REVIEWS AND APPROVALS

ALAMOSA-MONTE VISTA NATIONAL WILDLIFE REFUGE

Alamosa, Colorado

ANNUAL NARRATIVE REPORT

Calendar Year 1987

Melvin D. Neal 3/29/88
REFUGE MANAGER DATE

REFUGE SUPERVISOR REVIEW 3/8/88 DATE

Ralph F. Frie 3/8/88
REGIONAL OFFICE APPROVAL DATE

INTRODUCTION

Alamosa National Wildlife Refuge is located approximately three miles southeast of Alamosa, Colorado. The bulk of the refuge is located in Alamosa County. A small portion (141 acres) is located in Costilla County. The 11,169.11 acre refuge was established in 1962. The refuge consists primarily of Rio Grande River bottomland. Elevations range from 7,505 feet near the river to 7,576 feet on Hansen Bluff along the eastern border of the refuge.

Monte Vista National Wildlife Refuge is located six miles south of Monte Vista, Colorado. The bulk of the refuge is located in Rio Grande County. A portion (1,280 acres) is located in Alamosa County. The 14,189 acre refuge was established in 1953, and it was the first national wildlife refuge in Colorado. The refuge is located on the floor of the San Luis Valley, and is composed primarily of flat terrain with a gentle slope towards the southeast. Elevations range from a high of 7,685 feet on the west end to 7,585 on the east end.

Monte Vista Refuge was first conceived as a winter crop depredation control refuge. It has since developed into one of high duck and goose production during years with good water conditions. Alamosa Refuge was purchased as a waterfowl production and migratory bird maintenance refuge. The addition of whooping cranes in 1975 added another important objective for the refuges, providing migration habitat and protection for these endangered birds. Wildlife oriented recreation is provided on the refuges in the form of wildlife observation, photography, and hunting.

The refuges are located in the San Luis Valley, a high mountain valley located in south-central Colorado. The valley consists of a broad depression between mountain ranges converging to the north and is the first of a series of basins along the Rio Grande River. The mountain ranges to the east reach altitudes over 14,000 feet and those to the west between 13,000 and 14,000 feet. The length of the valley from north to south is over 80 miles, and its greatest width is about 50 miles. Due to the high elevation, the San Luis Valley is an important waterfowl production area in spite of its southern location.

The climate of the San Luis Valley is marked by cold winters and moderate summers, light precipitation, and much sunshine. The growing season in the vicinity of Alamosa Refuge averages about 90 days. July and August are usually the only frost free months. The highest temperature so far recorded was 93 degrees, and the coldest ever recorded was 50 degrees below zero. Winds are light during the coldest weather, but are strong with occasional blowing dust during the spring and early summer months.

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Sunset on Monte Blanca from the
Alamosa National Wildlife Refuge Office
3/87 S. Brock

PAGE

TABLE OF CONTENTS i

A. HIGHLIGHTS

Harvey (Mack) Rodgers was hired on May 10, 1987, to replace Jose I. Mondragon who is retiring on January 2, 1988. (See Section E. 1.)

Record amounts of water were available during the year for use on the refuges. Alamosa used 20,585 acre feet and Monte Vista used 33,047 acre feet of water. Additional water was available, but it could not be utilized. (See Section F. 2.)

An HRM grazing program was initiated on Alamosa Refuge during the year. (See Section F. 7.)

Water rights for 45 wells on Alamosa Refuge and 79 wells on Monte Vista Refuge were adjudicated during the year. (See Section F. 11.)

A new record of 37,977 ducks produced on Monte Vista Refuge was set this year. (See Section G. 3.)

A total of 356 duck nest predators were taken on Alamosa Refuge during the year and 270 were taken on Monte Vista Refuge. (See Section G. 15.)

An early outbreak of fowl cholera on Monte Vista Refuge started on November 28 and continued into 1988. Approximately 2,000 birds had died by year's end. (See Section G. 17.)

Another successful teachers environmental education workshop was conducted on September 26 - 27. A total of 29 teachers from Colorado and New Mexico attended the workshop. (See Section H. 3.)

A surplus dragline was acquired from the Bureau of Reclamation during the year. (See Section I. 4.)

B. CLIMATIC CONDITIONS

The year 1987 started out on the mild side until a snow storm on the 15th and 16th of January dropped 9.7 inches of snow. This snow fall caused a marked drop in temperatures to -27 degrees on the 18th. Surprisingly just one week of -15 degrees or below temperatures followed, with a warming trend that followed and continued throughout the remainder of the winter. We endured 27 days of below zero weather from January 1st through March 1st. Only 13 of the 27 days were -10 degrees or below. The snow fall from January 1st through April 30th totalled 32.1 inches, which yielded 2.27 inches of precipitation. The departure from normal for this time frame was +.88 inch.

May was a wetter than normal month providing 1.00 inch of precipitation in the form of rain showers. The last spring frost occurred on May 31st with a temperature of 31 degrees.

The summer through fall months, June through October, were very hot and dry with only 1.75 inches of precipitation. July broke the record book with 91 degrees on the 23rd. Only during two days in July did the temperatures drop below 80 degrees, this compares to ten days in 1986. The first fall frost was on September 8th, providing a total of 99 frost free days during 1987.

Our Indian Summer Fall ended on the 15th of November when 2.5 inches of snow fell. 1.46 inches of precipitation were received in the form of 14.3 inches of snow for the months of November and December. December 31st tied January 18th for the lowest temperature of -27 degrees for the year. Twenty days of below zero temperatures were recorded for the months of November and December, bringing the total to 47 days of below zero weather for 1987.

Total precipitation for 1987 equaled 6.49 inches, a -.64 inch departure from normal.

The most critical climatic factor affecting both refuges is the winter snowpack accumulations in the upper Rio Grande River watersheds of the San Juan Mountains. The 1987 spring snowpack was well above normal and provided the ninth successive good water year for both refuges. These above normal mountain water years allow the subsurface water table and artesian well flows in the San Luis Valley to increase. Good water flow in the Rio Grande River assures sufficient surface water flows via irrigation ditches to maintain refuge wetlands and irrigate meadows nesting cover and farm fields.

TEMPERATURE AND PRECIPITATION TABLE FOR 1987

MONTH	MAXIMUM TEMPERATURE (Fahrenheit)	MINIMUM TEMPERATURE (Fahrenheit)	PRECIPITATION	NORMAL PRECIPITATION	SNOWFALL
JANUARY	48	-27	.65	.27	12.8
FEBRUARY	48	- 6	.48	.26	7.0
MARCH	57	- 3	.29	.36	3.9
APRIL	72	7	.85	.50	8.4
MAY	75	26	1.00	.70	0.0
JUNE	87	34	.14	.55	0.0
JULY	91	35	.03	1.23	0.0
AUGUST	88	34	1.06	1.13	0.0
SEPTEMBER	81	24	.22	.74	0.0
OCTOBER	77	9	.31	.68	0.0
NOVEMBER	61	-16	.95	.35	6.8
DECEMBER	47	-27	.51	.36	7.5
		TOTALS	6.49	7.13	46.4

C. LAND ACQUISITION

1. Fee Title

No fee title land was acquired during the year. There was rumors that the Elmer Olson property on the west end of Monte Vista Refuge would be coming up for sale. This land is included within the approved boundary of the refuge, and it would still be an excellent addition to the refuge. The land would be of most value for grain fields. With the expanding waterfowl and sandhill crane populations it is necessary to grow more grain for wintering waterfowl and for spring and fall use by sandhill and whooping cranes. The land on the Olson property is well drained, and it does not have the alkali problems of some of the grain fields we are now forced to farm. Mr. Olson was contacted to determine his plans to sell. He confirmed that he did plan to sell the property but he did not know exactly when. He was informed that the refuge was still interested in purchasing the property and that we would like as much advance notice as possible.

The Olson property contains 168.41 acres of land and five shares of Monte Vista Water User's Association water. A purchase agreement for this property was signed on June 18, 1962. The purchase agreement was voided by Cancellation of Contract dated April 1, 1967. The purchase was not completed due to personal reasons of the Olson's at that time. The property was designated as Tracts 139, 139 I, and 139 II. A copy of the original tract map is included to show the exact location of the property.

2. Easements

Nothing to report.

3. Other

Alamosa Refuge leases two tracts of land from the State of Colorado. The two tracts, designated Tract 2 and Tract 2a total 611 acres (451 acres and 160 acres respectively). The annual rental rate for Tract 2 is $857.45 and the rental rate for Tract 2a is $96.00.

The proposal to exchange Bureau of Land Management (BLM) property for state property on Colorado National Wildlife Refuges is still under consideration, but no progress was made on the exchange during the year.

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

MONTE VISTA NATIONAL WILDLIFE REFUGE

ELMER GRANT OLSON TRACTS
(139, I, II)
168.41 ACRES

RIO GRANDE COUNTY, COLORADO
NEW MEXICO PRINCIPAL MERIDIAN

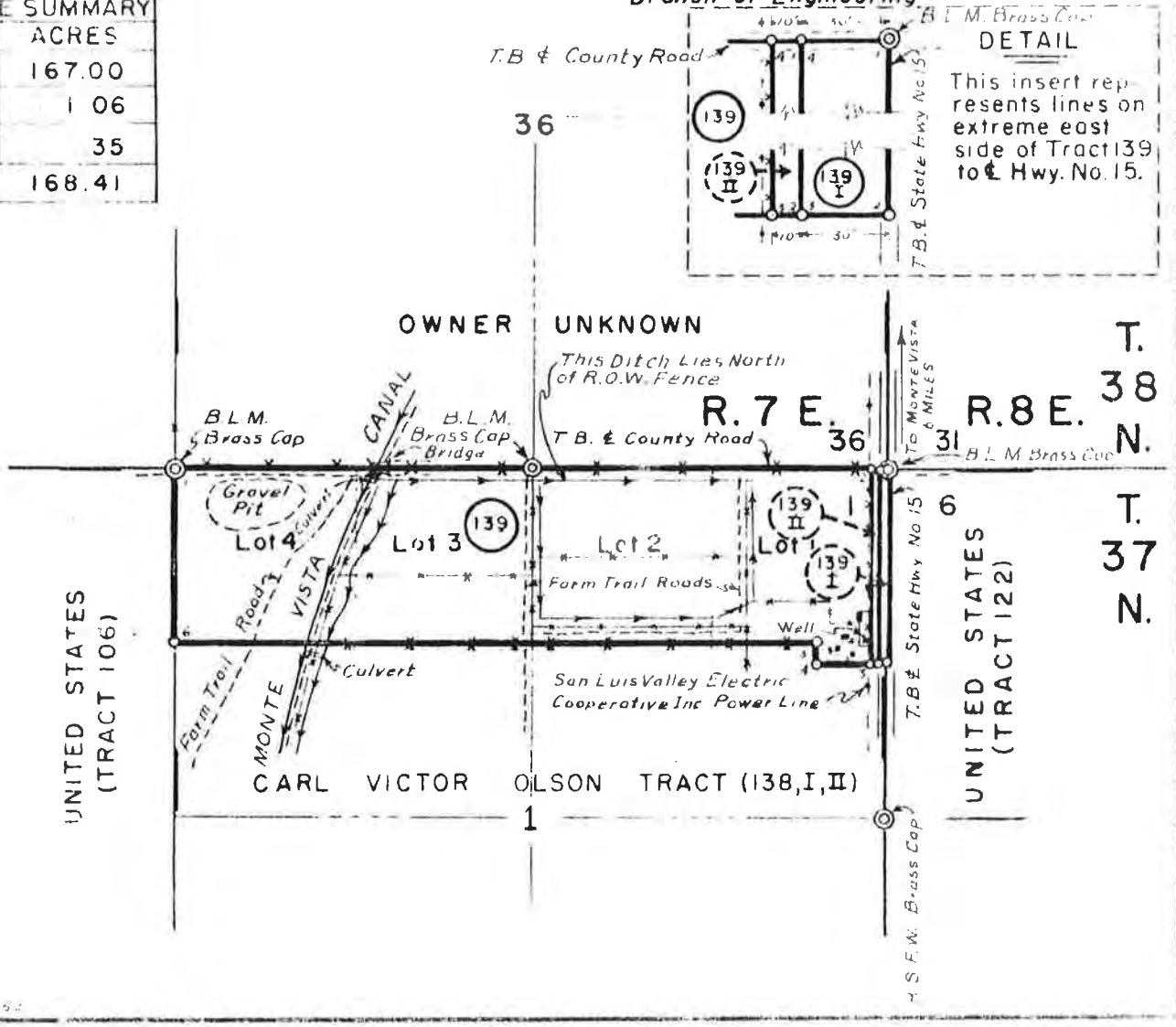
Scale: 0 5 10 20 40 60 80 CHAINS
0 1/4 1/2 3/4 1 MILE

THIS MAP was compiled from official plats of the Bureau of Land Management, aerial photographs, surveys and official records in the files of the Fish and Wildlife Service.

