/28/91	3	28.57	0.23	3.48				SHERMAN
11A3	0	117	0	1	118	ES-SD	198	43		05/20/91	05/24/91	4	38.10	0.32	3.72				SHERMAN
11A4	0	60	40	10	110	SD-S	198	43		07/01/91	07/05/91	4	38.10	0.35	3.99				SHERMAN
11A5	42	84	0	0	126	SD-S	198	43		07/09/91	07/11/91	2	19.05	0.15	3.48				SHERMAN
11A6	0	126	0	0	126	SD-S	198	43		06/28/91	07/01/91	3	28.57	0.23	3.48				SHERMAN
11A7	0	114	0	0	114	ES-SD	198	43		05/24/91	05/27/91	3	28.57	0.25	3.85				SHERMAN
11A8	0	114	0	0	114	SD-S	198	43		06/21/91	06/25/91	4	38.10	0.33	3.85				SHERMAN
12A1	0	83	0	0	83	ES-SD		304		05/21/91	05/23/91	2	19.93	0.24	3.66				COLBURN
12A2	0	82	0	0	82	SD-S		304		06/08/91	06/11/91	3	29.90	0.36	3.71				COLBURN
12A3	0	83	0	0	83	ES-SD		304		05/19/91	05/21/91	2	19.93	0.24	3.66				COLBURN
12A4	0	110	0	0	110	SD-S		304		06/14/91	06/17/91	3	29.90	0.27	2.76				COLBURN
12A5	17	63	0	0	80	ES-SD		304		05/14/91	05/16/91	2	19.93	0.25	3.80				COLBURN
12A6	0	100	0	0	100	R													
12A7	20	90	0	0	110	R													
12A8	20	90	0	0	110	ES-SD		304		05/16/91	05/19/91	3	29.90	0.27	2.76				COLBURN
12A9	0	82	0	0	82	SD-S		304		06/11/91	06/14/91	3	29.90	0.36	3.71				COLBURN
12B1	45	135	0	0	180	SGT			50	04/05/91	04/20/91	15	18.44	0.10	0.28				COLBURN
12B1	45	135	0	0	180	SGT			50	05/14/91	05/19/91	5	6.15	0.03	0.28				COLBURN
*****SUBTOTAL*****												20	24.59	0.13	*****				
12B2	0	170	0	0	170	SGT			50	04/20/91	05/14/91	24	29.51	0.17	0.29				COLBURN
12B3	74	46	24	6	150	SD-S		304		06/24/91	06/27/91	3	29.90	0.20	2.03				COLBURN
12B4	30	132	21	7	190	R													
12B5	0	184	4	2	190	SD-S		304		06/17/91	06/20/91	3	29.90	0.16	1.60				COLBURN

HABITAT UNIT	ACREAGE CHSA	BY SA	RANGE SB	SITE WL	TOTAL # ACRES	TREATMENT	C/C	STOCK ADULT	YEARLING	USE INDATE	DATE OUTDATE	# DAYS	AUMS/ ACRE	ANIMAL /ACRE	ACRES HAYED	TONS HAYED	DATE HAYED	PERMITTEE
13A	169	499	36	5	709	SD-S	203	10		06/04/91	06/14/91	10	86.48	0.12	0.59			LORD
13B1	391	389	62	17	859	SD-S		304		06/29/91	07/08/91	9	89.70	0.10	0.35			COLBURN
13B2	0	51	0	3	54	SD-S		304		06/27/91	06/29/91	2	19.93	0.39	5.96			COLBURN
13B3	0	28	0	1	29	SD-S		304		06/23/91	06/24/91	1	9.97	0.36	10.86			COLBURN
14A1	160	120	0	0	280	SD-S	407	18		06/20/91	06/23/91	3	51.81	0.19	2.97			LORD
14A2	167	121	6	0	294	SD-S	407	18		06/17/91	06/20/91	3	51.81	0.18	2.83			LORD
14A3	10	110	30	3	153	SD-S	407	18		06/14/91	06/17/91	3	51.81	0.34	5.44			LORD
14A4	10	50	125	15	200	R												
14B1	260	80	0	0	340	ES-SD	204	8		05/25/91	05/29/91	4	34.49	0.10	1.22			LORD
14B2	150	175	15	0	340	ES-SD	204	8		05/29/91	06/02/91	4	34.49	0.10	1.22			LORD
14B3	155	127	30	0	312	SD-S	204	8		06/02/91	06/07/91	5	43.11	0.14	1.33			LORD
14B4	127	128	5	0	260	SD-S	204	8		06/07/91	06/11/91	4	34.49	0.13	1.60			LORD
14B5	128	155	0	0	283	SD-S	204	8		06/11/91	06/14/91	3	25.87	0.09	1.47			LORD
15A	154	184	60	0	398	R												
15B	78	117	78	0	273	SD-S	407	18		06/23/91	06/26/91	3	51.81	0.19	3.05			LORD
15C1	0	0	30	10	40	R												
15C2	0	85	65	5	155	R												
15C3	0	2	110	63	175	H									20	21	07/24/91	GALLINO
15C4	0	2	83	114	199	H									62	85	07/21/91	GALLINO
15C4	0	2	83	114	199	SGT	128	6		05/17/91	05/29/91	12	65.31	0.33	1.32			LORD
16A1	0	4	37	3	44	R												
16A2	0	16	71	8	95	R												
16A3	0	8	34	107	149	SD-S	407			07/10/91	07/13/91	3	50.04	0.34	5.46			LORD
16B1	11	122	25	2	160	R												
16B2	11	132	150	24	317	SD-S	407	18		07/01/91	07/10/91	9	155.43	0.49	2.62			LORD
16B3	0	3	36	1	40	R												
16B4	0	174	1	0	175	R												
16C	186	305	33	0	524	SD-S	407	18		06/26/91	07/01/91	5	86.35	0.16	1.59			LORD
16E1	0	30	115	0	145	SGT	75	4		05/17/91	05/29/91	12	38.46	0.27	1.06			LORD
16E2	0	14	54	3	71	R												
16E3-4	0	147	140	44	331	SGT	204			05/09/91	05/13/91	4	33.44	0.10	1.23			LORD
16E3-4	0	147	140	44	331	SGT	204	9		05/13/91	05/23/91	10	86.56	0.26	1.26			LORD
16E3-4	0	147	140	44	331	SGT	204	8		05/23/91	05/25/91	2	17.25	0.05	1.26			LORD
*****SUBTOTAL*****												16	137.25	0.41	*****			*****
16E4	0	106	116	44	266	H									32	39	07/19/91	GALLINO
17	511	214	83	63	871	ES-SD	203	10		05/14/91	05/17/91	3	25.94	0.03	0.48			LORD
17	511	214	83	63	871	SD-S	407			07/13/91	07/20/91	7	116.76	0.13	0.93			LORD
*****SUBTOTAL*****												10	142.70	0.16	*****			*****

HABITAT	ACREAGE BY RANGE SITE				TOTAL	S T O C K				U S E D A T E		#	AUMS/	ANIMAL	ACRES	TONS	DATE	PERMITTEE	
UNIT	CHSA	SA	SB	WL	# ACRES	TREATMENT	C/C	ADULT	YEARLING	INDATE	OUTDATE	DAYS	AUMS	ACRE	/ACRE	HAYED	HAYED	HAYED	
18A1	39	261	39	0	339	ES-SD		374		05/08/91	05/13/91	5	61.31	0.18	1.10				YOUNG
18A2	85	71	7	0	163	ES-SD		374		05/13/91	05/15/91	2	24.52	0.15	2.29				YOUNG
18A3	60	90	0	0	150	ES-SD		374		05/06/91	05/08/91	2	24.52	0.16	2.49				YOUNG
18A3	60	90	0	0	150	SD-S	118	4		06/27/91	06/30/91	3	14.90	0.10	1.60				YOUNG
*****SUBTOTAL*****												5	39.42	0.26	*****				
18A4	60	160	0	0	220	ES-SD		374		05/03/91	05/06/91	3	36.79	0.17	1.70				YOUNG
18A4	60	160	0	0	220	SD-S	118	4		07/06/91	07/09/91	3	14.90	0.07	1.09				YOUNG
*****SUBTOTAL*****												6	51.69	0.24	*****				
18A5	110	150	0	0	260	SD-S	118	4		07/03/91	07/06/91	3	14.90	0.06	0.92				YOUNG
*****SUBTOTAL*****												3	14.90	0.06	*****				
18A6	26	254	10	0	290	ES-SD		374		05/15/91	05/18/91	3	36.79	0.13	1.29				YOUNG
18A6	26	254	10	0	290	SD-S	118	4		06/30/91	07/03/91	3	14.90	0.05	0.83				YOUNG
*****SUBTOTAL*****												6	51.69	0.18	*****				
18B1	0	6	71	4	81	R													
18B10	0	35	5	0	40	R													
18B2(H)	13	80	0	0	93	SD-S	118	4		06/24/91	06/27/91	3	14.90	0.16	2.58				YOUNG
18B2(H)	13	80	0	0	93	FD-L		246		03/08/92	03/14/92	6	48.39	0.52	2.65				YOUNG
81B2(H)	13	80	0	0	93	FD-L		134		03/14/92	03/26/92	12	52.72	0.57	1.44				YOUNG
18B2(H)	13	80	0	0	93	FD-L		3		03/26/92	04/03/92	8	0.98	0.01	0.06				YOUNG
18B2(H)	13	80	0	0	93	FD-L		105		04/03/92	04/10/92	7	30.12	0.32	2.26				YOUNG
18B2(H)	13	80	0	0	93	FD-L		175		04/10/92	04/25/92	15	107.58	1.16	3.76				YOUNG
18B2(H)	13	80	0	0	93	FD-L		211		04/25/92	05/01/92	6	51.89	0.56	4.54				YOUNG
*****SUBTOTAL*****												57	306.58	3.30	*****				
18B2(M)	0	4	76	3	83	H										22	51	08/20/91	YOUNG
18B3(H)	30	82	0	0	112	R													
18B3(M)	0	3	56	36	95	H										20	54	08/20/91	YOUNG
18B4(H)	50	53	0	0	103	R													
18B4(M)	0	5	20	17	42	H										12	13	08/24/91	YOUNG
18B5	0	10	57	5	72	R													
18B6	0	16	51	2	69	R													
18B7(N)	0	17	47	12	76	R													
18B7(SE)	0	22	6	5	33	R													
18B7(SW)	0	59	11	15	85	R													
18B8	17	97	57	0	171	ES-SD		374		05/01/91	05/03/91	2	24.52	0.14	2.19	15	22	08/21/91	YOUNG
18B8(W)	5	26	5	0	36	R													
18B9(H)	29	68	0	0	97	ES-SD		374		04/30/91	05/01/91	1	12.26	0.13	3.86				YOUNG

HABITAT UNIT	ACREAGE CHSA	BY SA	RANGE SB	SITE WL	TOTAL # ACRES	TREATMENT	S T O C K C/C ADULT	YEARLING	U S E INDATE	D A T E OUTDATE	# DAYS	AUMS	AUMS/ ACRE	ANIMAL /ACRE	ACRES HAYED	TONS HAYED	DATE HAYED	PERMITTEE
18B9(M)	0	8	33	0	41	H									14	22	08/21/91	YOUNG
18C1	29	134	47	6	216	R												
18C2	0	10	139	0	149	R												
19A	63	110	0	0	173	ES-SD	374		04/27/91	04/30/91	3	36.79	0.21	2.16				YOUNG
19A	63	110	0	0	173	FD-L	286		02/12/92	03/08/92	25	159.41	0.92	1.65				YOUNG
*****SUBTOTAL*****											28	196.20	1.13	*****				
19B	64	110	0	0	174	ES-SD	374		04/24/91	04/27/91	3	36.79	0.21	2.15				YOUNG
19C	0	10	91	0	101	H									18	49	08/22/91	YOUNG
20A1	0	31	89	0	120	R												
20A2	75	20	0	0	95	SD-S	118	4	06/07/91	06/10/91	3	14.90	0.16	2.53				YOUNG
20A3	91	69	0	0	160	SD-S		374	07/18/91	07/20/91	2	24.52	0.15	2.34				YOUNG
20A3	91	69	0	0	160	SD-S	118		06/04/91	06/07/91	3	14.51	0.09	1.48				YOUNG
*****SUBTOTAL*****											5	39.03	0.24	*****				
20A4	203	0	0	0	203	SD-S	118	4	06/10/91	06/13/91	3	14.90	0.07	1.18				YOUNG
20B1	81	249	10	0	340	SD-S		374	07/20/91	07/22/91	2	24.52	0.07	1.10				YOUNG
20B2	0	171	14	0	185	R												
20B3(E)	0	127	0	0	127	ES-SD	118		05/29/91	06/01/91	3	14.51	0.11	1.86				YOUNG
20B3(W)	0	112	0	0	112	SD-S		374	07/15/91	07/18/91	3	36.79	0.33	3.34				YOUNG
20B3(W)	0	112	0	0	112	SD-S	118		06/01/91	06/04/91	3	14.51	0.13	2.11				YOUNG
*****SUBTOTAL*****											6	51.30	0.46	*****				
20B4	30	155	0	0	185	ES-SD	118		05/26/91	05/29/91	3	14.51	0.08	1.28				YOUNG
20B5	11	104	0	0	115	ES-SD	118		05/23/91	05/26/91	3	14.51	0.13	2.05				YOUNG
20B6	40	115	0	0	155	SD-S		374	07/12/91	07/15/91	3	36.79	0.24	2.41				YOUNG
20B7	0	24	16	0	40	R												
21A1(A)	135	160	0	0	295	ES-SD		374	05/18/91	05/21/91	3	36.79	0.12	1.27				YOUNG
21A1(B)	40	245	0	0	285	ES-SD		374	05/21/91	05/24/91	3	36.79	0.13	1.31				YOUNG
21A1(C)	138	50	0	0	188	ES-SD		374	05/24/91	05/25/91	1	12.26	0.07	1.99				YOUNG
21A1(D)	99	189	3	0	291	ES-SD		374	05/25/91	05/28/91	3	36.79	0.13	1.29				YOUNG
21A1(E)	23	30	67	0	120	R												
21A2	2	62	57	13	134	R												
21A3	0	24	120	5	149	SGT-H	213		04/16/91	05/03/91	17	118.72	0.80	1.43	34	94	07/15/91	COLBURN
21A4	0	99	70	10	179	W	52		12/27/91	03/23/92	87	148.33	0.83	0.29	35	89	07/14/91	COLBURN
21B1	35	82	3	0	120	R												
21B2	0	22	82	2	106	R												
21B3	35	83	2	0	120	R												
21B4	55	70	3	0	128	R												
21B5	55	61	12	0	128	SD-S	374		06/16/91	06/18/91	2	24.52	0.19	2.92				YOUNG

HABITAT	ACREAGE BY RANGE SITE				TOTAL	S T O C K			U S E D A T E		#	AUMS	AUMS/	ANIMAL	ACRES	TONS	DATE	PERMITTEE	
UNIT	CHSA	SA	SB	WL	# ACRES	TREATMENT	C/C	ADULT	YEARLING	INDATE	OUTDATE	DAYS	AUMS	ACRE	/ACRE	HAYED	HAYED	HAYED	
21B6	5	75	60	3	143	R													
21B7	5	100	38	0	143	R													
21C1	5	92	20	3	120	R													
21C2	195	959	15	1	1170	SD-S		374		07/06/91	07/12/91	6	73.57	0.06	0.32				YOUNG
21C3	0	20	29	31	80	R													
21C4	0	12	111	4	127	SD-S		374		07/03/91	07/06/91	3	36.79	0.29	2.94				YOUNG
21C5	0	17	171	1	189	SD-S		374		06/30/91	07/03/91	3	36.79	0.19	1.98				YOUNG
22A1	100	257	3	0	360	SD-S		374		06/04/91	06/07/91	3	36.79	0.10	1.04				YOUNG
22A2	113	265	7	0	385	ES-SD		374		05/28/91	05/31/91	3	36.79	0.10	0.97				YOUNG
22A3	114	250	8	0	372	SD-S		374		06/07/91	06/10/91	3	36.79	0.10	1.01				YOUNG
22A4	200	190	0	0	390	SD-S		374		05/31/91	06/04/91	4	49.05	0.13	0.96				YOUNG
22B1	130	110	0	0	240	SD-S		374		06/10/91	06/12/91	2	24.52	0.10	1.56				YOUNG
22B2	118	300	2	1	421	SD-S		374		06/12/91	06/16/91	4	49.05	0.12	0.89				YOUNG
22B3	0	2	32	6	40	R													
22B4	0	51	38	1	90	R													
22B5	0	161	10	0	171	R													
23A1	10	140	10	0	160	SD-S		304		07/16/91	07/19/91	3	29.90	0.19	1.90				COLBURN
23A2	166	65	0	0	231	R													
23A3	30	181	0	0	211	SD-S		304		07/19/91	07/22/91	3	29.90	0.14	1.44				COLBURN
23B1	0	70	51	0	121	SGT-H		107		04/02/91	04/06/91	4	14.03	0.12	0.88	62	94	07/21/91	COLBURN
23B1	0	70	51	0	121	SGT-H		213		04/06/91	04/16/91	10	69.84	0.58	1.76				COLBURN
*****SUBTOTAL*****												14	83.87	0.70	*****				
23B1	0	70	51	0	121	W		52		11/18/91	12/27/91	39	66.49	0.55	0.43				COLBURN
23B1	0	70	51	0	121	W			45	12/30/91	03/16/92	77	85.20	0.70	0.37				COLBURN
*****SUBTOTAL*****												116	151.69	1.25	*****				
23B2	0	25	80	37	142	H										45	82	07/21/91	COLBURN
23C	132	330	124	13	599	SD-S		304		07/08/91	07/16/91	8	79.74	0.13	0.51				COLBURN
24A1	5	38	51	2	96	SGT-H	107	4		03/08/91	03/12/91	4	18.07	0.19	2.27	20	43	07/10/91	COLBURN
24A1	5	38	51	2	96	SGT-H	107	4		03/18/91	03/27/91	9	40.65	0.42	2.27				COLBURN
24A1	5	38	51	2	96	SGT-H	107	4		03/28/91	03/30/91	2	9.03	0.09	2.27				COLBURN
24A1	5	38	51	2	96	SGT-H	34			04/02/91	04/19/91	17	23.69	0.25	0.71				COLBURN
*****SUBTOTAL*****												32	91.44	0.95	*****				
24A2	40	35	5	0	80	R													
24A3	20	40	7	0	67	R													
24A4	0	5	35	0	40	SD-S		304		08/01/91	08/02/91	1	9.97	0.25	7.60				COLBURN
24A5	2	18	20	0	40	SD-S		304		08/02/91	08/03/91	1	9.97	0.25	7.60				COLBURN
24A6	29	71	4	0	104	ES-SD		304		05/10/91	05/12/91	2	19.93	0.19	2.92				COLBURN
24A7	0	37	17	0	54	SD-S		304		08/03/91	08/04/91	1	9.97	0.18	5.63				COLBURN
24A8	0	50	27	3	80	ES-SD		304		05/12/91	05/14/91	2	19.93	0.25	3.80	6	5	07/26/91	COLBURN
24B1	100	50	0	0	150	SD-S		304		07/29/91	08/01/91	3	29.90	0.20	2.03				COLBURN

HABITAT	ACREAGE	BY	RANGE	SITE	TOTAL		S T O C K		U S E	D A T E			AUMS/	ANIMAL	ACRES	TONS	DATE	PERMITTEE	
UNIT	CHSA	SA	SB	WL	# ACRES	TREATMENT	C/C	ADULT	YEARLING	INDATE	OUTDATE	DAYS	AUMS	ACRE	/ACRE	HAYED	HAYED	HAYED	
24B2	78	61	0	0	139	SD-S		304		07/26/91	07/29/91	3	29.90	0.22	2.19				COLBURN
24B3	75	11	0	0	86	R													
24C1	53	84	10	0	147	SD-S		304		07/23/91	07/26/91	3	29.90	0.20	2.07				COLBURN
24C2	0	8	79	10	97	H										30	77	07/12/91	COLBURN
24C3	0	49	5	0	54	SD-S		304		07/22/91	07/23/91	1	9.97	0.18	5.63				COLBURN
24C4	0	23	49	10	82	SGT-H		59		04/16/91	05/06/91	20	38.69	0.47	0.72	17	45	07/13/91	COLBURN
24D(N)	152	15	3	0	170	SGT		59		03/30/91	04/16/91	17	32.89	0.19	0.35				COLBURN
24D(S)	111	45	18	5	179	R													
25A	22	121	110	5	258	R													
25B	82	106	208	14	410	R													
25C1	0	10	52	20	82	R													
25C2	0	30	29	10	69	R													
25C3	93	68	0	0	161	ES-SD		355		05/18/91	05/21/91	3	34.92	0.22	2.20				LEE
25C4	110	90	0	0	200	ES-SD		355		05/15/91	05/18/91	3	34.92	0.17	1.77				LEE
26A1	0	110	217	8	335	R-H										5	12	08/15/91	ANDERSON/GRABHER
26A2	94	250	5	0	349	SD-S		357		07/24/91	07/30/91	6	70.23	0.20	1.02				LEE
26B1	0	9	100	1	110	FALL		248		09/30/91	10/10/91	10	81.31	0.74	2.25				ANDERSON/GRABHER
26B2	6	32	75	2	115	R													
26B3	2	10	96	2	110	SGT		30		05/01/91	05/21/91	20	19.67	0.18	0.27				ANDERSON/GRABHER
26B4	0	15	110	0	125	R													
27A1	0	18	14	0	32	SD-S	152	4		06/05/91	06/06/91	1	6.36	0.20	9.62				ANDERSON/GRABHER
27A1	0	18	14	0	32	SD-S	59	1		07/22/91	07/25/91	3	7.35	0.23	3.72				ANDERSON/GRABHER
*****SUBTOTAL*****												4	13.71	0.43					
27A2	0	5	262	0	267	H-W		223		12/02/91	12/16/91	14	102.36	0.38	0.84	150	228	07/01/91	ANDERSON/GRABHER
27A2	0	5	262	0	267	H-W		205		12/22/91	12/25/91	3	20.16	0.08	0.77				ANDERSON/GRABHER
27A2	0	5	262	0	267	H-W		205		12/27/91	01/02/92	6	40.33	0.15	0.77				ANDERSON/GRABHER
*****SUBTOTAL*****												23	162.85	0.61					
27B1	4	46	7	0	57	SD-S	152	4		06/04/91	06/05/91	1	6.36	0.11	5.40				ANDERSON/GRABHER
27B1	4	46	7	0	57	SD-S	59	2		07/19/91	07/22/91	3	7.45	0.13	2.11				ANDERSON/GRABHER
*****SUBTOTAL*****												4	13.81	0.24					
27B2	7	29	0	0	36	SD-S	152	4		06/08/91	06/10/91	2	12.72	0.35	8.56				ANDERSON/GRABHER
27B2	7	29	0	0	36	SD-S	59	1		07/28/91	07/31/91	3	7.35	0.20	3.31				ANDERSON/GRABHER
*****SUBTOTAL*****												5	20.07	0.55					
27B3	0	28	9	0	37	ES-SD	152	4		06/02/91	06/04/91	2	12.72	0.34	8.32				ANDERSON/GRABHER
27B3	0	28	9	0	37	SD-S	59	2		07/15/91	07/19/91	4	9.93	0.27	3.24				ANDERSON/GRABHER
*****SUBTOTAL*****												6	22.65	0.61					

HABITAT	ACREAGE	BY	RANGE	SITE	TOTAL		S T O C K		U S E	D A T E	#		AUMS/	ANIMAL	ACRES	TONS	DATE		
UNIT	CHSA	SA	SB	WL	# ACRES	TREATMENT	C/C	ADULT	YEARLING	INDATE	OUTDATE	DAYS	AUMS	ACRE	/ACRE	HAYED	HAYED	HAYED	PERMITTEE
27B4	0	25	12	0	37	SD-S	152	4		06/06/91	06/08/91	2	12.72	0.34	8.32				ANDERSON/GRABHER
27B4	0	25	12	0	37	SD-S	59	1		07/25/91	07/28/91	3	7.35	0.20	3.22				ANDERSON/GRABHER
*****SUBTOTAL*****												5	20.07	0.54					
28A1	55	20	5	78	158	SD-S	59	1		07/31/91	08/04/91	4	9.80	0.12	1.49				ANDERSON/GRABHER
28A2	20	60	0	0	80	ES-SD	152	3	2	05/28/91	05/30/91	2	12.75	0.16	3.86				ANDERSON/GRABHER
28A2	20	60	0	0	80	SD-S	59	2		07/05/91	07/08/91	3	7.45	0.09	1.50				ANDERSON/GRABHER
*****SUBTOTAL*****												5	20.20	0.25					
28A3(N)	37	3	0	0	40	SD-S	152	4		06/16/91	06/18/91	2	12.72	0.32	7.70				ANDERSON/GRABHER
28A3(N)	37	3	0	0	40	SD-S	59	1		08/04/91	08/07/91	3	7.35	0.18	2.98				ANDERSON/GRABHER
*****SUBTOTAL*****												5	20.07	0.50					
28A3(S)	38	2	0	0	40	ES-SD	152	3	2	05/23/91	05/26/91	3	19.13	0.48	7.72				ANDERSON/GRABHER
28A3(S)	38	2	0	0	40	SD-S	152	4		06/18/91	06/20/91	2	12.72	0.32	7.70				ANDERSON/GRABHER
28A3(S)	38	2	0	0	40	SD-D	58	1		08/11/91	08/13/91	2	4.82	0.12	2.92				ANDERSON/GRABHER
*****SUBTOTAL*****												7	36.67	0.92					
28A4	77	5	3	0	85	ES-SD	140	1	2	05/26/91	05/28/91	2	11.64	0.14	3.33				ANDERSON/GRABHER
28A4	77	5	3	0	85	W		205		12/16/91	12/22/91	6	40.33	0.47	2.41				ANDERSON/GRABHER
*****SUBTOTAL*****												8	51.97	0.61					
28A5	12	10	52	1	75	ES-SD	152	3	2	05/30/91	06/02/91	3	19.13	0.26	4.12				ANDERSON/GRABHER
28A5	12	10	52	1	75	SD-S	59	2		07/08/91	07/12/91	4	9.93	0.13	1.60				ANDERSON/GRABHER
*****SUBTOTAL*****												7	29.06	0.39					
28A6	22	15	42	1	80	SD-S	59	2		07/12/91	07/15/91	3	7.45	0.09	1.50				ANDERSON/GRABHER
28B1	90	199	0	0	289	SD-S	152	4		06/10/91	06/16/91	6	38.16	0.13	1.07				ANDERSON/GRABHER
28B1	90	199	0	0	289	SD-S	59	1		08/07/91	08/11/91	4	9.80	0.03	0.41				ANDERSON/GRABHER
*****SUBTOTAL*****												10	47.96	0.16					
28B2	98	196	0	0	294	SD-S		322		07/20/91	07/24/91	4	42.23	0.14	1.10				HANNA
28B3	81	199	0	0	280	ES-SD		320		05/22/91	05/27/91	5	52.46	0.19	1.14				HANNA
28B3	81	199	0	0	280	SD-S		322		07/24/91	07/28/91	4	42.23	0.15	1.15				HANNA
*****SUBTOTAL*****												9	94.69	0.34					
28B4	5	262	20	0	287	ES-SD		320		05/17/91	05/22/91	5	52.46	0.18	1.11				HANNA
28B4	5	262	20	0	287	SD-S		322		07/28/91	08/01/91	4	42.23	0.15	1.12				HANNA
*****SUBTOTAL*****												9	94.69	0.33					
28C	0	510	170	30	710	H										40	112	07/26/91	GALLINO
29A1	0	20	70	0	90	R													
29A2	0	40	136	0	176	SD-S		357		06/26/91	06/29/91	3	35.11	0.20	2.03				LEE
29A2	0	40	136	0	176	SD-S		322		06/26/91	06/29/91	3	31.67	0.18	1.83				HANNA
*****SUBTOTAL*****												6	66.78	0.38					
29B1	0	49	50	0	99	ES-SD		355		05/21/91	05/24/91	3	34.92	0.35	3.59				LEE

HABITAT	ACREAGE BY RANGE SITE				TOTAL	S T O C K			U S E D A T E		#	AUMS/	ANIMAL	ACRES	TONS	DATE			
UNIT	CHSA	SA	SB	WL	# ACRES	TREATMENT	C/C	ADULT	YEARLING	INDATE	OUTDATE	DAYS	AUMS	ACRE	/ACRE	HAYED	HAYED	HAYED	PERMITTEE
29B2	72	96	14	0	182	ES-SD		355		05/24/91	05/27/91	3	34.92	0.19	1.95				LEE
29B3	22	39	6	2	69	ES-SD		355		05/27/91	05/28/91	1	11.64	0.17	5.14				LEE
29B3	22	39	6	2	69	SD-S		357		07/19/91	07/20/91	1	11.70	0.17	5.17				LEE
29B3	22	39	6	2	69	ES-SD		320		05/27/91	05/28/91	1	10.49	0.15	4.64				HANNA
29B3	22	39	6	2	69	SD-S		322		07/19/91	07/20/91	1	10.56	0.15	4.67				HANNA
*****SUBTOTAL*****												4	44.39	0.64					*****
29B4	0	69	20	0	89	SD-S		357		07/20/91	07/22/91	2	23.41	0.26	4.01				LEE
29B5	26	174	146	30	376	SD-S		357		07/22/91	07/24/91	2	23.41	0.06	0.95				LEE
30A(T)	0	15	0	0	15	R													
30A1	0	451	5	2	458	SD-S		357		06/07/91	06/12/91	5	58.52	0.13	0.78				LEE
30A1	0	451	5	2	458	SD-S		322		06/07/91	06/12/91	5	52.79	0.12	0.70				HANNA
*****SUBTOTAL*****												10	111.31	0.25					*****
30A2	0	195	4	2	201	SD-S		357		06/20/91	06/23/91	3	35.11	0.17	1.78				LEE
30A2	0	195	4	2	201	SD-S		322		06/20/91	06/23/91	3	31.67	0.16	1.60				HANNA
*****SUBTOTAL*****												6	66.78	0.33					*****
30A3	200	137	70	3	410	SD-S		357		06/15/91	06/20/91	5	58.52	0.14	0.87				LEE
30A3	200	137	70	3	410	SD-S		322		06/15/91	06/20/91	5	52.79	0.13	0.79				HANNA
*****SUBTOTAL*****												10	111.31	0.27					*****
30A4	61	198	40	13	312	SD-S		357		06/12/91	06/15/91	3	35.11	0.11	1.14				LEE
30A4	61	198	40	13	312	SD-S		322		06/12/91	06/15/91	3	31.67	0.10	1.03				HANNA
*****SUBTOTAL*****												6	66.78	0.21					*****
30B1(E)	20	174	8	0	202	SD-S		357		07/08/91	07/11/91	3	35.11	0.17	1.77				LEE
30B1(E)	20	174	8	0	202	SD-S		322		07/08/91	07/11/91	3	31.67	0.16	1.59				HANNA
*****SUBTOTAL*****												6	66.78	0.33					*****
30B1(W)	20	119	7	0	146	SD-S		355		05/31/91	06/03/91	3	34.92	0.24	2.43				LEE
30B1(W)	20	119	7	0	146	SD-S		320		05/31/91	06/03/91	3	31.48	0.22	2.19				HANNA
*****SUBTOTAL*****												6	66.40	0.46					*****
30B2	0	240	16	0	256	ES-SD		355		05/28/91	05/31/91	3	34.92	0.14	1.39				LEE
30B2	0	240	16	0	256	SD-S		357		07/17/91	07/19/91	2	23.41	0.09	1.39				LEE
30B2	0	240	16	0	256	ES-SD		320		05/28/91	05/31/91	3	31.48	0.12	1.25				HANNA
30B2	0	240	16	0	256	SD-S		322		07/17/91	07/19/91	2	21.11	0.08	1.26				HANNA
*****SUBTOTAL*****												10	110.92	0.43					*****
30B3	0	118	10	0	128	SD-S		357		07/14/91	07/17/91	3	35.11	0.27	2.79				LEE
30B3	0	118	10	0	128	SD-S		322		07/14/91	07/17/91	3	31.67	0.25	2.52				HANNA
*****SUBTOTAL*****												6	66.78	0.52					*****

HABITAT	ACREAGE BY RANGE SITE				TOTAL	S T O C K			U S E D A T E		#	AUMS/	ANIMAL	ACRES	TONS	DATE	PERMITTEE		
UNIT	CHSA	SA	SB	WL	# ACRES	TREATMENT	C/C	ADULT	YEARLING	INDATE	OUTDATE	DAYS	AUMS	ACRE	/ACRE	HAYED	HAYED	HAYED	
30B4	0	110	25	0	135	SD-S		357		07/11/91	07/14/91	3	35.11	0.26	2.64				LEE
30B4	0	110	25	0	135	SD-S		322		07/11/91	07/14/91	3	31.67	0.23	2.39				HANNA
*****SUBTOTAL*****												6	66.78	0.49	*****				
30C1	0	313	15	0	328	SD-S		357		06/03/91	06/07/91	4	46.82	0.14	1.09				LEE
30C1	0	313	15	0	328	SD-S		322		06/03/91	06/07/91	4	42.23	0.13	0.98				HANNA
*****SUBTOTAL*****												8	89.05	0.27	*****				
30C2	0	161	9	10	180	SD-S		357		07/05/91	07/08/91	3	35.11	0.20	1.98				LEE
30C2	0	161	9	10	180	SD-S		322		07/05/91	07/08/91	3	31.67	0.18	1.79				HANNA
*****SUBTOTAL*****												6	66.78	0.38	*****				
30C3	60	73	50	3	186	SD-S		357		07/02/91	07/05/91	3	35.11	0.19	1.92				LEE
30C3	60	73	50	3	186	SD-S		322		07/02/91	07/05/91	3	31.67	0.17	1.73				HANNA
*****SUBTOTAL*****												6	66.78	0.36	*****				
30C4	12	89	80	5	186	SD-S		357		06/29/91	07/02/91	3	35.11	0.19	1.92				LEE
30C4	12	89	80	5	186	SD-S		322		06/29/91	07/02/91	3	31.67	0.17	1.73				HANNA
*****SUBTOTAL*****												6	66.78	0.36	*****				
30C5	0	162	24	2	188	SD-S		357		06/23/91	06/26/91	3	35.11	0.19	1.90				LEE
30C5	0	162	24	2	188	SD-S		322		06/23/91	06/26/91	3	31.67	0.17	1.71				HANNA
*****SUBTOTAL*****												6	66.78	0.36	*****				
31A	0	87	84	0	171	H										39	82	07/05/91	GALLINO
31A(T)	0	15	0	0	15	R													
31B(T)	0	30	0	0	30	R													
31B1	97	277	181	0	555	SD-S		374		06/18/91	06/22/91	4	49.05	0.09	0.67				YOUNG
31B2	90	289	50	0	429	SD-S		374		06/22/91	06/26/91	4	49.05	0.11	0.87				YOUNG
31C	60	306	130	10	506	SD-S		374		06/26/91	06/30/91	4	49.05	0.10	0.74				YOUNG
32A	93	398	0	0	491	R													
32B1	0	69	158	70	297	R													
32B2	0	53	99	3	155	H										65	94	07/25/91	GALLINO
32C1	0	196	118	0	314	ES-SD	215			05/23/91	05/28/91	5	44.06	0.14	1.37				GALLINO
32C1	0	196	118	0	314	ES-SD	215	5		05/28/91	06/02/91	5	44.88	0.14	1.39				GALLINO
*****SUBTOTAL*****												10	88.94	0.28	*****				
32C2	0	0	73	10	83	R													
33	178	381	281	0	840	W		145		12/13/91	12/27/91	14	66.56	0.08	0.17	36	88	07/10/91	GALLINO
33	178	381	281	0	840	FD-R		145		12/27/91	01/05/92	9	42.79	0.05	0.17	36	88	07/10/91	GALLINO
33	178	381	281	0	840	FD-R		223		01/05/92	01/28/92	23	168.16	0.20	0.27		88		GALLINO
*****SUBTOTAL*****												46	277.51	0.33	*****				
34A1	175	65	0	0	240	SD-S	214	9		06/14/91	06/17/91	3	27.20	0.11	1.82				GALLINO
34A1	175	65	0	0	240	SD-S	214	9		07/19/91	07/20/91	1	9.07	0.04	1.82				GALLINO
*****SUBTOTAL*****												4	36.27	0.15	*****				