June 29, 1962
Date

H. Francis V. Olson
Regional Engineer
Branch of Engineering

ACREAGE SUMMARY	
TRACT	ACRES
139	167.00
139-I	1.06
139-II	.35
TOTAL	168.41



D. PLANNING

1. Master Plan

Nothing to report.

2. Management Plan

Assistant Refuge Manager Steve Brock prepared the Annual Water Management Plan on January 12, 1987.

Assistant Refuge Manager Roberta Salazar revised the Station Safety Plan.

Assistant Refuge Manager Ed Merritt wrote the Prescribed Burn Plan on November 13, 1987. The plan was approved on December 30, 1987.

Refuge Manager Melvin T. Nail prepared a written Hazard Communication Program during the year.

3. Public Participation

Nothing to report.

4. Compliance with Environmental and Cultural Resource Mandates

Nothing to report.

5. Research and Investigations

The research project on the wintering mallard population of the San Luis Valley continued during the year. The project is designed to study winter survival rates of female mallards and the relation in mallards between fat reserves and reproduction success. The project is expected to last three years with 1987 being the first year. Word was received on November 24, 1987 that the Fish and Wildlife Service was providing $50,000.00 and the Colorado Division of Wildlife was providing $42,000.00 for the 1988 work on the project. Quarterly progress reports on this project are in the refuge files.

6. Other

Nothing to report.

E. ADMINISTRATION

1. Personnel

There was only one change in the full-time, permanent staff during the year. Harvey (Mack) Rodgers was hired as a Maintenance Worker at Alamosa Refuge effective May 10, 1987. Mack transferred to the Service from the Corps of Engineers at Republican City, Nebraska. Mack was hired to replace Tractor Operator Joe Mondragon who plans to retire on January 2, 1988.

All summer temporary employees are listed in the personnel table on Page 9 by name, position, and date of employment.

The following table shows the number of personnel employed at the refuge during FY-87. For comparison purposes, fiscal year 1982 through 1986 are also shown.

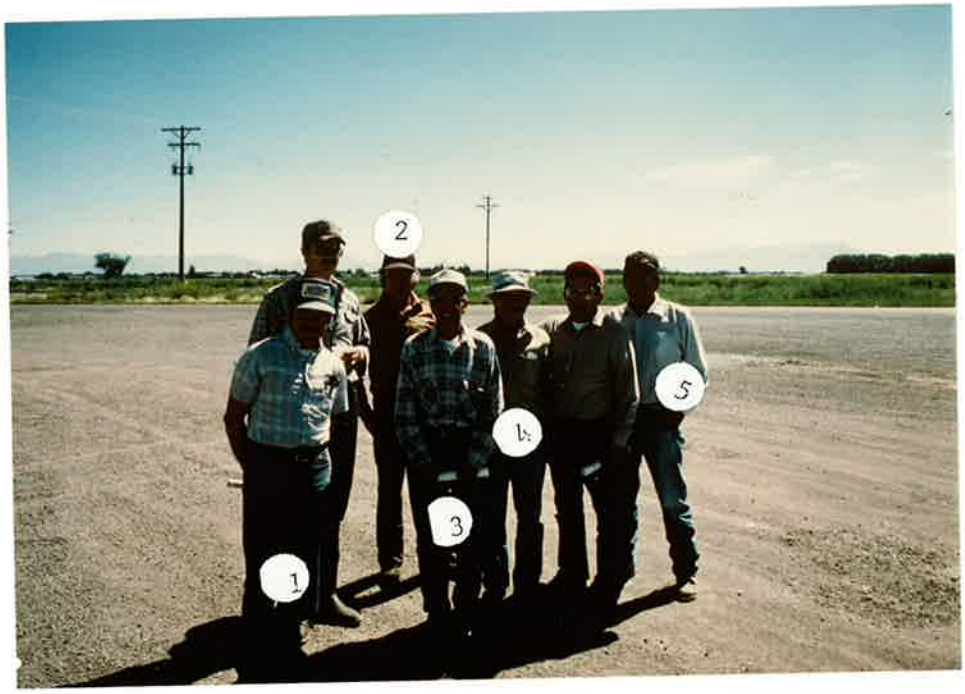
PERMANENT				
FULL TIME	PART TIME	TEMPORARY	TOTAL FTE'S	YEAR
11	0	5	12.04	1987
10	0	6	12.69	1986
10	0	7	12.43	1985
10	0	7	12.03	1984
10	0	10		1983
10	0	4		1982

PERSONNEL

1.	Melvin T. Nail	Refuge Manager (GS-12/10), PFT
2.	Steven P. Brock	Assistant Refuge Manager (GS-11/3), PFT
3.	Edward S. Merritt	Assistant Refuge Manager (GS-9/3), PFT
4.	Roberta A. Salazar	Assistant Refuge Manager-Trainee (GS-7/2), PFT
5.	Georgena C. Rennick	Refuge Assistant (GS-6/4), PFT

PERSONNEL

1.	Thomas J. Hudson	Maintenance Foreman (WG-6/5), PFT
2.	Juan B. Espinosa	Maintenance Worker (WG-8/5), PFT
3.	William O. McDermith	Engineering Equipment Operator (WG-8/5), PFT
4.	Thomas E. Wartman	Tractor Operator (WG-6/3), PFT



PERSONNEL

1. Ernest J. Vigil	Crane Operator (WG-5725 9/2), Temp., 3/29/87 - 12/18/87
2. Gilbert E. Lucero	Laborer (WG-3502 3/5), Temporary, 4/13/87 - 8/7/87
3. Jose E. Archuleta	Laborer Green Thumb Program, 1/1/87 - 12/11/87
4. Lucien Martinez	Laborer (WG-3502 3/5), Temporary, 5/10/87 - 8/7/87
5. Adolfo Amaya	Laborer (WG-3502 2/2), Temporary, 5/10/87 - 8/7/87

NOT PICTURED

Jose I. Mondragon	Tractor Operator (WG-5705 6/5), PFT
Daniel A. Anderson	Laborer (WG-3502 2/1), Temporary, 7/8/87 - 8/7/87
Harvey M. Rodgers	Maintenance Worker (WG-4749 8/1), EOD 5/10/87, PFT

2. Youth Programs

The refuge did not have a YCC program during the year.

3. Other Manpower Programs

Joe E. Archuleta worked at Monte Vista Refuge throughout most of the year under the Green Thumb Program. He was paid by the Green Thumb Program, and there was no cost to the refuge. Joe quit on December 11, 1987. We will not attempt to fill his position until spring.

Mark Larson worked at the refuge from May 18 through July 27, 1987 under a work study program with Vermilion Community College in Ely, Minnesota. Mark worked a total of 400 hours at a cost to the refuge of $800.00. He was also provided a trailer house on the refuge to live in.

4. Volunteer Program

Vicki Brayton and Ron Garcia walked nesting transects for the refuge under a Volunteer Services Agreement. Both are local residents. Vicki has a B.S. Degree, and Ron is attending Adams State College in Alamosa.

Refuge volunteers Vicki Brayton and Ron Garcia, along with Intern Mark Larson

6/87 E. Merritt

5. Funding

The following table shows the funding available in FY-87 to operate the refuge program.

1260 - Refuge Operations and Maintenance	
Base Operation and Maintenance	$370,000.00
ARMM'S - Small	$ 88,000.00
ARMM'S - Large	$ 50,000.00
6860 - Expenses for Sales	$ 10,000.00
8610 - Quarters Operation and Maintenance	$ 9,466.00
TOTAL	$527,466.00

The following table summarizes the total funding for FY-82 through FY-87 for comparison purposes:

FY-82	$368,000.00
FY-83	$417,000.00
FY-84	$499.000.00
FY-85	$492,133.00
FY-86	$530,608.00
FY-87	$527,466.00

6. Safety

It was not a good year for our safety record. Six accidents of varying degrees of seriousness happened during the year. On January 21, 1987, Assistant Refuge Manager Roberta Salazar stepped through a snow covered cattle guard and injured her leg slightly. She missed four hours of work that afternoon, and returned to work the next morning. No medical treatment was required.

Assistant Refuge Manager Steve Brock was injured on March 10, 1987, while qualifying on the Colorado Division of Wildlife's pistol range in Denver, Colorado. A small piece of copper bullet jacketing ricocheted back and hit him in the finger. The injury did not result in any lost time, but medical treatment was required to remove the fragment.

On March 19, 1987, Tractor Operator Joe Mondragon was injured while pulling debris from in front of the New Ditch Diversion Dam. As he was pulling on a log, the dirt gave way where he was standing and he fell into a washout cavity below the surface of the ground. When he fell his hip hit a steel headwall. The injury resulted in one day of lost time, and no medical treatment was required.

On June 16, 1987, Student Intern Mark J. Larson got an infection in his toe while walking nesting transects. The injury did not result in any lost time, but medical treatment was required to clear up the infection.

Also on June 16, 1987, Volunteer Vicki L. Brayton twisted her knee while walking nesting transects. Vicki lost her balance while crossing a muddy ditch and twisted her knee. The injury did not result in lost time, but medical treatment was required to determine the extent of the injury.

On August 5, 1987, Laborer Gilbert E. Lucero had a reaction to metal fumes while cutting galvanized sheet piling with an oxygen/acetylene torch. The accident resulted in two lost time days, and medical treatment was required.

The following refuge employees attended a CPR training course on January 26, 1987.

Melvin T. Nail	Roberta Salazar	Juan B. Espinosa
Steven P. Brock	Thomas Hudson	Thomas E. Wartman
Edward S. Merritt	William O. McDermith	Jose I. Mondragon

On June 16, 1987, Refuge Assistant Georgena Rennick and Maintenance Worker Harvey Rodgers attended a S130 and S190 basic fire fighting training course. On June 17 they also attended a course on fire line construction and pumper operation.

On November 9, 1987 an all terrain vehicle (ATV) training and certification program was conducted for refuge employees who will be operating ATVs.

7. Technical Assistance

Nothing to report.

8. Other

Nothing to report.

F. HABITAT MANAGEMENT

1. General

Habitat management measures on both Alamosa and Monte Vista refuges consist of rest-rotation grazing, high intensity short duration grazing, prescribed burning, farming, water manipulation, and attempts to control undesirable vegetation through animal impact, mechanical, and chemical means. Although progress in the control of noxious weeds has been realized through the use of chemicals, we continue to explore alternative methods with the major emphasis currently on animal impact. Early evaluation of a high intensity, short duration grazing system on Alamosa NWR is showing promise in the control of giant whitetop. In cooperation with the Colorado Division of Wildlife, pheasant habitat was expanded again this year on Monte Vista NWR. Water deliveries for 1987 were up slightly for Alamosa NWR, and up significantly for Monte Vista relative to the previous year (see F. 2).

2. Wetlands

ALAMOSA NWR

The refuge received a total of 20,585 acre feet of water during 1987, as compared to 20,035 acre feet in 1986. The Mumm Well was shut down during June and July this year in an effort to reduce water levels in grazing allotments, and again in October, November and December due to issuance of a water rights decree (see F. 11). Table F-1 summarzies water delivery by source on Alamosa NWR for all years. Table F-2 lists quantities of water delivered to Alamosa NWR by month for each source during 1987.

The Mumm Well, which continues to provide the only significant open water on Alamosa NWR during winter, delivered a total of 935 acre feet of water from January 1 through March 31, which is a three percent increase over the same period in 1986. Water from the well was used to build ice and provide a melt to sustain pools and attract early nesters. Thawing winter ice buildup, along with the delivery of an additional 318 acre feet of Mumm water in April, completely filled the lower end of Alamosa NWR. Water from the Mumm Well was also used to maintain open areas for ducks and geese throughout winter.

Approximately three-quarters of all water used on Alamosa NWR is diverted directly from the Rio Grande River, or indirectly through ditch companies. Therefore, maintenance of refuge wetlands is highly dependent on spring runoff. The headwaters of the Rio Grande River are in the San Juan Mountains to the west. Snow surveys conducted by the Soil Conservation Service during the winter and spring revealed the snowpack to be 167 percent of the 25 year average and an ample water year was predicted. Widespread flooding occurred along the upper Rio Grande again this year and the river was out of it's banks and flooding the lower half of Alamosa NWR in May. Flows at the Alamosa gauge station peaked on May 18 at 5,130 cfs, as compared to last year's flood stage peak of 4,470 cfs. Flows then declined to 1,250 cfs on May 31, but reached flood stage again from June 8 through 20. Flooding resulted in considerable loss of nesting habitat for the third consecutive year.