HABITAT	ACREAGE BY RANGE SITE				TOTAL	S T O C K				U S E D A T E		#	AUMS/	ANIMAL	ACRES	TONS	DATE	PERMITTEE	
UNIT	CHSA	SA	SB	WL	# ACRES	TREATMENT	C/C	ADULT	YEARLING	INDATE	OUTDATE	DAYS	AUMS	ACRE	/ACRE	HAYED	HAYED	HAYED	
34A2	225	15	0	0	240	SD-S	214	9		07/20/91	07/23/91	3	27.20	0.11	1.82				GALLINO
34A3	122	100	0	0	222	SD-S	214	9		07/11/91	07/14/91	3	27.20	0.12	1.97				GALLINO
34A4	10	209	0	0	219	SD-S	214	9		07/14/91	07/17/91	3	27.20	0.12	2.00				GALLINO
34A5	50	110	0	0	160	SD-S	214	9		06/17/91	06/20/91	3	27.20	0.17	2.73				GALLINO
34A6	10	110	0	0	120	SD-S	214	9		07/17/91	07/19/91	2	18.13	0.15	3.64				GALLINO
34B1(E)	0	170	4	0	174	SD-S	214	9		07/26/91	07/29/91	3	27.20	0.16	2.51				GALLINO
34B1(W)	25	176	0	0	201	SD-S	214	9		07/08/91	07/11/91	3	27.20	0.14	2.17				GALLINO
34B2	0	284	22	0	306	SD-S	214	9		07/05/91	07/08/91	3	27.20	0.09	1.43				GALLINO
34B3(S)	0	140	2	0	142	R													
34B3(N)	0	164	0	0	164	SD-S	214	9		07/23/91	07/26/91	3	27.20	0.17	2.66				GALLINO
34C(T)	0	15	0	0	15	R													
34C1	0	10	180	12	202	SD-S	214	9		06/23/91	06/26/91	3	27.20	0.13	2.16				GALLINO
34C2	0	159	65	3	227	SD-S	214	9		07/02/91	07/05/91	3	27.20	0.12	1.93				GALLINO
34C3	0	120	35	0	155	SD-S	214	9		06/29/91	07/02/91	3	27.20	0.18	2.82				GALLINO
34C4	0	60	90	5	155	R													
34C5	0	120	35	0	155	SD-S	214	9		06/26/91	06/29/91	3	27.20	0.18	2.82				GALLINO
34D	26	89	114	2	231	FD-L		223		02/05/92	02/18/92	13	95.05	0.41	0.97	50	111	07/14/91	GALLINO
34D	26	89	114	2	231	FD-L		448		02/18/92	03/03/92	14	205.64	0.89	1.94				GALLINO
*****SUBTOTAL*****												27	300.69	1.30	*****				
34E1	0	198	24	0	222	SD-S	214	9		06/20/91	06/23/91	3	27.20	0.12	1.97				GALLINO
34E2	0	230	80	0	310	ES-SD-H	313			04/18/91	04/22/91	4	51.31	0.17	2.02	35	86	07/18/91	GALLINO
34E3	0	210	80	0	290	ES-SD-H	313			04/22/91	04/25/91	3	38.48	0.13	2.16	40	63	07/17/91	GALLINO
34F	0	50	53	0	103	SGT		100		05/15/91	05/29/91	14	34.43	0.33	0.97				GALLINO
35A(N)	0	184	40	0	224	SD-S	214			08/12/91	08/15/91	3	26.31	0.12	1.91				GALLINO
35A(S)	0	378	22	0	400	R													
35B	0	141	181	0	322	SD-S	214			07/29/91	08/04/91	6	52.62	0.16	1.33				GALLINO
35BCAMP	0	35	3	0	38	SD-S	214			08/10/91	08/12/91	2	17.54	0.46	11.26				GALLINO
35C	0	14	255	8	277	SD-S	214			08/04/91	08/10/91	6	52.62	0.19	1.55				GALLINO
36A	0	97	127	5	229	R													
36B	41	398	176	0	615	R													
GWNA	216	682	0	24	922	R													
HACKBERRY	37	9	75	0	121	YR		1 HORSE		01/01/91	01/01/92	1YR	12.00	0.10					REFUGE
NA#2	220	239	0	0	459	R													
PELICAN	0	73	63	0	136	YR		1		04/15/91	01/01/92	261	8.56	0.06	0.01				KIME
PONY	0	0	23	0	23	R													
SweetR	0	95	15	0	110	H										15	32	07/12/91	COLBURN

agreements, we follow similar procedures with the U.S. Forest Service, Nebraska National Forest. Aggressive support of VRFPD by refuge crews has brought beneficial return with equally aggressive support of fires on or threatening refuge lands. Refuge staff and seasonal firefighters enable the complex to readily fulfill their obligation to this program.



Figure 19. Seasonal firefighters: Terry Nelson, Kevin Kvame, Rich Sterry, Tim Langston, Roger Foster, Dean Mostad, Todd Eichenberger, Bill Waln, Al Kasper, and David Prasch. (LLV)

ME-VAL 3/11

During 1991, the Complex maintained a fire organization consisting of three type 6X engines, five type 7X engines, eleven collateral duty firefighters, and 10 seasonal firefighters. Fortunately, there were no fires within the refuge during 1991, but nineteen engines with operators and/or crews were dispatched to support cooperators on 14 fires. In addition to saving valuable private rangeland and hay, Complex crews were credited with saving one residence, one barn, one fuel tank, and one tractor. Complex engines also assisted with suppressing several vehicle fires and a structure fire. (Table 9.)

Table 9. Refuge Responses to Fires, 1991.

<u>Date</u>	<u>Fire Name</u>	<u>Land Ownership</u>	<u>Cause - Acres - Comments</u>
02/15	Stetter	Private	VRFPD requested assistance on a wildfire. One type 6X engine w/crew was dispatched. The fire was controlled at 0.5 acres.
02/25	Reiser	Private	VRFPD requested assistance on a wildfire 4 miles south of Valentine NWR. Two type 6X engines with operators were dispatched. The fire was controlled at 50 acres.
03/04	Daniels	Private	Complex staff observed smoke near the Valentine NWR boundary. One type 6X engine and crew were dispatched. Staff arriving on the scene discovered the fire to be on private property burning adjacent to a residence, barn, and fuel tank. The fire was controlled at 0.5 acres, and the residence, barn, and fuel tank were saved.
04/07	McLeod	Private	VRFPD requested assistance on a ranch fire. Two type 6X engines with crews were dispatched from the Complex. Complex engines were first on the scene and discovered a garage 80% consumed. Complex engines extinguished the structure fire and controlled the grass fire at 0.1 acre. VRFPD engines arrived and handled overhaul of the structure.
04/23	Sears	Private	VRFPD requested assistance on a ranch fire. Two type 6X engines w/ crews were dispatched from the complex. The fire was controlled at 2 acres.

<u>Date</u>	<u>Fire Name</u>	<u>Land Ownership</u>	<u>Cause - Acres - Comments</u>
05/19	Lovejoy	Private	VRFPD requested assistance on a ranch fire. One type 6X engine and operator were dispatched from the Complex. A tractor fire was extinguished by the USF&WS engine operator with a chemical fire extinguisher. The fire was controlled at 0.1 acres, and one tractor was saved.
07/18	McPeak	Private	VRFPD requested assistance on a ranch fire. One type 6X engine w/ crew and one type 7X engine w/ crew were dispatched from the complex. The fire was controlled at 5 acres.
07/19	Arabia I	Private	VRFPD requested assistance on a tractor and grass fire. The refuge dispatched one type 6X engine and crew. The grass fire was controlled at 1 acre. A tractor and hay baler were destroyed.
07/30	Johnson	Private	VRFPD requested assistance on a wildfire. One type 6X and two type 7X engines with crews were dispatched. The fire was suppressed at 1 acre.
08/01	Snake River	Private	VRFPD requested assistance on a wildfire burning in a steep canyon of the Snake River. Two type 6X engines and crews were immediately dispatched, and an additional 2 type 7X engines were placed on stand-by. The fire was suppressed at 6 acres.
08/01	Bradenburg	Private	VRFPD requested assistance on a wildfire. One type 6X engine w/ crew and one type 7X engine w/ crew were dispatched. The fire was suppressed at 2 acres.

<u>Date</u>	<u>Fire Name</u>	<u>Land Ownership</u>	<u>Cause - Acres - Comments</u>
08/16	Melcher	Private	VRFPD requested a hand crew to assist on a series of lightning fires burning in the canyons approximately 20 miles east of the refuge. A 6 person refuge crew was formed, but the order was canceled before leaving the Complex.
08/23	Newcomb	Private	A vehicle fire was discovered by refuge staff on private land. VRFPD units and a refuge type 6X engine and crew were dispatched. The refuge engine arrived first and prevented the spread of the fire from the vehicle to the grass fuels. The vehicle was a total loss.
09/04	By The Way	Private	VRFPD requested assistance in the suppression of a hay stack fire. One type 6X engine and crew was dispatched. Four 1 ton hay bales were destroyed, and approximately 300 bales were saved.

10. Pest Control

Insecticide treated mineral was used by Valentine NWR permittees to control horn and face flies on cattle in 1991. No pesticides were used other than this.

Twenty angora goats were borrowed from a refuge neighbor for leafy spurge control at Valentine NWR. A horse trailer was used to house the goats and a portable electric fence used to confine the goats to the spurge patches. The goats show a real preference for the spurge over grass, eating all the leaves and the smaller plants down to the ground. The use of goats for spurge control showed some promise during the first year. Stem counts in sample plots went from an average of 63 stems per square meter to 26. Height of the plants was also reduced from 25 to 12 inches. The plants also produced no seed. Goats grazed the spurge at two separate times. The down side is that it takes quite a bit of time to move the goats, fence, and trailer between the patches.

A prescribed burn plan for burning Canadian thistle was sent in. This year seems to have been ideal for its growth. A neighbor to Valentine NWR has contacted us and the county weed control agent. Burning done in July destroyed the seed if it was done before maturity. Plants

burned in July were checked again in the fall and had regrown to a height of a few inches. The burning was a slow process using a weed torch.

Canadian thistle growing at Valentine NWR was checked and stems damaged by stem boring insects seen. A native thistle growing at Ft. Niobrara NWR had a fairly large white grub found feeding in the flower head.

Richard Maleki of the New York Coop. Unit was contacted about biological control of purple looserife. The plant is common along the Niobrara River and now one plant has been found at Valentine NWR. Dr. Maleki has three bugs that attack the plant. One is cleared for release. He is seeking funds to propagate the one and clear the others. It would be beneficial to stop looserife before it becomes a problem in Sandhills lakes and marshes.

ROS Lindvall attended the Area II Weed Supervisors Meeting held in Valentine on December 10. A presentation on non-chemical controls used on the refuges, including goats, fire, buffalo, and plastic covering, was given. The new weeds of concern are spotted knapweed and purple looserife. Knapweed will soon be added to the weed list. The weed supervisors for Cherry, Brown, and Rock Counties were provided a copy of Non-chemical Alternatives for Managing Selected Plant Species in the Western United States.

13. WPA Easement Monitoring

FmHA transferred the 480 acre Tower Property in fee title to the U.S. Fish and Wildlife Service. The property was formerly an easement. We requested additional lands that include some wetlands but the request was denied. A level 1 contaminant survey was completed for the transfer. No contaminants were found on the property. Adjacent lands owned by FMHA do, however, have used oil stored in barrels and diesel stored in above ground tanks present. The local office of FmHA was contacted but the oil and diesel were not removed by year's end.

A water control structure was installed in the old ditch that connects the marsh and small lake portions of the wetland. A water gauge was also put in place. The water gauge is not tied into sea level and is located on the front of the water control structure. The top of the gauge is located just below the angle iron on the front of the structure and reads 10.12. On 19 December 1991 when the gauge was installed, the water level reading was 8.64 and water was flowing through the pipe. This is about the maximum pool without backing water onto adjacent lands. Readings of the water level from a stake were converted to the new gauge readings and are: Feb. 1989 - 8.56, May 1989 - 8.4, June 1989 - 8.08, September 1989 - 7.52, May 1990 - 8.08, June 1990 - 8.00, October 1990 - 7.36, March 1991 - 7.96, July 1991 - 8.00 (August 1991 control structure installed, boards added), and December 1991 - 8.64.



Figure 19a. The water control structure assures that this fine wetland will remain filled. (MLL)

Pair and brood counts were done on the Tower Property. Two hundred and eighty three pairs were recorded. Most were blue-winged teal and mallards. Other species seen were gadwall, shoveler, redhead, canvasback, ruddy, scaup, bufflehead, and green-winged teal. The duckling production index for the property was 717, all dabblers. Observed brood pair ratios were 7% for blue-winged teal and 14% for mallard. There were an estimated 5,000 black terns on the area. A fall survey found 10,000 ducks on the property. This land is a fine addition. Almost every visit to the place is impressive with the large numbers and variety of birds and other wildlife present.

The other easements, the Mead and Johnson, were not visited in 1991.

14. Private Lands Program

The Ft. Niobrara-Valentine NWR Complex staff assumed a more active role in the Private Lands Program in the Sandhills region of Nebraska in 1991. Field reviews of two 404 permit applications in Cherry County were completed. Technical assistance, airboat, and operator were provided on the George Lake renovation project accomplished by the Rainwater Basin WMD. A wetlands restoration project in Rock County that was initiated in 1988 came one step closer to completion with the receipt of a 404 permit in April. The 3 year wait for Corps of Engineer approval "dampened" the willingness of the landowner to restore the wetlands. The project remained unfinished at year's end.

G. WILDLIFE

1. Wildlife Diversity

Wildlife diversity, with the exception of large ungulates and their predators, is relatively unchanged in the Nebraska Sandhills as compared to most areas of the United States. Native grasslands predominate the area and indigenous wildlife are well represented.

The primary refuge objective is waterfowl production and maintenance. Criteria for evaluating program activities is its compatibility with the primary objective; however, a broad base has been applied for implementing program activities. The three activities which have the most influence upon wildlife diversity are grassland management, wetland management and public use programs.

Preservation and maintenance of native prairie is essential for the diversity of indigenous and naturalized wildlife species common to this area. An active grazing program has been the primary program thrust for providing/maintaining grassland habitat. Since 1972, total grassland composition and condition have improved by employing planned treatments of grazing, mowing and rest to support legal and administrative mandates. Monitoring procedures were initiated in 1978 to document wildlife response to habitat provided. This information dictates that maintenance of a greater quantity of tall, vigorous native vegetation for nesting cover is the goal for which we should be striving.

A major thrust of the refuge is to maintain wetland quality by minimizing the effects of carp infestations and prevent infestation of lakes that are carp free. Carp are known to be in four of seven lakes previously renovated. Modifications of fishing regulations and management to encourage biological control of carp was initiated in 1986. Extensive effort has also been made to prevent carp movement between lakes and in particular into the Marsh Lakes, Sweetwater and Dad's Lake drainage. However, carp may have entered the Marsh Lakes. Thriving carp populations have historically had adverse effects upon the biotic diversity of refuge wetlands and associated wildlife resources.

The refuge is committed to a public use program which primarily consists of fishing and hunting. The objective level of 34,000 annual visitation may be too high for the fragile environment of the Sandhills. An effort to improve the quality of out-of-doors experiences has dictated that the quantity of public use facilities (trails, boat ramps, toilet facilities and parking areas) be limited in line with the physical and financial capability of funding and manpower targets as well as objectives relating to "naturalness" of the refuge.

2. Endangered and/or Threatened Species

a. Whooping Crane

There were no sightings of whooping cranes during 1991.

b. Bald Eagle

Bald eagle numbers rarely exceed a half dozen individuals at a given time. Most bald eagles winter in the vicinity of Merritt Reservoir, Snake River, Gordon Creek, Schlagel Creek and Niobrara River. However, a winter kill of carp on Willow Lake concentrated bald eagles during the late winter and early spring on Willow Lake and up until mid-March it was not uncommon to observe as many as 20 individuals at any given time. Several observations were made in mid-April which is later than usual.

Refuge staff cooperated in the National Wildlife Federation Winter Eagle Count, but, most eagles are concentrated along the riverine habitat in the area.

c. Barn Owl

The barn owl, classified endangered by the State of Nebraska, nested successfully during 1980-87 in the observation tower at the west end of Hackberry Lake. In 1988 nesting activity was absent; successful in 1989; but, absent again in 1990 in 1991.

d. Blowout Penstemon

Blowout penstemon, Penstemon haydenii, was proposed for Federal listing as an endangered species in 1986 and was so listed in September of 1987. This species is endemic to the Nebraska Sandhills and is found on and adjacent to blowouts. Blowouts are open sand areas generally in the choppy range sites that result from disturbance and maintained by wind erosion. If blowouts are the key to this species survival there is no shortage of habitat throughout the Nebraska Sandhills.

Blowout penstemon has been documented to naturally occur on Valentine NWR, Crescent Lake NWR, The Nature Conservancy's Graves Ranch Preserve, Ballard Marsh State Special Use Area and several private ranches including the Francis Crowe Ranch adjacent to H.U. 3B, east of Hackberry Headquarters. On Valentine NWR it has been recorded in two locations (Figure 22)--H.U. 3D and 8B. In 1968, former Refuge Manager Ned I. Peabody photographed the plant, however, the specific site location is unknown.

In 1937 Penstemon haydenii was collected north of Dewey Lake and this is the location that Dr. Ron Weedon located 70-80 plants in 1979. A sharp decline in plant numbers was noted in 1985 and by 1987 only 6 plants were present. No plants were observed during the dry years of 1988 & 1989. On May 22, 1989 a wildfire burned the N-NE portion of this unit and the ensuing drought conditions left the south facing slopes void of vegetation throughout the growing season. A single plant was present in 1990.

During 1991, a single *Penstemon Haydenii* plant was observed in H.U. 3D by Biologist McDaniel, but, insects defoliated the plant prior to flowering--a seed stalk from 1990 was also apparent (Figure 19).

YCC located 3 flowering plant clusters in H.U.8B2 east of where the species was observed in H.U.8B1. This is the first observation of this species in H.U.8B2. YCC also completed an inventory on the Francis Crowe Ranch adjacent to H.U.3B and observed 188 flowering plants.

Biologist McDaniel assisted Dr. Jim Stubbendieck and Tom Sybert, UN-L, with the collection of diseased and insect affected blowout penstemon plants on and adjacent to Valentine NWR. Evidently, a stem boring beetle is adversely affecting this species. However, numerous other insect species and mammals are also feeding on blowout penstemon plants reducing both seed production and plant survival.

The Draft Recovery Plan for *P. hadenii* was reviewed by refuge staff and forwarded to FWE-Grand Island.



Figure 19b. Insect damaged blowout penstemon plant in H.U. 3D (6/5/91 LLM).

NE-VAL-3112

f. Western Prairie Fringed Orchid

Western Prairie Fringed Orchid, *Platanthera praeclara*, was listed under the provisions of the Endangered Species Act during 1989.

Two new site locations were found to be occupied by the threatened prairie fringed orchid during 1991. A total of 110 plants were located in H.U. 32B2, H.U. 29A1, H.U. 24C, H.U. 18B7, Pvt./H.U. 7A and H.U. 25B (Fig. 22). Ground searches were accomplished with the assistance of YCC and Mike Fritz, Nebraska Game & Parks Commission. Biologist McDaniel assisted Mike Fritz in collecting leaf samples for laboratory genetic analysis by John Pleasant, Iowa State University, under the provisions of Sec. 6, Endangered Species Act. Samples were taken from Pony and East Sweetwater Valleys (H.U. 32B2 and H.U. 29A1) on Valentine NWR.

Pony Valley

P. praeclara has been recorded on three occasions in Habitat Unit 32B2 which is primarily a sub-irrigated meadow adjacent to Center Lake. This meadow has been mowed on an annual basis prior to establishment of Valentine NWR in 1935. In recent years this meadow has been annually mowed to provide winter feed for the Texas longhorn cattle at Ft. Niobrara NWR.

On July 7, 1989 Craig Freeman, University of Kansas Biological Survey, observed three flowering plants at the west end of this unit. The 1989 site location is outside the historic mow line in an old borrow area adjacent to Pony Lake Dike. In the 1970's Biological Technician Vaughn collected a specimen of P. praeclara 100 yards south of the 1989 site. During 1990, a single prairie fringed orchid plant was observed in the old borrow area. This year a total of 45 plants were observed scattered at the west end of H.U. 32B2 in both the mowed and unmowed areas. This area was excluded from mowing during 1991.

West Sweetwater Valley

P. praeclara was recorded on the north and south sides of the marsh adjacent to Highway 83 by Marlin Bowles, Natural Land Institute, Illinois on July 4, 1985. Two plants were recorded on the north side of the marsh (H.U. 29A1) and 13 plants were observed on the south side of the marsh (H.U. 25B). This species was not observed during 1986-89 in either unit; however, extensive surveys were not carried out. In 1990, 22 flowering plants were located and this year 40 plants were observed in H.U. 29A1. In addition, 10 orchids were located by YCC in H.U. 24C and 2 more in the right of way of highway 83 adjacent to H.U. 24C which are new site locations.

Cow Lake

A single flowering orchid was observed in the fence line H.U. 25A and H.U. 25B at the west end of Cow Lake which is also a new site location.

Hackberry Headquarters

On July 1, 1989 Wildlife Biologist McDaniel observed a single flowering plant in the north right of way of Highway 16B approximately 0.3 miles west of Hackberry Headquarters. This plant was mowed by State Dept. of Roads (N.D.O.R.) maintenance crews within a week of the observation. The N.D.O.R. also used herbicide on willow growth in the right of way in this same area. Coordination of mowing/spraying the right of way via State maintenance crews was accomplished to prevent future impacts at this site. No plants have been observed at this site since 1989.

Dewey Lake

Historic records list P. praeclara as occurring on Dewey Lake. However, the lake elevation was raised during the 1940's and 50's by construction of a dike and the historic sites may have been flooded.



NE-VAL-3113

Figure 20. Prairie fringed orchid just prior to flowering in H.U. 29A1 (6/24/91 LLM)



Figure 21. Prairie fringed orchid seeded out in H.U. 29A1 (9/29/90 LLM)

WE-VL 3/14

Duck Lake

This site location is on private land immediately west of Duck Lake (H.U. 7B) on the Powell Ranch. Flowering plants were observed by Biological Technician Emrick and Range Technician Glup during 1986-89 and 5 plants were present during 1990. The specific site location is a wetland range site that is generally too wet to mow. During 1991, 7 flowering plants were observed.

Calf Camp Valley

Calf Camp Valley was a new site location record for Prairie Fringed Orchids on Valentine NWR in 1990. Four flowering plants were located by Mike Fritz, Nebraska Game & Parks, while inventorying the status of specific site locations in Cherry County. During 1991, 5 flowering plants were present.

One interesting item about three of the orchid sites (H.U. 32B2, H.U. 18B7 and the Powell Ranch location near Duck Lake) is that the site locations are areas where approximately one foot of soil has been removed. This was also the case with the 1989 site location west of Hackberry Headquarters. The site location in the East Sweetwater Marsh is an area that experienced high water levels during 1982-87 and left exposed soil areas as the water receded. Prairie Fringed Orchid seeds are spoor-like and being extremely light in weight, may need disturbance to contact bare ground before for germination can occur.

VALENTINE NATIONAL WILDLIFE REFUGE

UNITED STATES
DEPARTMENT OF THE INTERIOR

CHERRY COUNTY, NEBRASKA

UNITED STATES
FISH AND WILDLIFE SERVICE

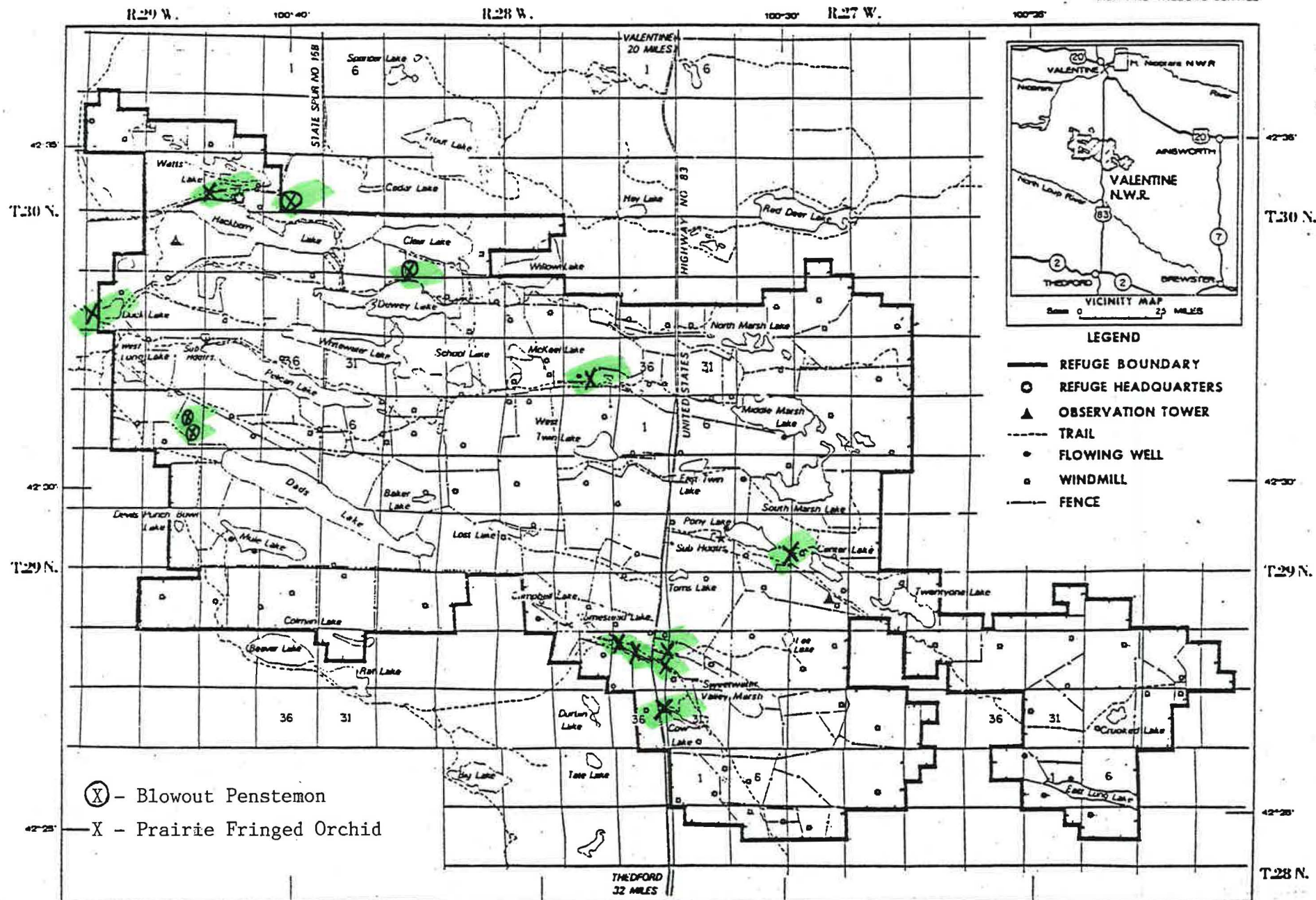


Figure 22. Site locations of Blowout Penstemon & Prairie Fringed Orchids

g. American Burying Beetle

Photos of the American Burying Beetle were obtained from FWE - Grand Island for reference in 1989. A similar beetle is commonly captured in the bullsnake traps on the Marsh Lakes and occasionally observed elsewhere on the refuge. To date, no specimens of the American Burying Beetle have been verified on Valentine NWR; however, the species range is not reported to be within this area of Nebraska.

3. Waterfowl

Total waterfowl use days estimated from migration and production surveys were 8,947,318 -- 1.3 million use-days above the 7.6 million objective level. Refuge lakes began opening up in late February and ducks began to migrate into the area in substantial numbers by the end of March.

a. Ducks

Refuge duck use-days were estimated from migration, pair counts and brood surveys. Annual use days were 7,180,558, up somewhat compared to 1990 (Table 10). However, both spring and fall migrations have not been impressive the past five years. Ducks accounted for 40,700 birds of the spring waterfowl migration peak and 62,900 birds of the fall peak. The fall peak occurred the end of October, but a winter storm hit on October 31 freezing refuge wetlands and moving most waterfowl out of the area.

Refuge breeding pair counts were accomplished during the period May 8 - May 25. Total breeding pairs tabulated were 4,620 (4,291 dabblers and 329 divers). Since 1982, a positive trend in the mallard breeding population has been documented on the refuge and in particular in the Marsh Lakes area. The general increase is particularly notable when considering the continental mallard population trend and local dry conditions experienced during 1988-89 (Figure 23, Figure 24, and Figure 25). The lake renovation project 1975-82 did have a temporary effect upon breeding pairs in the mid-1980's, but it was short-lived.

Two brood counts were accomplished during June and July on 12 sample wetlands. The sample wetlands held 45% of refuge tabulated breeding pairs. Classification of broods by species and age class was recorded to eliminate duplication of broods in subsequent counts. The brood/pair ratio derived was applied to refuge pairs by species to obtain an Annual Duckling Production Index. The Marsh Lakes information is separated from the rest of the refuge. This procedure generally under estimates later nesters particularly gadwall and ruddy ducks. The production index calculation process was standardized with a Lotus 123 program where only the observed breeding pairs and broods need to be entered. This program was also used to recalculate the Duckling Production Index for all years since 1968 in which comparable data were available (Figures 26 and 27).

HISTORICAL DUCK BREEDING PAIRS

VALENTINE NWR

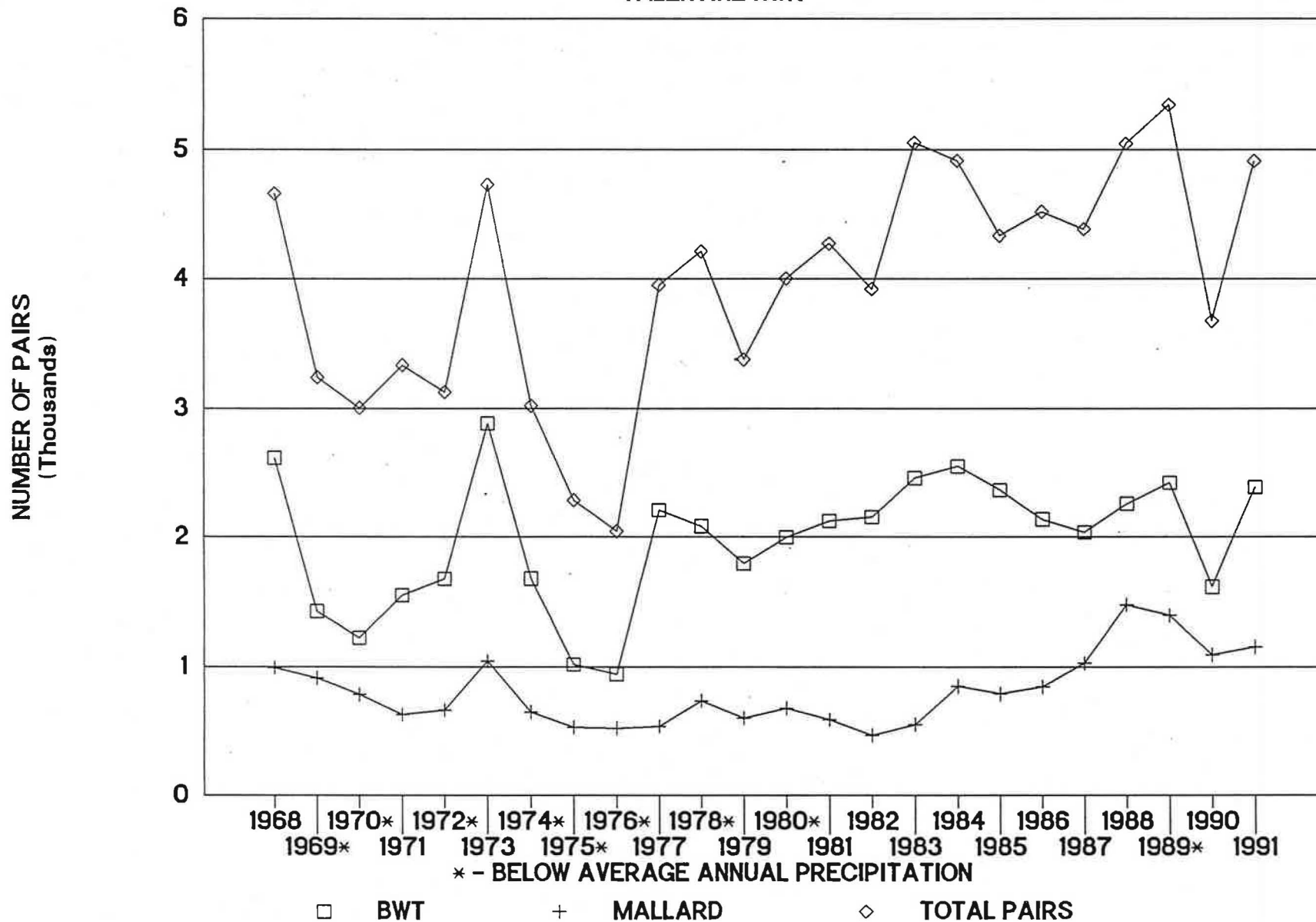


Figure 23.

There were few diver broods observed during 1988-91 (Figure 28 and Table 10). Diving duckling production remained low due to the lack of over water nesting cover. High water levels, without any significant means of water level control, prevailing during 1982-87, flooded most emergent vegetation. Receding water elevations since 1987 have left many exposed and shallow wetland areas void of vegetation. It will take some time before residual emergent vegetation will be available to provide adequate nesting cover for divers. Conversely, planning for and providing adequate nesting cover for dabbling ducks is a management strategy within the physical capabilities of this station. Production potential (the ratio of disturbed to undisturbed cover available for upland nesting birds) for 1991 was not at the level achieved during 1988 and 1989, but much improved from 1990 (Figure 12 and 13 - Sec. H.5.).

Table 10. Duck use and production by species, 1991.

Species	1991				1990		1989	
	Breeding Pairs		Production Index					
	#	(%)	#	(%)	% Pairs	% Pro. Index	% Pairs	% Pro. Index
BWT	2,385	(51.6)	3,540	(53.2)	44.0	52.0	45.3	56.8
Mallard	1,154	(25.0)	2,286	(33.3)	29.7	30.9	26.2	34.5
Gadwall	292	(6.3)	258	(3.8)	9.3	3.7	8.7	5.8
Pintail	85	(1.8)	234	(3.4)	2.1	5.7	3.5	1.8
Shoveler	242	(5.2)	174	(2.5)	6.3	2.6	6.0	0.5
Wood Duck	14	(0.3)	78	(1.1)	0.4	2.5	0.4	-
GWT	19	(0.4)	-	-	1.0	-	0.7	-
Wigeon	-	-	-	-	-	-	-	-
Dabbling Duck								
TOTAL	4,291	(92.9)	6,684	(97.4)	93.0	97.4	90.8	99.4
Redhead	247	(5.3)	90	(2.3)	5.0	2.3	5.3	0.5
Canvasback	13	(0.3)	5	(0.1)	0.2	0.1	0.3	-
Ruddy Duck	69	(1.5)	6	(0.2)	1.9	0.2	3.6	0.1
Ringneck	-	-	-	-	-	-	-	-
L. Scaup	-	-	-	-	-	-	-	-
Bufflehead	-	-	-	-	-	-	-	-
C. Goldeneye	-	-	-	-	-	-	-	-
C. Merganser	-	-	-	-	-	-	-	-
H. Merganser	-	-	-	-	-	-	-	-
Diving Duck								
TOTAL	329	(7.1)	178	(2.6)	7.0	2.6	9.2	0.6
Production								
TOTALS	4,620		6,862		3,677	3,901	5,340	6,954
TOTAL Use Days								
			7,180,558		6,584,172		7,676,180	

Graduate studies and documentation by refuge staff have substantiated that both duck nest density and productivity are greater on meadow acreage that is in undisturbed cover treatment for two or more growing seasons - "preferred nesting cover". Mallard and dabbling duck breeding pairs have also generally tracked the total acreage of undisturbed cover - i.e., cover rested one or more growing seasons (Figures 14 and 15); dabbling duck hen success, based upon observed brood/pair ratios, indicates an inverse relationship with total "disturbed cover" (Figure 30); and a positive correlation with undisturbed and preferred cover (Figure 31) except for some deviation during the dry years of 1980, 1988 and 1989. In 1991, a higher ratio of undisturbed to disturbed cover was available for upland nesting birds compared to 1990 and productivity improved (Figure 32 and 33). Grassland cover treatment of the meadow acreage during the nesting season for 1991 is summarized in Figure JJ34.

DABBLING DUCK BREEDING PAIRS

VALENTINE NWR

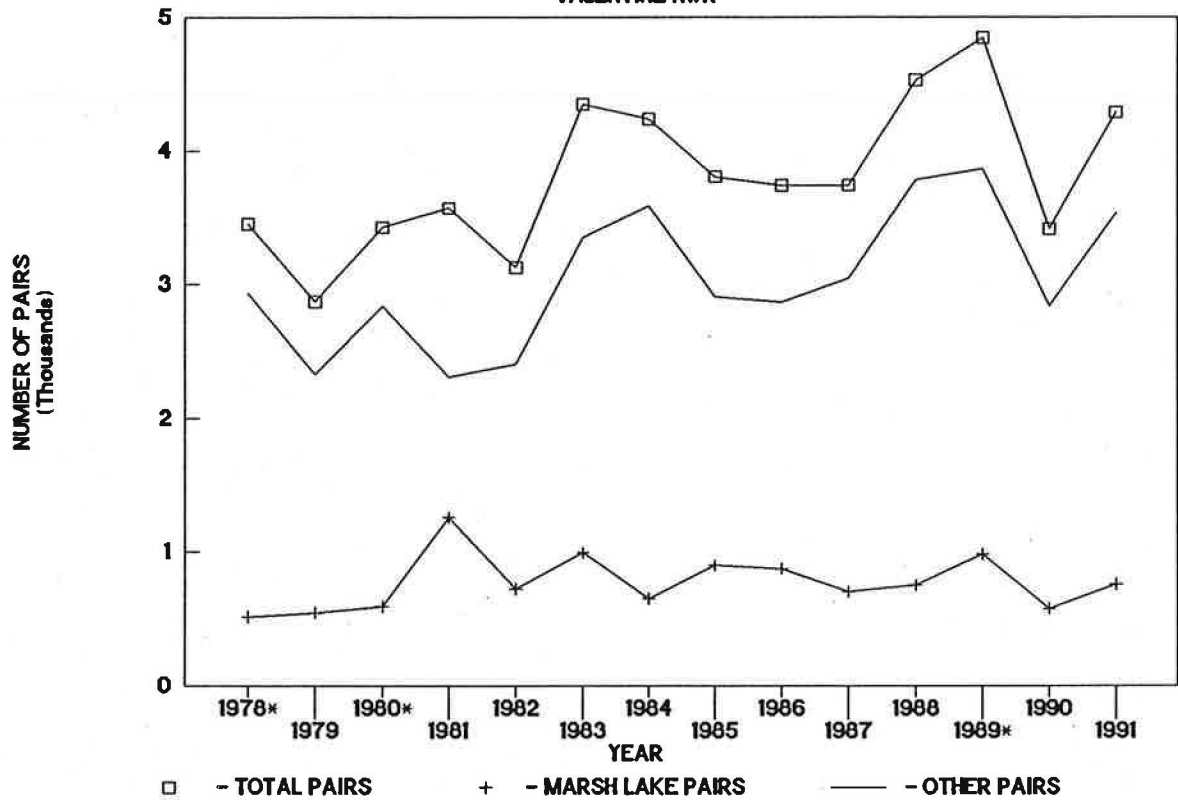


Figure 24.

MALLARD BREEDING PAIRS

VALENTINE NWR

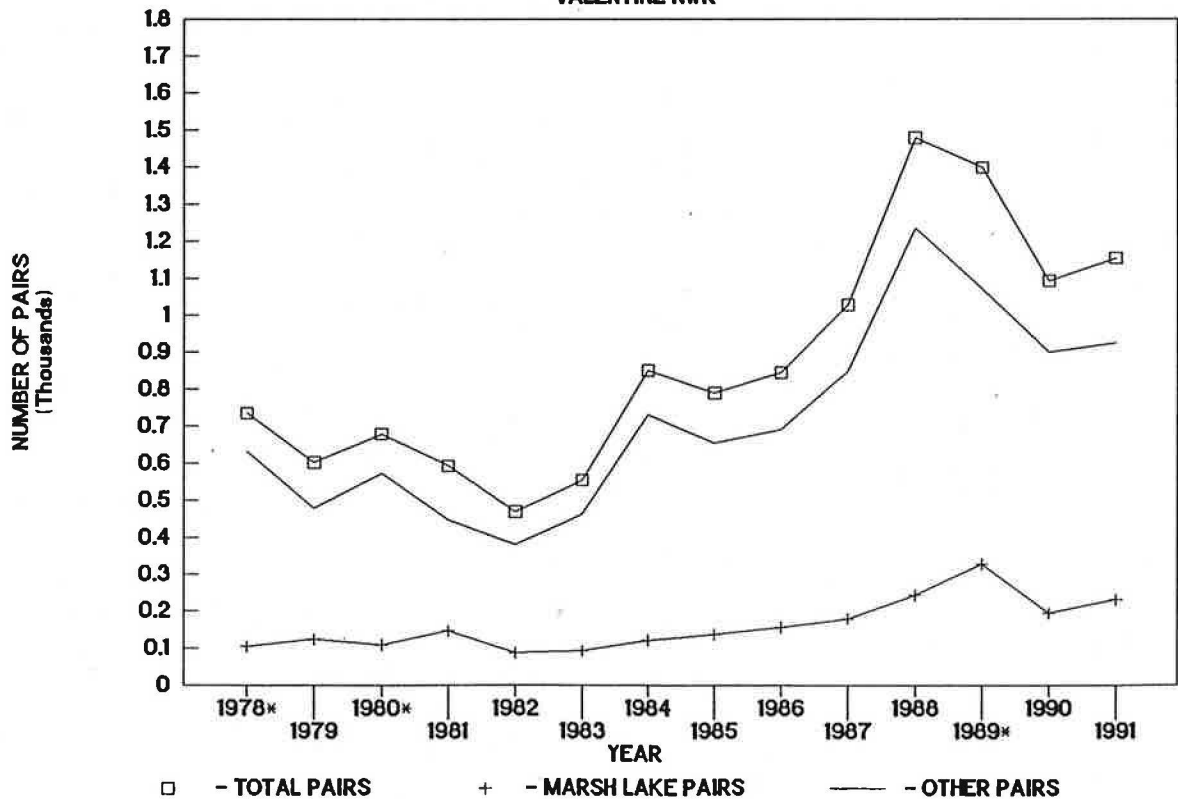


Figure 25.

DABBLING DUCK PRODUCTION INDEX

VALENTINE NWR

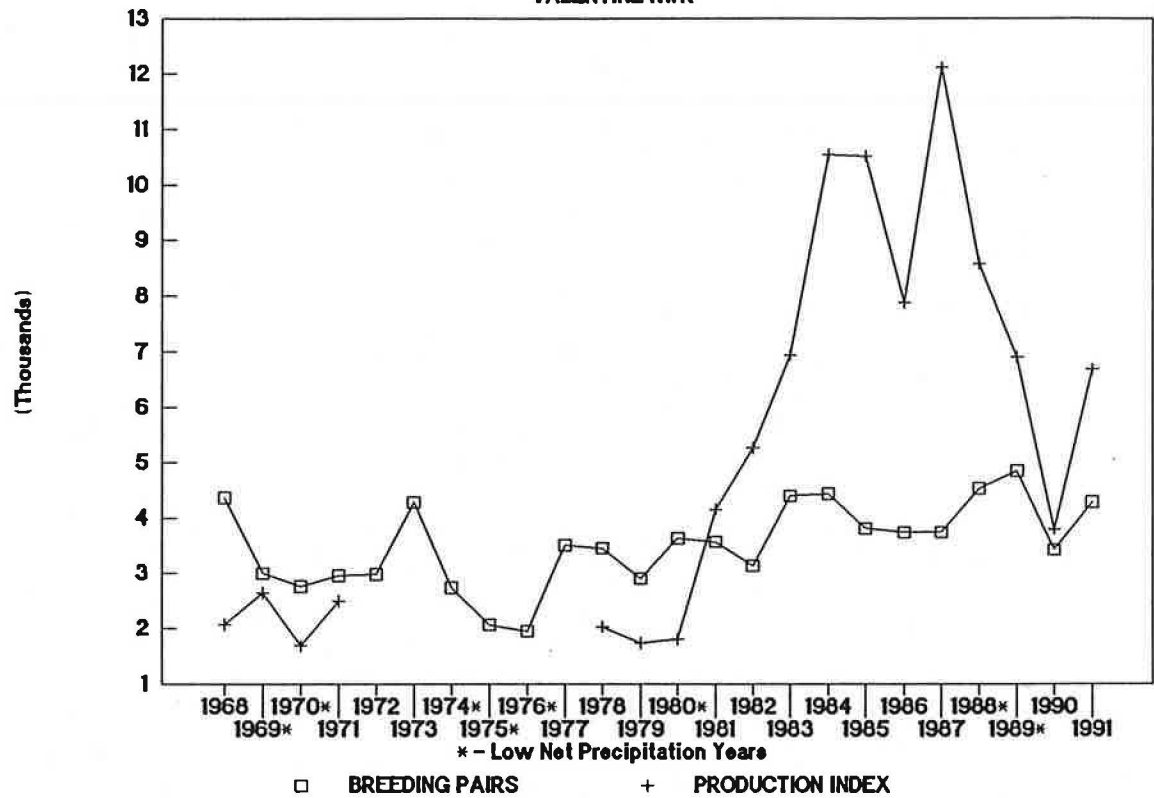


Figure 26.

DIVING DUCK PRODUCTIVITY

VALENTINE NWR

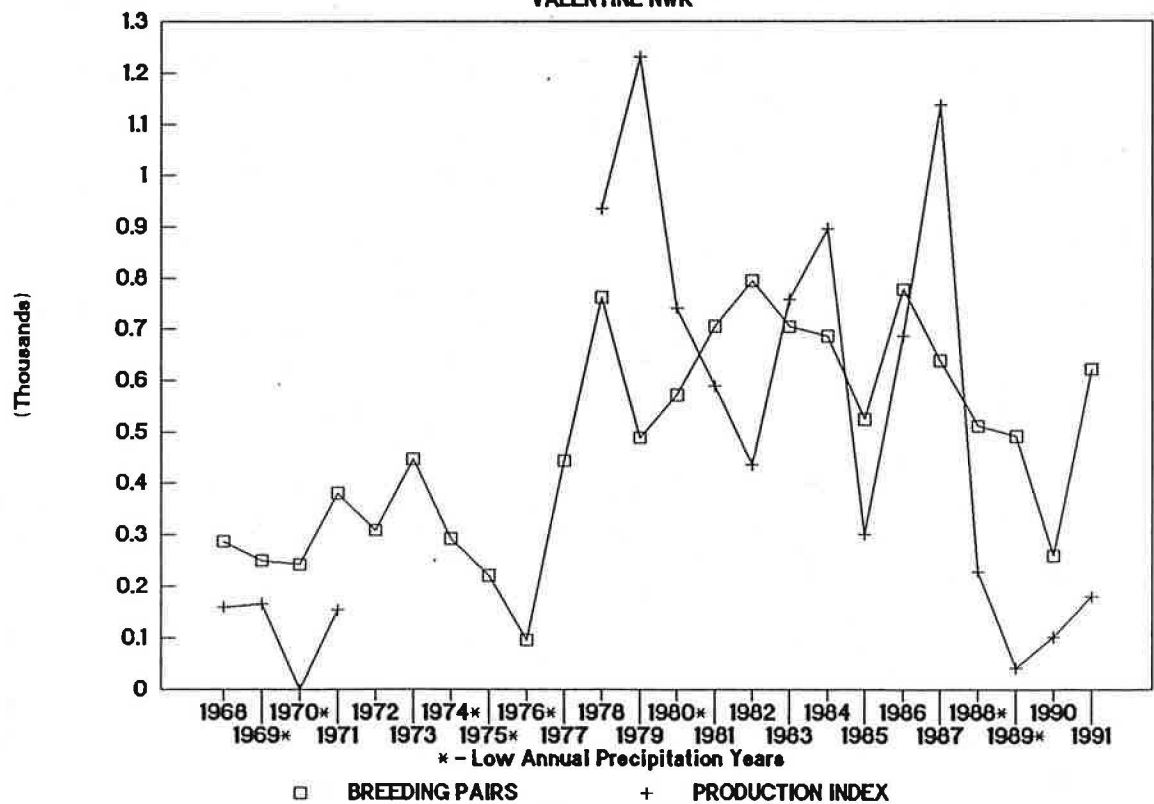


Figure 27.

DABBLER PAIRS V.S. UNDISTURBED COVER

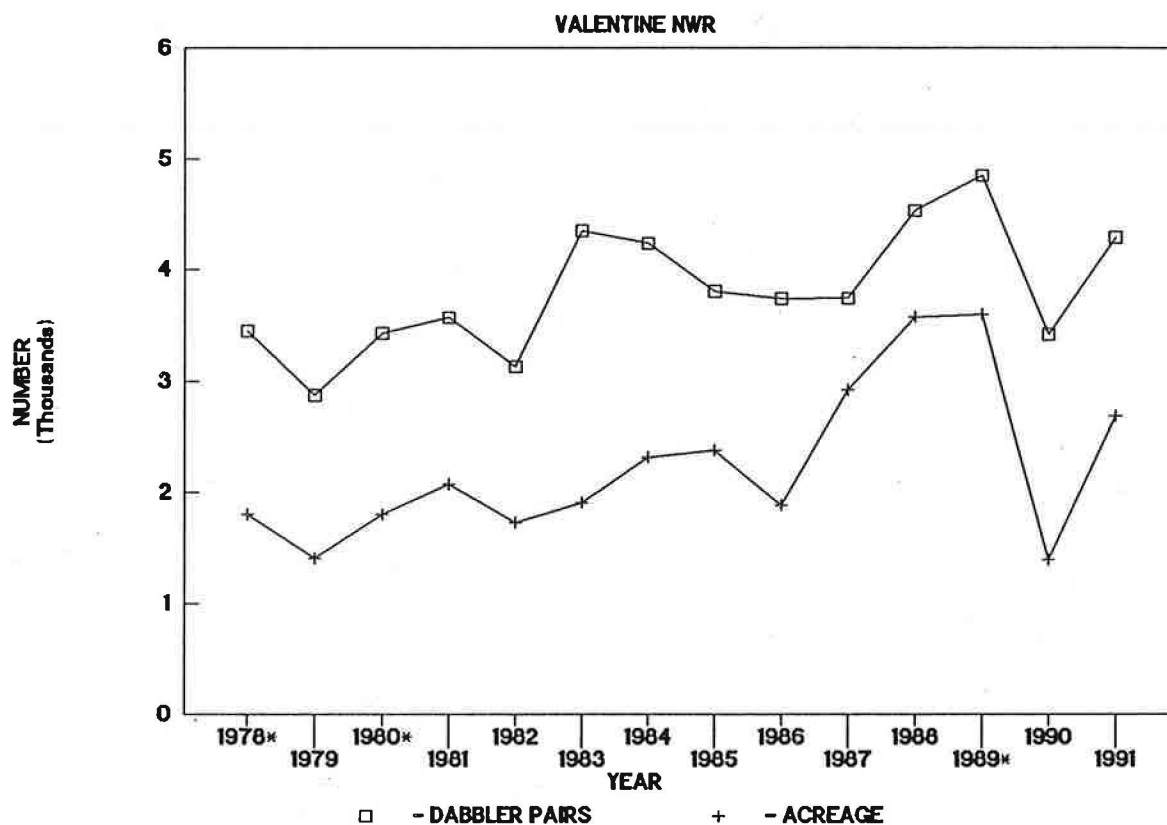


Figure 28.

MALLARD PAIRS V.S. UNDISTURBED COVER

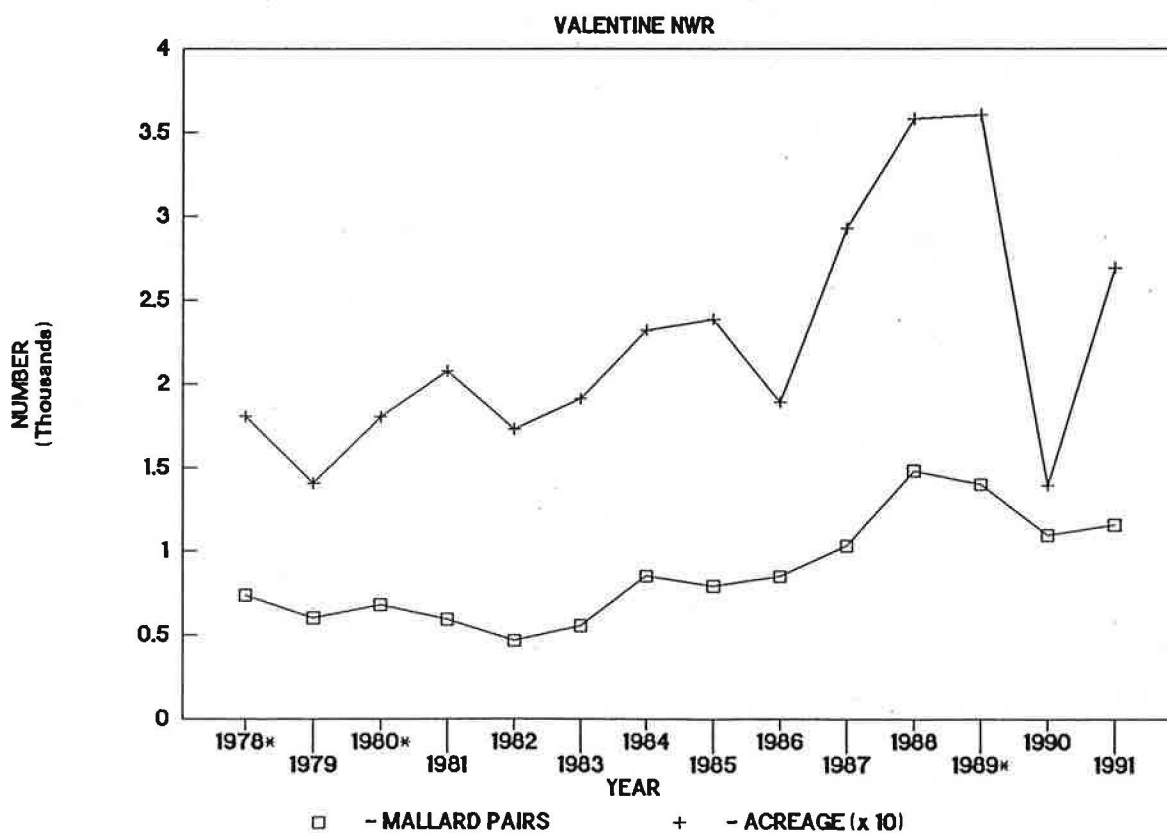


Figure 29.

HEN SUCCESS vs DISTURBED COVER

VALENTINE NWR

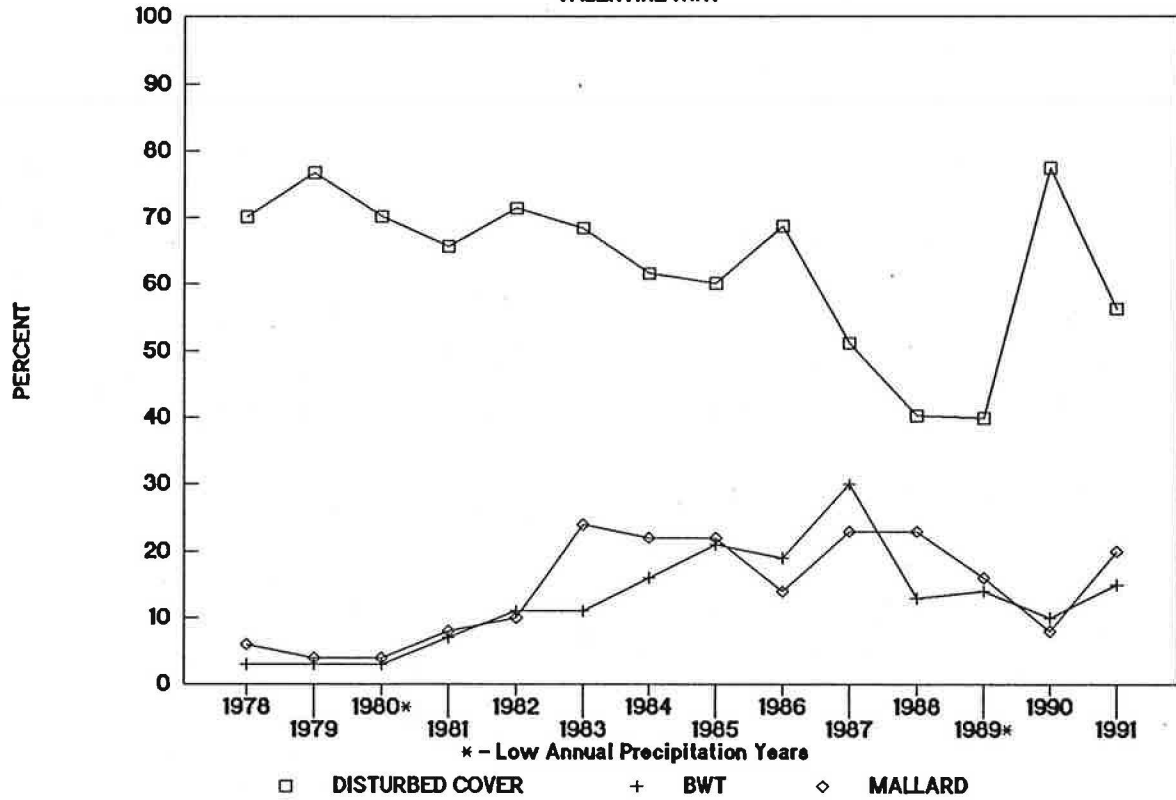


Figure 30.

HEN SUCCESS vs PREFERRED COVER

VALENTINE NWR

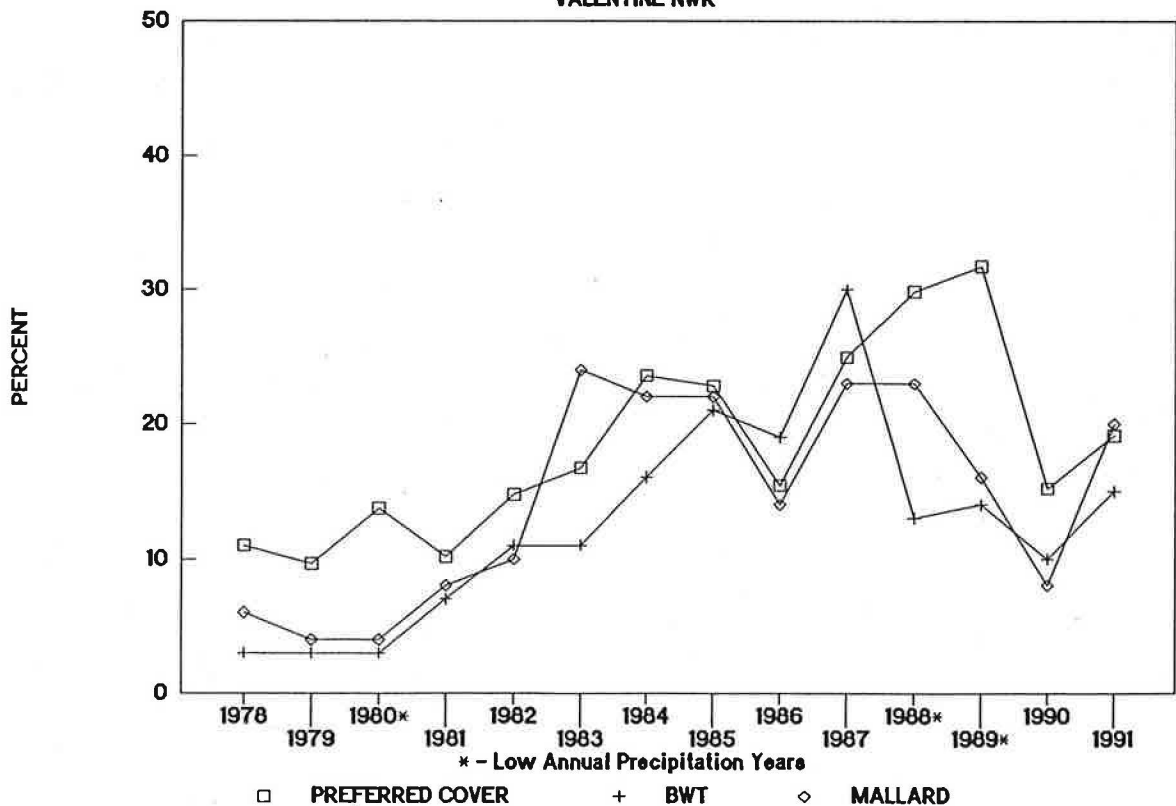


Figure 31.

DABBLING DUCK PRODUCTIVITY vs COVER

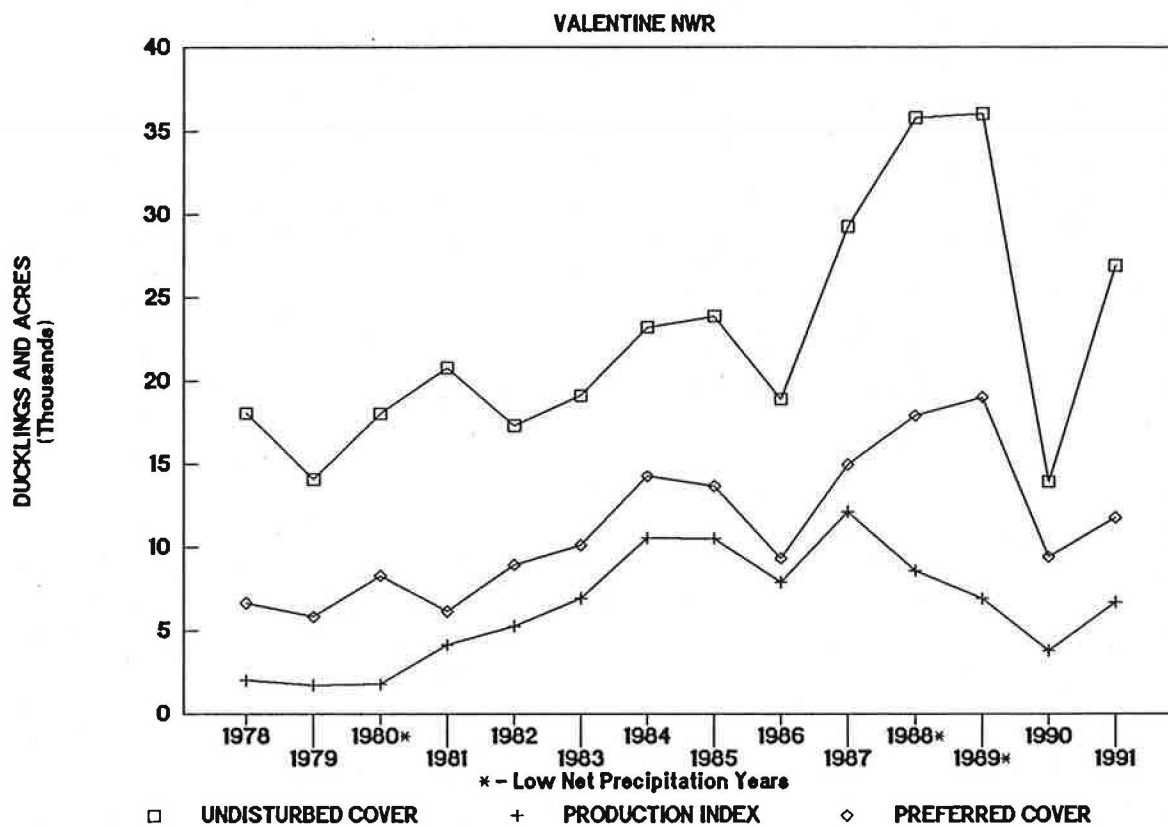


Figure 32.

MALLARD PRODUCTIVITY vs PREFERRED COVER

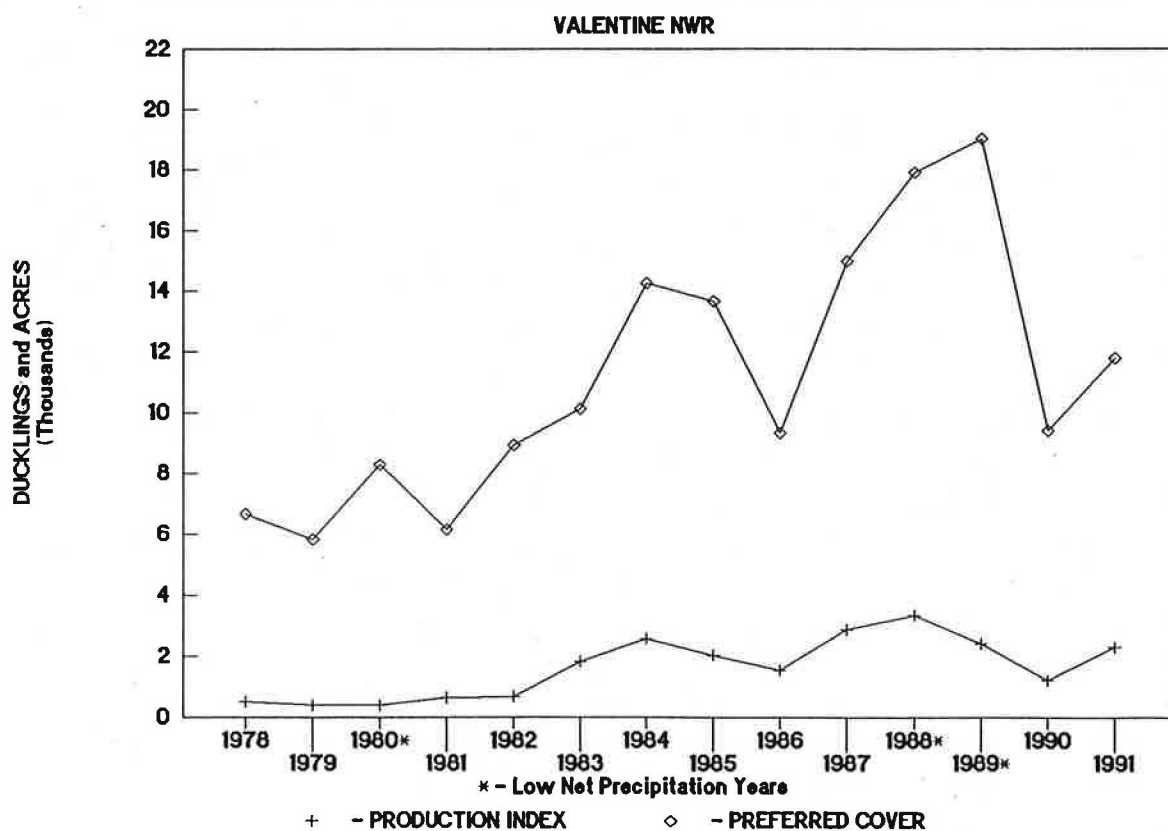


Figure 33.