The River Road Walk below the Refuge Office was flooded during most of the month of June.
6/87 G. Rennick

The lower half of the Alamosa Refuge below the bluff was almost totally inundated by flooding in late May and early June.
5/87 S. Brock

Looking west from Bluff Overlook on the south end of Alamosa Refuge during flood stage in late May.
5/87 S. Brock

TABLE F-1

WATER DELIVERY RECORD 1967 - 1987 ALAMOSA NWR

YEAR	NEW DITCH	CHICAGO DITCH STEWART	CHICAGO DITCH MUMM	CHICAGO DITCH ANDREWS	SHEPARD DITCH	COSTILLA DITCH	SAN LUIS DITCH	MUMM WELL	CLOSED BASIN WATER DEL.	TOTAL
1967	4632	1996	468	284		1638	30	1577		10625
1968	3104	2010	562	238		990	100	2090		9094
1969	2538	1714	875	152		1070	170	2286		8805
1970	4904	2526	830	220	96	1096	216	1210		11098
1971	3628	2488	1144	410	54	418	20	2130		10292
1972	2582	3560	1116	298	132	966	24	2455		11133
1973	1816	2388	2290	966	126	774	318	2640		11317
1974	3906	6616	932	1010	248	392	36	2580		15720
1975	492	4421	864	151	116	1049	190	2175		9458
1976	4686	6726	914	150	224	896	174	2500		16270
1977	2664	3020	100	104	40	192		2702		8822
1978	512	3238	174	594	62	74	19	2900		7573
1979	3514	5612	1116	376	120	1032	253	2100		14123
1980	3716	2068	1922	670	13	775	244	3434		12842
1981	1504	7800	248	812	16	353	54	3395		14182
1982	415	6521	3056	460	4	511	106	3190		14263
1983	3027	4316	566	328	12	1559	186	3242		13236
1984	645	6864	428	508	794	1042	266	3540		15061
1985	4206	4189	806	978	150	1125	185	3550		15189
1986	2334	7892	1032	419	210	1772	219	3310	2847	20035
1987	4582	4724				1654	2240	2065	5320	20585

TABLE F-2
ALAMOSA NATIONAL WILDLIFE REFUGE
WATER USAGE AND SOURCES 1987 (ACRE FEET)

MONTH	NEW DITCH	CHICAGO DATCH	COSTILLA DITCH	SAN LUIS DITCH	MUMM WELL	CLOSED BASIN DEL. MUMM DITCH	CLOSED BASIN DEL. CHICAGO DITCH	TOTAL
JAN					310	407.5	185.4	902.9
FEB					296.8	592.4	167.4	1056.6
MAR		240.0			328.6			568.6
APRIL		702.0	240.0	278.0	318.0	488.0	178.9	2204.9
MAY		444.0	428.0	676.0	31.8	98.1	39.1	1717.0
JUNE		808.0	293.6	1104.0		3.7	634.6	2843.9
JULY	978.0	146.0	52.0	182.0	310.0		568.9	2236.9
AUG	1094.0	930.0	54.0		310.0	106.9	494.4	2989.3
SEPT	898.0	598.0	344.0		160.0	180.1	386.1	2566.2
OCT	1062.0	420.0	198.0			154.5	397.6	2232.1
NOV	550.0	436.0	44.0			76.2	160.8	1267.0
DEC								
1987 TOTAL	4582.0	4724.0	1653.6	2240.0	2065.2	2107.4	3213.2	20585.4
1986 TOTAL	2334.0	9553.0	1772.0	219.0	3310.0	465.6	962.1	20034.7

*In Addition in 1986 received 307.97 acre feet from the Closed Basin Delivery at the Pumping Plant

Good water conditions prevailed from March through June resulting in good nesting habitat over those portions of the refuge not under flood water. Ample water deliveries in June (2,844 acre feet), and July (2,237 acre feet) ensured good nesting and brood-rearing habitat throughout summer.

MONTE VISTA NWR

Abundant water for maintaining wetlands on Monte Vista NWR was available again this year. A total of 33,047 acre feet was delivered in 1987, which is an increase of sixteen percent over the 28,325 acre feet recorded in 1986. Since 1980, snowpacks have been above normal and both the artesian and unconfined aquifers continue to improve. Well flows continue to increase in volume resulting in increased wetland habitat and reduced pumping costs. Table F-3 summarizes water delivery by source on Monte Vista NWR for all years. Table F-4 lists quantities of water delivered to Monte Vista NWR by month for each source during 1987.

Approximately 950 acre feet of water was dispersed over refuge wetlands in February to attract early nesters and to distribute birds to prevent cholera outbreaks. An additional 425 acre feet from pumped and artesian wells, and 1,300 acre feet from Spring Creek and other diversions were delivered during March. A high ground water table along with 1,774 acre feet from canal deliveries and wells resulted in excellent nesting conditions by mid April. Ample water, a mild spring, and a warm summer resulted in good marsh plant growth and seed production, good invertebrate habitat, and excellent waterfowl nesting and brood rearing conditions.

Refuge ponds are scheduled to be drawn down, dried up, and chiselled or renovated to aerate the soil once every three years. This practice results in an abundance of marsh plant species which provide good invertebrate habitat. This year, as with the previous two years, the water table remained high and soil conditions were such that equipment operation was impossible. No draw-downs were completed in 1987.

TABLE F-3

WATER DELIVERY RECORD 1953 - 1987
MONTE VISTA NATIONAL WILDLIFE REFUGE

YEAR	MONTE VISTA CANAL	SPRING CREEK	EMPIRE CANAL	OTHER DECREED WATER	PUMP WELLS	ARTESIAN WELLS	PUMP AND ARTESIAN COMBINED	TOTAL
1953	616	200				1200		2016
1954	604	180			80	800		1664
1955	782	160			100	800		1842
1956	1047	300			100	900		2347
1957	3532	800			100	1000		5432
1958	2750	760			150	3000		6660
1959	1961	780		84	150	3800		6775
1960	3494	840	422	136	300	3932		9124
1961	2909	900	350	245	800	3800		9004
1962	4174	1000	488	860	1828	3760		12110
1963	1359	1228	179	1200	2500	3900		10366
1964	1537	1300	224	1800	2700	3860		10421
1965	5292	1280	592	2200	3200	3800		15364
1966	3544	1340	436	2251	3800	2800		14171
1967	1525	1478	619	2412	4127	2735		12887
1968	2987	1974	714	3801	2453	3764		15693
1969	3471	1738	773	2019	1705	3091		12797
1970	4516	2071	442	1811	1437	2598		12877
1971	2381	1391	592	1068	2208	2797		10437
1972	2632	1540	760	1135	2519	3049		11656
1973	5517	1797	1295	1766	1489	2587		14451
1974	905	98	231	46	2898	2787		6965
1975	4847	1211	1016	1410	1613	2617		12714
1976	2499	663	743	1485	1176	2384		8950
1977	188	241	21	182	2271	2445		5348
1978	1486	526	404	301	15889	805		19411
1979	2775	833	913	836	7936	1171		14464
1980	2923	1039	931	1309	6781	5061		18044
1981	902	60	276	138			12110	13486
1982	3992	457	1288	1494			7500	14731
1983	4136	621	1196	1295	6857	3780		17885
1984	9080	2160	2664	827	4121	2876	6998	21731
1985	6228	3280	2333	1915	4681	3590	8271	22029
1986	8745	6740	598	4196	4255	3792	8047	28325
1987	6078	7748		6177	9984	3061	13045	33047

TABLE F-4
MONTE VISTA NATIONAL WILDLIFE REFUGE
WATER USAGE AND SOURCE 1987 (ACRE FEET)

MONTH	MONTE VISTA CANAL	SPRING CREEK	EMPIRE CANAL	OTHER DECREED DIVERSIONS	PUMPED WELLS	ARTESIAN WELLS	TOTAL
JANUARY		282.0		184.5	399.3	201.5	1067.30
FEBRUARY		121.5		219.0	477.9	134.0	952.40
MARCH		507.5		767.9	385.4	39.0	1699.80
APRIL		619.4		883.5	224.5	46.5	1773.90
MAY	1693.78	1330.8		1035.5	732.24	436.0	5228.32
JUNE	1643.92	1645.7		1492.8	708.4	239.9	5730.72
JULY	1804.46	949.6		567.5	752.32	176.0	4249.88
AUGUST	894.94	783.0		315.0	1023.22	418.50	3434.66
SEPTEMBER	40.50	245.0		543.5	1595.16	379.50	2803.66
OCTOBER		457.00		116.5	1663.53	387.50	2624.53
NOVEMBER		415.00		36.0	867.86	312.60	1631.46
DECEMBER		391.50		15.50	1153.76	290.02	1850.78
1987 TOTAL	6077.60	7748.00		6177.20	9983.59	3061.02	33047.4
1986 TOTAL	8745.31	6740.30	597.50	4195.84	4254.66	3792.12	28325.5

3. Forests

Nothing to report.

4. Croplands

ALAMOSA REFUGE

A total of 81.4 acres of cropland is currently committed to small grain production on Alamosa Refuge. All farm fields are located in the north central edge of the refuge. The entire 81.4 acres were planted to barley in 1987, as compared to 56 acres in 1986 and 42 acres in 1985. Production was greatly improved over the previous year primarily by better controlling San Luis Ditch water so that excessive sub-water did not build up in the fields. The average yield was 47 bushels per acre with a total of 3,820 bushels produced. The entire crop was essentially consumed by mid-December. The crop was heavily used by 3,000 - 5,000 mallards, about 750 Canada geese, sandhill cranes, pheasants and about 15 mule deer. Triumph variety barley was planted in 1987. This is a new variety for the refuge to try and seemed to produce and stand up well for a wildlife feed.

MONTE VISTA REFUGE

The farming goal for Monte Vista Refuge continues to be to maximize yields of existing farm fields in order to meet the feed requirements for the expanding population of ducks, Canada geese and sandhill cranes.

A total of 286 acres were planted to small grain in 1987. In order to provide some diversity in refuge small grain, 27 acres were seeded to Triticale (a wheat-rye hybrid) and 24 acres were seeded to spring wheat. An additional 32 acres were seeded to field peas. Triumph variety barley was planted in 1987. This is a new variety to be seeded on the refuge and proved to be very successful. It seemed to yield more and most importantly, lodging was almost non-existent. It also has a shorter stalk which allows waterfowl access to it for feeding without requiring mowing. This assures that the grain is available in the winter standing above the snow compared to mowing which can allow the grain to become unavailable under the snow. The experimental crop of triticale proved to be unsuccessful for our wildlife needs. It produced only 40 bushels per acre on some of the better refuge farm ground and has a plant height about 4 feet which makes it too high for waterfowl feed without mowing. The experimental crop of Blanca variety of soft spring wheat proved to be very productive with a yield of 105 bushels per acre.

The 1987 farming season was very successful with a total yield of 26,307 bushels of small grain. This is a 10 percent increase over the 1986 crop of 23,651 bushels. The crop utilization surveys conducted in the spring revealed that all fields were essentially 100 percent consumed.

The winter of 1986-87 supplied a snow cover of about 12 inches of heavy crusted snow in January on the Monte Vista Refuge's grain fields. This snow resulted in severe lodging of the older variety of barley. Very little grain was available for wintering waterfowl during early January and required blading of the fields with a road grader. Blading causes severe crusting of the snow and much of the grain still remained unavailable until the snow melted. This lodging problem in grain appears to have been solved by changing to the Triumph variety of barley which has a more rigid, shorter stalk. Lodging has not been a problem in the winter of 1987-1988 and blading has not been required, although snow cover is similar to the winter of 1986-1987.