1991 MEADOW GRASSLAND COVER TREATMENT

VALENTINE NWR

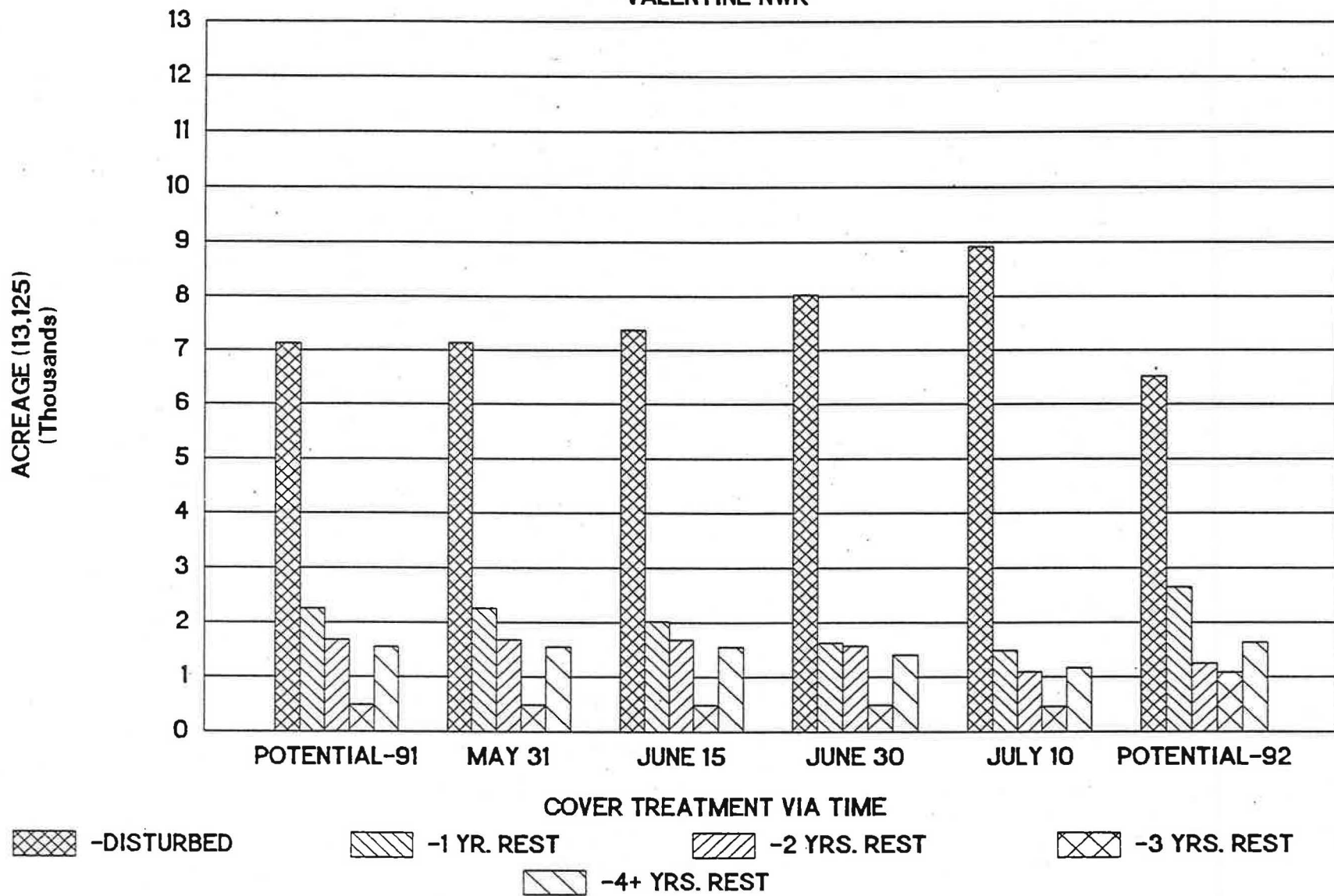


Figure 34.

This year 299 nests including 283 duck, 2 Canada goose, 2 sharp-tailed grouse, 9 prairie chicken 2 pheasant and 1 harrier nests were located and monitored for fate on 640 acres. Included in the total duck nests were 101 mallard (37%), 128 blue-winged teal (46.9%), 40 gadwall (14.7%), 6 redhead (2.2%) and 8 shoveler (2.9%). Nests were located on both upland and island habitat. Upland nest density was highest on the acreage in "undisturbed cover" and in particular "preferred cover", e.g., grassland that has received two or more growing seasons of rest treatment and, mainly, where predation management was also accomplished in H.U.18C1 and H.U.21B on the Marsh Lakes (Figures 35 and 36). However, the Island (H.U.18C2) continued to have the highest nest density and success (Figures 53 and 54). Historic mallard nest density is summarized in Table 11 for six habitat units in which nest dragging information is available.

Table 11 Historic mallard nest density per acre and number of mallard nests of total duck nests found during nest dragging activities by habitat unit.

Year	Habitat Unit					
	18C1	18C2	21B*	21B2	26B	25A
1991	.53 (16-34)	11.0 (44-82)	.30 (9-18)	.34 (22-79)	.01 (5-45)	.04 (5-15)
1990	.13 (4-22)	40.5 (101-131)	.20 (6-16)	.23 (14-69)	.01 (4-62)	.05 (7-30)
1989	.23 (7-19)	54.4 (109-163)	.13 (4-18)	.18 (11-35)	.02 (9-66)	.07 (9-29)
1988	.27 (8-20)	43.5 (87-106)	.13 (4-17)	.35 (21-100)	.09 (33-83)	.15 (20-46)
1987	.03 (1-10)	23.5 (47-100)	.13 (4-17)	.25 (15-86)	.04 (16-102)	.07 (9-37)
1986	.27 (8-27)	8.0 (114-180)	.20 (6-16)	.16 (11-118)	.01 (5-50)	N.A.
1985	.17 (5-33)	6.6 (79-198)	.07 (2-16)	.24 (21-161)	.03 (1-14)	N.A.
1984	- (0-25)	3.5 (56-188)	- (0-17)	.09 (6-108)	N.A.	N.A.
1983	N.A.	0.4 (18-141)	- (0-2)	- (0-44)	N.A.	N.A.
1982	N.A.	0.2 (13-141)	N.A.	.06 (1-20)	N.A.	N.A.
1981	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
1980	- (0-10)	0.04 (3-32)	N.A.	N.A.	N.A.	N.A.
1979	- (0-14)	0.03 (2-32)	N.A.		N.A.	N.A.
1974	.02 (1-13)	0.03 (2-14)	.03 (2-23)		N.A.	N.A.
1972	- (0-10)	0.01 (3-55)	.01 (1-22)		N.A.	N.A.
1971	.02 (1-10)	0.02 (2-41)	.02 (2-16)		N.A.	N.A.

* 1971-74 H.U.21B information combined; 1983-90 H.U.21B* includes area presently designated as H.U.21B6 & 7.

OBSERVED DUCK NEST DENSITY - 1983-91

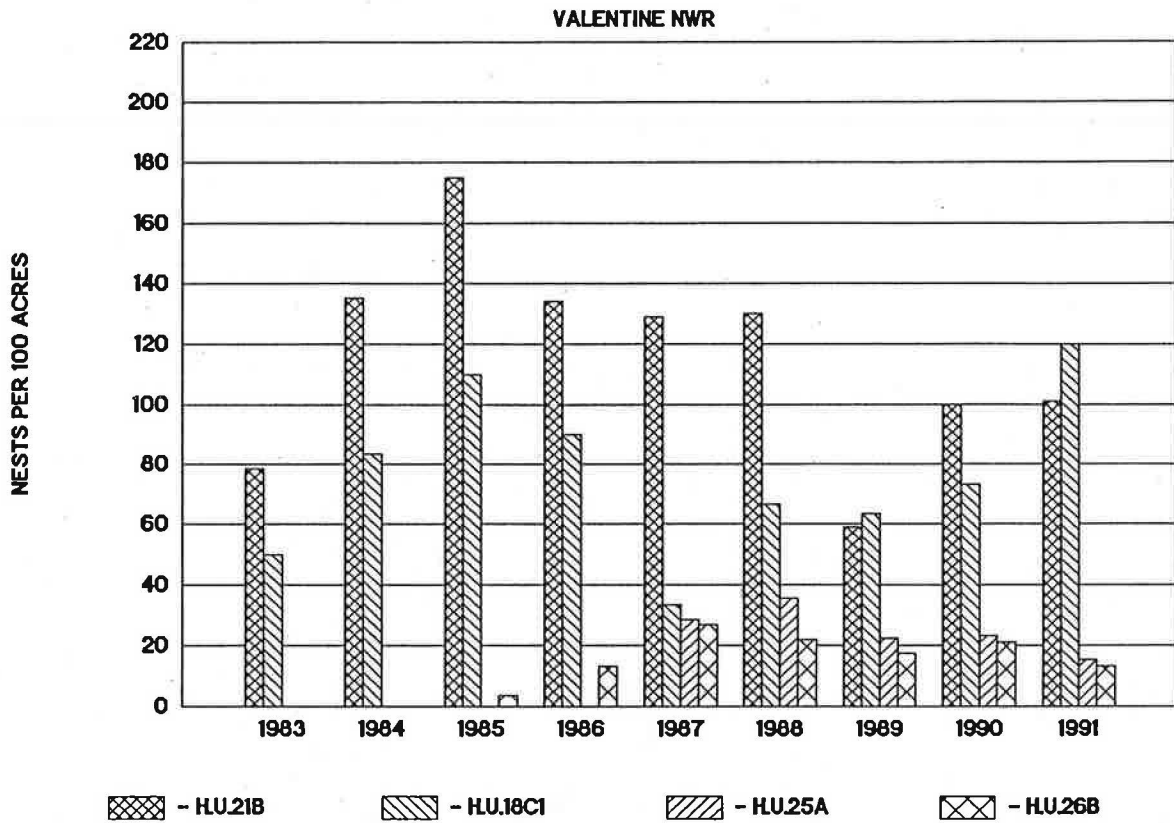


Figure 35.

OBSERVED MALLARD NEST DENSITY - 1983-91

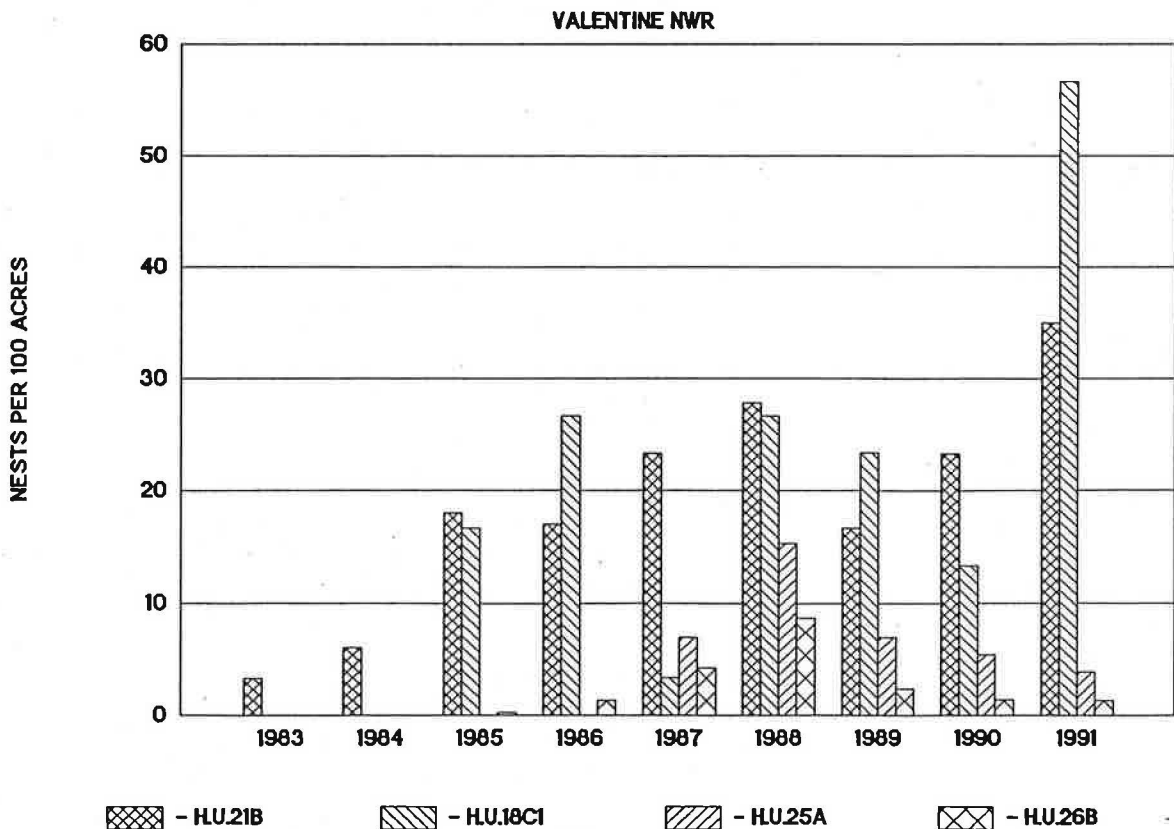


Figure 36.

The 1990-91 winter was relatively mild and for the third year in succession, potential nesting cover was not adversely affected from flattening by snow pack as in 1988. Visual obstruction readings (VORs) were recorded for potential upland nesting cover on areas being monitored for nesting activity prior to green-up (May 15) and then at 2-week intervals until July. Monthly readings were taken throughout the summer and terminated in September. VORs were also recorded for most duck nests being monitored.

Average VORs of potential nesting cover on Valentine NWR do not significantly change until after May 15 due to the absence of cool-season vegetation. Mallard nesting is well under way by this date and blue-winged teal are just initiating nesting; therefore, May 15 is generally a cut-off date beyond which new vegetative growth will affect VORs.

Average VORs documented at mallard and blue-winged teal nests have substantiated that nesting hens are selecting nest sites with higher VORs than documented for potential cover (N.R. 1989). Average VORs at duck nests continue to be higher for undisturbed cover than for disturbed cover acreages being monitored Table #C.

Table #C. Average VOR of duck nest by cover treatment - 1991.

<u>Species</u>	<u>Disturbed Cover (206 ac.)</u>	<u>Undisturbed Cover Upland (430 ac.)</u>	<u>Undisturbed Cover Island (4.0 ac.)</u>
Mallard	1.8 (2)	2.8 (48)	3.9 (25)
BWT	1.2 (14)	1.5 (101)	2.7 (3)
Gadwall	--	2.7 (13)	4.5 (24)
Shoveler	1.8 (1)	1.3 (5)	--
Pintail	--	--	--

*VOR in d.m and () = number of nests.

COW-KING FLAT DUCK NEST MONITORING

Nest monitoring activities were continued in the Cow-King Flat area (H.U.25A and H.U.26B); however, the second nest drag was not completed in H.U.26B due to weather conditions and timing. The second drag in H.U.25A was completed late and only two blue-winged teal were located. Duck nest density, and in particular mallard nests, was not as high as nest density documented in the Marsh Lakes' area. Wetland conditions within the Cow-King Flat area are not present in the quality nor quantity as experienced during the 1980's. This area also has a history of active grassland manipulative treatment and annually the greatest percent of total acreage is in disturbed cover throughout the year (Figures 37 and 28).

1991 GRASSLAND COVER TREATMENT

PONY - KING FLAT AREA

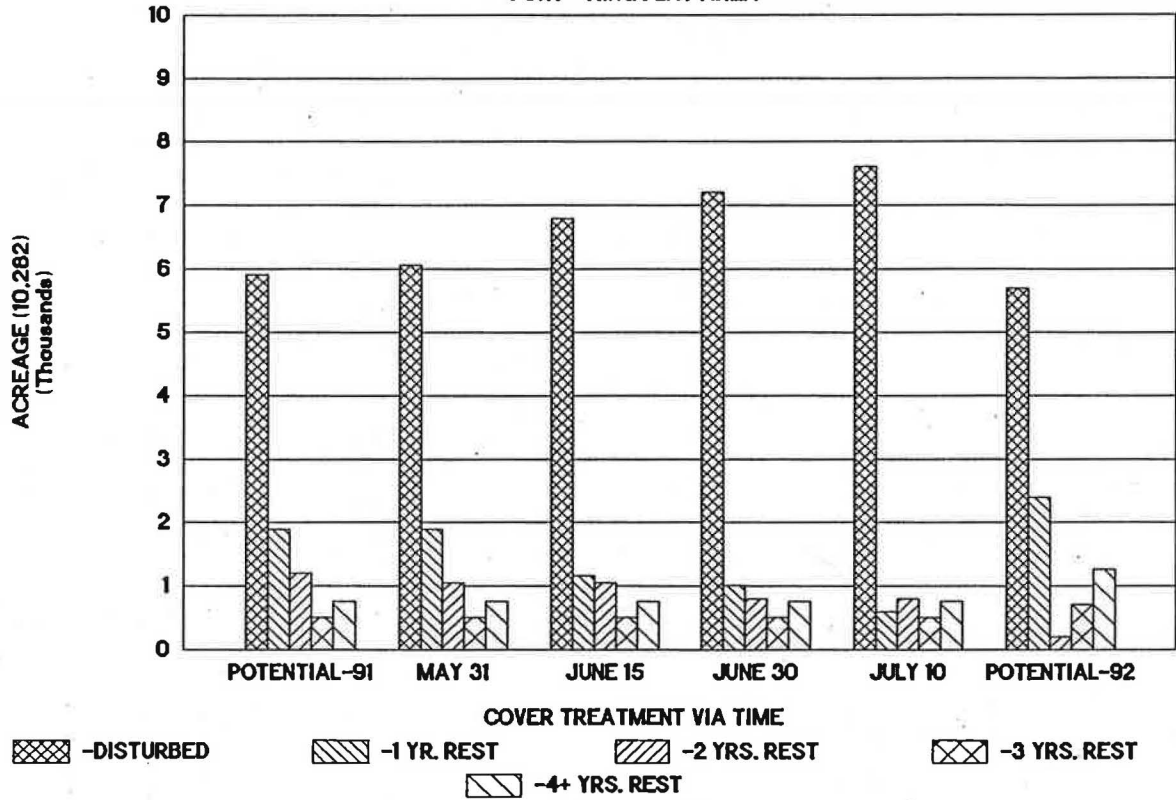


Figure 37.

AVAILABLE COVER ACREAGE VIA TREATMENT

PONY - KING FLAT AREA

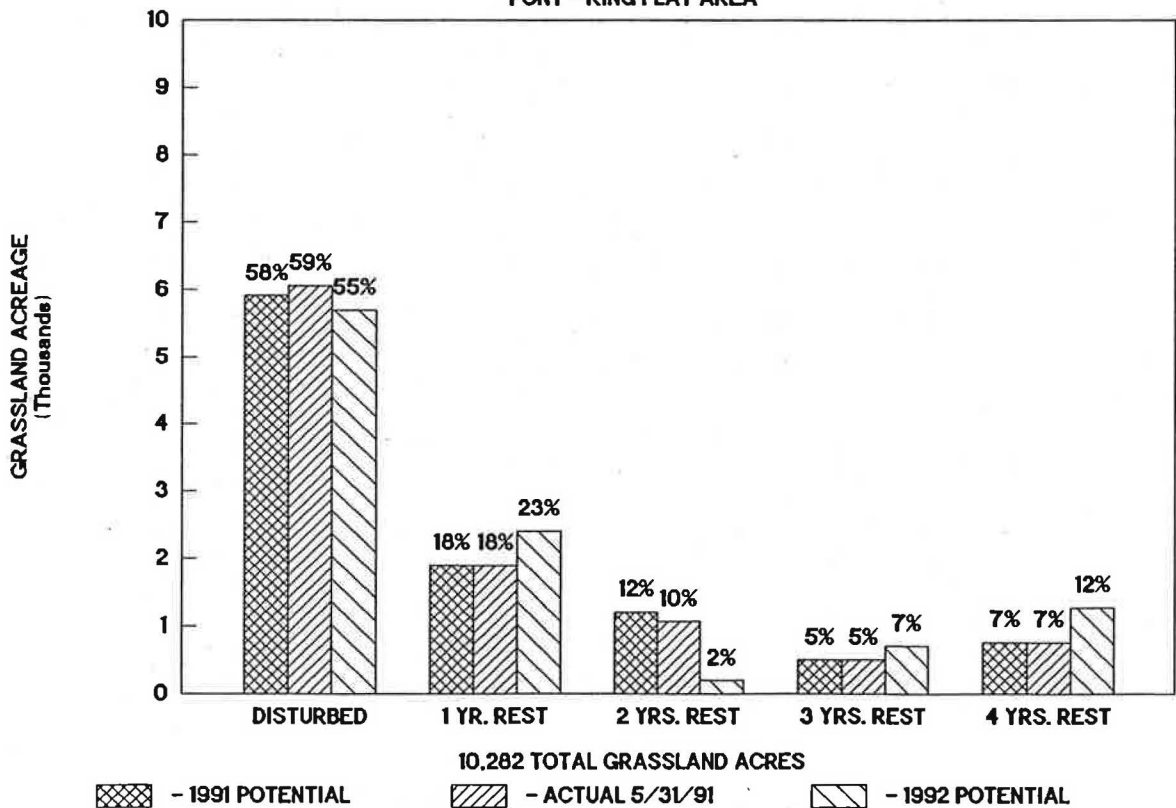


Figure 38.

Table 13. Bullsnake capture per unit effort-King Flat - 1987-91.

	H.U. 26B*				H.U. 25A			
	I-D*	#B.snakes	#/I-D**	I-D/Ac	I-D*	#B.snakes	#/I-D**	I-D/Ac
1991	214.2	1	<0.01	0.6	214.2	13	0.06	1.6
1990	214.2	1	<0.01	0.6	214.2	10	0.05	1.6
1989	214.2	7	0.03	0.6	214.2	17	0.08	1.6
1988	214.2	2	<0.01	0.6	214.2	8	0.04	1.6
1987	107.1	1	<0.01	0.3	107.1	5	0.05	0.8

* - I-D = Trap Day or 100 ft. trap lead set per day.

** - All snakes captured in 1987-89 were released.

Table 14. Nest Dragging Summary H.U. 26B, 1991.

	# Nests	#Nests Hatched	#Ducks Hatched	Bullsnake # Depre.	Predation # Dest.	Mammal Dest.	#Nests Aband.
<u>H.U. 26B1: (100 ac.)</u>							
Mallard	3	-	-	1	1	2	-
BWT	21	4	35(35.0)	3	3	11	3
Shoveler	3	-	-	1	1	2	-
Pintail	-	-	-	-	-	-	-
Total	27	4	35(35.0)	5	5	15	3
<u>H.U. 26B2: (75 ac.)</u>							
Mallard	-	-	-	-	-	-	-
BWT	5	2	16(21.3)	1	1	2	-
Gadwall	1	-	-	-	-	1	-
Total	6	2	16(21.3)	1	1	3	-
<u>H.U. 26B3: (96 ac.)</u>							
Mallard	2	1	8(8.3)	-	-	1	-
BWT	8	1	4(4.2)	-	-	6	1
Shoveler	1	-	-	1	1	-	-
Total	11	2	12(12.5)	1	1	5	1
<u>H.U. 26B4: (110 ac.)</u>							
Mallard	-	-	-	-	-	-	-
BWT	6	1	7(6.4)	1	1	2	2
Total	6	1	7(6.4)	1	1	2	2

() - Ducklings hatched/100 acres.

Table 15. Nest Dragging Summary Cow-King Flat 1991.

	#			<u>Bullsnake Predation</u>		<u>Mammal</u>		<u>#Nests Other/</u>	
	<u># Nests</u>	<u>Hatched</u>	<u>Hatched</u>	<u># Depre.</u>	<u># Dest.</u>	<u>Dest.</u>	<u>Aband.</u>	<u>Unknown</u>	
<u>Habitat Unit 25A (Rest--130 ac.)</u>									
Mallard	5	1	10 (8.5)	4	4	-	-	-	
BWT	14	-	-	8	8	4	-	2	
Shoveler	1	-	-	1	1	-	-	-	
Total	20	1	10 (8.5)	13	13	4	-	2	
<u>Habitat Unit 26B (Short-Duration Grazed--381 ac.)**</u>									
Mallard	5	1	8 (2.1)	1	1	3	-	-	
BWT	40	8	62 (16.3)	5	5	21	-	6	
Shoveler	4	-	-	2	2	2	-	-	
Gadwall	1	-	-	-	-	1	-	-	
Total	50	9	70 (18.4)	8	8	27	-	6	

() - Ducklings hatched/100 acres.

** - Only one nest drag accomplished.

MARSH LAKES PREDATOR CONTROL PROJECT

Predator control can be an effective means of enhancing duck nest density and success provided the basic habitat requirements are available that contribute to high duckling production potential. However, to be effective, direct predator control has to be efficiently administered to all potential nest predators in a timely manner. Personnel, and specifically, adequately trained personnel are not available to accomplish this task with presently approved control techniques over any significant area. Therefore, predator control efforts on Valentine NWR are basically being directed to the Marsh Lakes - an area of high duckling production potential. The Marsh Lakes Predator Control Project (MLPCP) comprises approximately 10% of the total refuge grassland acreage (approximately 7,000 acres of which 1,500 are meadow).

Mammalian and reptilian duck nest predator control activities were initiated, on a significant basis, in 1985 and have been continued since. However, bullsnake trapping activity has been confined to two peninsulas (H.U. 21B and 18C1) totalling approximately 100 acres. All force account mammalian control activities continue to be carried out after the opportunity for recreational harvest is completed. During the winter of 1990-91 only recreational hunting was accomplished--there were not any applications returned expressing interest in recreational trapping.

Aerial coyote hunting was accomplished in cooperation with USDA-APHIS, Nebraska Animal Damage Control personnel on March 26 and 27. Force-account mammalian control activities, primarily for the smaller predators, were carried out with Conibear type traps. Force-account trapping activity was concentrated within and adjacent to the MLPCP and several other critical nesting areas primarily during the period of March-June. Raccoon and skunks were generally removed in a timely manner; however, mink, badger, weasel and coyotes were not (Table 16).

There has been an increasing trend in total harvest, per trapping effort, of raccoon and particularly skunks since trapping activity was initiated in 1982 (Figures 39 thru 44). It is not known to what extent the harvest of coyotes (Figure 43 and 44) may have affected the increase but evidently it has had an influence. The overall populations of raccoon and skunk are still relatively low compared to populations elsewhere and also to the local coyote population. Unless the numbers of smaller mammalian predators increases to a greater extent, the present coyote control strategy will not need to be modified. Recreational harvest was initiated in 1982 and the experience since has emphasized that we cannot depend upon recreational harvest, even when linked with high fur prices and/or trapping incentives, to accomplish waterfowl production objectives in this region of Nebraska (Figures 39, 41, and 43).

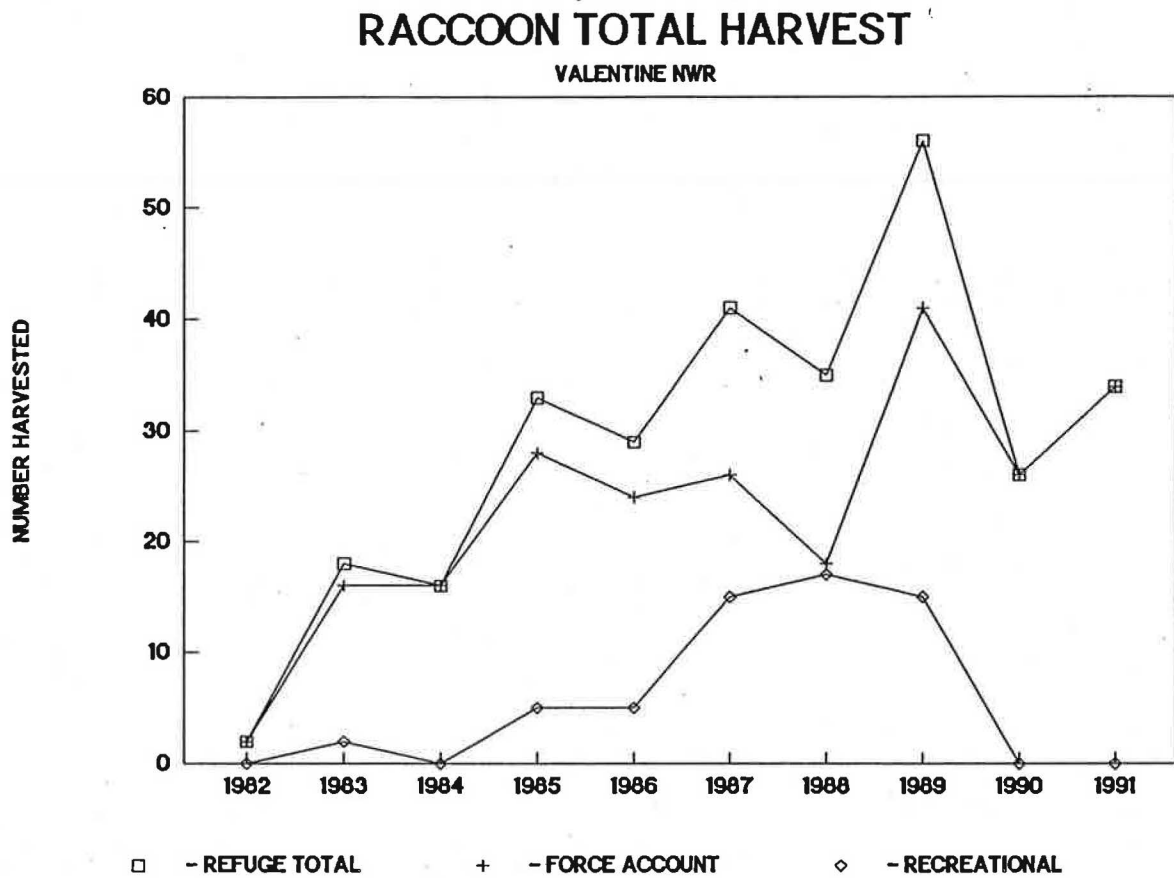


Figure 39.

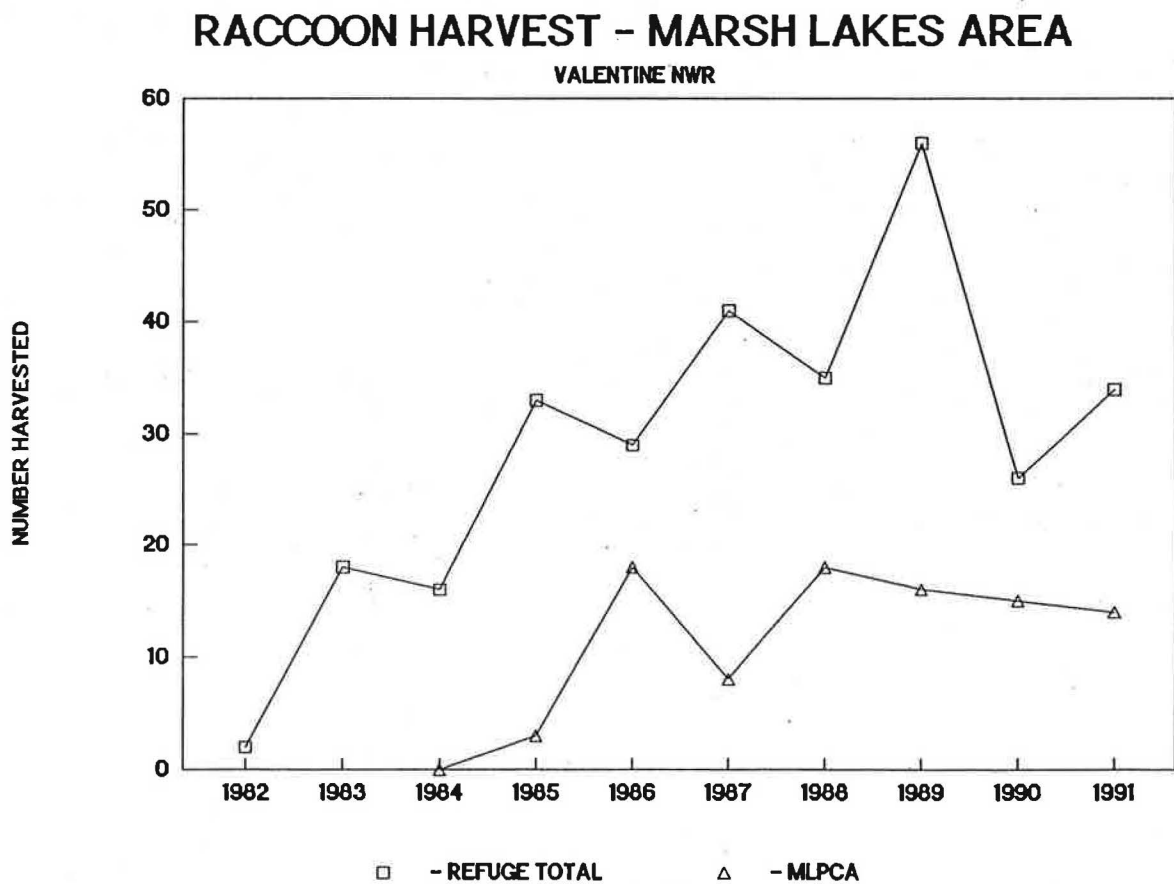


Figure 40.

SKUNK TOTAL HARVEST

VALENTINE NWR

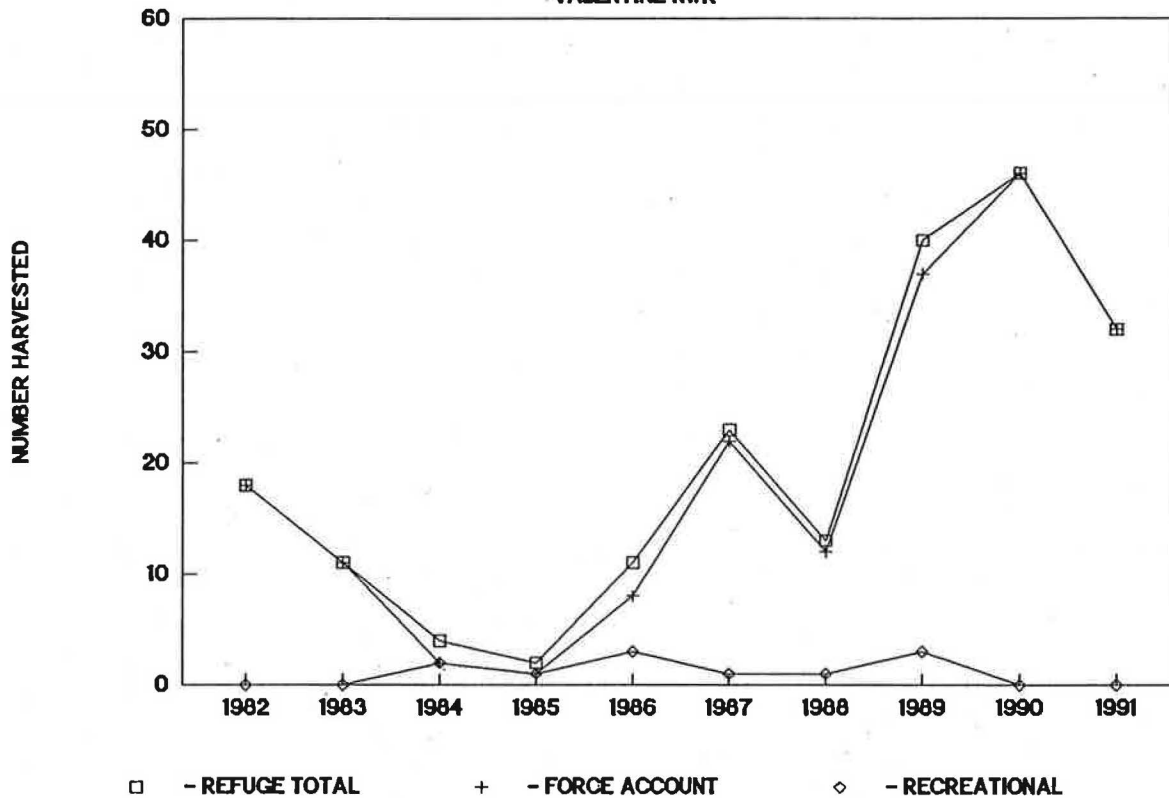


Figure 41.

SKUNK HARVEST - MARSH LAKES AREA

VALENTINE NWR

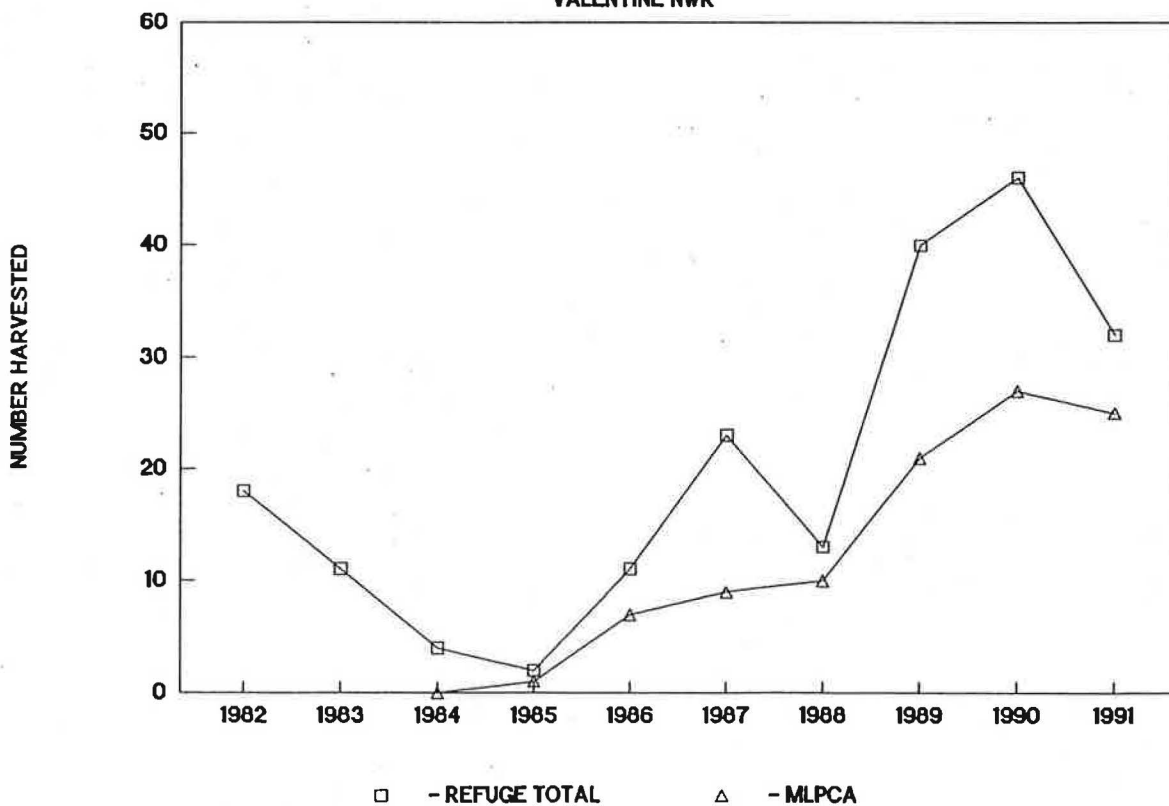


Figure 421

COYOTE HARVEST

VALENTINE NWR

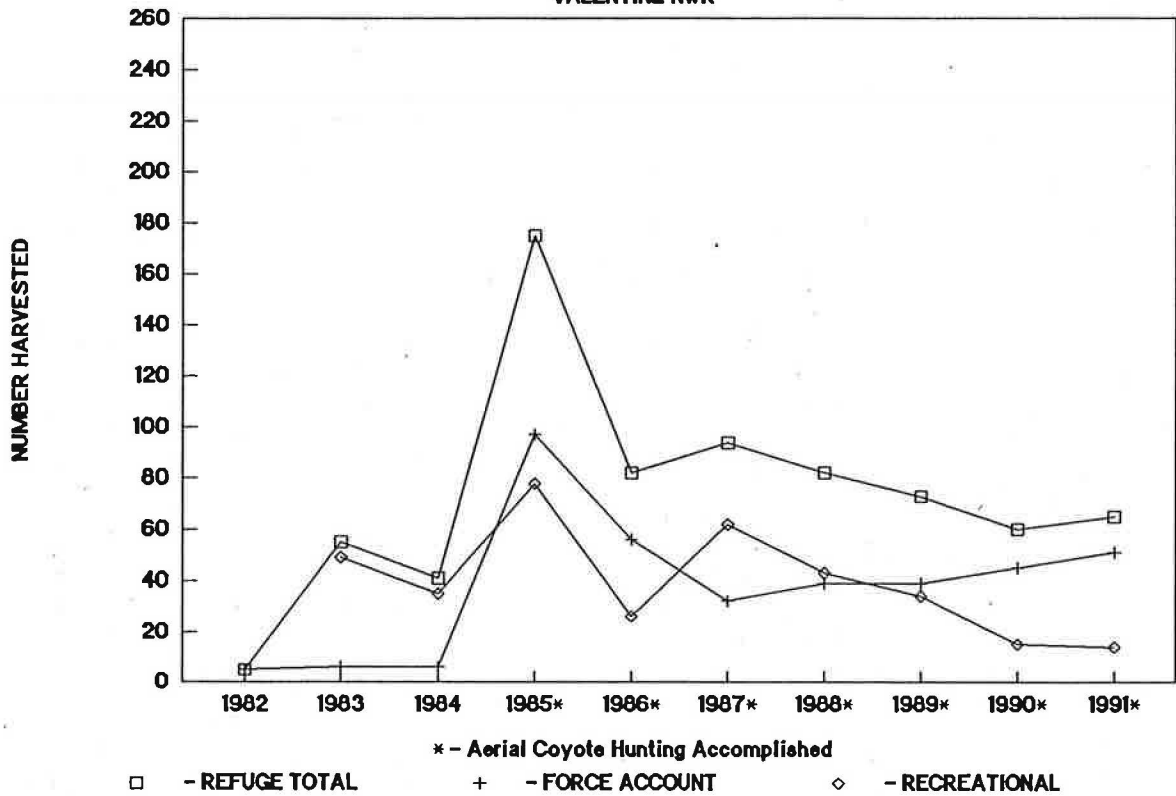


Figure 43.

COYOTE vs RACCOON & SKUNK HARVEST

VALENTINE NWR

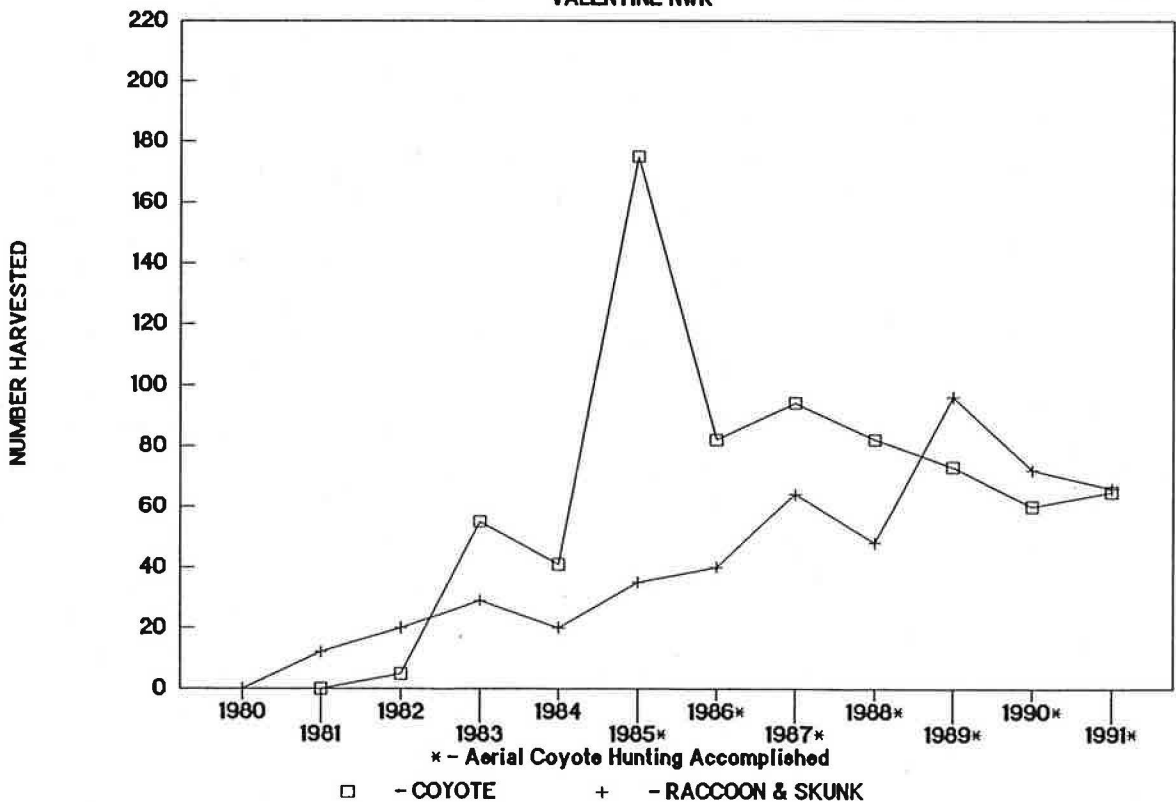


Figure 44.

Table 16. Mammalian Nest Predator Removal - Marsh Lakes Predator Control Project (Includes Pony Valley) 1991.

1990-91					
	Recreational Harvest		Refuge Staff/Contract		
	Trappers	Hunters*	Aerial Hunting	Force Acct.-Other	Total
Coyote	-	14	44	7	59
Raccoon	-	-	---	14	15
Skunk	-	-	---	25	26
Mink	-	-	---	1	-
Weasel	-	-	---	2	1
Badger	-	-	---	5	1
Bullsnake**	-	-	---	147	147
Totals	-	14	44	201	259

* Reported harvest refuge wide.

** Includes 27 hatchlings from 1991

Historically, bullsnake nest predation has been a limiting factor on duck production throughout the Nebraska Sandhills. Bullsnares are a very difficult species to control with presently known techniques. Bullsnares do not emerge from hibernation until the nesting season is in progress; therefore, it is not possible to remove them prior to the nesting season. Past management activities (specifically cover removal) to minimize the food base supporting bullsnares have not worked nor was it a positive strategy for upland bird production. Bullsnares, being cold-blooded animals, do not require vast food resources to support a large population. Also, mechanical control, over any large area, is not a practical consideration. Bullsnares are not known to have large home ranges and labor intensive trapping activities on approximately 100 acres (H.U. 18C1 - 21B2) have reduced the catch per unit effort and also the adult (>38-inch snout-vent length) population since 1985 (Tables 17 and 18, Figures 45, 46, 47 and 48).

Table 17. Bullsnake Removal, H.U. 18C1 and 21B, 1985-91.*

Year	Total # Removed	Sub-Adult		Adult		#/Ac.
		#	%	#	%	
1991	120	61	51	59	49	0.5
1990	66	39	56	31	44	0.4
1989	97	60	62	37	38	0.5
1988	253	146	58	107	42	1.1
1987	241	128	53	113	47	1.1
1986	439	265	60	174	40	1.7
1985	384	78	20	306	80	3.1
TOTAL	1,484	716	48	768	52	N.A.

* = Hatchlings of the year not included.

Table 18. Bullsnake Control - H.U. 18C1-21B, 1991.

		Nesting Season						Total		
		(May 1 - July 14)			July 15 - Oct. 15					
Habitat	Bull-	Trap	# Per	Bull-	Trap	# Per	Bull-	Trap	# Per	
Unit	Snakes	Days	Trap-Day	Snakes	Days	Trap-Day	Snakes	Days	Trap-Days	
18C1	43	984.2	0.04	27	1403.0	0.02	70	2,387.2	0.03	
21B2	37	3,150.0	0.01	12	3,906.0	<0.01	49	7,056.0	<0.01	

* - Does not include 27 hatchlings.

** - Trap day = 100 feet trap/day

BULLSNAKE LENGTH FREQUENCY - 1985

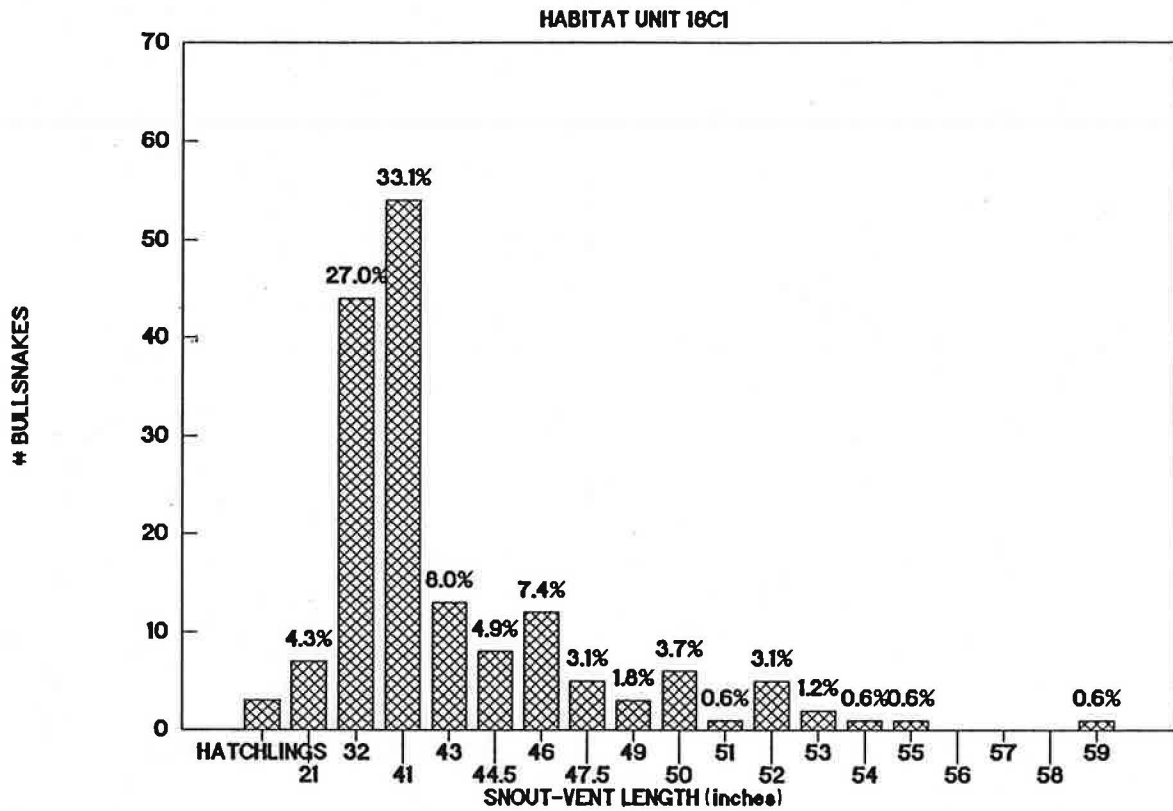


Figure 45.

BULLSNAKE LENGTH FREQUENCY--1991

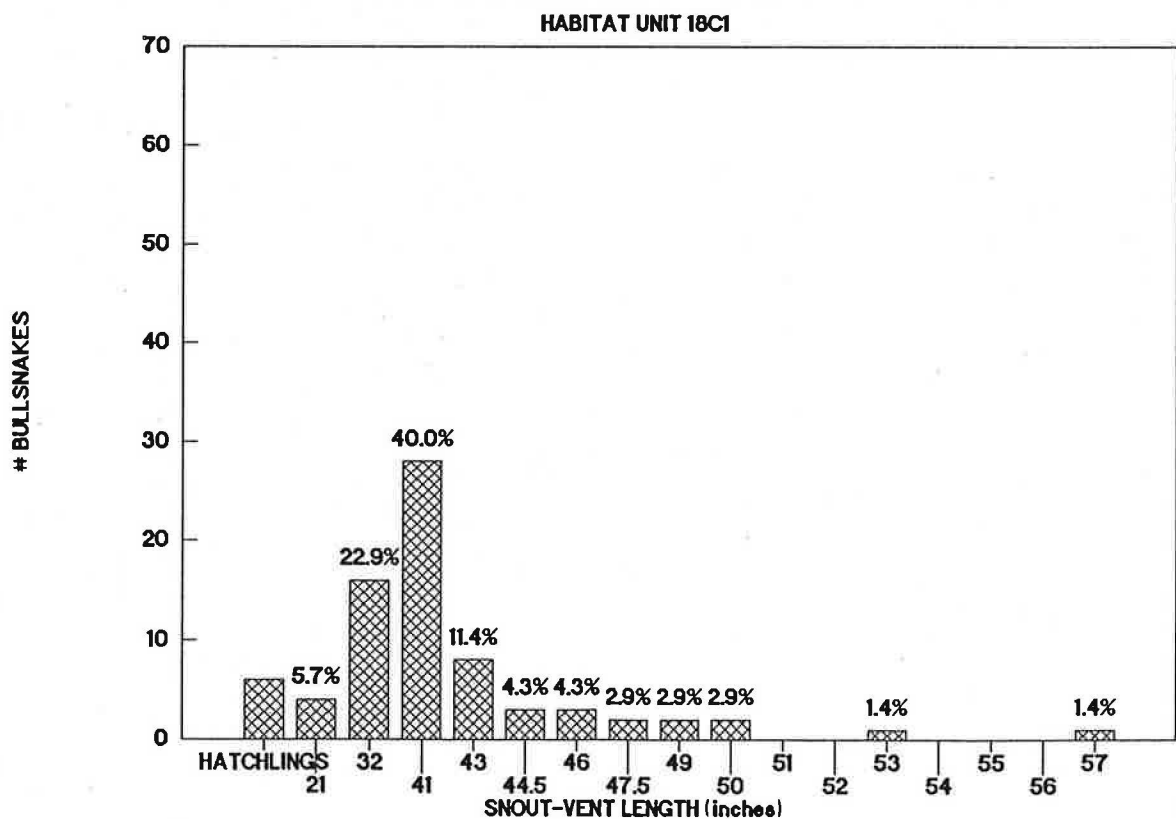


Figure 46.

BULLSNAKE LENGTH FREQUENCY - 1985

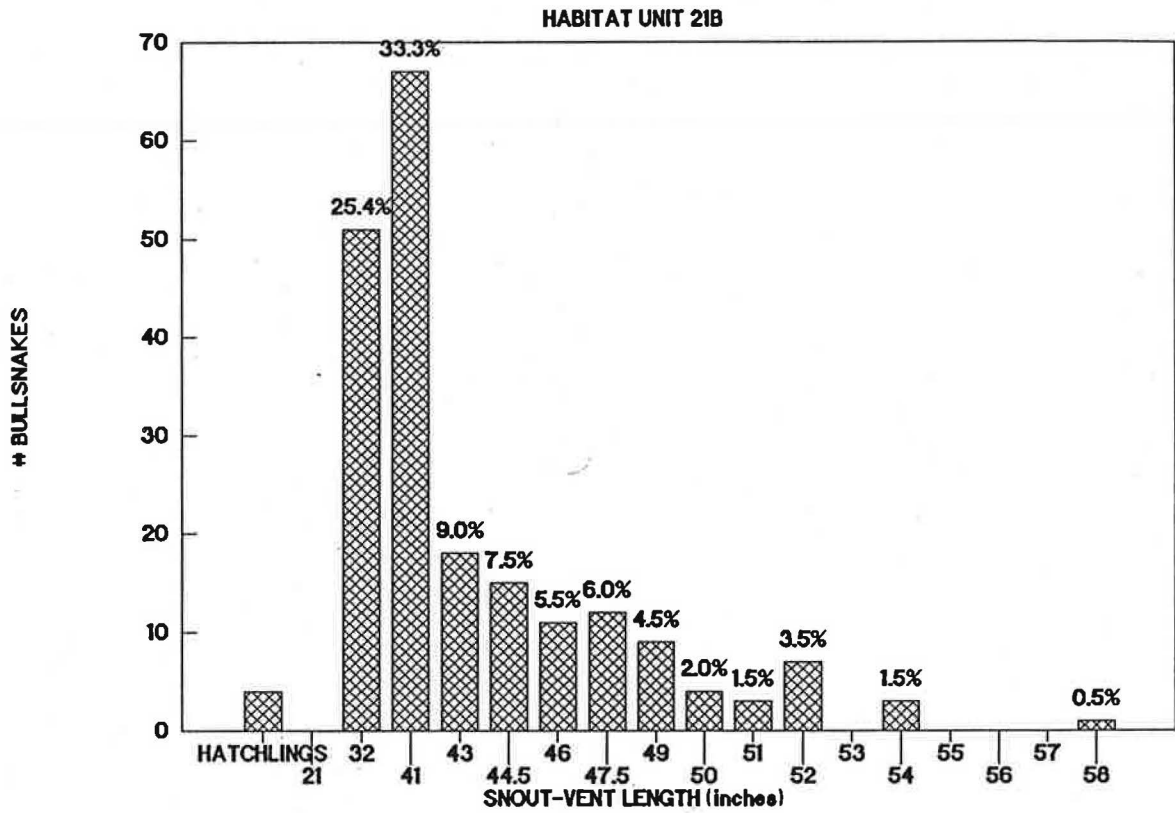


Figure 47.

BULLSNAKE LENGTH FREQUENCY--1991

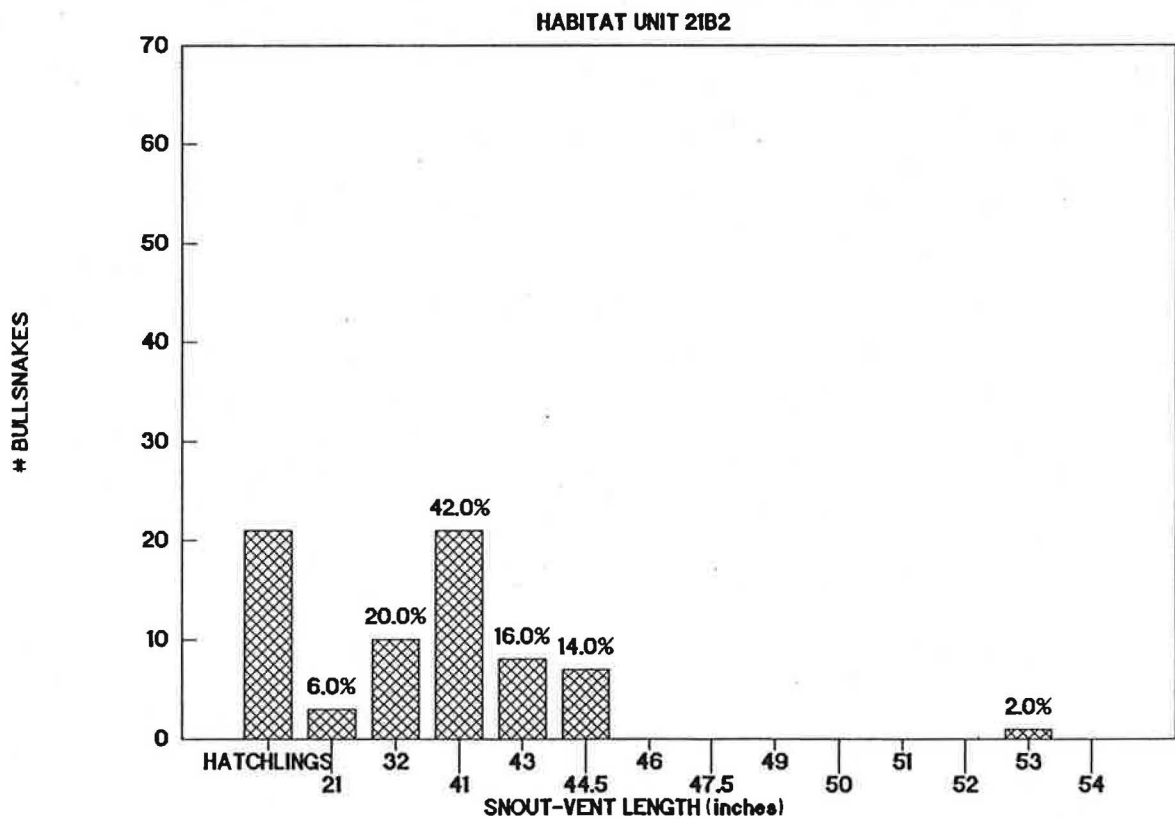


Figure 48.

Nest predation rates by mammals or bullsnakes individually, during the 7-year period, could generally be considered within acceptable limits; however, the combination of both types of depredation is excessive. During 1991 the number of nests destroyed by mammals was much higher than documented in the previous years but bullsnake depredation was less (Table 19).

Table 19. H.U. 18C1 and 21B2 duck nest predation, 1985 - 91.

<u>Year</u>	<u>Nests</u>	<u># Bullsnake Predation</u>		<u>Total</u>	
		<u>Depredated</u>	<u>Destroyed</u>	<u>Mammal Destroyed</u>	<u>Predator Destroyed</u>
1991	113	21 (19)	18 (16)	63 (56)	81 (72)
1990	92	30 (33)	23 (25)	27 (29)	50 (54)
1989	54	21 (39)	17 (32)	16 (30)	33 (61)
1988	120	50 (42)	34 (28)	28 (23)	62 (52)
1987	96	23 (24)	14 (15)	28 (29)	42 (44)
1986	145	40 (27)	21 (14)	26 (18)	47 (32)
1985	<u>195</u>	<u>94 (49)</u>	<u>52 (27)</u>	<u>13 (7)</u>	<u>65 (33)</u>
TOTAL	702	258 (37)	161 (23)	138 (20)	299 (43)

() = Percent

Predator control efforts have generally not been as effective as desired. However, looking at a broad overview, higher blue-winged teal and mallard hen success has been achieved within the MLPCA than the area outside of the MLPCA (Figures T and U). Blue-winged teal are potentially subjected to higher rates of mammalian and reptilian nest predation than mallards since they are a later nesting species. Provided adequate nesting cover is available, the nesting strategy of mallards results in a higher percentage of hatch than blue-winged teal since nesting is prior to the peak bullsnake nest predation activity period. Bullsnake predation generally increases as the season progresses and reaches a high rate by the second week of June.

BLUE-WINGED TEAL HEN SUCCESS

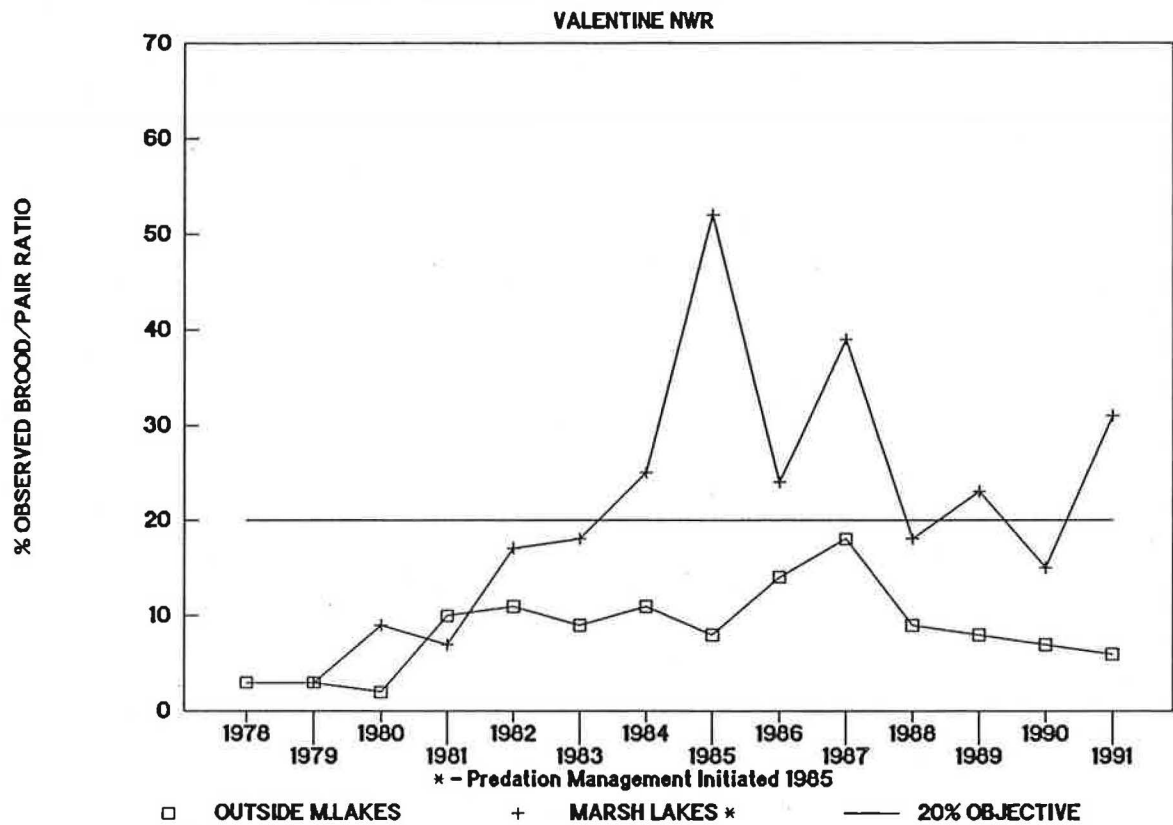


Figure 49.

MALLARD HEN SUCCESS

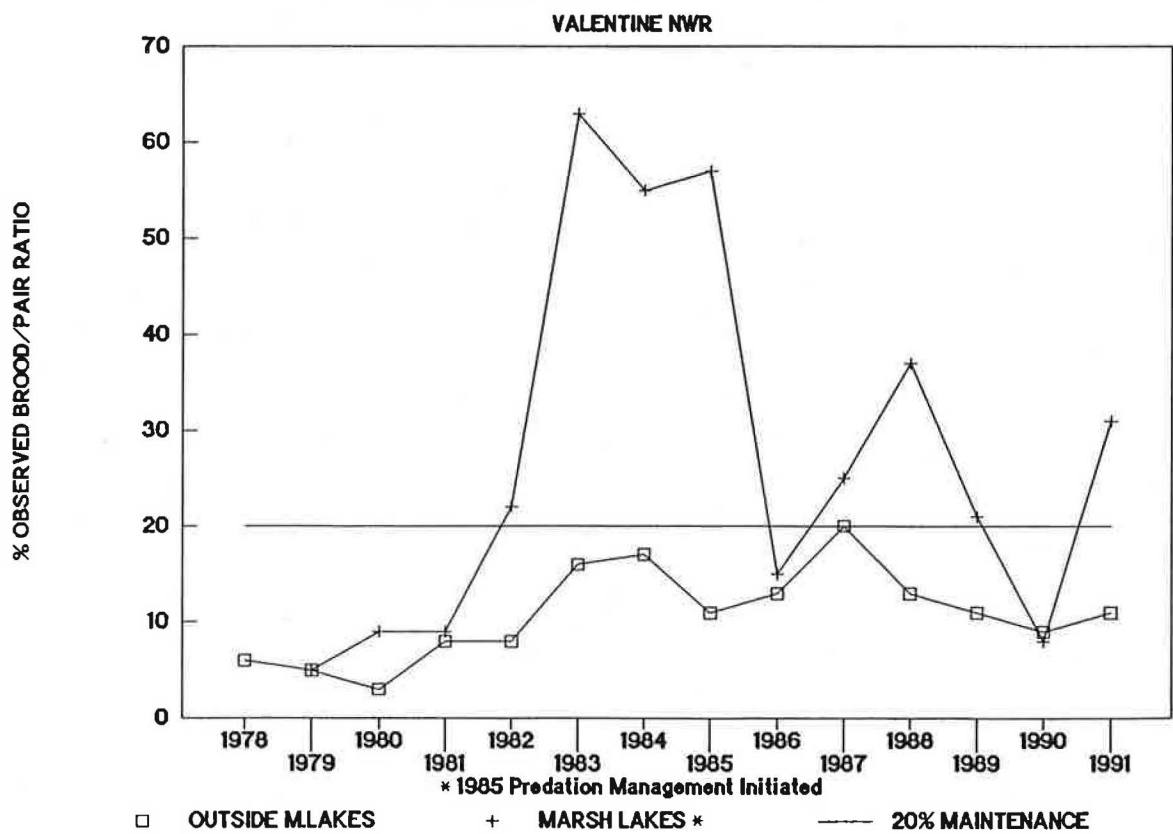


Figure 50.

The Marsh Lakes Dabbling Duck Production Index during 1991 recovered from the low level documented in 1990 since emphasis to increase production were initiated in the MLPCA in 1982 (Table 20). Specifically, increasing undisturbed cover acreage and implementation of initial predator control/exclusion from the Island (H.U. 18C2).

Monitoring of nesting activities in the MLPCP have been limited to H.U. 18C1 and 21B on the upland and H.U. 18C2 -- an island. The evaluation process has been complicated due to gross changes in habitat conditions which were beyond our control (weather); cover treatment acreage which is within the discretion of management; and the interaction between the two conditions.