Blading of refuge grain fields was necessary in January and February to allow waterfowl and sandhill cranes access to feed under about eight inches of crusted snow.
2/87 S. Brock

Assistant Manager Merritt inspects availability of barley for waterfowl in bladed grain field.
1/87 S. Brock

TABLE F-5: CROP PRODUCTION
MONTE VISTA NWR - 1987

FIELD NUMBER	ACREAGE	CROP	YIELD BU./ACRE	TOTAL BU. PRODUCED
MTV-13F2	27	Triticale	40	1,080
MTV-13F2	24	Spring Wheat	105	2,520
MTV-13F6	15	Barley	143	2,145
MTV-13F7	37	Barley	110	4,070
MTV-14F1	37	Barley	34	1,258
MTV-14F2	42	Barley	119	4,998
MTV-20F2	40	Barley	113	4,520
MTV-22F2	16	Barley	123	1,968
MTV-22F2	22	Barley	103	2,266
MTV-24F2	26	Barley	57	1,482
TOTAL	286			TOTAL 26,307
MTV-13F6	10	Field Peas		
MTV-22F2	22	Field Peas		

MONTE VISTA NATIONAL WILDLIFE REFUGE

RIO GRANDE AND ALAMOSA COUNTIES, COLORADO

UNITED STATES
DEPARTMENT OF THE INTERIOR

VICINITY MAP

REFUGE BOUNDARY

- BOUNDARY PUBLIC HUNTING AREA
- FALLOW
- BARLEY
- SPRING WHEAT
- FIELD PEAS
- TRITICALE
- PERMANENT PHEASANT COVER

106°10' R7E R8E 106°08' 106°06' 106°04' R8E R9E

37°32' 37°30' 37°28'

T 38 N
T 37 N

THREEMILE ROAD · MONTE VISTA 3 MILES · GUNNABELL ROAD · LATERAL #2 · MONTE VISTA LATERAL · LATERAL #3 · LATERAL #4 · HEADQUARTERS AREA · STATE HIGHWAY 15 · PARMA CANAL · DITCH #3 · SPRUCE LAWN DIVERSION · Spring Creek · PARMA DRAIN · SANDERSON TAKEOUT · SANDERSON DITCH · SPRUCE DITCH · FARM · SOUTH MEADOW DITCH · BOWLES DRAIN · RIO GRANDE ALAMOSA COUNTY · MEADOW DITCH · Creek DITCH · NORTH Spring SHEPHERD · RESETTLEMENT DITCH · ROBISON SEEPAGE · SHAEFFER TAKEOUT · BARBER TAKEOUT · SEVENMILE ROAD · EIGHTMILE ROAD · BERRY LATERAL · MILLER LATERAL · LATERAL #5 · ECKELS LATERAL · LATERAL #6 · LATERAL #7 · WOODS LATERAL

COMPILED IN SURVEYS AND MAPS FROM SURVEYS BY THE B L M, U S G S AND F W S

NEW MEXICO PRINCIPAL MERIDIAN

0 1320 2640 7920 10560 FEET
0 ¼ ½ 1½ 2 MILE

MEAN DECLINATION

DENVER, COLORADO
REVISED: MAY 1982

JANUARY, 1959

D. 450 401

5. Grasslands

Grassland management on both refuges has consisted primarily of livestock grazing and prescribed burning to rejuvenate dense, decadent stands of baltic rush, in order to provide quality nesting habitat for waterfowl, (see F. 7 and F. 9).

Grasslands on both the Alamosa and Monte Vista refuges are severely infested with giant whitetop, which is listed as a noxious weed in Rio Grande County. Existing waterfowl nesting data indicates that whitetop is not a preferred nest cover type. Further expansion of this weed on the refuges may threaten waterfowl production. Although this infestation has been battled with chemical treatment for years, approximately 3,100 acres were sprayed on both refuges in 1987, (see F. 10), it is believed that this expensive treatment will remain a continuing annual project. Furthermore, the long range effects of 2,4-D are essentially unknown and at the very least, plant diversity is drastically reduced.

A two day meeting/tour was held on the refuges in July, 1986, to evaluate current problems with noxious weeds on the two refuge complex. The meeting was an effort to determine an alternative method to costly, and potentially harmful, herbicide use. Assisting with this meeting was Refuge Supervisor Jim Matthews, Regional Staff Specialist Steve Berlinger, SCS Range Conservationist Dick Sparks, and refuge staff members Nail, Brock and Merritt. A general plan was developed for implementation of a high intensity, short duration cell grazing system within the current Mestas grazing unit on Alamosa NWR in 1987, (see F. 7).

6. Other Habitats

On April 10, 1984 the refuge entered into an agreement with the Colorado Division of Wildlife to provide cover to enhance pheasant habitat on Monte Vista NWR. Under the terms of the agreement, the refuge would provide the land, seed, and labor to establish and maintain permanent nesting cover while the Colorado Division of Wildlife provided the necessary irrigation water. Seedings consist of six pounds Jose tall wheatgrass, four pounds crested wheatgrass, two pounds intermediate wheatgrass, two pounds Ladak alfalfa, and two pounds of yellow sweet clover per acre.

On January 9, Refuge Manager Nail met with Ed Dumph, Colorado Division of Wildlife to review the pheasant habitat - irrigation water exchange program. A total of 195 acres of cover has been established under the program on Monte Vista refuge during the years 1984 - 1986, (See Table F-5). In early July, the refuge seeded an additional 25 acres of pheasant nesting cover in field 19F-2. The refuge has seeded an additional 165 acres over the past few years and the Colorado Division of Wildlife agreed to incorporate these plantings under the program in 1987. With the 195 acres that have been established under the program, the 165 acres that will now be included in the program, and the 25 acres seeded in 1987, the total acreage under the program for 1987 is 385 acres. At three acre feet of water per acre, the water supplied by the Colorado Division of Wildlife in 1987 was 1,155 acre feet.

6. Other Habitats - Continued

TABLE F-6: ACREAGE SEEDED TO PHEASANT COVER FROM 1984 THROUGH 1987 ON MONTE VISTA NATIONAL WILDLIFE REFUGE

DATE	ACRES	
1984	49	
1985	64	
1986	82	
1987	190	(165 acres from prior seedings)
TOTAL	385	

About 30 cottonwood saplings were cut on the Alamosa refuge and "planted" in about four foot deep holes along the east side of the refuge. This was done in an effort to increase the plant's diversity in this portion of the refuge which has very few trees. It was hoped that these saplings would eventually provide additional roost trees for raptors.

Each sapling was cut at ground level and trimmed of all branches. Then they were placed in holes deep enough so that roots would sprout in the permanent water table. About 80 percent were successful in producing some buds and leaves. Although we attempted to place these in areas with no beaver, they found them anyway. About 10 were cut down before we were able to protect them with chicken wire. Then most of the remaining ones were located by buck mule deer and the bark stripped when they rubbed their antlers. By winter only a handful of live trees remained. It was worth a try.

Tractor Operator Mondragon examines a recently planted cottonwood sapling along the Mumm Lateral of the Alamosa Refuge.
6/87 S. Brock

6. Other Habitats

Cottonwood-willow riparian habitat along the Rio Grande River on Alamosa NWR is the other major habitat type actively managed. Currently, management is limited to minimizing the spread of scrub willows which impede water flow in ditches and canals, and controlling beaver populations in order to reduce the loss of cottonwood trees.

7. Grazing

The grazing program on both refuges primarily runs from July 15 through February 28 each year and is used as a tool to maintain healthy stands of baltic rush, which is the most productive nesting on the refuges. Eight permittees are involved with the grazing program. One permittee, Frank Mestas, successfully tried a spring and summer intensive cell grazing program on the Alamosa Refuge this year. Seven other permittees each have three grazing units which they move through on a three year cycle. The goal of this program is to remove as much of the dormant baltic rush growth as possible. If matted stands remain following the grazing, prescribed fire is then used to clean-up the wet meadow sites. This three year cycle has been very successful in maintaining vigorous stands of baltic rush.

The grazing fee charged on both refuges was $5.40 per AUM for adult animals, $6.75 per AUM for cow with calf and $4.05 per AUM for yearling. This is a five cent per AUM increase over 1986 and is based on the 1986 fall beef prices. Frank Mestas' grazing fee was reduced to $4.90 per AUM. This fifty cent reduction was to help off set his additional time and effort spent to install and maintain electric fence, repeated cattle movements, and to make up for anticipated reduced quality of feed.

ALAMOSA REFUGE

The Alamosa Refuge completed it's first year of an experimental intensive grazing program (HRM) with grazing permittee Frank Mestas. This 3,733 acre cell type grazing program was initiated primarily in an effort to find an alternative method to herbicides for controlling extensive infestations of giant whitetop and phragmites. Additional goals are to maintain high quality vegetative cover attractive to wildlife and in particular nesting waterfowl. This program also has to be workable and profitable for the grazing permittee.

The three Mestas grazing units on the southern third of the Alamosa Refuge were combined into one grazing cell. This cell was subdivided into basically five smaller pastures (paddocks) using existing barbed wire fences and constructing about two miles of permanent single strand wire electric fence. A total of 2,800 AUMs were utilized on this grazing unit. From early June to mid-August 420 cow/calf pairs were rotated through these five paddocks. In mid-August the cattle numbers were increased to 600 pairs and by the first of September the herd reached 650 pairs. All cattle were removed on September 28.

The 570 acre paddock to the left of the fence has been grazed six of the scheduled seven days by 420 cow/calf pairs. The paddock to the right has had 22 days of rest following the grazing treatment.
7/87 S. Brock

It is too premature to make any final judgements as to the long term effects of this program following only this first year. In general, all parties involved remain very optimistic that this program can be used to eventually attain the goals specified in our original planning. Grazing permittee Frank Mestas remains very excited about the program. His calves showed an average two pounds higher weight gain than in his traditional grazing. His cows have a 93 percent conception rate compared to his previous 88 percent pregnancy. His losses were limited to one calf and one cow. He believes he saved $17,000.00 in his first year in operating costs by not having to move his cattle to the high country of New Mexico in the summer as he has done in the past. The only problem remains to be the half day it takes three to four people to move cattle from one paddock to another in an extensive marsh environment.

Giant whitetop was definitely impacted by intensive cattle numbers. Both height and density of the plants were reduced. Continual grazing for several years of this program is expected to bring this plant under control. Phragmites control appears to be successful only in the drier marginal habitat zones of this plant. Baltic rush and grass regrowth was limited following the last rotation through the cell. There is about fifty percent less residual cover available for next spring. However, our nesting activity at this 7,000 foot elevation does not peak until around mid-May and with less litter insulating the ground we expect earlier green-up and expect to have high quality nesting cover by the peak of nesting season.

An example of heavily grazed whitetop in late July.
7/87 S. Brock

A nesting study was conducted within the grazed cell and on an ungrazed control area outside the cell. A total of 42 nest were located in the grazing cell and 41 nests in the control area. Predation rates were higher in the grazed area with 26 percent being destroyed by coyote and an overall apparent nest success of 40 percent. The control area had only four percent destroyed by coyote and the apparent nest success was 75 percent. The increase in predation on the grazed area may have been due to it's location within a coyote territory. Monitoring of nest success in future years will remain very important. Trampling of nests by cattle did not appear to be a problem. Late summer regrowth in moist soil areas seemed to attract more Canada goose use than in the past. Reduced vegetation height also attracted more sandhill crane use during September. As could be expected, large cattle numbers resulted in increased damage to refuge dikes, ditches and roads.

Assistant Manager Salazar and Intern Mark Larson searching for waterfowl nests the hard way.
6/87 S. Brock

Plans for 1988 include constructing additional single strand permanent electric fences to further sub-divide the grazing cell into nine paddocks. This should provide more animal impact, shorter grazing periods within each paddock which will prevent overgrazing of some plants, and will allow some paddocks to not be grazed after mid-August when plant regrowth slows down. All of these should provide a healthier grass stand.

"The marshy environment in the Mestas grazing cell complicated fencing, cattle movement and distribution."
6/87 S. Brock

This 570 acre paddock had just completed six days of grazing by 420 cow/calf pairs (June 9)
6/87 S. Brock

The same location with 37 days of rest. (July 17)
7/87 S. Brock

The same location following two more seven day grazing treatments. The last date grazed was August 27. (October 21)
10/87 S. Brock

The Bagwell-Sowards' grazing permit was issued for the unit east of the Closed Basin Conveyance Channel. They used 1,046 AUMs with 200-400 cattle between October 31 and January 18. By mid-January all available forage was removed.

The Lillpop's grazing permit was issued for the unit west of the entrance road to the refuge office. They used 649 AUMs and pulled out January 9 to prepare for calving. This grazing unit is currently too large and needs to be subdivided into two pastures in order to remove enough vegetation with 250 head of cattle to stimulate quality plant regrowth. Only moderate removal of rushes was accomplished this year.

ALAMOSA REFUGE GRAZING

PERMITTEE	AUMS	TIME PERIOD	FEE
Sowards	1046.6	Oct. 31 - Jan. 18	$5,651.64
Lillpop	649	Oct. 16 - Jan. 9	$3,504.60
Mestas	2803.2	May 15 - Sept. 28	$13,735.68
TOTAL	4498.8		$22,891.92

MONTE VISTA REFUGE

A total of 2,414.6 AUMs were used on the Monte Vista Refuge, all under the traditional grazing program of July 15 through February 28. The permittees grazed the following refuge units in 1987: Getz - Unit 4 and the northwest portion of Unit 10; Brown - Units 5, 11, 24 and southeast portion of Unit 10; Cooley - Unit 19; Fuchs - Unit 7; and Ziegler - Unit 22. Cooley, Brown, and Ziegler's grazing units were grazed heavily enough to provide good quality regrowth without requiring spring burning. Both Getz and Fuchs' grazing units were not grazed heavily enough and probably will require some spring burning to remove matted baltic rush.