The management of nesting cover prior to and throughout the nesting season is critical to the productivity level achieved by ground nesting birds. Cover treatment of adjacent acreages is also of great importance and has been discussed at great lengths when placed in context of an "island" of cover surrounded by a large acreage of cropland. While a similar acreage of nesting cover located within an area of disturbed grassland is not as obvious, the function of the undisturbed grassland to provide secure nesting cover may not be significantly different than the "island" of cover in cropland.

The meadow acreage of undisturbed cover within the MLPCP during the 1991 nesting season was greater than in 1990. The acreage of disturbed cover was 20-30% greater during the 1990 nesting season compared to 1988, 1989 and 1991; and the dabbling duck production index was one-third the level documented. Dabbling duck productivity levels, in particular mallards, were adversely affected in 1990, but recovered in 1991 (Table 20, Figures 51 and 52).

Table 20. Marsh Lakes' Dabbling Duckling Production Index By Species, 1979-90*.

YEAR	MAL	BWT	GAD	PIN	SHOV	WOOD		WIG	TOTAL
						DUCK	GWT		
1991	936	1,897	168	--	18	--	--	--	3,019
1990	198	602	66	18	--	--	--	--	884
1989	900	1,547	162	126	36	--	--	--	2,771
1988	1,188	1,020	138	42	36	--	--	--	2,524
1987	594	2,737	120	42	84	--	14	--	3,591
1986	318	1,995	186	42	36	--	--	--	2,577
1985	1,032	4,907	228	378	84	24	--	30	6,683
1984	878	1,673	474	252	72	48	--	54	3,449
1983	774	1,449	48	210	138	--	--	--	2,619
1982	252	1,337	24	150	24	--	--	--	1,787
1981	174	924	84	30	66	--	--	--	1,278
1980	120	490	60	36	24	--	--	--	730
1979	78	161	12	36	24	--	--	--	311

* Based upon brood/pair date.

MLPCP COVER TREATMENT vs NESTING SEASON

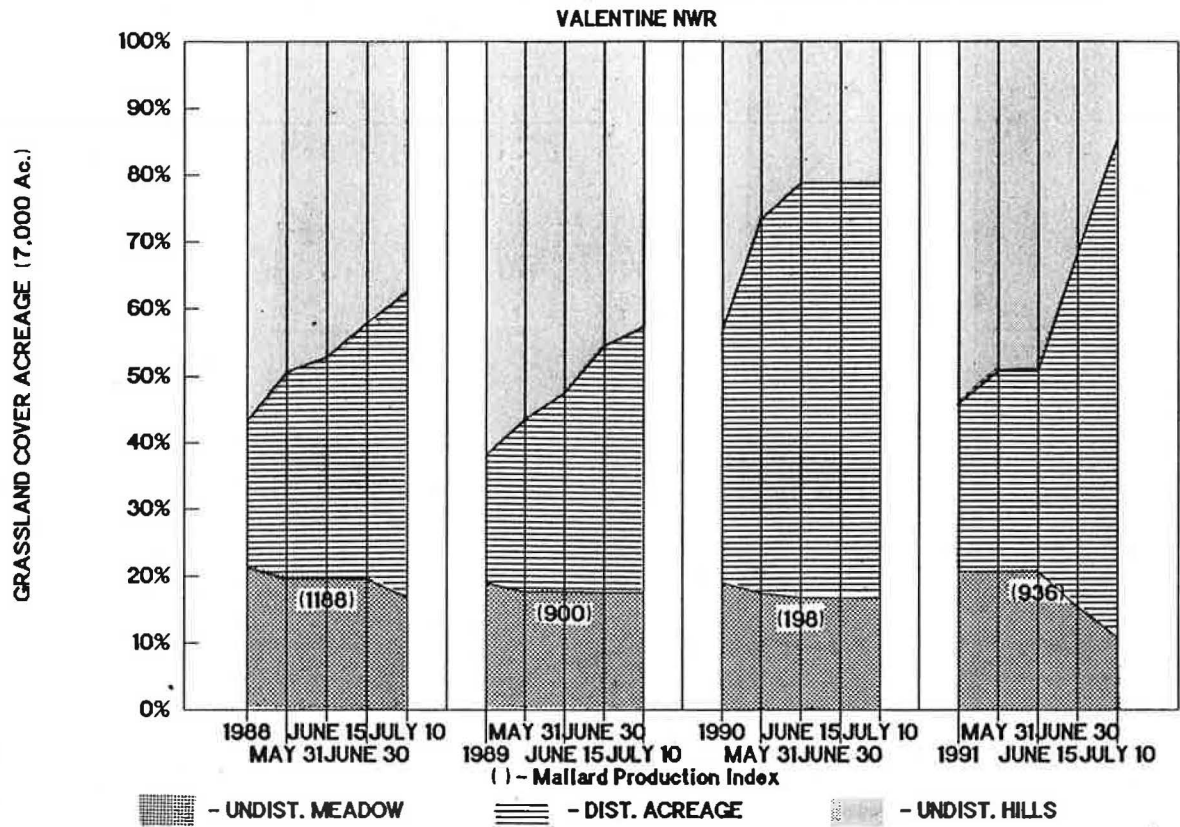


Figure 51.

MARSH LAKES COVER TREATMENT - 1991

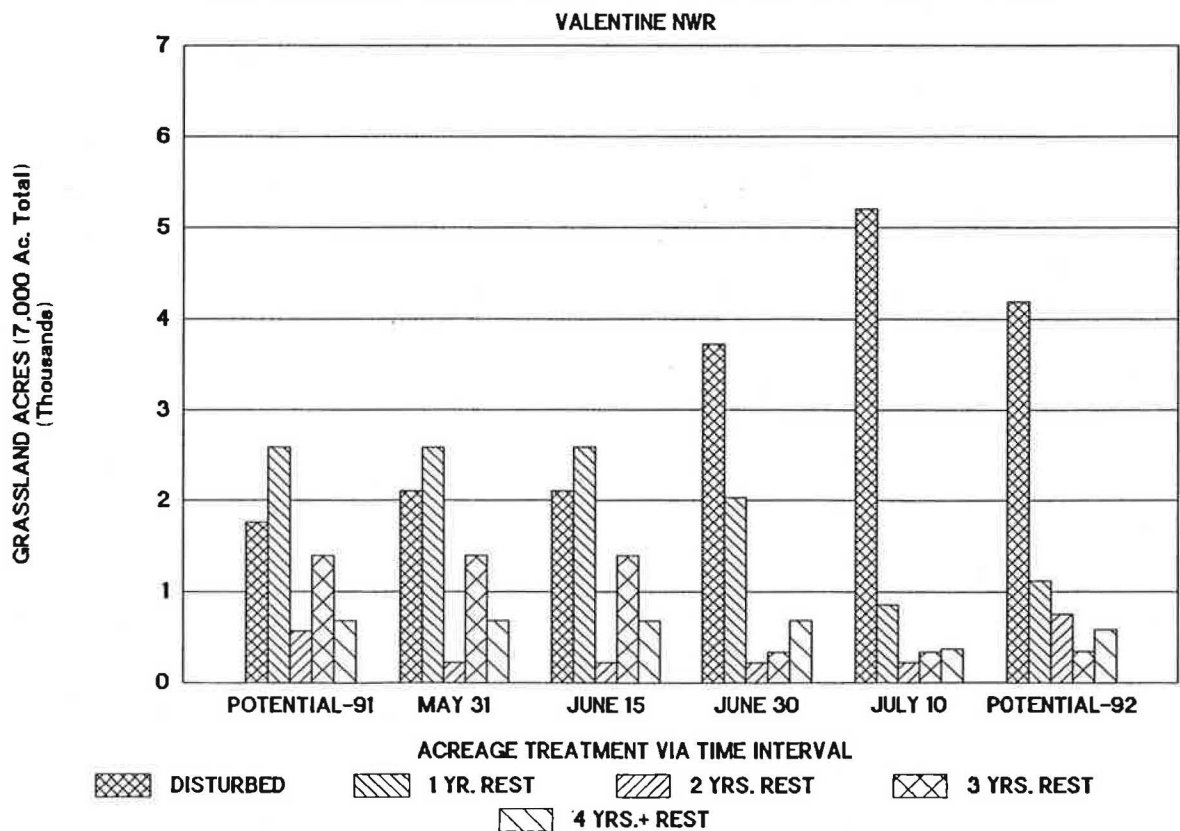


Figure 52.

Nest Monitoring of Upland Areas Within MLPCP

Habitat Unit 21B2:

H.U. 21B is a peninsula of approximately 100 acres; however, the acreage varies depending upon the water elevation of the Marsh Lakes. Mammalian predator control activities are carried out and the bullsnake trapping effort is accomplished with drift fence and funnel traps placed in the established fence line and randomly throughout the unit.

Nesting information is summarized in Tables 21 & 22. In addition to the 79 duck nests being monitored during 1991 there were also two pheasant nesting attempts.

Table 21. Habitat Unit 21B2 - Nest Dragging Summary, 1991*.

<u>Species</u>	# <u>Nests</u>	# Nests		# Nests		#Nests Other	
		<u>Success-</u>	<u>Ducklings</u>	<u>Bullsnake</u>	<u>Depredation</u>	<u>Mammal</u>	<u>Unsuc-</u>
		<u>ful</u>	<u>Hatched**</u>	<u>Predation</u>	<u>Destroyed</u>	<u>Dest.</u>	<u>ful</u>
Mallard	22	7	48 (73.8)	3	3	8	4
Gadwall	8	3	20 (30.8)	2	1	4	-
Shoveler	2	-	- -	-	-	1	1
BWT	47	-	- -	3	3	33	11
Total	79	10	68 (104.6)	8	7	46	16

* 65 acres dragged.

(**) - Ducklings hatched/100 acres.

Table 22. Historic duck nesting information, H.U. 21B2*.

Year**	Treatment	Nests	No./100 Ac.	Nest Density		Nest Observed	Success Mayfield
				Successful Nests/100 Ac.			
1991	Rest 2-yrs.	79	122	15		13	8
1990	Rest 1-yr	70	117	50		43	20
1989	SD-S-1988	35	58	18		31	10
1988	Rest 8 yrs.	100	167	75		45	23
1987	Rest 7 yrs.	86	143	77		54	40
1986	Rest 6 yrs.	118	169	109		69	56
1985	Rest 5 yrs.	161	230	154		67	56
1984	Rest 4 yrs.	108	154	54		35	12
1983	Rest 3 yrs.	45	150	102		68	32
1982	Rest 2 yrs.	25	93	40		21	N.A.
1974	Rest 1 yr.	23	29	8		26	N.A.
1972	Winter Grazed	22	28	6		23	N.A.
1971	Winter Grazed	15	14	8		63	N.A.

* Annual acreage dragged not always the same.

** Nest predator control initiated in 1985.

Habitat Unit 18C1:

H.U. 18C1 includes approximately 30 acres of meadow in a narrow band adjacent to the Marsh Lakes. Therefore, it is naturally subjected to a high rate of nest predation. Mammalian and reptilian predator control activities are both carried out. Nest density continued to increase following the spring grazing treatment in 1987. In addition to the 34 duck nests there was also 1 prairie chicken and 1 sharptail nest under observation.

Table 23. Habitat Unit 18C1 - Nest dragging summary, 1991*.

Species	# Nests	# Nests Hatched	# Nests Ducklings Hatched**	# Nests		#Nests Mammal Dest.	Other Unsus-ful
				Bullsnake Predation	Depredation Destroyed		
Mallard	16	4	29 (95.7)	2	1	10	1
BWT	15	-	-	10	10	4	1
Gadwall	3	-	-	1	-	3	-
Total	34	4	29 (95.7)	13	11	17	2

* 30 acres dragged.

(**) - Ducklings hatched/100 acre.

Table 24. Historic duck nesting success and cover treatment - H.U. 18C1.

Year	Cover Treatment*	# Nests	Nests/100 Acres		% Nest Success	
			Observed	Successful	Traditional	Mayfield**
1991	Rest 4 Yrs.	34	113.3	13.3	12	4
41990	Rest 3 Yrs.	22	73.3	16.7	10	23
1989	Rest 2 Yrs.	19	66.3	23.3	37	15
1988	Rest 1 yr.	20	66.7	20.0	30	13
1987	Spring Grazing Treatment	10	33.3	6.7	20	1
1986	Rest 5 yrs.	27	90.0	33.3	46	26
1985	Rest 4 yrs.	33	110.0	27.0	24	7
1984	Rest 3 yrs.	25	83.3	16.7	20	N.A.

* Cover treatment prior to or during the nesting season.

** Nest sample size inadequate.

Habitat Units 21B6 & 21B7:

H.U. 21B6 & 21B7 are immediately adjacent to H.U. 21B2 peninsula and are narrow bands of meadow acreage in which nest dragging information has been separated from H.U. 21B2 peninsula since 1983. Combined, these units are a classic example where nest density, and in particular mallard nest density, improved when undisturbed cover was available. Mammalian predator control activities are carried out; however, bullsnake control activities are not specifically accomplished in either unit and nest predation remained excessive.

Table 25. Habitat Unit 21B6 - Nest dragging summary, 1991*.

Species	# Nests	# Success- ful	Ducklings Hatched**	# Nests Bullsna- ke Destroyed	# Nests Mammal Destroyed	# Nests Other Unsus-unk.
Mallard	8	1	9 (60.0)	3	2	2
BWT	4	-	-	3	1	-
Total	12	1	9 (60.0)	6	3	2

* 15 acres dragged.

(**) - Ducklings hatched/100 acres.

Table 26. Habitat Unit 21B7 - Nest dragging summary, 1991*.

<u>Species</u>	<u># Nests</u>	<u># Nests</u> <u>Success-</u> <u>ful</u>	<u>Ducklings</u> <u>Hatched**</u>	<u># Nests</u> <u>Bullsnake</u> <u>Destroyed</u>	<u># Nests</u> <u>Mammal</u> <u>Destroyed</u>	<u>Other</u> <u>Unsus-unk.</u>
Mallard	3	-	-	1	2	-
Gadwall	1	1	8 (53.0)	-	-	-
BWT	4	-	-	1	2	1
Total	8	1	8 (53.0)	2	4	1

* 15 acres dragged.

(**) - Ducklings hatched/100 acre.

Table 27. H.U. 21B6 & 21B7 - Nest Dragging Summary, 1991*.

<u>Species</u>	<u># Nests</u>	<u># Nests</u> <u>Success-</u> <u>ful</u>	<u>Ducklings</u> <u>Hatched**</u>	<u># Nests</u> <u>Bullsnake</u> <u>Destroyed</u>	<u># Nests</u> <u>Mammal</u> <u>Destroyed</u>	<u>Other</u> <u>Unsus-unk.</u>
Mallard	11	1	9 (30.0)	4	4	2
BWT	8	-	-	4	3	1
Gadwall	1	1	8 (26.7)	-	-	-
Total	20	2	17 (56.7)	8	7	3

* 30 acres dragged.

(**) - Ducklings hatched/100 acres.

Table 28. Historic Duck Nesting Success and Cover Treatment - H.U. 21B6-7.

Year	Cover Treatment*	# Nests	Nests/100 Acres		% Nest Success	
			Observed	Successful	Traditional	Mayfield**
1991	Rest 2 Yrs.	18	59.9	6.7	11	2
1990	Rest 1 Yr.	16	53.3	16.7	31	11
1989	SD-S	18	60.0	16.7	28	10
1988	SD-S	17	56.7	20.0	35	11
1987	SD-S & ES-SD	17	56.7	13.3	24	5
1986	Rest 1 yr.	16	53.3	20.0	38	18
1985	Fall Grazed	14	46.7	6.7	14	13
1984	Rest 1 yr.	17	56.7	13.3	24	N.A.
1983	S #1	2	6.7	0.0	0	N.A.

* Cover treatment prior to or during the nesting season.

** Nest sample size inadequate - >50 nests.

*** Previously H.U.21B1.

Island Duck Nest Predator Control/Exclusion Project - H.U. 18C2.

The tenth year of the predator control/exclusion project was accomplished in Habitat Unit 18C2 (Island). In 1982, the year the project was initiated, there were 66 acres of potential upland nesting cover. Increasing water levels of the Marsh Lakes further reduced the acreage of the "Island" to 10 acres in 1986 and during 1987-89 there were 2 acres. During 1990 there were 2.5 acres of nesting cover and another 1.5 acres of mud flat present.

A total of 84 waterfowl nests were located on the upland by flushing/walking -- 37 (44%) were successful. Nests consisted of 76 dabbling duck, 6 diving duck and 2 Canada goose nests -- 21.0 nests/acre of which 9.3 nests/acre were successful. There were 11.0 mallard nests/acre of which 4.5 nests/acre hatched. Seventy two duckling/goslings hatched per acre with 31.5 ducklings/acre being mallards. Redheads parasitized 6% of all duck nests under observation. Forty-one (50%) of 82 duck nests were destroyed by predators. Bullsnares only destroyed one nest but caused egg loss in a second nest while mammalian predators destroyed the remainder (Table 29).

Results of 1991 were not as positive as documented during 1988-1990 (Figures 53 & 54). However, lower water levels increased the opportunity of mammalian predator access to the "Island" even though steel wire panels with electrically charged wire fencing were established on the east and west dikes providing access to the island. Furthermore, nest monitoring activities were not as intensive as in the past. Therefore, nest density and success

appears lower than actually achieved since the opportunity of locating destroyed nests is much greater than locating successful nests that were not being monitored.

Nest parasitism by redheads was not as severe as noted in past years. Only 4 mallard and 1 gadwall nests were parasitized and only one of the mallard nests was unsuccessful. Four redhead ducklings were hatched from three successful nests. Redhead eggs were removed from one mallard nest due to the disparity between the incubation stage of the host's clutch. The eggs removed were placed and successfully hatched by a very docile mallard hen in H.U.18C1 that was sitting on an infertile clutch. This mallard hen would simply move (not necessarily fly) out of the way of the investigator when checking her clutch of infertile eggs. Five fertile redhead eggs, 8 days into incubation, were substituted for the original eggs. The mallard hen was documented to have been on the nest for a minimum of 42 days by the time the redhead eggs hatched.

Since the project was initiated in 1982, mallard nest density has dramatically increased and since 1984 remained relatively high (Table 11 and Figure 54). However, the key to increasing mallard nest density is maintaining hen success in excess of 60% which has not been achieved during 1990 and 1991.

Table 29. Waterfowl Productivity Summary - H.U. 18C2, 1991*

Species	#Nests	#Hatched	#Ducklings	Bullsnake Predation		Mammal Dest.	#Aban.	Redhead Parasitism (%)
				Depre.	Dest.			
Mallard	44	18	126 (3150)	1	1	23	2	4 (9)
Gadwall	27	15	126 (3150)	1	-	10	2	1 (4)
BWT	4	1	11 (275)	-	-	3	-	-
Shoveler	1	-	-	-	-	-	1	-
Redhead	6	2	23 (575)**	-	-	4	-	-
TOT-DUCK	82	36	292 (7300)	2	1	40	5	5 (6)
C. goose	2	1	6 (150)	-	-	1	-	-
TOTAL	84	37	298 (7450)	2	1	41	5	5 (6)

* - Total of 4 acres in H.U. 18C.

** - Includes 4 redhead ducklings hatched in parasitic nests.

() - Ducklings and/or goslings hatched/100 acres.

H.U.18C2 - DUCK NEST DENSITY

ISLAND PREDATION CONTROL PROJECT

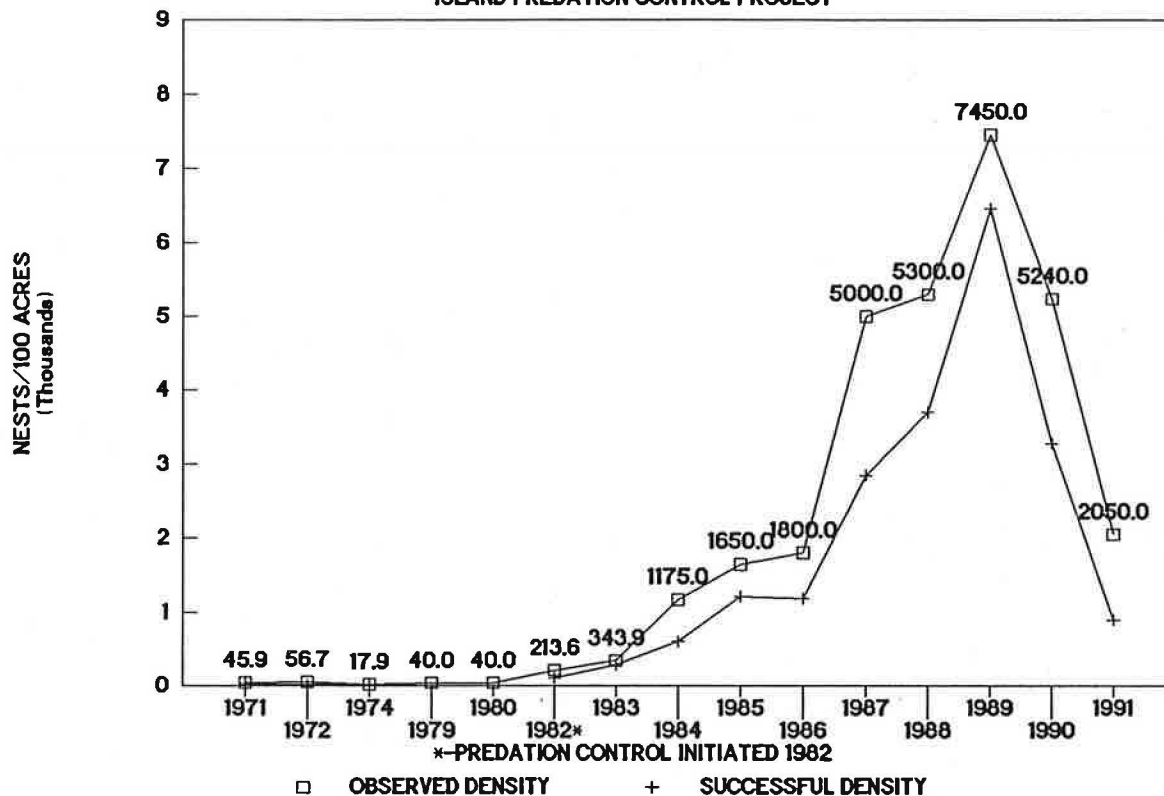


Figure 53.

H.U.18C2 - MALLARD NEST DENSITY

ISLAND PREDATION CONTROL PROJECT

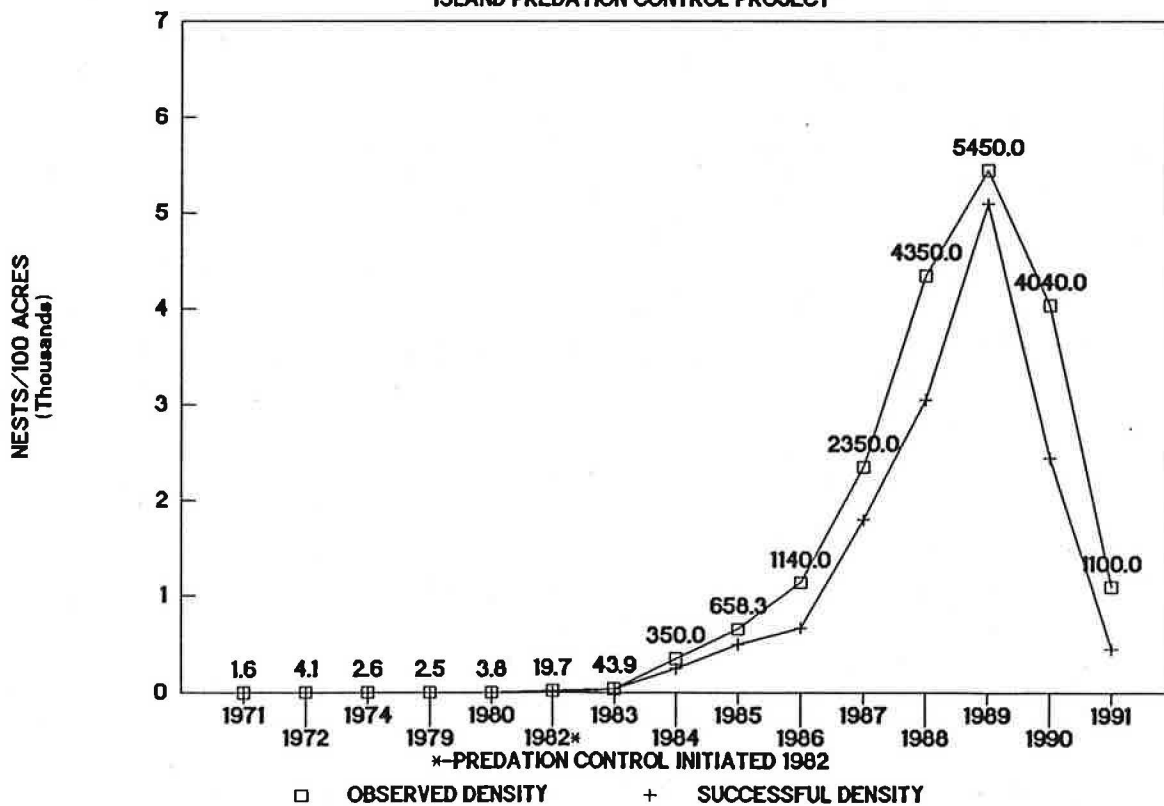


Figure 54.

FmHA - Tower Property

In 1988, 480 acres of FmHA property south of Ainsworth were acquired. Most of the upland nesting cover is residual volunteer rye; however, some native vegetation is beginning to appear. To date, no manipulative treatments have been planned and accomplished but trespass grazing does occasionally occur.

Pair counts were accomplished at the Tower Easement in May. There was a decrease of 36% in total pairs from 1990 with dabblers comprising 92% of the total 246 pairs. Blue-winged teal and mallards were the most common species observed during both the breeding pair and brood counts. The duckling production index for the easement was 714, of which all were dabblers (Figure 55). Duckling production was down 25% from 1990; however, hen success for dabblers continued to improve somewhat (Figure 56).

DUCKLING PRODUCTION INDEX

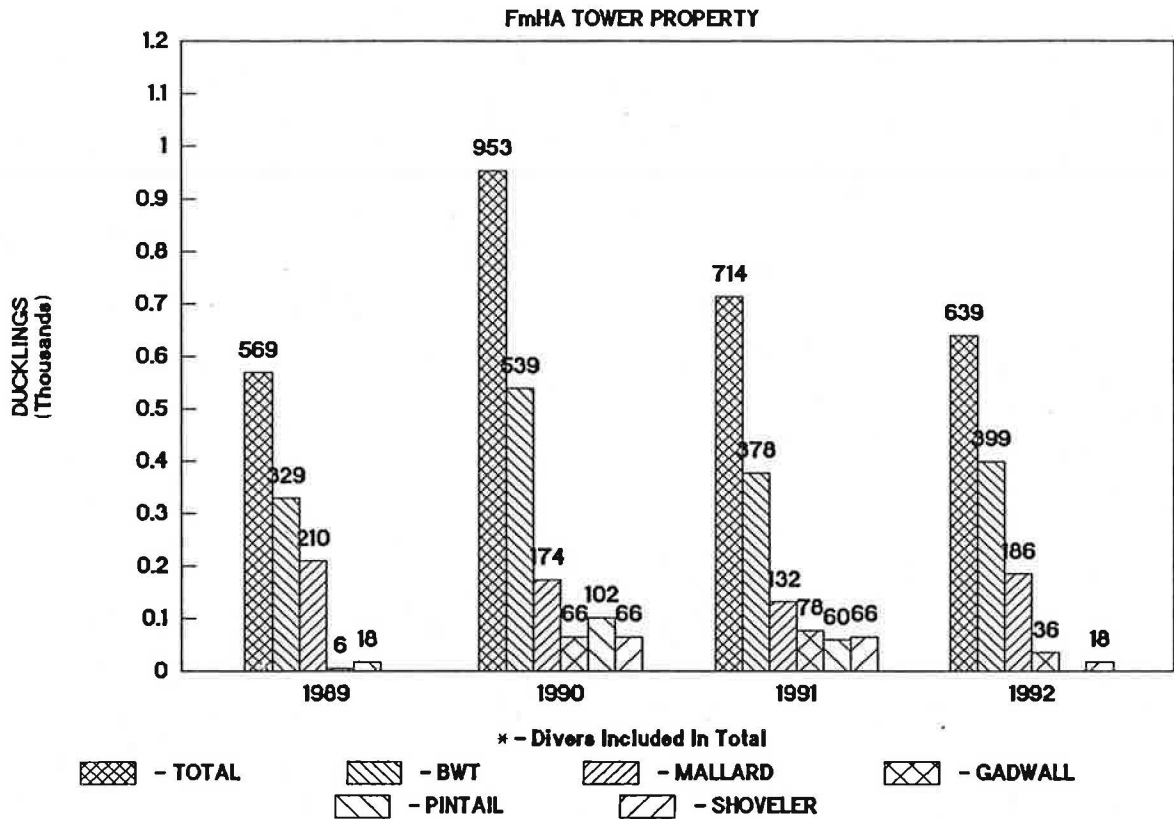


Figure 55.

OBSERVED HEN SUCCESS - DABBLING DUCKS

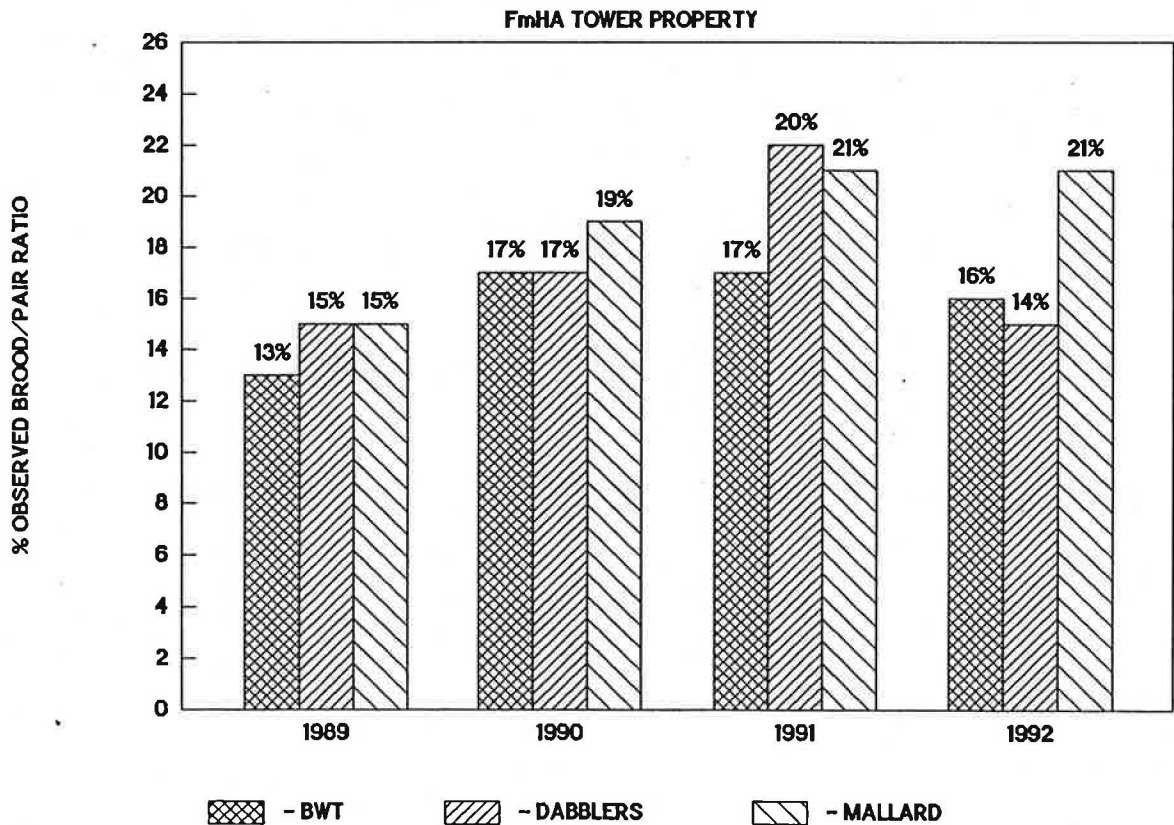


Figure 56.

b. Geese

The Sandhills Canada Goose Restoration Flock combined with the West River Flock in South Dakota has expanded nesting throughout the Nebraska Sandhills. Canada goose spring and fall migration concentrations are considerably higher than documented 10-15 years ago. The spring migration peak occurred the end of February with 10,500 Canada geese on refuge and many stayed in the area longer than normal. The fall migration was short due to an early freeze-up at the end of October and before the Canada goose fall migration occurs; however, a couple hundred birds stayed on Valentine NWR during the 1990-91 winter.

A total of 205 Canada goose territorial pairs were observed during the duck breeding pair counts compared to record high 224 pairs observed in 1989; however, some of the pairs are non-breeding. Forty-four broods were documented on refuge during routine activities.

This was the 12th year that dark geese have been subjected to legal hunting since establishment of the Sandhills Restoration Flock. Hunting is by special permit only -- 2 Canada geese/season with a maximum of one bird/day. This was the 9th year that goose hunting was authorized on refuge in the waterfowl hunting area. To date, only two geese are known to have been harvested on the refuge during the 9-year period. Canada goose hunting interest, like all waterfowl hunting in the Nebraska Sandhills, appears to be extremely low for the opportunity that is available. Past band recoveries from hunter harvested geese indicate that a bulk of the local birds are harvested near Kirwin, Kansas.

White-fronted geese were first observed migrating through the area on October 9 and 200 were observed on Hackberry Lake. White-fronts usually migrate through the area and seldom stop over.

Snow geese usually migrate through the area during the spring. A flock of 25 were observed on the Marsh Lakes on March 31 and a single bird was observed on April 6.

Table 30. Goose use-days.

<u>Species</u>	<u>1991</u>	<u>1990</u>	<u>1989</u>	<u>1988</u>	<u>1987</u>	<u>1986</u>
Canada	679,525	304,668	218,390	225,095	101,600	112,860
White-fronted	900	300	775	-	-	-
Snow/blue	155	310	-	620	-	-
Totals	680,580	304,660	219,165	225,715	101,600	112,860

c. Trumpeter Swan

Trumpeter swans were observed periodically throughout the year and there were infrequent reports of a pair of swans in the area of the Marsh Lakes and Calf Camp Valley. The last successful nesting attempt on refuge was in 1978 on "21" Lake.

d. Coot

A total of 1,086,150 million coot use-days were estimated from migration and production surveys this year. This species is generally very successful on the refuge but has been adversely impacted by the lack of residual over water nesting cover. Coot production/summer use has been low since 1986 when water levels began to decrease and with lower water levels, emergent vegetative growth has not developed to provide adequate nesting habitat for coots. The coot breeding population is inventoried during the duck breeding pair survey. Total pairs documented were 556 which is low compared to the past 10 years.