MONTE VISTA REFUGE GRAZING

PERMITTEE	AUMS	TIME PERIOD	FEE
Ziegler	655.5	Sept. 18 - Jan. 21	$3,539.70
Brown	506.7	July 15 - Jan. 9	$2,142.18
Cooley	545.3	July 19 - Jan. 29	$2,944.62
Fuchs	326.4	Nov. 9 - Jan. 8	$1,762.56
Getz	380.7	Dec. 18 - Jan. 14	$2,055.78
TOTAL	2,414.6		$12,444.84

GRAZING MANAGEMENT TRAINING AND FIELD TRIPS

In 1987 emphasis continued on more of a holistic management method of grazing on refuges. Local interest in this form of grazing also has increased and several tours were requested of the Alamosa grazing cell. The following is a list of training and tours the refuge staff were involved with:

DATE	DESCRIPTIONS
March 31 - April 2	Merritt and Salazar attended Holistic Resource Management I Course in Canon City, Colorado.
June 23	Holistic Resource Management (HRM) discussion and tour of Alamosa Refuge Grazing Cell with Refuge Supervisor Jim Matthews.
June 25	Tour of Alamosa Refuge Grazing Cell with SCS Area Range Conservationist Dick Sparks.
July 14	Tour of Alamosa Refuge Grazing Cell with the San Luis Valley HRM Management Club. Eight people attended this tour.
August 27-28	Brock, Merritt, and Salazar attend a HRM workshop at Monte Vista Cooperative. This workshop included a short tour stop on Monte Vista Refuge to discuss current grassland management. About 50 local people attended this tour.
August 29	Brock attended a half day HRM consulting session conducted by Champ Green from the Center for Holistic Resource Management. This session was held on a private ranch near Del Norte, Colorado.

September 28 Tour of Alamosa Refuge Grazing Cell attended by Regional Office Personnel Ralph Fries, Steve Berlinger, and Ned Peabody. Seven other interested individuals attended from the Colorado Division of Wildlife, Soil Conservation Service, Rio Grande County Weed Specialist and private ranchers.

The San Luis Valley Holistic Resource Management Club toured the Mestas grazing cell in mid-July.
7/87 S. Brock

8. Haying

Nothing to report.

9. Fire Management

Eleven prescribed burns totalling approximately 4,070 acres were planned for 1987 on the two refuge complex. Objectives were planned for 1987 on the two refuge complex. Objectives were to rejuvenate dense, rank growth of baltic rush in which waterfowl use has declined, and to open up infestations of cattails and phragmites. All burns were scheduled to be completed during the late winter/early spring period. Unfortunately, weather and ground conditions were such that only a few burns were attempted and the results were marginal.

Two burns were attempted on Alamosa NWR in March to open up phragmites stands. On March 24, 50 acres of phragmites were ignited but ice, and a lack of ground fuel continuity resulted in a very "spotty" burn. On March 31, approximately 750 acres were ignited with somewhat better, although still marginal, results. On April 2, a third and final attempt to achieve a good burn on phragmites netted similar results on an additional 100 acres. No burns were attempted on Monte Vista NWR during 1987.

10. Pest Control

Annual pest control activities consisted primarily of spraying herbicides to control noxious weeds. Although some mechanical control (mowing, etc.) have been attempted, it is not considered practical or cost effective on most areas. Our most promising alternative appears to be control through animal impact (see F. 7.). Tables F-7 and F-8 outline chemical treatments for both refuges in 1987.

TABLE F-7: PESTICIDE USE ON ALAMOSA NWR-1987

PESTICIDE	ACRES TREATED/TYPE	TARGET SPECIES
2,4-D	18 ACRES/GRASSLANDS	GIANT WHITETOP CANADA THISTLE
TEKNAR	400 ACRES/WATER	MOSQUITOES
TRIALLATE	80 ACRES/CROPLAND	WILD OATS
DICAMBA/2,4-D	80 ACRES/CROPLAND	CANADA THISTLE KNAPWEED
DICAMBA/2,4-D	9 ACRES/GRASSLAND	GIANT WHITETOP CANADA THISTLE

TABLE F-8: PESTICIDE USE ON MONTE VISTA NWR - 1987

PESTICIDE	ACRES TREATED/TYPE	TARGET SPECIES
2,4-D (AERIAL)	2,170 ACRES/GRASSLANDS	GIANT WHITETOP
TRIALLATE	293 ACRES/CROPLANDS	WILD OATS
CUTRINE PLUS	0.5 ACRES/DRAINAGE DITCH	FILAMENTOUS ALGAE
GLYPHOSATE	20 ACRES/CROPLANDS	QUACKGRASS CANADA THISTLE
DICAMBA/2,4-D	640 ACRES/GRASSLANDS	GIANT WHITETOP CANADA THISTLE KNAPWEED
DICAMBA/2,4-D	293 ACRES/CROPLANDS	GIANT WHITETOP CANADA THISTLE KNAPWEED

11. Water Rights

Water Judge Robert W. Ogburn signed a decree on September 14, 1987 adjudicating the water rights on 45 wells on Alamosa Refuge. This decree granted a water right to use the Mumm Well (FWS-23-20A) at a flow rate of 2,865 gpm (6.38 c.f.s.) during the period April 1 to July 31. In addition to this right the United States was asking for a second right to use the Mumm Well during the period August 1 to March 31. Ogburn also signed a decree on September 14, 1987, denying this claim.

The table on the following page shows well number, gallon per minute, and use granted by the decree. Except for the Mumm Well, all wells are decreed for year round use.

DECREED WELLS
ALAMOSA NATIONAL WILDLIFE REFUGE

WELL NUMBER	GALLONS PER MINUTE	USE [W-Wildlife; I-Irrigation; S-Stock Water]
FWS-1-3A	13	S
FWS-2-6A	12	S
FWS-3-2A	15	S
FWS-4-4A	15	S
FWS-5-3A	15	S
FWS-6-2A	40	S I
FWS-7-3A	40	S I
FWS-8-4A	25	S I
FWS-9-4A-P	15	S
FWS-10-4A	15	S
FWS-11-2A	10	S
FWS-12-2A	25	S I
FWS-13-2A	12	S I
FWS-14-4A	25	S I
FWS-15-1 1/2A	15	S I
FWS-16-2A	10	S I
FWS-17-2A	10	S
FWS-18-4A	12	S
FWS-19-3A	20	S I
FWS-20-4A	35	S I
FWS-21-2A	WITHDRAWN	
FWS-22-3A	30	S I
FWS-23-20A	2,865	S I
FWS-24-2A	35	S I W
FWS-25-4A	100	S I W
FWS-26-4A	50	S I W
FWS-27-3A	10	S
FWS-28-6A	100	S I W
FWS-29-4A	50	S I W
FWS-30-2A	15	S
FWS-31-2A	15	S
FWS-32-2A	13	S
FWS-33-2A	20	S I
FWS-34-2A	15	S
FWS-35-2A	15	S
FWS-36-4A	15	S
FWS-37-2A	20	S I
FWS-38-2A	15	S
FWS-39-2A	20	S I
FWS-40-2A	15	S
FWS-41-2A	15	S
FWS-42-2A	15	S
FWS-43-2A	15	S
FWS-44-2A	15	S
FWS-45-3A	15	S
FWS-46-2A	14	S

On November 18, 1987, Water Judge Robert W. Ogburn signed a decree adjudicating the underground (well) water rights in Units 2, 5, 8, 9, 11, 13, 15, 20, 21, 22 and 24 on Monte Vista Refuge.

The following table shows the unit number, well number, gallons per minute, and use granted by the decree.

DECREED WELLS
MONTE VISTA NATIONAL WILDLIFE REFUGE

UNIT NO.	WELL NUMBER	GALLONS PER MINUTE	USE (W-WILDLIFE; D-DOMESTIC; I-IRRIGATION; S-STOCKWATER)
2	FWS-2-1-3A	25	I W S
	FWS-2-2-2A	15	I W S
	FWS-2-3-2A	15	I W S
5	FWS-5-1-2A	15	I W S
8	FWS-8-1-3A	20	I W S
	FWS-8-2-3A	25	I W S
	FWS-8-3-2A	15	I W S
	FWS-8-4-16A	1700	I W
	FWS-8-5-2A	15	I W S
	FWS-8-6-3A	27	I W S
	FWS-8-7-2A	15	I W S
	FWS-8-8-2A	15	I W S
	FWS-8-9-2A	15	I W S
9	FWS-9-1-2A	35	I W S
	FWS-9-2-2A	20	I W S
	FWS-9-3-2A	30	I W S
	FWS-9-4-2A	30	I W S
	FWS-9-5-2A	20	I W S
	FWS-9-6-2A	20	I W S
	FWS-9-7-2A	15	I W S
	FWS-9-8-2A	27	I W S
	FWS-9-9-2A	15	I W S
	FWS-9-10-2A	15	I W S
	FWS-9-11-2A	15	I W S
	FWS-9-12-2A	25	I W S
	FWS-9-13-2A	35	I W S
11	FWS-11-1-16P	300	I W
	FWS-11-2-2A	20	I W S
	FWS-11-3-3A	25	I W S
13	FWS-13-1-16P	1800	I W
	FWS-13-2-6P	15	D S
15	FWS-15-1-2A	20	I W S
	FWS-15-2-16 A&P	2200	I W
	FWS-15-3-2A	15	I W S
	FWS-15-4-2A	36	I W S
	FWS-15-5-2A	30	I W S
	FWS-15-6-2A	20	I W S
	FWS-15-7-2A	15	I W S

35A 6715

DECREED WELLS (CONTINUED)
MONTE VISTA NATIONAL WILDLIFE REFUGE

UNIT NO.	WELL NUMBER	GALLONS PER MINUTE	USE (W-WILDLIFE; D-DOMESTIC; I-IRRIGATION; S-STOCKWATER)
15	FWS-15-8-2A	15	I W S
	FWS-15-9-2A	15	I W S
	FWS-15-10-2A	10	I W S
	FWS-15-11-2A	20	I W S
	FWS-15-12-2A	20	I W S
	FWS-15-13-2A	20	I W S
	FWS-15-14-2A	15	I W S
	FWS-15-15-2A	15	I W S
	FWS-15-16-2A	10	I W S
	FWS-15-17-2A	20	I W S
	FWS-15-18-2A	10	I W S
	FWS-15-19-2A	15	I W S
	FWS-15-20-16 A&P	1500	I W S
	FWS-15-21-2A	30	I W S
20	FWS-20-4-16P	1838	I W
	FWS-20-7-20P	2000	I
	FWS-20-8-4A	10	I W
	FWS-20-22-16P	1450	I
21	FWS-21-23-2A	15	I W S
	FWS-21-24-2A	12	I W S
	FWS-21-39-2A	20	I W S
	FWS-21-40-4A	1	I W
	FWS-21-45-4A	1	I W
	FWS-21-49-16P	1264	I W
22	FWS-22-1-2A	12	I W S
	FWS-22-2-2A	15	I W S
	FWS-22-3-16 A&P	2200	I W S
	FWS-22-4-2A	47	I W S
	FWS-22-5-6A	5	I W
	FWS-22-6-3A	10	I W S
	FWS-22-7-2A	15	I W S
	FWS-22-8-16 A&P	1500	I W
	FWS-22-9-3A	17	I W S
	FWS-22-10-3A	15	I W S
	FWS-22-11-2A	20	I W S
	FWS-22-12-2A	10	I W S
24	FWS-24-2-2A	25	I W S
	FWS-24-3-2A	25	I W S
	FWS-24-4-4A	40	I W S
	FWS-24-5-2A	40	I W S
	FWS-24-6-2A	50	I W S

39A 12382

The decree for underground (well) water rights in Units 1, 3, 4, 6, 7, 14, 16, 17, 18, 19, and 23 is still pending. The case number containing the wells in these units contained one or more contested wells and have been delayed. The U. S. has reached agreement with the contestors on these wells, and no further problem is anticipated. A decree on these wells will probably be issued in the early part of 1988.

A total of 5,320.6 acre feet of water was received during the year from the Closed Basin Project. Since Elephant Butte Reservoir in New Mexico spilled early in 1987, no Closed Basin Project water was needed to help meet the current year's Rio Grande Compact commitment (Priority 1) or to help pay off any accumulated debt to the Compact (Priority 3). Alamosa Refuge's Priority No. 2 took most of the Closed Basin Project water during the year. Project water was run down the Rio Grande River during December to help spill Elephant Butte Reservoir for the 1988 water year.

12. Wilderness and Special Areas

Nothing to report.

13. WPA Easement Monitoring

Nothing to report.

G. WILDLIFE

1. Wildlife Diversity

Both the National Breeding Bird Survey and Audubon Christmas Bird Count reflect the diversity of bird species occurring in the San Luis Valley (Tables G-1 and G-2). Habitat types found on the two refuges consist of riparian woodland, marsh, wet meadow, grassland, farmland, and desert shrub communities which support a wide array of wildlife. At least 189 bird, and 55 mammal species are know to occur on the two refuges at times throughout the year. Although no specific projects were planned or initiated during the year to increase wildlife diversity, maintenance of existing habitat types and projects to increase waterfowl habitat also benefit other species.

TABLE G-1: NATIONAL BREEDING BIRD SURVEY RESULTS
San Luis Valley - June 12,1987

SPECIES	NUMBER OBSERVED	SPECIES	NUMBER OBSERVED
Mallard	7	Horned Lark	99
Turkey Vulture	1	Tree Swallow	54
Swainson's Hawk	4	Barn Swallow	131
Red-tail Hawk	3	Black-billed Magpie	19
Golden Eagle	1	Common Raven	3
American Kestrel	2	Bewick's Wren	46
Killdeer	37	American Robin	4
Common Snipe	19	Sage Thrasher	2
Mourning Dove	84	Loggerhead Shrike	1
Great-horned Owl	1	European Starling	17
Common Nighthawk	25	Yellow Warbler	11
Red-shafted Flicker	3	Chipping Sparrow	38
Brewer's Sparrow	6	Savannah Sparrow	78
Red-winged Blackbird	82	Yellow-Headed Blackbird	7
Brewers Blackbird	188	W. Meadowlark	64
American Goldfinch	1	House Sparrow	35
Wilson's Phalarope	16	Cinnamon Teal	10
Shoveler	2	American Avocet	4

TABLE G-2: AUDUBON CHRISTMAS BIRD COUNT
San Luis Valley - December 25, 1987

SPECIES	NUMBER OBSERVED	SPECIES	NUMBER OBSERVED
Great-blue Heron	2	Ring-necked Pheasant	125
Canada Goose	720	Great-horned Owl	1
Green-wing teal	250	Red-shafted Flicker	2
Mallard	15,000	Horned Lark	1,000
N. Pintail	2,000	Black-billed Magpie	60
Gadwall	10	Common Raven	50
Common Merganser	8	European Starling	2,000
Bald Eagle	26	American Tree Sparrow	580
N. Harrier	10	Song Sparrow	275
Red-tailed Hawk	7	Dark-eyed Junco	200
Rough-legged Hawk	19	Red-winged Blackbird	450
Golden Eagle	6	W. Meadowlark	12
Prairie Falcon	4	House Finch	40

2. Endangered and/or Threatened Species

Whooping cranes, bald eagles, and peregrine falcons use both refuges at times during the year. The greater sandhill crane, which is abundant in the Valley during the spring and fall migration, is listed as an endangered species by the State of Colorado due to the small number of pairs breeding in the State. Managing for sandhills is also important in terms of the whooping crane cross-fostering experiment. Management actions in support of endangered species are directed toward meeting habitat needs and monitoring for possible threats and conflicts.

BALD EAGLES

Alamosa NWR began the year with five bald eagles being counted on January 9, 1987, during the National Wildlife Federation's mid-winter eagle survey. The population peaked in late March as 46 birds, including 16 immatures, congregated to feed on winter killed carp. The bald eagle population on Monte Vista NWR peaked at approximately 25 birds, including 4 immatures, in January and averaged 20 birds from January 1, through mid-March. Numbers then declined rapidly and by mid-April none were present on either refuge. The fall migration of bald eagles back in to the Valley was late this year due to an unusually mild weather in Canada. Bald eagles returned to the Valley in November with the first observation recorded on November 16, on Alamosa NWR. Five bald eagles were using the refuge by early December. At year's end, 26 birds were observed on Monte Vista NWR and three on Alamosa regularly. Table G-3 outlines numbers of bald eagles recorded during the National Wildlife Federation's mid-winter survey from 1983 through the current year.

TABLE G-3: 1983-1988
ANNUAL MID-WINTER EAGLE SURVEYS
(January Bald Eagle Counts)

Refuge	1983	1984	1985	1986	1987	1988
Monte Vista NWR	13	10	17	6	20	26
Alamosa NWR		3	3	6	5	3

Wintering bald eagles are commonly observed on both of the refuges in mid-winter.
1/87 R. Salazar

PEREGRINE FALCON

Peregrine falcons are occasional visitors to both refuges and are most likely attracted to the area by concentrations of waterfowl. Records covering the previous six years include one sighting on Alamosa NWR in August 1985. At Monte Vista NWR, two were observed in May 1982, two were observed in May 1983, two in October 1984, two in July 1986, three in November 1986, and four in January 1987. No observations of peregrine falcons were recorded in 1987 after the January sightings.

WHOOPING CRANE

Spring Migration:
Sandhill cranes were first observed in the Valley on February 7; compared with January 18 the previous year. The first whooping crane observation was recorded on February 23 along with 1,100 sandhills. By month's end, the Valley population had climbed to approximately 5,000 sandhill and four whooping cranes, including one juvenile. At least three of the four whooping cranes were observed in Marsh Unit 24 on Monte Vista NWR regularly.

Approximately 24,000 greater sandhill and 22 whooping cranes were estimated to be in the San Luis Valley during March. Numbers of lesser sandhills passing through the Valley during the spring migration appears to be increasing as more lessers winter along the Rio Grande. At least eight, and possibly ten, whooping cranes used Monte Vista NWR throughout the month for roosting and/or feeding. Two whoopers were observed on Alamosa NWR intermittently throughout the month.

One Whooping crane spent several days loafing in a wet meadow site 300 yards north of the Alamosa refuge office.
3/87 M. Nail

Although a few sandhill cranes remained on Monte Vista NWR at April's end, most departed during the first week of the month. One whooping crane was observed using a grain field on Alamosa NWR on April 10, which was the last whooping crane sighting on the refuge this spring.

Fall Migration:
Small numbers of sandhill cranes began migrating into the Valley in August with approximately 25 being observed in the La Jara area on August 14. Approximately 50 sandhills were using Monte Vista NWR at month's end. No whooping crane sightings were recorded during August. Sandhill cranes began arriving in large numbers in early September. Approximately 3,000 sandhills were using the area around Monte Vista NWR, and 1,000 were using Alamosa NWR by September 20. By September's end, most of the Rocky Mountain flock of sandhills had migrated into the Valley. The experimental whooping crane flock which migrates with the sandhills from Grays Lake NWR through the Valley to Bosque del Apache NWR, now contains 20-22 individuals, down from 27 last year. Three whooping cranes were observed just off the north boundary of Monte Vista refuge on September 16. One unconfirmed sighting of a whooper on Alamosa NWR was received at mid-month. By the end of September, refuge personnel had confirmed the presence of six individual whooping cranes in the San Luis Valley. On November 3, a dead whooping crane was found beneath a powerline on Monte Vista NWR. The site is located on the 7-mile south road between hunter parking area 4 and the Switch road. This line has been a problem with collisions by sandhill cranes, but this is the first whooping crane collision recorded. The bird was later diagnosed as having been infected with avian tuberculosis which may have been a contributing factor. The whooping crane was one of only two chicks fledged at Grays Lake NWR this year. The other chick has not been located since it left Grays Lake. Most sandhill and whooping cranes had departed the Valley by November's end. The last whooping crane sighting recorded was on December 12 at Monte Vista NWR. Tables G-4 and G-5 summarized whooping crane use on both refuges since 1975. Table G-6 summarizes use Valley wide.

TABLE G-4: WHOOPING CRANE USE ON ALAMOSA NWR

YEAR	SPRING USE DAYS	FALL USE DAYS
1979	1	65
1980	86	35
1981	53	1
1982	0	0
1983	0	0
1984	0	0
1985	0	0
1986	0	42
1987	30	12

TABLE G-5: WHOOPING CRANE USE ON MONTE VISTA NWR

YEAR	PEAK NUMBER	SPRING USE DAYS	PEAK NUMBER	FALL USE DAYS	SUMMER USE DAYS
1975	0	0	0	35	0
1976	2	98	1	7	0
1977	4	133	2	14	0
1978	2	80	4	130	0
1979	5	147	3	70	0
1980	8	349	3	101	0
1981	7	354	3	141	0
1982	6	183	4	116	0
1983	4	99	10	266	0
1984	9	359	12	254	120
1985	11	457	14	417	0
1986	10	420	8	248	0
1987	14	435	10	275	0

TABLE G-6 WHOOPING CRANE USE IN THE SAN LUIS VALLEY

YEAR	DATE ARRIVE	DATE DEPARTED
1975	October 9	November 20
1976	February 17	May 12
	October 5	November 17
1977	February 21	April 8
	October 4	November 19
1978	February 27	May 11
	October 1	November 28
1979	February 20	April 13
	September 29	November 16
1980	February 8	May 10
	September 19	November 17
1981	February 15	April 26
	September 17	December 18
1982	February 22	April 17
	October 3	November 26
1983	February 24	May 26
	October 5	November 20
1984	February 8	Summered in Valley
	Summered in Valley	November 26
1985	February 18	April 30
	September 23	December 1
1986	February 10	April 14
	September 19	December 10
1987	February 7	April 10
	September 16	December 12

3. Waterfowl

ALAMOSA REFUGE

The year began with approximately 1,200 Canada geese and 500 mallards residing on the refuge. Small numbers of pintails and green-winged teal were also present. Waterfowl populations began increasing in late February as spring migrants began returning to the Valley. The duck population peaked at approximately 9,500 birds in mid-April, an increase of 14 percent over last year's peak, and then gradually declined to a breeding population level of approximately 7,600 birds.

Flooding on Alamosa NWR for the third consecutive year resulted in a loss of 3,000 acres of nesting habitat (sec. F. 2.). Despite this, numbers of breeding pairs were up significantly and the refuge produced an estimated 6,240 ducks, an increase of 22 percent relative to 1986. Table G-7 lists production by species for Alamosa in 1987.

TABLE G-7: WATERFOWL PRODUCTION ON ALAMOSA NWR - 1987

SPECIES	NUMBER PRODUCED
Mallard	1,370
Gadwall	1,269
Pintail	450
Shoveler	590
Green-winged Teal	42
BW/C Teal	2,130
Redhead	224
Ruddy	165
TOTAL	6,240

Alamosa Refuge has experienced good consecutive water years since 1981, and production has increased accordingly. Had it not been for the last three years of flooding, 1987 might have been a record production year. Table G-8 compares duck production to water availability on Alamosa NWR. Table G-9 lists production figures for all years on record.

TABLE G-8: DUCK PRODUCTION AND WATER AVAILABILITY
ALAMOSA NWR

YEAR	ACRE/FT. WATER DELIVERY	WATERFOWL PRODUCTION
1980	12,842	2,349
1981	14,182	3,718
1982	14,263	4,819
1983	13,236	4,705
1984	15,061	8,137
1985	15,190	6,302
1986	20,035	5,099
1987	20,585	6,240

TABLE G-9: RECORD OF DUCKS PRODUCED - ALAMOSA NWR
1965-1987

YEAR	NUMBER PRODUCED	YEAR	NUMBER PRODUCED
1965	826	1976	1,653
1966	4,499	1977	1,849
1967	1,230	1978	3,943
1968	1,515	1979	1,989
1969	1,155	1980	2,399
1970	1,732	1981	3,718
1971	1,905	1982	4,819
1972	3,410	1983	4,705
1973	2,937	1984	8,137
1974	1,579	1985	6,302
1975	1,400	1986	5,099
		1987	6,240

Abundant water provided good brood rearing conditions throughout summer and good water conditions prevailed into the hunting season. Approximately 13,000 ducks were using the refuge in September and early October. Numbers then began to decline steadily and approximately 3,000 mallards remained on the refuge at year's end.

Canada goose production increased from 225 in 1985, and 194 in 1986, to approximately 350 birds in 1987. March, April, and May were typical for the San Luis Valley with near normal temperatures and precipitation throughout the goose nesting period. The first goose brood observed on Alamosa Refuge was on April 20. The refuge summered an average population of 500 geese. In October, Canada geese began concentrating on the refuge with an average population in October of 800, 1,000 in November, and a peak of 1,800 in early December.

MONTE VISTA NWR

Monte Vista NWR supported approximately 20,000 mallards and 1,000 Canada geese during January and February. Waterfowl populations began to increase in late February and early March as migrant birds, mostly pintails and mallards, began arriving in the Valley. The peak of migration occurred in March. Numbers then declined as migrants departed and resident birds dispersed for nesting. By late May a breeding population of approximately 17,000 birds resided on the refuge.