Table 31. Coot use-days.

	Use-days (Million)	Breeding Population*	Migration Peaks	
			Spring	Fall
1991	1.09	556	6,500	16,500
1990	1.48	954	6,000	18,500
1989	2.28	1,977	9,000	22,500
1988	2.69	1,553	16,000	21,000
1987	2.65	745	18,500	30,500
1986	3.29	507	23,000	37,500
1985	3.09	1,057	26,000	38,000
1984	3.10	2,505	31,000	37,000
1983	2.97	2,590	22,000	34,000
1982	2.43	1,593	23,000	32,000
1981	2.20	3,950	28,100	24,000
1980	2.80	3,500	24,000	37,000

* From duck breeding pair count survey.

4. Marsh and Waterbirdsa. Sandhill Crane

The first spring migrating sandhill cranes were observed the first week of April with the major migration completed the second week of April. Seldom do migrating cranes stop over on the refuge. Sandhills cranes migrated through on October 6 and continued throughout the month. A big push was particularly noted during the ice storm at the end of the month. Approximately 250 sandhills cranes were observed on East Twin Lake on October 23.

b. Cormorants and White Pelicans

Cormorants began nesting on the Marsh Lakes in 1977 and annual production continually increased until 1985. Since then, suitable nesting sites have been limited by high water levels. Cormorants initially began nesting in artificial nesting structures established for Canada geese and then expanded nesting by constructing over-water nests in emergent residual vegetation. Since 1989 nesting cormorants have nested on the east island adjacent to H.U. 18C2 and an island in H.U.21C.

A total of 412 cormorant nests were observed in 1991; however, only 15 young fledged and they were the oldest age class. All the young in the remaining nests died of unknown source(s). Several biological specimens were submitted to the National Wildlife Health Center but the samples were too old to determine the cause of mortality.

White pelicans have not nested on Valentine NWR but four pelican eggs were observed with the nesting cormorants. Commonly, 4-500 pelicans can be observed on refuge during the summer. Fall migration peaks exceed 4,000 birds.

c. Other Marsh and Waterbirds

Nesting sites for this category of migratory birds have been extremely limited due to high water levels and subsequent destruction of extensive cattail and phragmites stands. The past five years, black-crowned night herons nested in Center Lake. Another nesting colony was located on the Marsh Lakes -- northeast corner of H.U. 18C2. Cattle egrets are not known to have nested on the refuge the past four years, however, 25-30 birds were commonly observed on the Marsh Lakes during the summer.

Long-billed dowitchers were particularly common on the Marsh Lakes and East Sweetwater Lake during early fall migration. Numerous nests with young black-crowned night herons were observed on the Marsh Lakes during other monitoring activities. Also, three pairs of nesting white-faced ibis were observed on the Marsh Lakes. Most avocet nests had hatched or been otherwise terminated early in June. Least bittern young were observed on the Marsh Lakes where nesting has been previously documented.

5. Shorebirds, Gulls, Terns and Allied Species

Wilson's phalaropes were particularly numerous this spring. Some nesting activity was documented. Shorebirds have not been observed in the quantity that would be expected considering the amount of available habitat the past two years.

Considerable nesting of black and Forster's terns was observed which is normal. The Marsh Lakes being a primary area of concentration.

6. Raptors

Great horned owls, marsh hawks, American kestrels and Swainson's hawks are the primary nesting species on the refuge. Nesting raptors are recorded and records are forwarded to the Heritage Program - Nebraska Game & Parks Commission.

A great horned owl nested in a fiberglass goose nesting tub in the brood marsh at the east end of Dewey Lake (H.U. 16A1) for the third year in succession. Nearly every tree patch throughout the refuge has a great horned owl nest during the spring.

Osprey observations were made on Hackberry and Duck Lake during May and also on Hackberry Lake during September.

During September, the major fall migration of raptors occurred. Sharp-shinned, Merlin's, kestrels, marsh, Swainson's, and ferruginous hawks were the predominate species. The predominate winter species are great horned owls and rough-legged hawks. Dark phase rough-legged hawks have wintered on Crowe's Corner/Watts Lake area for the past seven years.



Figure 57. Screech Owl at Hackberry Headquarters (10/19/91
LLM)

NE-VAL 3115

7. Other Migratory Birds

There were not any new species occurrence records added to the Valentine NWR Bird List by refuge staff during the year. The National Ecology Research Center (NERC) conducted breeding bird surveys on refuge and

pending the results of the final report, status for several species of migratory birds is expected to change.

Table 32. Refuge bird list - 1991.

<u>Year</u>	<u>Number Species Observed</u>	<u>Species added to Refuge List</u>	<u>Total Species On Refuge List</u>
1991	169	2	269
1990	143	3	267
1989	144	-	264
1988	130	-	264
1987	164	2	264
1986	162	-	262
1985	158	3	262
1984	181	1	259
1983	208	10	258
1982	149	2	248
1981	144	1	246

Graduate student Jim Anderson, University of Nebraska-Omaha, completed his second year of field work for the 1990-91 seasons re: a breeding bird study on short-duration grazing v.s. season-long grazing practices. His study is comparing breeding bird populations on short-duration grazing on Valentine NWR v.s. grazing on private lands adjacent to the refuge. Transects were not established on grasslands not subjected to grazing by domestic livestock.

8. Game Mammals

a. Deer

The refuge is divided by Highway 83 into two State management units -- Calamus West and Sandhills. The Nebraska Game & Parks Commission is in a stage of modifying deer harvest regulations; therefore, emphasis is being attempted to document the adult:fawn harvest ratio and the harvest ratio between the two species.

Table 33. Deer Harvest - 1986-91

Year	White-tail				Mule				Harvest	
	Fawn	Adult	Total	A:F Ratio	Fawn	Adult	Total	A:F Ratio	Total	WT:M Ratio
1991	29	62	91	2.1	2	30	32	15.0	123	2.8
1990	12	74	86	6.2	1	18	19	18.0	105	4.5
1989	22	75	97	3.4	-	17	17	-	114	5.7
1988	NA	NA	45	-	NA	NA	11	-	56	4.1
1987	NA	NA	46	-	NA	NA	9	-	55	5.1
1986	NA	NA	38	-	NA	NA	6	-	44	6.3

b. Muskrat and Other Furbearers

The muskrat population experienced a significant disease die-off in the 1950's; however, an upward trend occurred during the late 70's through 1988. Muskrat die-offs usually occur the end of December and have been diagnosed as "Tizzer's disease". Therefore, from the standpoint of muskrat and waterfowl management, it is desirable to maintain a high summer/fall muskrat population but a low over wintering population.

Aerial and ground fall house counts were initiated in 1978 to document muskrat population trends and for use in establishing trapping activities initiated in 1981. The primary concern is that areas of high muskrat activity be trapped by the end of December to minimize the opportunity of disease decimating the local population. Permittee trappers are required to concentrate initial trapping activities in designated areas identified as potential disease "hot spots" based upon high house density. There were no such areas requiring this designation during the past seven years.

Even at low house density muskrats are serving a valuable function by providing Canada geese with secure nesting sites. House counts have been down the past three years. A ground count was used this year to document muskrat houses because of the low population and lack of potential trapping applicants. No trapping activity was accomplished during the 1989-90 nor 1990-91 seasons due to the poor fur market and subsequent lack of "recreational type" trappers.

Table 34. Muskrat population and recreational harvest trend, 1978-91.

<u>Trapping Season</u>	<u>Aerial House Count</u>	<u>Harvest</u>	<u>Harvest/House*</u>	<u>Harvest/Trapping Day</u>
1990-91	87	-	-	-
1989-90	229	-	-	-
1988-89	877	229	N.A.	8.5
1987-88	2,201	1,092	0.8	18.2
1986-87	1,420	2,000	1.9	32.3
1985-86**	1,581	338	1.0	8.2
1984-85	2,554	2,408	0.9	28.8
1983-84	1,623	2,824	2.0	27.6
1982-83	1,348	1,958	2.0	19.0
1981-82	1,431	1,705	0.8	18.7
1980-81	1,214	-	-	-
1979-80	1,014	-	-	-
1978-79	524	-	-	-

* Harvest/house of lakes trapped; in 1988-89 trapping activity was not adequate.

** Weather prevented trapping activity.

Other information on mammals in this section is covered in Section G.3a and G.15.

10. Other Resident Wildlife

a. Prairie Grouse

Both prairie chickens and sharp-tailed grouse occur in Nebraska with nearly equal numbers of each species being reported harvested by hunters. However, the sharptail is the more abundant species on Valentine NWR where, based upon State harvest data, the highest population density is found throughout Nebraska.

State-wide prairie grouse breeding population surveys are conducted by the Nebraska Game and Parks Commission. Information for one of 15 survey routes is collected on Valentine NWR by refuge staff and, along with brood and hunter harvest information, is forwarded to the District Biologist in Bassett.

Prairie grouse populations declined in the drought years of 1988 and 1989 and continued downward in 1990 due to the lack of adequate nesting and protective cover. During 1991 cover conditions improved and prairie grouse productivity also increased (Figures 58 & 59).

Since 1980, we have cooperated with Nebraska Game and Parks Commission on data collection of prairie grouse hunter harvest. Five sites were established to distribute and collect hunter information and prairie grouse wings. From the data collected, we obtain minimum hunter use, harvest by species and age class, hatching chronology and age ratios that were not possible prior to the use of the survey (Figures 59 & 60).

During the 1991 Prairie Grouse Season a total of 428 birds (68% sharp-tailed grouse and 32% prairie chicken) were reported harvested in 240 hunter days (1.8 birds/hunter day). The Immature/Adult Harvest Ratio was 3:7 for sharptails and 3:2 for prairie chickens.

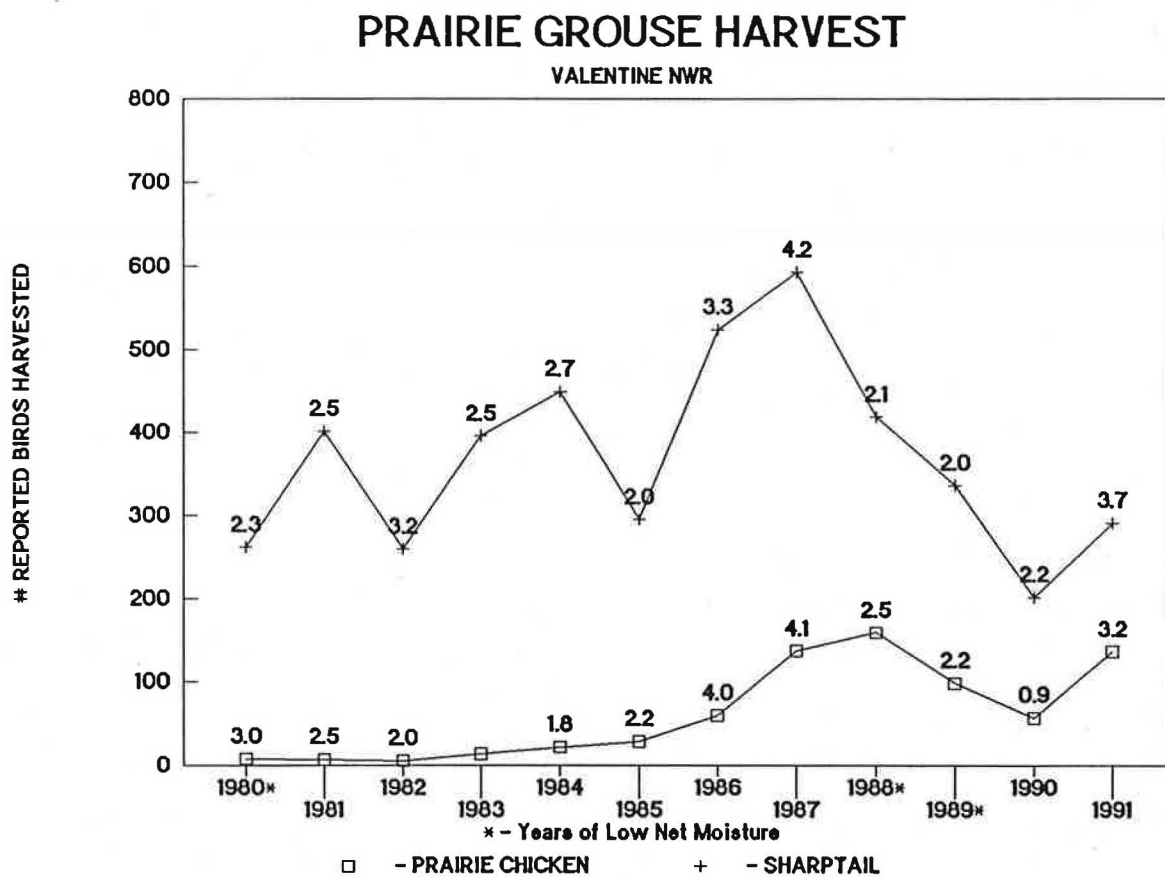


Figure 58.

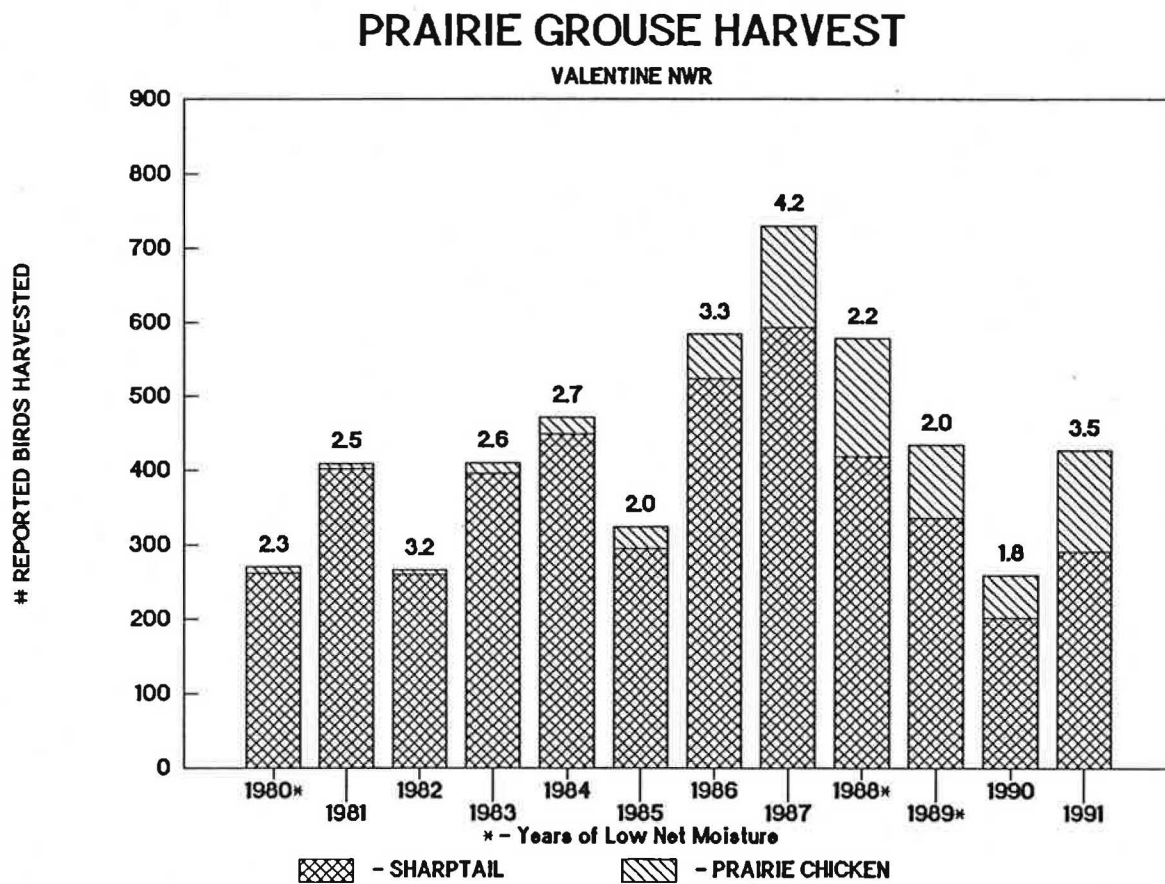


Figure 59.

GROUSE HATCHING CHRONOLOGY - 1991

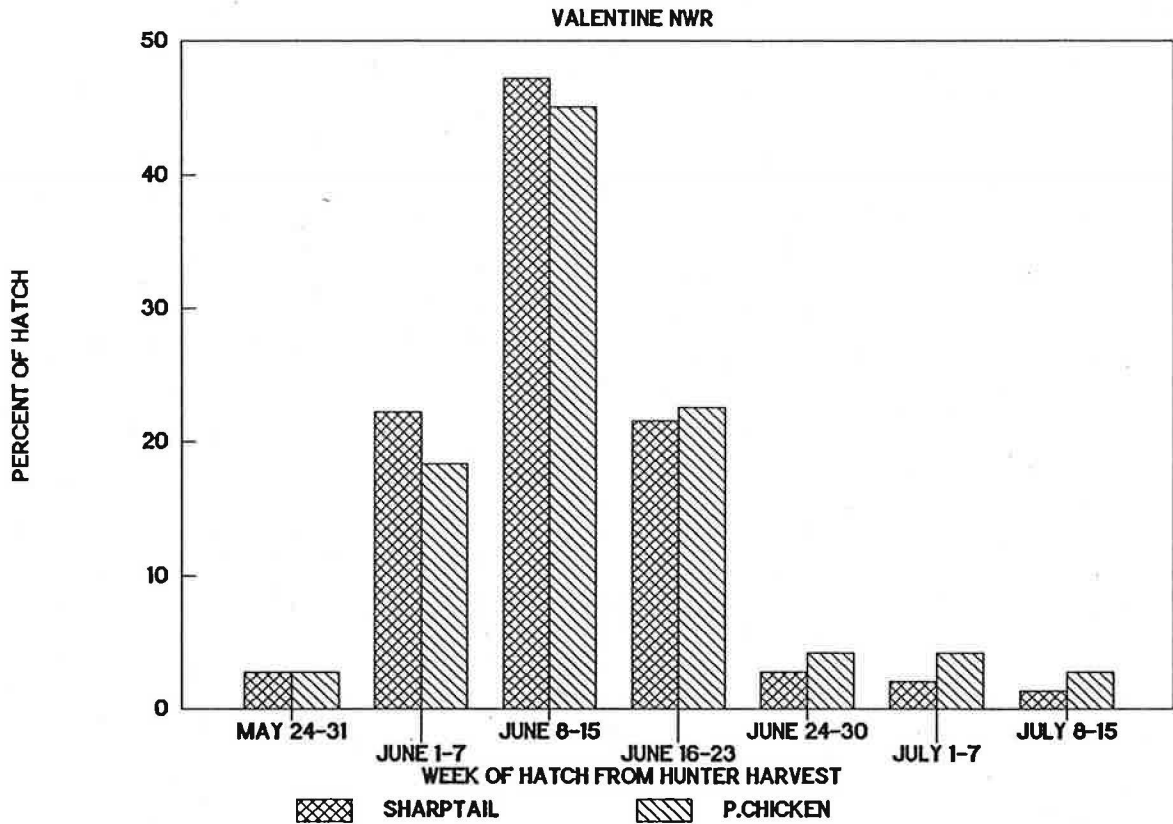


Figure 60.

PRAIRIE CHICKENS v.s. AUM UTILIZATION

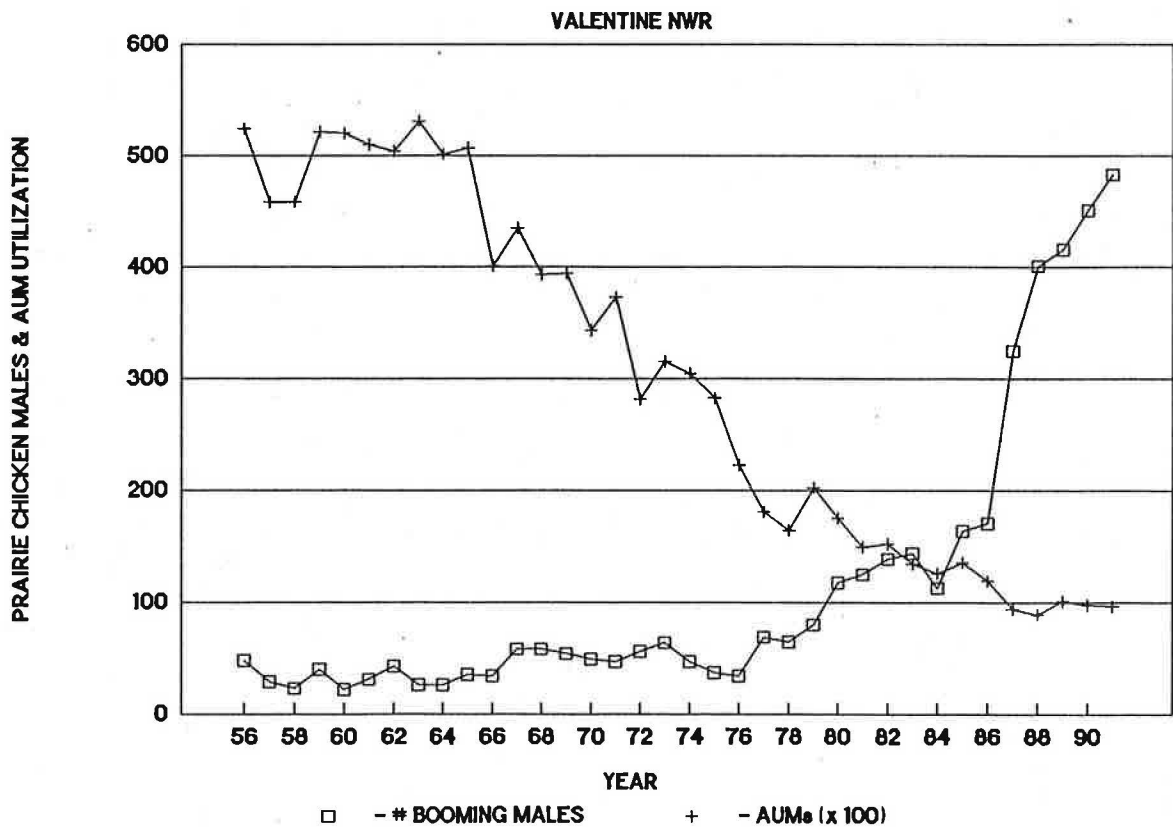


Figure 61.

Prairie Chicken

Complete coverage of the refuge and adjacent private land is usually accomplished to document the prairie chicken breeding population. The prairie chicken population has continued the major upward trend documented since 1977. During the period 1956-85 the population increase had an inverse relationship to AUM utilization (Figure 61). Since 1987 AUM utilization has stabilized and the rate of increase in the prairie chicken population has decreased. Future expansion of the prairie chicken population on Valentine NWR will depend upon vegetative cover treatment and timing of manipulative treatments to maximize the acreage of undisturbed cover on meadows. Cover conditions for 1991 were improved over 1990 (Figures 62 & 63).

This year 483 male prairie chickens were observed on 44 booming grounds - 19 of which were on private land and 10 within the State Sample (Figure 66). A total of 647 prairie chickens were observed during the spring breeding population count.

P.CHICKEN GRASSLAND COVER via TREATMENT

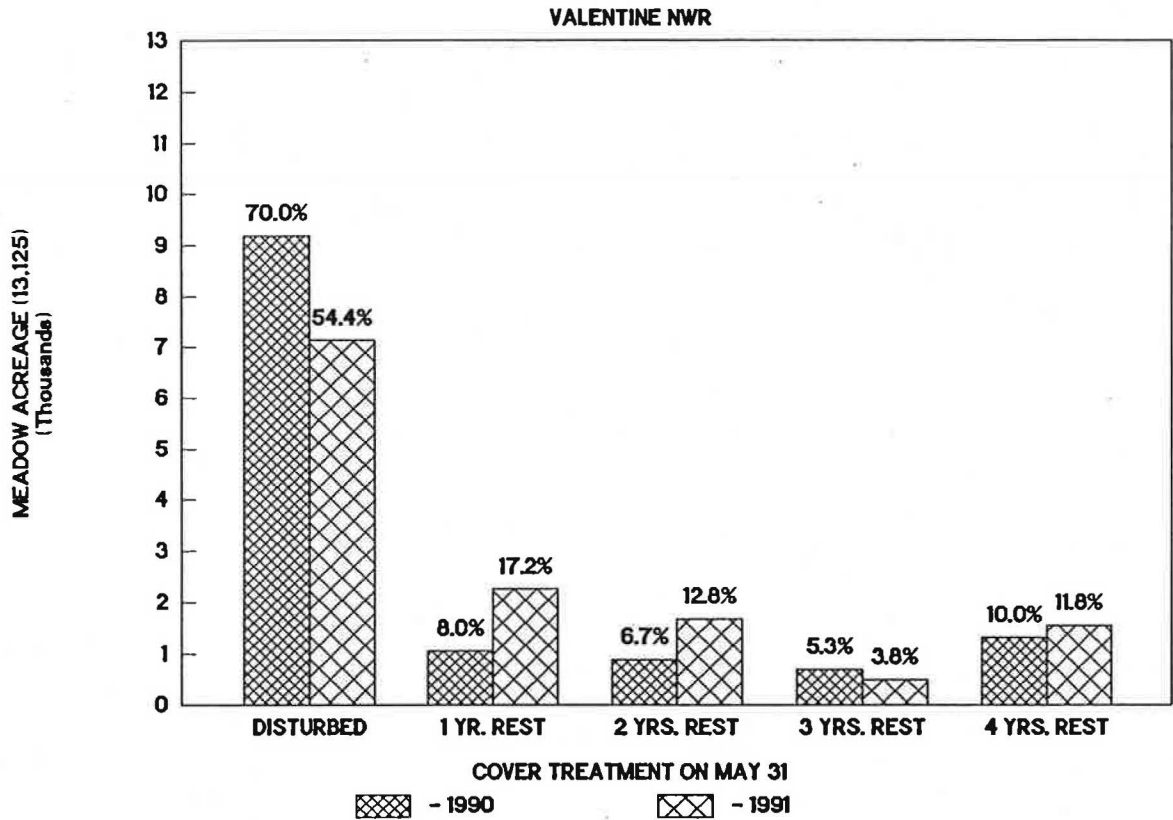


Figure 62.

1991 MEADOW GRASSLAND COVER TREATMENT

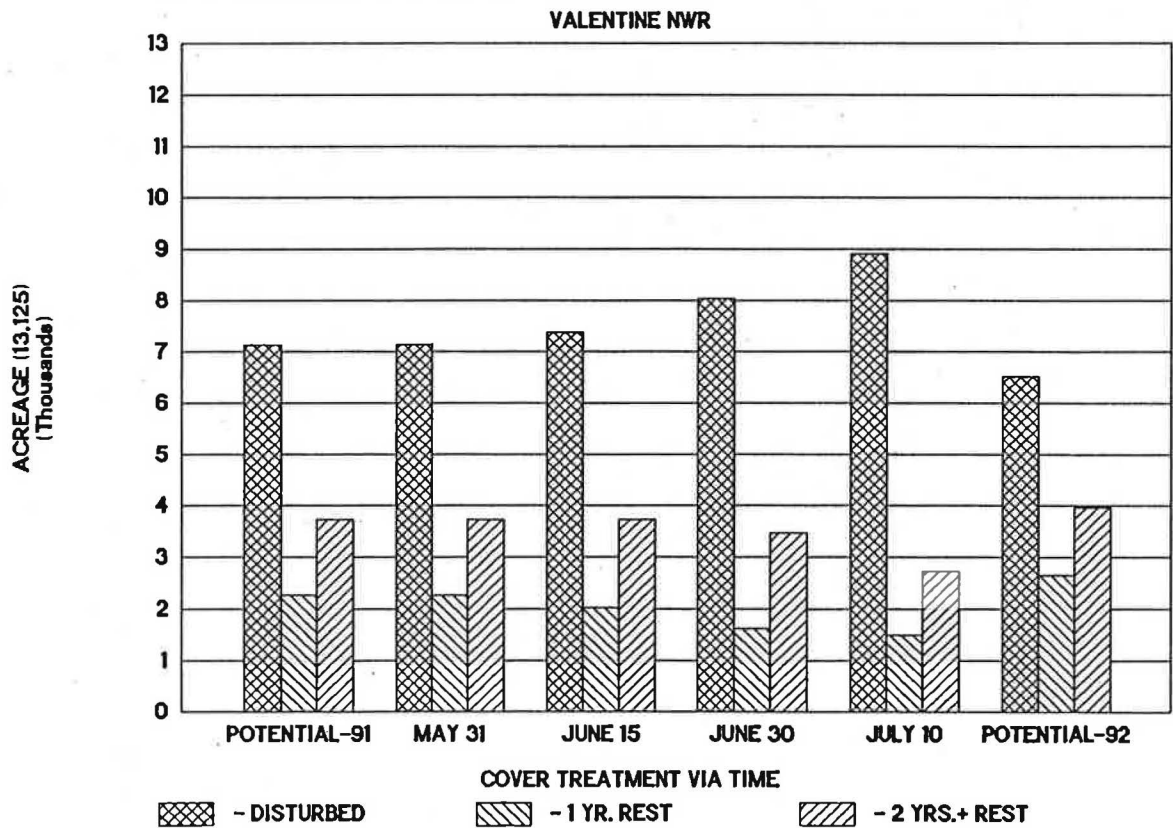


Figure 63.

Sharp-tailed Grouse

Coverage of the entire refuge to locate all sharp-tailed grouse leks is not attempted. Also, with the increase in prairie chicken leks it is difficult to locate sharptail leks by listening stops. The "booming" of the prairie chickens plus other marsh and water birds over-rides the vocalization of the sharptails except at short distance.

The sharptail breeding population is estimated in cooperation with Nebraska Game & Parks Commission from a State Sample Block (Figure H). The State Sample Block was expanded in 1991 and therefore is not comparable to past information collected on Valentine NWR. Within the sample area in 1991, 9 sharptail leks were located totalling 130 birds (95 males and 35 females). An additional 225 birds (179 males and 41 females) were observed on 21 sharptail leks outside the sample area. Fourteen of the sharptail leks were on private land adjacent to the refuge.

Refuge breeding population surveys, and in particular the State Study Block, have not been a good indicator for predicting the sharptail fall population. Little correlation exists between breeding populations and hunter harvests. The reproductive effort is linked to the quality and quantity of nesting cover acreage available to nesting hens. The quality and quantity of protective cover is particularly important after the nesting season for the survival of young age-class broods. Drought conditions, and particularly high temperatures in June, has limited prairie grouse production potential by increasing mortality of young birds as was the case in 1988 and 1989. Cover treatment of grassland is critical during severe summer weather conditions for maintaining and/or increasing population levels. Adequate protective cover was not available during this critical time for maximizing sharptail brood survival during 1990. During 1991, cover conditions were improved over 1990 and reproduction improved (Figures 58, 64 and 65).

SHARPTAIL GRASSLAND COVER via TREATMENT

VALENTINE NWR

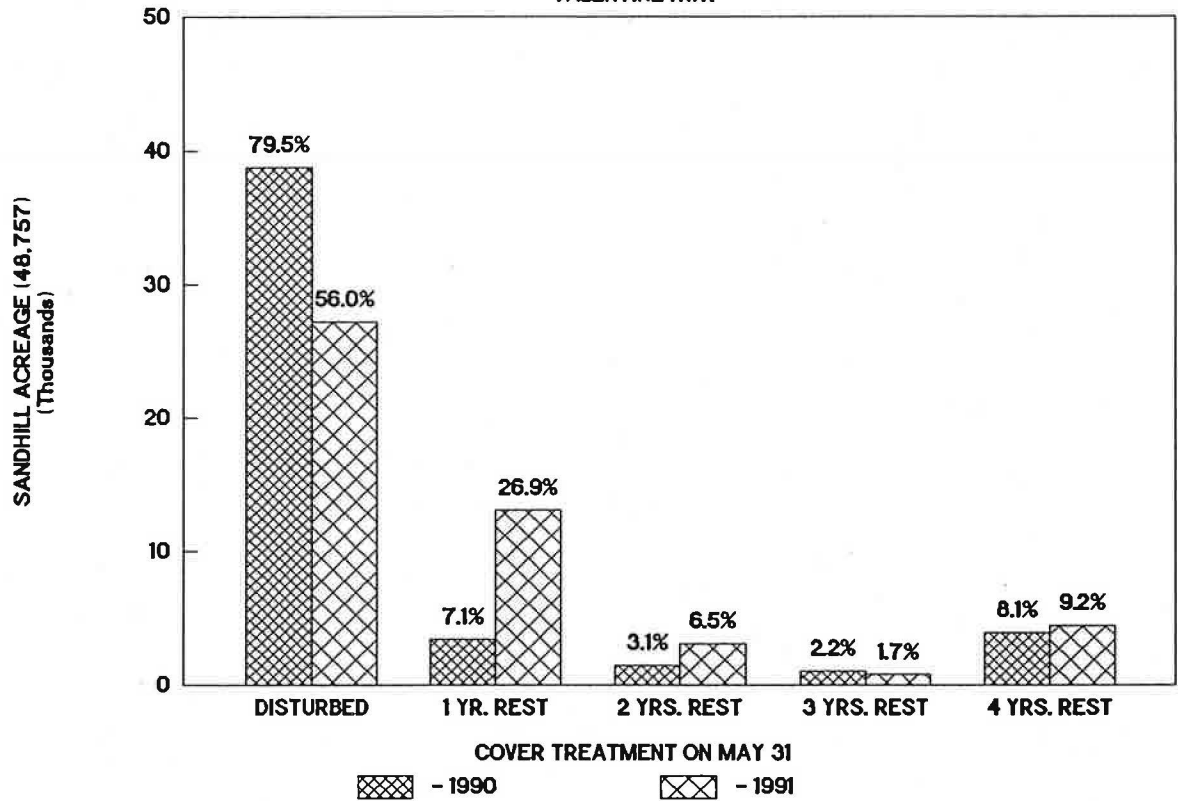


Figure 64.