Six consecutive good water years in conjunction with continued predator management resulted in a new record for production on Monte Vista NWR. Nest surveys conducted in May and June revealed a total of 37,977 ducks produced which is an increase of approximately 19 percent from 1986. Overall nest success remains at 65 percent and no significant changes in average clutch or brood sizes were evident. The highest nest success ever recorded was 77 percent in 1966, the last year strychnine was used to control predation on the refuge. Large flooded stands of baltic rush continue to be the preferred nesting cover type. The following tables show production by species for 1987, production in relation to water availability from 1980 through 1987, percent of nest success from 1964 through 1987, and production records from 1953 through 1987.

Waterfowl production on Monte Vista Refuge reached a record high of 38,000 in 1987.
7/87 R. Salazar

Canada goose production was up with an estimated 350 birds produced as compared to 270 in 1985, and 250 in 1986. Most production is from artificial nest structures. Ten new fiberglass dish type structures were installed prior to nesting and all but one were used.

TABLE G-10: WATERFOWL PRODUCTION ON MONTE VISTA NWR - 1987

SPECIES	NUMBER PRODUCES
Mallard	17,313
Pintail	4,040
Gadwall	5,062
Shoveler	2,925
BW/C Teal	6,270
GW Teal	567
Redhead	1,000
Ruddy	800
Canada Geese	350
TOTAL	38,327

TABLE G-11: DUCK PRODUCTION AND WATER AVAILABILITY
Monte Vista NWR

YEAR	ACRE/FT. WATER DELIVERED	NUMBER DUCKS PRODUCED
*1980	18,044	8,466
1981	13,486	12,600
1982	14,731	13,525
1983	17,885	13,511
1984	21,731	20,576
1985	22,029	25,825
1986	28,325	31,812
1987	33,047	37,977

*1980 followed relatively dry period. Delivery in 1979 was only 14,464 acre feet, and 1977 was one of the lowest years on record with 5,348 acre feet of water delivered.

TABLE G-12: PERCENT NEST SUCCESS FROM 1964 - 1987
Monte Vista NWR

YEAR	PERCENT SUCCESS	YEAR	PERCENT SUCCESS
1964	54.8	1976	39.0
1965	55.7	1977	12.0
1966	77.0	1978	28.0
1967	61.9	1979	42.0
1968	54.0	1980	37.0
1969	62.4	1981	42.0
1970	48.4	1982	49.0
1971	38.5	1983	48.0
1972	47.9	1984	52.0
1973	49.3	1985	65.0
1974	32.0	1986	65.0
1975	43.0	1987	65.0

TABLE G-13: RECORD OF DUCKS PRODUCED - MONTE VISTA NWR
1953-1987

YEAR	NUMBER PRODUCED	YEAR	NUMBER PRODUCED
1953	136	1970	19,536
1954	590	1971	13,942
1955	1,260	1972	12,299
1956	980	1973	7,920
1957	980	1974	5,274
1958	3,000	1975	4,570
1959	2,300	1976	2,894
1960	830	1977	1,123
1961	14,506	1978	2,135
1962	18,000	1979	5,681
1963	15,000	1980	8,466
1964	13,976	1981	12,600
1965	15,010	1982	13,525
1966	22,888	1983	13,511
1967	20,133	1984	20,576
1968	18,120	1985	25,825
1969	24,247	1986	31,812
		1987	37,977

4. Marsh and Water Birds

Cranes are the major species in terms of use and are discussed in detail under Section G. 2., Endangered and/or Threatened Species. Other notable species in this category include eared and western grebes, herons, egrets, and white-faced ibis. The Monte Vista Refuge continues to provide the only significant colonial nesting on the complex. Two rookeries, one in Parker Pond and another in Marsh Unit 18, were censused by Assistant Manager Merritt. Census results follow in Tables G-14 and G-15.

TABLE G-14: NEST SURVEY OF PARKER POND ROOKERY
MONTE VISTA NWR 1984-1987

	ACTIVE NESTS			
SPECIES	1984	1985	1986	1987
Black-crowned Night Heron	72	126	267	280
Snowy Egret	75	70	152	167
Cattle Egret	1	3	7	5
White-faced Ibis	8	23	42	51

TABLE G-15: NEST SURVEY OF MANAGEMENT UNIT 18 ROOKERY
MONTE VISTA NWR 1985-1987

	ACTIVE NESTS		
SPECIES	1985	1986	1987
Black-crowned Night Heron	24	31	35
Snowy Egret	8	11	9
White-faced Ibis	61	78	72

A small colony of eared grebe nests adjacent to the auto tour route on Monte Vista NWR. Nesting was up from 1986 with 15 nests located.

Although no significant colonial nesting is know to occur on the Alamosa NWR, use by white-faced ibis during late summer and early fall was noteworthy. As many as 1,000 ibis were counted in early September and apparently congregated on the refuge to feed as shorelines receded.

5. Shorebirds, Gulls, Terns and Allied Species

Abundant water resulted in another good year for shorebird production on both refuges. Young avocets, killdeer, and Wilson's phalaropes were abundant throughout the summer. A few northern phalaropes were observed on both refuges again this year. Although we have no accurate census data, black-necked stilt nesting appears to be on the increase. One unusual sighting occurred on Alamosa NWR on September 21 when a flock of approximately 250 lesser yellowlegs were observed along the Rio Grande River.

6. Raptors

Raptor use on both refuges appeared typical throughout 1987. Bald eagles and peregrine falcons are discussed in Section G. 2., Endangered and/or Threatened Species. Golden eagles were observed regularly throughout the year on both refuges. The Raptor Center of Pueblo treated 117 injured raptors during 1987. Of that total, 22 were transported to the center by refuge personnel. Table G-16 lists the San Luis Valley birds by species and their fate.

TABLE G-16: INJURED RAPTORS FROM SAN LUIS VALLEY TRANSPORTED FOR REHABILITATION - 1987

SPECIES	NUMBER TREATED	FATE
Merlin	1	1 Educational Bird
Golden Eagle	5	2 Released 2 Still at Facility 1 Euthanized
Great-horned Owl	7	1 Still at Facility 4 Died 2 Released
Rough-legged Hawk	1	1 Died
Swainson's Hawk	6	3 Still at Facility 3 Released
Red-tailed Hawk	1	1 Died
Northern Harrier	1	1 Released
TOTAL	22	

7. Other Migratory Birds

Two annual mourning dove-coo counts were conducted in the San Luis Valley on May 28 and 29, by Assistant Manager Merritt. Although Colorado's doves have declined over the last five years, transect data from the San Luis Valley show little change in the dove population relative to the last several years. Dove hunting opportunity was poor again this year as most birds departed the Valley before the season opened.

8. Game Mammals

The mule deer population on Alamosa NWR remains stable at 50-60 head. As was the case in 1986, deer use on refuge barley was heavy during late fall and early winter. No significant deer or elk use occurred on Monte Vista during the year.

9. Marine Mammals

Nothing to report.

10. Other Resident Wildlife

The pheasant population on both refuges remained stable relative to 1986. The refuge continues to participate in the Colorado Division of Wildlife's pheasant cover program (see F. 6), and predator management. The current population on Monte Vista is estimated at 1,800 birds. Public hunting opportunity has increased dramatically in recent years as the pheasant population expands (see H. 8.).

11. Fisheries Resources

Nothing to report.

12. Wildlife Propagation and Stocking

Nothing to report.

13. Surplus Animal Disposal

Nothing to report.

14. Scientific Collections

Nothing to report.

15. Animal Control

Predator population management is conducted with a view towards maximizing waterfowl production which is our primary refuge objective. Predator species are targeted on the basis of nest fate data gathered in June and July. Control measures exercised on both refuges during 1987 consisted of the following:

1. Aerial gunning of coyotes by Department of Agriculture personnel.
2. Ground searches for coyote dens.
3. Trapping of coyotes, raccoons, skunks, feral cats, magpies and ravens.
4. Opportunistic shooting of coyotes, raccoons, skunks, feral cats, magpies and ravens.

Recreational trapping is not permitted on either refuge but one "professional" trapping permit is issued for each refuge on a high bid basis. Trapping permittees are provided with an incentive to remove predators through a rebate system. The amount a permittee owes the government can be reduced significantly or eliminated altogether through the following rebate schedule:

REBATE SCHEDULE

Species	Rebate	Number Allowed
Coyote	$25.00	10
Raccoon	$10.00	40
Skunk	$10.00	100
Beaver	$10.00	20

Beaver are included in the rebate schedule because control of this species is necessary in order to protect eagle roost trees and reduce maintenance problems on ditches, canals, and water control structures. Results of predator management conducted during the fall of 1986, and winter and spring of 1987 are summarized in Table G-16.

Coyote scent station lines were established on both refuges to provide a relative index of abundance in an effort to gauge the success of control efforts. The survey is conducted twice annually, once during nesting and again each fall. This year's surveys revealed a slight increase in the relative abundance of coyotes on each refuge during waterfowl nesting relative to the same period in 1986. Tables G-17 and G-18 summarize scent station data from 1985 through 1987.

TABLE G-16: PREDATOR MANAGEMENT SUMMARY
October 1, 1986 - July 15, 1987

ALAMOSA NWR

METHOD	SPECIES	TAKE
Trapped by Permittee	Coyote	10
	Raccoon	13
	Skunk	46
Trapped or Shot by Staff	Coyote	3
	Raccoon	5
	Skunk	163
	Feral Cat	6
	Magpie	88
	Raven	11
Aerial Gunning (Dept. of Agriculture)	Coyote	11

SUMMARY SPECIES	TOTAL
Coyote	24
Raccoon	18
Skunk	209
Feral Cat	6
Magpie	88
Raven	11

MONTE VISTA NWR

METHOD	SPECIES	TAKE
Trapped by Permittee	Coyote	4
	Raccoon	4
	Skunk	55
	Red Fox	1
Trapped or Shot by Staff	Skunk	59
	Feral Cat	14
	Magpie	105
	Raven	13
Aerial Gunning (Dept. of Agriculture)	Coyote	15

SUMMARY SPECIES	TOTAL
Coyote	19
Raccoon	4
Skunk	114
Red Fox	1
Feral Cat	14
Magpie	105
Raven	13

TABLE G-17: ALAMOSA NWR
COYOTE SCENT STATION SURVEY SUMMARY

DATE	NUMBER OPERABLE STATION NIGHTS	NUMBER COYOTE VISITS	RELATIVE INDEX
June 1985	140	21	150
September 1985	108	7	64
June 1986	119	4	33
September 1986	99	11	111
June 1987	116	6	52
September 1987	97	9	93

TABLE G-18: MONTE VISTA NWR
COYOTE SCENT STATION SURVEY SUMMARY

DATE	NUMBER OPERABLE STATION NIGHTS	NUMBER COYOTE VISITS	RELATIVE INDEX
June 1985	46	5	108
September 1985	50	2	40
June 1986	40	1	25
September 1986	50	6	120
June 1987	49	2	41
September 1987	50	2	40

16. Marking and Banding

No pre-season waterfowl banding was requested by the Colorado Division of Wildlife in 1987. The only marking and banding conducted during the year was in conjunction with a study being conducted at Monte Vista NWR on wintering mallard (see D. 5).

17. Disease Prevention

Two outbreaks of fowl cholera disease were confirmed on Monte Vista NWR during 1987. The first outbreak was detected on January 29 and was short-lived, ending on February 3. The outbreak was limited to a small area of open water adjacent to well 7 in Marsh Unit 23. Estimated total mortality was 50 birds. Water at the outbreak site was shut off immediately in order to freeze the area down and force the birds to move from the contaminated site. Carcasses were picked up daily for the duration of the outbreak.

A second outbreak occurred on November 28 and continued into 1988. Total estimated mortality at year's end was 2,000 birds. Rotation of open water areas, daily carcass pick-up, and closure of the tour route and public hunting area were all employed in an effort to minimize the severity of the outbreak. Closure of the public hunting area and tour route were necessary in order to minimize stress in the resident waterfowl population, and to maximize options in terms of where we could create open water. This is the first time on record that a serious cholera outbreak has occurred requiring closures. The hunting public was supportive of our efforts and few complaints were voiced.

H. PUBLIC USE

1. General

Overall visitation at the two refuges increased approximately 12 percent relative to 1986. The total number of visits recorded during 1987 was 2,600 on Alamosa NWR, and 4,900 on Monte Vista NWR. Increases in consumptive recreation (sec. H.8), and environmental education activities (sec. H.2) account for most of the gain. Continued increases in environmental education activities are the result of the station's teacher workshop program which is now in its second year, and completion of the exhibit room at the Alamosa NWR Headquarters. The refuge staff continues to promote the Take Pride in America program during interpretive and environmental education activities, both on and off refuge.