1991 SANDHILL GRASSLAND COVER TREATMENT

VALENTINE NWR

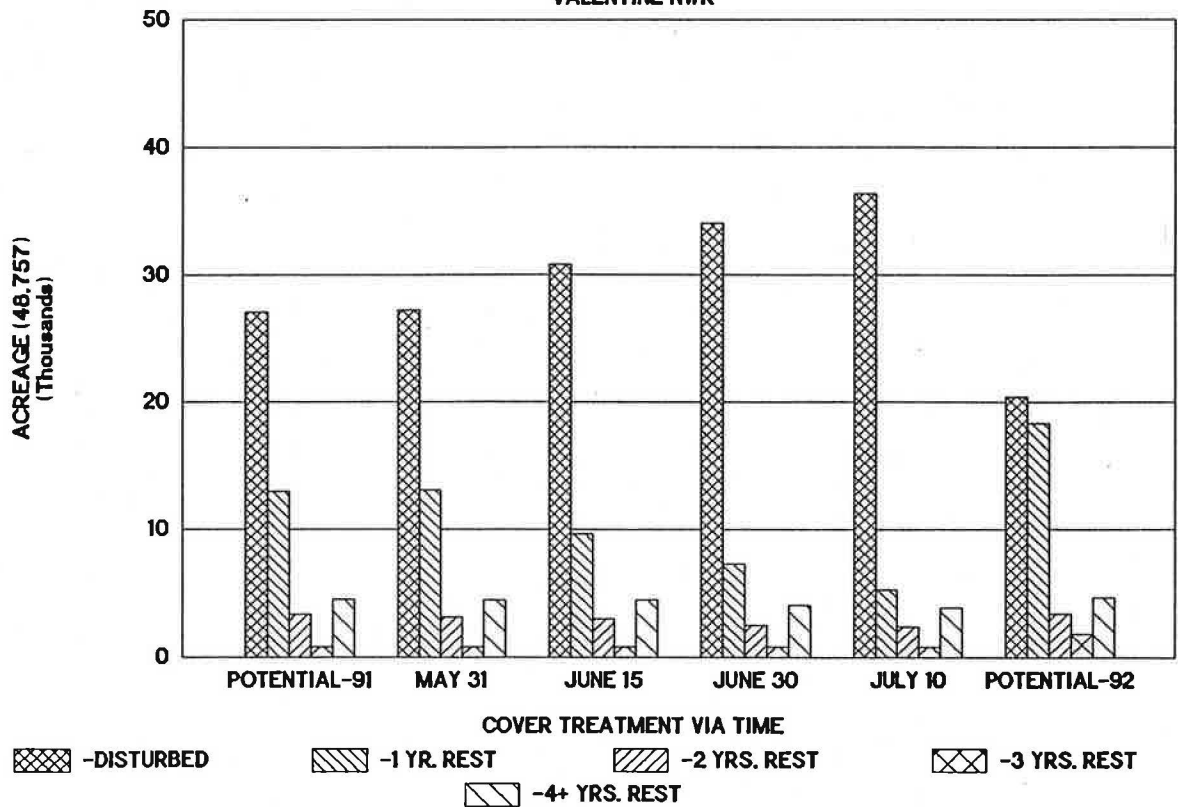


Figure 65.

VALENTINE NATIONAL WILDLIFE REFUGE

UNITED STATES
DEPARTMENT OF THE INTERIOR

CHERRY COUNTY, NEBRASKA

UNITED STATES
FISH AND WILDLIFE SERVICE

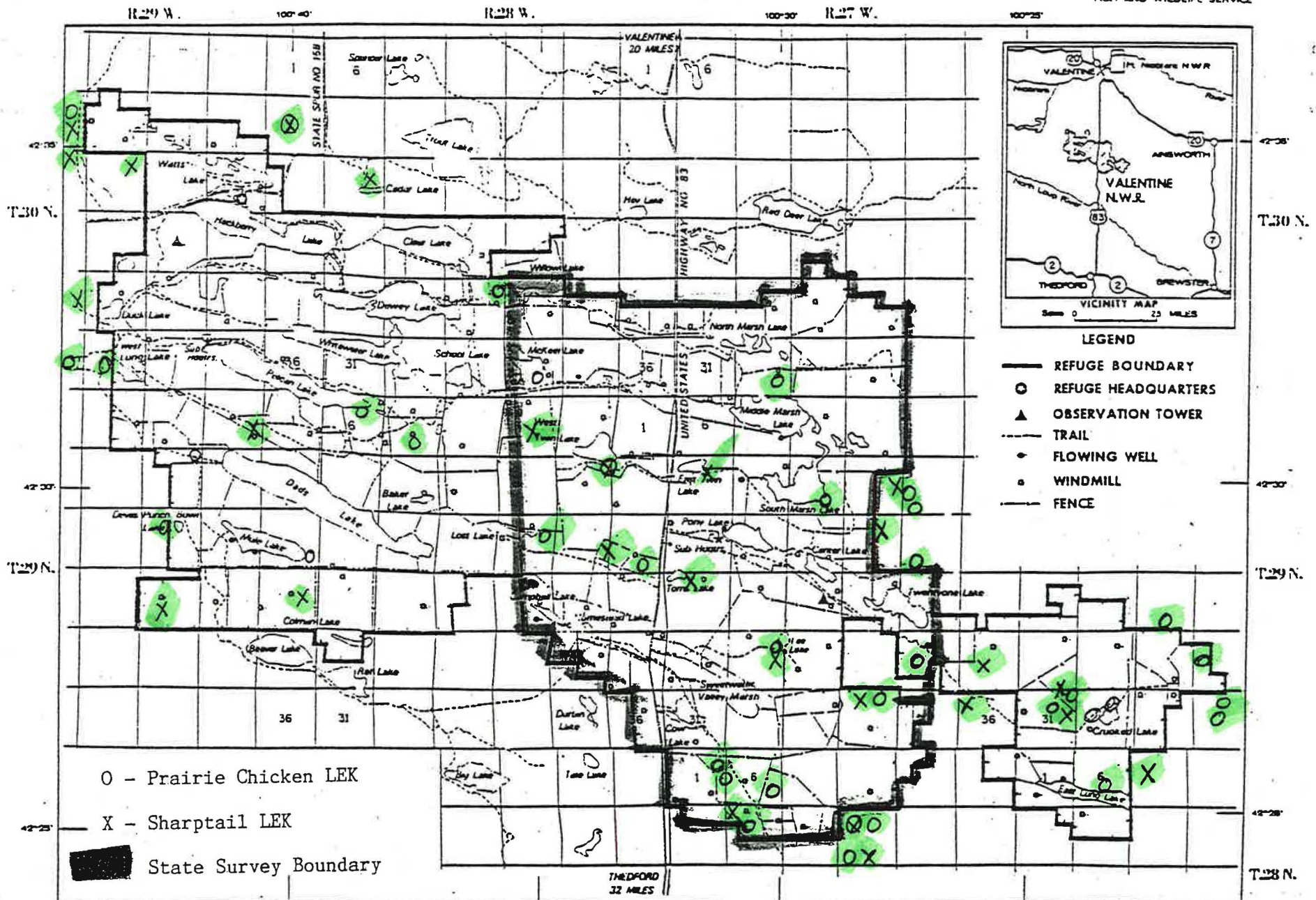


Figure 66. 1991 Known Prairie Grouse LEK Locations

b. Ring-necked Pheasant

The refuge generally hosts a high pheasant population for a non-agricultural crop production area. Available/adequate food is usually the limiting factor of the refuge pheasant population during severe winters. More broods were observed this year than over the past six years. Pheasant brood information is randomly collected and forwarded to Nebraska Game & Parks District Biologist in North Platte.

c. Wild Turkey

The wild turkey population in the Pony-Marsh Lakes area experienced a drastic increase since 1985 when intense mammalian predation control was initiated to improve duck nest success in the Marsh Lakes area. Approximately 125-150 birds constitute a viable breeding population that is now established on the refuge and has expanded to the Hackberry Headquarters-Pelican Lake Sub-headquarters area (40-50 birds). Reproduction was not as high as in 1988-89 but turkeys are being observed over a greater portion of the refuge.

d. Gray Partridge

Gray partridges were not observed on the refuge during the year.

e. Reptiles, Amphibians and Others

Noteworthy in this category is the bullsnake duck nest predation addressed in Sections D.5 and G.3a.

f. Rodents

Noteworthy in this category is addressed in Section D.5.

11. Fisheries Resource

The Valentine Fishery Assistance Office (FAO) conducts and coordinates fish management activities on refuge. Activities are carried out under the Valentine NWR Fish Management Plan and documented in Valentine FAO Annual Reports. FAO personnel sampled Clear, Dad's, Dewey, Duck, Hackberry, Pelican, Pony, Rice, Watts and West Long Lakes this year.

The cooperative Federal/State northern pike trapping operation has been a long term project carried out on the refuge. Trapping activity for northern pike was accomplished on Pelican Lake.

Table 35XX summarizes fish stocking on the refuge. The primary objective of fish management is currently to manage fish populations to hold carp populations in check and provide anglers an opportunity to catch quality size fish. In 1988, size-limit regulations were implemented. In 1991 a limit was in effect for bass on all refuge

lakes; a 36-inch limit on northern pike in Dewey and Pelican Lakes; and a 30-inch limit on Clear Lake. Flat-head catfish were previously stocked in Dewey Lake. Management toward lower relative weights of larger sized northern pike appears necessary to control carp.

Fisheries personnel captured young-of-the year carp in Hackberry Lake during sampling activities. This is the first documentation of carp reproduction since the lake was renovated in 1975. Without a size limit on northern pike to protect the larger sized pike population it is only a matter of time before carp are successful in taking over.

Fish stocking is summarized in Table 35; however, the stocking also included fresh water drum as well. Evidently the stockings are not cleaned as well as they should be.

Table 35. Fish stocking/distribution - 1991.

<u>Species</u>	<u>Number</u>	<u>Size</u>	<u>Date</u>	<u>Destination</u>	<u>Source</u>
Large-mouth bass	35,000	Fingerlings	July	Dewey	Gavins Pt. NFH
Large-mouth bass	8,000	Fingerlings	July	Clear	Gavins Pt. NFH
Large-mouth bass	35,000	Fingerlings	July	Hackberry	Gavins Pt. NFH
Large-mouth bass	5,000	Fingerlings	July	Watts	Gavins Pt. NFH
Large-mouth bass	40,000	Fingerlings	July	Pelican	Gavins Pt. NFH
Large-mouth bass	5,000	Fingerlings	July	Duck	Gavins Pt. NFH
Large-mouth bass	5,000	Fingerlings	July	West Long	Gavins Pt. NFH

14. Scientific Collections

Painted and snapping turtle on-going studies conducted by Colorado State University, Memphis State University, Franklin and Marshall College and George Mason University continued. Eggs were removed from the refuge and hatched in the laboratory. Some hatchlings were returned to the refuge. Results of the studies are reported in Section D.5.

Collections were accomplished in conjunction with the Biological Diversity Study on Valentine NWR by the National Ecology Research Center. Results of the study will not be available until the 1992 season is completed.

15. Animal Control

Animal control operations were carried out this year to enhance waterfowl productivity in the Marsh Lakes area. Specific details are covered in Section G.3a.

16. Marking and Banding

Nothing to report.

17. Disease Prevention and Control

Disease/mortality checks on the Marsh Lakes indicated that mortality was all but non-existent during the summer in spite of receding water levels. Botulism mortality was much higher under increasing water levels and mortality peaked in 1984. Cormorant mortality was observed on the Marsh Lakes in June. The mortality involved the later hatching young that were still in the nest. Specimens were sent to the National Wildlife Health Laboratory but nothing could be diagnosed from the specimen available.

H. PUBLIC USE

1. General

Total visitation for the refuge (5,590), declined for the second year in a row. Again this was due to the decrease in the number of fishermen, especially ice fishermen, using the refuge. Sixteen counts were used to estimate the number of ice fishermen. No summer counts were done. Estimates of duck, deer, and grouse hunters were based on surveys. No surveys were done for wildlife observation and pheasant hunters. A "best guess" was used to estimate these. Visitation for the past 6 years was: 1990 - 7,440; 1989 - 9,140; 1988 - 8,184; 1987 - 10,455; 1986 - 15,612; 1985 - 17,438.

Five projects for handicapped access for refuge recreation were submitted to the Regional Office for funding. Projects for hunting, fishing, and wildlife observation were included.

Ray Pumel, a deer hunter who is confined to a wheelchair, was contacted concerning providing hunting opportunities on Valentine NWR. He had some ideas we may be able to use and has agreed to help us in getting a program in place for the upcoming year. A special use permit allowing use of a small ATV for ice fishing was issued to an individual with difficulty walking.

One segment of Land of the Eagle, a special 8 hour presentation on PBS, was filmed at Valentine NWR and aired during the year. The section on western grebe which is part of the 2 hour prairie segment was done on the Marsh Lakes.

News releases were prepared and sent out to 31 local and area newspapers and radio stations. The local outlets, KVSH Radio, Midland News, and the Valentine Newspaper, used all releases. It is not known how many of the other outlets used them. News releases for 1991 were:

Predators of the Night
Youth Conservation Corp
YCC Completes 16th Season
Autumn Activities
Outdoor Ethics
Leave It to Beaver
Ice Fishing Class
Waterfowl Hunting Class
Trapping on Valentine National Wildlife Refuge
Reward Offered for Eagle Killer
New Fishing Regulations for Valentine NWR

The draft sections on both Ft. Niobrara and Valentine NWR's for Riley's new book on the National Wildlife Refuge System were reviewed and returned to the authors. The refuge Natural History Association has sold this book in the past and still receives quite a few requests for it.

Regional Audubon Representative Ron Klataske held a "Birdathon" the weekend of May 18 and included both Ft. Niobrara and Valentine NWR's on his route. He was accompanied by several local and out of state birders and refuge staff in his successful quest to get 100 species. For each species sighted the Audubon Society received a donation.

2. Environmental Education - Students

Wildlife Biologist McDaniel provided a spontaneous presentation to a tour bus of 25 high school students from Germany. They were particularly interested in the background and establishment of National Wildlife Refuges.

Wildlife Week programs were presented to the Valentine High School science classes, Valentine Elementary and Middle Schools, Wood Lake and Crookston School, and five country schools students. The subject this year was the Arctic and our new Range Technician Jeff Fields, recently returned from Alaska, related his experiences there including his work in oil spill cleanup. Eight hundred students were reached. We had trouble again this year getting the packets from the National Wildlife Federation.

Range Technician Jeff Fields taught a course on bird migration to 350 students at the 4-H Camp at Halsey National Forest. He highlighted the importance of areas in Nebraska to migrating birds, particularly the Rainwater Basins and Platte River.

The Refuge Academy Class from Blair, NE toured both Ft. Niobrara and Valentine NWR's the weekend of May 11. They were given an introduction to big game management at Ft. Niobrara and canoed down the river. At Valentine NWR they were introduced to grassland management techniques and the effects that management has on wildlife.

Range Technician Fields taught an evening class on backyard bird-watching and attracting birds to your back yard. The excellent class was taught on the evenings of September 11 and 12.

6. Interpretive Exhibits/Demonstrations

The refuge had a booth for the Cherry County Fair held in August. The Wildlife Need Wetlands display was used as a backdrop. We had aquariums with native fish and a fish identification game provided by Fisheries Assistance. A VCR was set up with the "Get Hooked on Fishing Not Drugs" film shown. Door prizes of fish and bird prints were given out to get people to stop and chat.



Figure 67. The refuge had a display at the Cherry County Fair. (MLL)

8. Hunting

A waterfowl hunting class was offered just prior to duck hunting season. The one young hunter who attended was provided information on duck identification and using and reloading steel shot.

Waterfowl hunting is permitted on Watts, Rice, and Duck Lakes. Seasons and limits are the same as for the state. The first split of the season ran from October 19 through November 11 and the second from November 22 through December 18. Six groups hunted on Valentine NWR for the first 2 weekends of the season. The next weekend the lakes were iced over and it was time to put away the decoys and get out the ice auger! An estimated 72 hunter visits were made by duck hunters.

The pheasant season ran from November 2, 1991 through January 31, 1992. Before the season it looked like this would be one of the better years for pheasant hunting in recent years. There were lots of roosters in areas where pheasants are regularly seen and many birds in areas where pheasants have not been the past few years. A snow and ice storm hit the area just prior to the opener and possibly killed some birds and made the rest pretty wild. The refuge remained coated in ice for over a week. The weather also kept hunters home for the opener with only a few groups braving the elements. The rest of the season was generally mild with quite a few hunters getting out. No formal counts were done of hunters but an estimated 330 hunter visits is made.

The 1991 prairie grouse hunting season ran from September 14 through November 30 with a 3 bird limit. Hunter harvest is documented via wing collection in cooperation with Nebraska Game & Parks Commission. During 1991, a total of 428 prairie grouse were reported harvested by 268 voluntary participants -- 1.6 birds harvested /hunter day. Sharptails

comprised 68% of the total harvest and prairie chicken 32%; the juvenile to adult harvest ratio was 3.8 for sharptails and 3.3 for prairie chickens. The refuge is one of the better areas in the state for grouse hunting and attracts quite a few out of state hunters.

The rifle deer season ran from November 9 through November 17. Hunters shot 123 deer during the season. More information on harvest is found in section G.8. of this report. Hunter success, as estimated by the state from check stations, was 58% for Calamus West and 75% for the Sandhills Unit. The Sandhills Unit had 100% either sex licenses this year. It is also possible to get 2 permits per hunter and quite a few hunters using the refuge do this. Most of the hunting pressure is during the opening weekend of the season. Refuge officers recorded 147 individual permits during the season. Vehicle license numbers were obtained from 38 motor vehicles from which no permit numbers were obtained. These figures are used to get an estimated 200 hunters for the year. If the average hunter stays 3 days this figures out to 600 hunter visits.

Coyotes can be hunted between December 1 and March 15 on the refuge. A free permit is required. Hunters are asked to return the permit with a record of coyotes shot. In the December 1, 1990 through March 15, 1991 season 37 permits were issued. Twenty four returned the harvest card and reported taking 14 coyotes.

9. Fishing

Fishing, especially ice fishing, accounts for most of the visits to the refuge. This year an estimated 3,300 visits were made for fishing. Counts of fishermen were done on 4 weekend days and 12 weekdays during ice fishing. For three weeks in December, all of January, and half of February there was enough ice for fishing. These counts were used to estimate fishing for the winter. No counts were done in the summer but an estimate of 1,500 summer visits was made on the basis of casual observation. The estimated 3,300 is the lowest visitation for fishing in a number of years. In 1990 an estimated 4,800 and in 1989 an estimated 7,700 fishing visits were made.

Minimum size limits for the refuge were 36 inches for northern pike for Pelican and Dewey Lakes, 30 inches for northern pike on Clear Lake, and 15 inches on bass. Catch and release for muskie and bass remained in effect on Watts Lake. Nebraska retained the restriction in their statutes but didn't get it printed in their fishing brochure. The restriction is listed in our brochure and on signs at the lake. A news release was also put out to keep fishermen informed. The size limits on pike have remained controversial. Pan fishermen feel the large pike are responsible for the decline in the pan fishery. Some people, however, really like the limits because of the chance of a trophy fish and the ease of catching a lot of fish even though most must be returned to the lake.

An article "Valentine Massacre" appeared in the Midwest section of the

January issue of Outdoor Life. The article was critical of the size limits on pike in the lakes. Unfortunately or perhaps characteristically no one called the refuge to check out the information provided in the article.

Fishing seminars were done for refuge staff, state fish hatchery staff, and the public on November 7. The hows and whys of carp management using predators was explained. Generally speaking, the proposed size limits and slot limits were well received.

The fishing opportunities questionnaire was completed and submitted to the Regional Office. Valentine NWR has about all the fishing we can handle.

Mike Avery, Nebraska Game and Parks, taught a fishing instructors clinic hosted by the refuge. Sixteen people spent an evening learning methods and becoming familiar with materials used to teach a fishing clinic and organize a fishing day. Nebraska Game and Parks will provide support in the form of instructional materials, poles, fishing packets, and videos for future events.

An ice fishing class was offered on October 30. Techniques, safety, and a video on ice fishing were presented to the four fishermen who could hardly wait for ice (and got their wish).

10. Trapping

No trappers applied for trapping on the refuge this year due to very low fur prices.

11. Wildlife Observation

Blinds were placed on a sharptail lek and a prairie chicken lek at Valentine NWR. The blinds are quite popular. People, mostly from out of state, travel to the area for this spring extravaganza.

No formal count is made of people who come to the refuge for this purpose. A guesstimate of 1,200 visits was made. Every year this category has increased here. We receive many written requests each year for those wishing to bird watch in the area.

17. Law Enforcement

Ft. Niobrara NWR hosted the Fall Law Enforcement Refresher. Officers from LaCreek, Rainwater Basin, Crescent Lake/North Platte NWR Complex and here were present. Firearms qualifications and practical exercises using "paint ball" guns were completed.

All refuge officers completed the physical exam and the PPBE battery run at Marana. The PPBE is a good bench mark and caused more than a few of us to eat less and exercise more! All officers completed the 40 hour

refresher at Marana. Wildlife Biologist McDaniel gave up his law enforcement credentials during the year which left 6 officers for the Complex.

Seven tickets were written by refuge officers during 1991 and are listed below. Our bond schedule was revised with the fines increased. This has resulted in more people going to, or thinking of going to court. All our cases were run through Central Violations Bureau this year. Two cases pending at the end of 1990 were settled when the fines were paid.

Table 36. Citations issued by refuge officers in 1991.

<u>Violation</u>	<u>Date</u>	<u>Fine</u>	<u>Disposition</u>
Size limit-fish	01/19/91	\$250	paid
Size limit-fish	01/16/91	\$250	paid
Size limit-fish	01/16/91	\$250	paid
Trespass - closed area	06/13/91	\$50	paid
Littering	08/10/91	\$50	paid
Littering	08/10/91	\$50	paid
Shot deer in closed area	11/09/91	\$125	paid

I. EQUIPMENT AND FACILITIES

2. Rehabilitation

a. Buildings

Several major rehabilitation projects, some of which have been on-going for several years, were completed in 1991.

4. Equipment Utilization and Replacement

a. Repairs and Improvements

One of the Complex's new Dodge 3/4 ton pickups was rendered inoperable in a collision with a cow on U.S. Highway 83 south of Valentine. The pickup was repaired at Service expense after the rancher's insurance company refused compensation and the Solicitor's office declined suing for "such a small amount."

The 6x6 semi-tractor and lowboy trailer were inspected by the Nebraska State Highway Patrol, and various recommendations made to bring the unit into road-legal condition. Repairs completed included broken lugs and studs on trailer wheels; windshield wipers, lights, wiring, and emergency brakes on the tractor. Repairs were made Ray Bacon Repair, who was able to locate all parts needed in spite of the equipment's age and all-military design.

The White 2-155 four wheel drive tractor is the principal machine used for all purposes from snow removal and winter big game feeding operations to construction and rehabilitation of facilities. A variety of major repairs were made to the tractor during the year ranging from hydraulic cylinders to steering to main hydraulic controls. Major hydraulic problems were recognized when the tractor would not operate the new bale hauler/mulcher (See I.4.c.). Additional problems were encountered when Mathis Equipment found that the twelve year old tractor is considered obsolete by the company and were unable to even obtain a current parts book. Through another dealer in Nebraska, an old manual was accessed and parts ordered out of Canada.

Similar problems were encountered with the Hough front end loader. Efforts at repairing the emergency brake and leaking transmission seals resulted in learning that Hough cannot cross reference military sources from the manual, and military sources advise the military and National Stock Numbers are obsolete and no longer valid. Brake parts were ordered by dimension with shafts, housing and seals being turned to standard dimensions by a local machine shop. The loader was later found with anti-freeze in the oil pan. The oil was changed and closely observed during operation in attempt to locate the problem, without a repeat occurrence.

A replacement loader was obtained (See I.4.c.); the Hough will be phased out as the new unit proves its reliability.

b. Fire Equipment

Five 125 gallon Wajax-Pacific slip-on pumpers were purchased in 1990. All were mounted on a skid system with self securing hardware to fit pickups in the complex. During 1991, a hydraulic hoist and dolly system was designed and developed for loading, unloading and storing the slip-on units. Four of the hoist systems were built by Four-M Welding of Valentine.

Four new 3/4 ton four-wheel-drive Dodge pickups were received and outfitted to be used as fire units with racks, pumper mounts, light bars, antenna mounts, bumper reinforcements and trailer hookups. The complex was authorized by Regional Office to carry the surplus vehicles for use by the additional personnel picked for the fire season under fire funding.

A 5,000 gallon tanker was picked up from military surplus by Flint Hills NWR for our station. The tanker will be used in fire fighting and construction work. At year's end, however, we were still waiting to confirm the identity of the liquids in the tank and determine proper purging procedures.

Two new implements were purchased under the fire program in 1991. A John Deere 630 rigid tandem disk will be used with the White 4x4 tractor for fire break/fireline construction. A John Deere 9 foot bar mower was fitted to the 6610 Ford farm tractor stationed at Valentine NWR. The new mower was put to immediate use in mowing trails/fire lines on the refuges. Both implements were delivered and set up by Grossenberg Implement of Winner, S.D.

c. Replacement

Several vehicles and pieces of equipment were picked up on surplus throughout the year. One new vehicle was purchased for general operations.

A 1986 Jeep Wagoneer, surplus from U.S. Army Corps of Engineers, was picked up in Billings, Montana to replace a 1952 military jeep.

A truck trade with Rainwater Basin WMD was completed in December; a 1990 Dodge 3/4 ton, 4X4 was traded for a 1986 Chevy 1 ton flatbed, each with approximately 10,000 miles.

A cab-over diesel single axle semi-tractor was picked up from DeSoto NWR. The tractor is rather light duty, and with one axle will be restricted to hauling on pavement. It will serve to

shuttle light equipment (loader, backhoe, etc.) to strategic areas between refuges and to easements.

A new 3/4 ton four wheel drive suburban was purchased and received to serve as the Complex passenger vehicle. It will replace a well-worn 1980 suburban.

5. Communications Systems

Work was initiated in 1990 on design and contracting for a new radio system for the Complex, capable of operating on FWS and Nebraska State Fire frequencies. The system was to address effective communications over the entire complex and adjacent areas.

The contract was won by Motorola; radio components and parts for the new radio system began to arrive January 18, with plans to have the system operational by spring.

By year's end, Motorola had installed new multichannel FWS/fire radios in all new 3/4 ton 4X4 trucks, as well as older "keeper" 4X4's. Older dual channel G.E.'s were retained and installed in non-fire vehicles. New radio towers had been installed at Pony Lake and Ft. Niobrara. Base radios had been installed at Ft. Niobrara, Pony Lake and Hackberry on Valentine NWR. A repeater had been installed at Pony Lake. Portable radios had likewise been received and put in use.

Although the system is "in place" it is not fully functional, with problems remaining in the compatibility of the repeater and base at Pony Lake, an apparent lack of coverage of portions of the area by the system, and thus far an inability by Motorola to program the dual frequencies into the portables.

A new Fujitsu Dex 530 facsimile machine was purchased and functioned "temporarily" for several months on the main refuge telephone line until U.S. West Communications installed a dedicated line for the facsimile machine and the computer modem.

6. Computer Systems

The MapInfo software came in February and was signed out to Refuge Operations Specialist Lindvall and Wildlife Biologist McDaniel, as they were the two designated to take the MapInfo training.

In September, the complex received two Zoom 2400 Baud MX2400R external modems.

Two Dell SYS320SX computers, associated support software and two Fujitsu DL3400 color dot matrix printers were received. One of the new computers and printers was assigned to ROS Lindvall and the second new computer and printer was put in the front office to be used mainly by Office Automation Clerk Kesterson. The Zenith data systems computer and old dot matrix printer were assigned to Refuge Assistant Ayers.

J. OTHER ITEMS3. Items of Interest

A check for \$84,215 was given to Cherry County under the Revenue Sharing program.

Biological Technician Vaughn was given a Special Achievement Award for constructing boxes and stands for solar fence chargers. He used mostly surplus material including ammunition boxes to build the units at a considerable savings to the government.

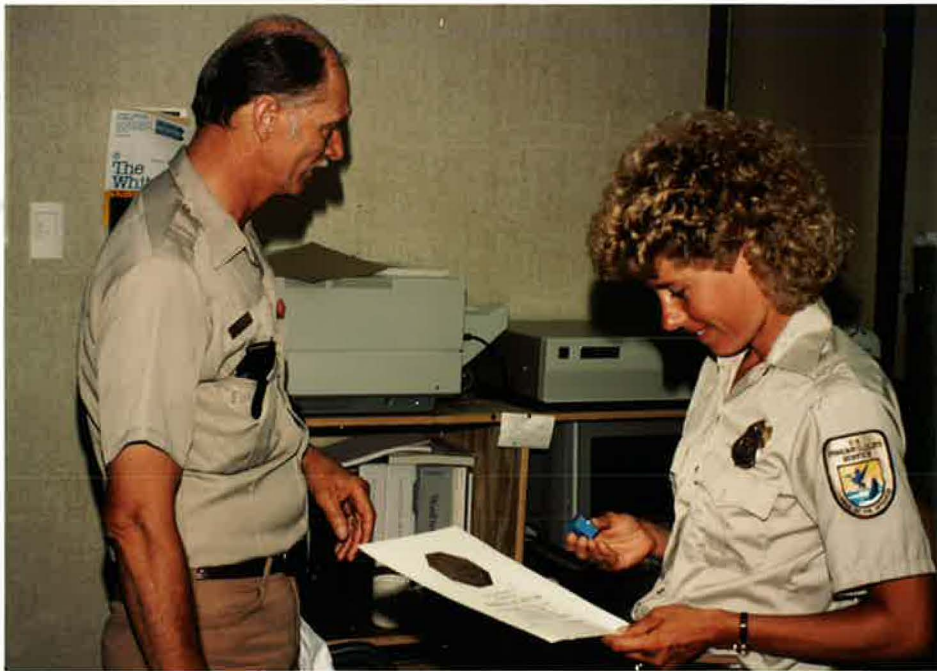


WE-VAL-3/16

Figure 68. Larry Vaughn and his solar charger. (MLL)

Todd Eichenberger, Range Technician, was married on June 22.

Refuge Manager Ellis presented Refuge Operations Specialist McPeak with her ten year Service Certificate and Pin at the June 28th staff/safety meeting.



NE-VAL-3117

Figure 69. Refuge Manager Ellis presented Refuge Operations Specialist McPeak her 10 Years of Service Award. (MLL)



Figure 70. Biological Technician Vaughn's Special Achievement Award presented by Refuge Operations Specialist Lindvall. (KMM)

ME-VAL-3118

Biological Technician Larry Vaughn was operated on for a tumor in his stomach in August. The operation was done in Lincoln and Larry recuperated at home for several weeks and was then placed on light duty for a period but was soon back to work full time.

Refuge Manager Ellis presented Maintenance Worker McPeak with his ten year Service Certificate and Pin at the August 30th staff/safety meeting.

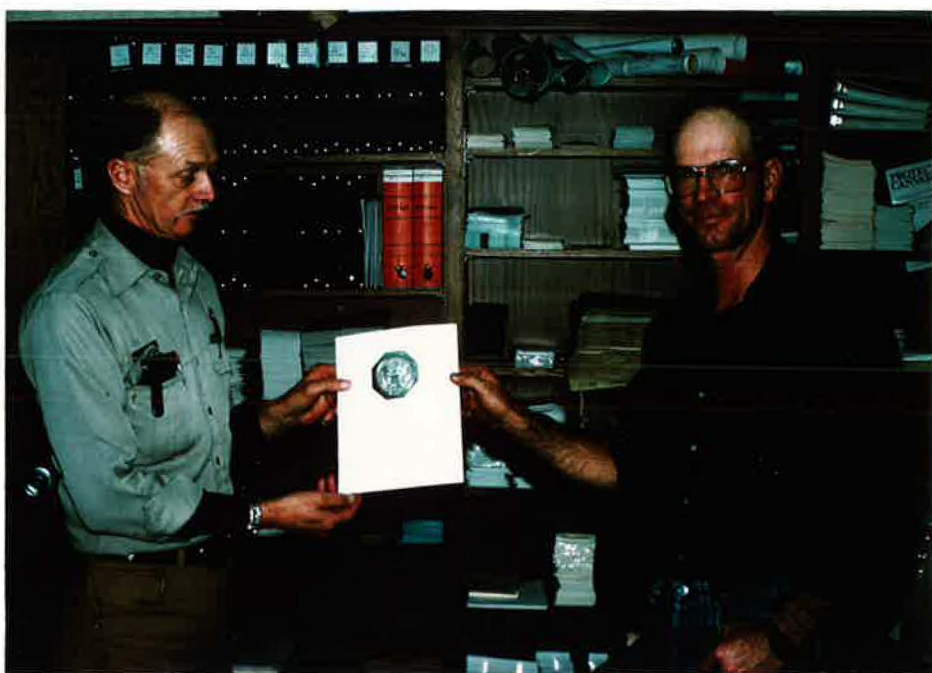


Figure 71. Refuge Manager Ellis presenting Maintenance Worker McPeak with his 10 Years of Service Award. (MLL)

ME-VAL-3119

In October arrangements were made with DeSoto refuge to have \$2,000 of grain credited to Ft. Niobrara NWR at the Discount Feed, Inc., in Valentine.

At the November 22, Staff and Safety Meeting, Refuge Manager Ellis presented Maintenance Worker Kime with a 20 Year Length-of-service Award.



ME-JAL-3120

Figure 72. Maintenance Worker Kime receiving his 20 Year Length-of-Service Award from Refuge Manager Ellis. (MLL)

Refuge Manager Ellis also presented Refuge Assistant Ayers with a Performance Award for the rating period of 7/1/90 through 6/30/91.



WE-VAL-3121

Figure 73. Refuge Assistant Ayers receiving her performance award from Refuge Manager Ellis. (MLL).

Special Achievement Awards signed by the Regional Director on November 25, 1991 were given to Maintenance Workers Turner, Beman, McPeak and Engineering Equipment Operator Purdy.



ME-VAL-3/22

Figure 74. Maintenance Workers Beman and Turner with their awards. (JLS)



WE-JAL-3123

Figure 75. Maintenance Worker McPeak and Engineering Equipment Operator Purdy with their awards. (JLS)

4. Credits

Manager Ellis prepared Section E.5; Wildlife Biologist McDaniel prepared the Introduction, Sections A (part), B, D.5, E.7 (part), F.2, F.5 and Section G; Supervisory Refuge Operations Specialist Sellers prepared Section I; Refuge Operations Specialist Lindvall prepared Sections C. D.4, H, and J.1; Refuge Operations Specialist McPeak prepared Sections D.5, E.2, and F.13-14; Fire Management Officer Segar prepared Section H.9; Refuge Assistant Ayers Prepared Sections E.1, E.3-8, and J.3.

Photo credits are as follows: RME - Robert M. Ellis, MLL - Mark Lindvall, KM - Kathy McPeak, LLM - Len McDaniel, LEV - Larry Vaughn, and RS - Rich Sterry.