2. Outdoor Classrooms-Students

The demand for guided school group tours and other environmental education activities remains high. Approximately 670 students visited the refuges during 1987. This represented an increase of 24 percent over the 540 students recorded during 1986. These visits resulted in a total of approximately 1,500 activity hours on refuge environmental education. Requests for assistance from area educators for talks, tours and programs continue to peak during spring when refuge personnel are extremely busy with other tasks. It is hoped that continuation of the station's teacher workshop program will both increase environmental education activity and decrease dependence on staff members.

Approximately 350 student visits were recorded during March, April and May on Alamosa NWR. This figure is a record high for Alamosa for the spring field trip season, and spring visitation exceeded that recorded for Monte Vista NWR for the first time. In addition to the teacher workshop program, which is based at Alamosa, another contributing factor to the increase was completion of the exhibits and displays at the Alamosa NWR headquarters. The exhibit room was visited frequently by school groups with 65 visits recorded in March, 190 in April, and 100 in May. In addition to the exhibit room, several audio/visual programs and two nature trails are available to school groups at Alamosa. Refuge Assistant Rennick handled most of the spring environmental education activities on Alamosa. Student use of Monte Vista NWR was essentially limited to bus tours of the refuge. Staff members severed as on-bus guides on a request basis. Tours were handled by Assistant Managers Salazar and Merritt. A total of 250 student visits were recorded on Monte Vista NWR during the spring field trip season.

3. Outdoor Classrooms-Teachers

Efforts to provide support for teachers interested in environmental education continued in 1987 through our workshop program. The workshop was conducted over a two-day period, September 26 and 27, totalling 15 hours of contact instruction at Alamosa NWR and Great Sand Dunes National Monument. The course was offered through the Adams State College's Office of Extension Education for one semester hour of graduate credit. In order to receive college credit, enrollees were required to complete the following:

1. Full attendance at all workshop seminars.
2. Completion of a field journal with notes on all activities.
3. Completion of the workshop evaluation.
4. Development of an original environmental education lesson plan, field testing of that plan with their students, and submission of the lesson and field evaluation.

The purpose of the last requirement was to ensure that our efforts would reach area students, and to assist us in compiling a lesson plan booklet.

Map of location of Teachers in Workshop
9/87 G. Rennick

A total of 29 teachers from Colorado and New Mexico enrolled in the course generating an estimated 900 teacher activity hours, and 4,500 off-refuge student activity hours of environmental education. The success of this program, as reflected in course evaluation forms, could not have been possible without interagency cooperation and an array of talented instructors. Their names and affiliations follow:

1.	Dr. Hobert Dixon	Adams State College - Biology Department
2.	Dr. George Ek	Colorado State Dept. of Education
3.	Carol Jones	Colorado Division of Wildlife State Coordinator - Project Wild
4.	John Rawinski	U.S. Forest Service - Soil Scientist
5.	Tom Rennick	U.S. Forest Service - Forester
6.	Barbara Relyea	Project Learning Tree Coordinator
7.	Kristy Wumkes	National Park Service-Great Sand Dunes NM
8.	Ron Miller	Soil Conservation Service - District Conservationist
9.	Jack Rudder	Educator - Sanford School District
10.	Ed Merritt	Alamosa NWR, Assistant Manager
11.	Georgena Rennick	Alamosa NWR, Refuge Assistant

Part of the Wetlands Seminar was Birding. Participants spent time at the Bluff Overlook learning birding techniques.
9/87 G. Rennick

This year we incorporated Project Learning Tree into the Workshop. Barb Relyea and Tom Rennick provided instruction.
9/87 G. Rennick

Mark Cousins, DOW-Wildlife Officer, demonstrates the "Chain of Life" during Project Wild Seminar.
9/87 G. Rennick

Ed Merritt reads the workshop participants the story of Truman Everett before they are sent into "the House Of Nature" seminar.
9/87 G. Rennick

Providing assistance to educators was not limited to the workshop effort. Refuge staff members provided talks, tours and programs in conjunction with school field-trip activities throughout the year. On January 15, Assistant Manager Salazar conducted an outreach program for the Hooper School District. The presentation reached 135 students and increased awareness of local wildlife issues and refuge management. On February 21, Assistant Manager Merritt provided assistance to Colorado Division of Wildlife personnel by providing a session on the use of micro-computers in environmental education to 16 area educators.

4. Interpretive Foot Trails

Two foot trails are maintained along the Rio Grande River on Alamosa NWR. Although we have no accurate means of measuring public use on these trails, we believe activity is continuing to increase. Both foot routes have trail-heads adjacent to refuge headquarters which houses a new exhibit package. Visitation has increased at headquarters because of these new exhibits and it seems logical that trail use would also increase. Use of the trail by school groups in conjunction with environmental education activities is frequent during the spring field trip season. Use by the visiting public continued to be heaviest during spring and fall. A lack of birds in winter, and no lack of mosquitoes or horseflies in summer, minimize use during these seasons. It is estimated that nearly 1,000 visitors walked one or both trails during the year. Foot trails are not provided on Monte Vista NWR where access for wildlife observation is excellent via county and refuge roads.

5. Interpretive Tour Routes

The Avocet Trail, our six-mile auto tour route which is interpreted through signs and a leaflet, is available to visitors on Monte Vista Refuge. The route is popular with school groups and receives good use during spring as a bus route. This year an estimated 2,300 visitors traversed the route which is roughly equivalent to last year's figure. Approximately 250 of the visits recorded can be attributed to use of the route by school groups.

The tour route is an all weather road and is open year round except during waterfowl hunting seasons. The closure is necessary because a portion of the route traverses the public hunting area which is "walk-in" only. The closure does not impair wildlife viewing opportunities because county roads bisect areas of the refuge closed to hunting, where birds tend to concentrate when the pressure is on. Wildlife viewing opportunities are best during spring and fall on Monte Vista Refuge. No interpretive auto tour routes have been developed on Alamosa Refuge.

6. Interpretive Exhibits/Demonstrations

This year marked the first full year that our new exhibit and displays were "on-line" for the visiting public. The interpretive package, which was originally on display at Bear River MBR, consists of wall panels which interpret bird behavior, flight, and adaptation for living with water. The exhibits feature a bird sound booth, several wood carvings, and original art work. Approximately 1,200 visitors viewed the new exhibits and displays during 1987, and use of Alamosa NWR by school groups has increased.

With installation of the Bear River exhibit package we essentially upgraded from a Visitor Contact Station to a Visitor Center. The increase in the quality of our facility is reflected in attendance figures. Prior to installation of the exhibits, we were averaging approximately 400 visitors per year. Since the doors to the exhibits opened, the average has tripled to approximately 1,200 per year.

7. Other Interpretive Programs

Refuge personnel continue to provide programs and tours on a request basis. This year the Monte Vista Chamber of Commerce sponsored its' fourth annual Whooping Crane Festival. Refuge Manager Nail coordinated the event with the Chamber and the refuge again provided guides for bus tours. Refuge Assistant Georgena Rennick, and Assistant Manager Roberta Salazar conducted three bus tours for 177 people. The bus tours were all successful with nine individual whoopers viewed on the first tour, four on the second tour, and seven on the third tour. In addition to the tours the festival included a wildlife exhibit, a banquet with Dr. James Lewis (Whooping Crane Coordinator for USFWS) as guest speaker, and a program on peregrine falcons presented by Jerry Craig, Colorado Division of Wildlife.

"Whooping Crane Groupies"
4th Annual Whooping Crane Tours.
3/87 G. Rennick

Assistant Managers Brock and Merritt participated in a Ducks Unlimited Greenwing Day on May 16, conducting a tour on Monte Vista Refuge for 38 "Greenwingers" and interested parents. Other activities sponsored by our local DU Chapter that day consisted of a trap shoot, retriever demonstration on the refuge, and a pot-luck dinner. This was our third Greenwing Day in the Valley and judging from the continued enthusiastic response of our participants, and their parents, it now seems well rooted as an annual event.

Numerous other tours and programs were provided throughout the year. Assistant Managers Merritt and Brock provided tours of Monte Vista NWR to the Arkansas Valley, Salida, and Denver Chapters of the Audubon Society on October 24. On February 10, Assistant Refuge Manager Merritt provided tour of Monte Vista Refuge and a video taped interview for Leo McQuire, TV-Channel 4, Denver. The segment was aired in March on their Weekend Getaways "spot" as part of the evening news broadcast. Other groups receiving programs or tours during 1987 are as follows:

1. Rotary Club - Monte Vista
2. Latch Key Program - Alamosa
3. Citizenship Club - Alamosa
4. Alamosa Garden Club - Alamosa
5. 4H Fair - Monte Vista
6. Summer Recreation Program - Monte Vista
7. Boy Scouts - Alamosa
8. Cub Scouts - Alamosa
9. Career Days - Alamosa Schools

8. Hunting

Very mild fall weather combined with several articles in Denver and Colorado Springs newspapers describing high waterfowl numbers in the San Luis Valley may have been the cause of increased hunter use on both of the refuges. The Alamosa NWR had a total of 476 hunter use days which is a 13 percent increase over the 1986 season. Monte Vista NWR had a total of 1,032 hunter use days which was a 23 percent increase from the previous year. The total number of waterfowl harvested on Alamosa NWR was 949 birds, a 13 percent increase from the previous year. Although the general population of waterfowl on the Monte Vista NWR was as high or higher than the 1986 season, the harvest declined 22 percent to 1,424 birds.

The Monte Vista NWR public hunting area was closed on December 23 due to the start of a severe outbreak of avain cholera. This closure, which shortened the refuge hunting season by 11 days, was done in an effort to reduce stress to the waterfowl population and to provide more undisturbed open water areas in order to allow better dispersal of the birds.

All goose hunting in the San Luis Valley continues to be by permit only. Due to the continuing increase in the resident flock of Canada geese, the number of permits available was increased from 1,500 in 1986 to 3,000 in 1987. Only 2,800 applications were received for these licenses so the remaining 200 permits were not issued. This was the second consecutive year that each permit allowed the harvest of two geese.

8. Hunting - Continued

Pheasant hunting activity remained similar to 1986 with 300 hunter visits this year compared to 320 the previous year. The harvest of pheasants dropped from 410 birds in 1986 to 240 birds this year. The average birds per hunter bag was .8 birds.

Hunting for snipe, mourning dove, cottontail and jack rabbit is permitted on both refuges during the open waterfowl seasons. Hunter hours expended on these species is relatively low and no accurate data exists with regard to number of hunters or hours spent pursuing these species.

TABLE H-1: TOTAL WATERFOWL HUNTER USE DAYS RECORDED FROM 1985 THROUGH 1987 ON ALAMOSA AND MONTE VISTA REFUGES BY SEASON SPLIT.

ALAMOSA NWR				MONTE VISTA NWR		
1985	1986	1987		1985	1986	1987
430	330	236	EARLY SEASON	445	495	410
120	70	240	MID SEASON	250	190	525
60	15	0	LATE SEASON	140	105	97
610	415	476	TOTAL	835	790	1032

TABLE H-2: WATERFOWL HARVEST SUMMARY 1987

ALAMOSA NWR
NUMBER HARVESTED

SPECIES	EARLY SEASON Oct. 3 - Oct. 17	MID SEASON Oct. 31 - Nov. 29	LATE SEASON Dec. 12- Jan. 2
Mallard	132	102	FROZEN NO BIRDS AVAILABLE
Pintail	35	33	
Gadwall	200	69	
Shoveler	56	12	
BW/C Teal	57	15	
GW Teal	123	21	
Wigeon	13	12	
Redhead	11	6	
Ruddy	7		
Wood Duck	1		
Canvasback		1	
C. Merganser		1	
C. Goose		42	
TOTAL BIRDS	635	314	0
TOTAL HUNTERS	236	240	0
AVG. BIRDS/BAG	2.69	1.31	0

944

MONTE VISTA NWR
NUMBER HARVESTED

SPECIES	EARLY SEASON Oct. 3 - Oct. 17	MID SEASON Oct. 31 - Nov. 29	LATE SEASON Dec. 12 - Jan. 2
Mallard	389	300	38
Pintail	28	60	2
Gadwall	186	60	
Shoveler	44	12	
BW/C Teal	86	5	
GW Teal	91	6	
Wigeon	11	3	
Redhead	19	6	
Ruddy	3		
Goldeneye			1
C. Goose		18	3
TOTAL	857	470	44
TOTAL HUNTERS	410	525	97
AVG. BIRDS/BAG	2.09	0.90	0.45

TABLE H-3: COMPARATIVE WATERFOWL HARVEST DATA
1987-1986

EARLY SEASON

TOTAL HUNTERS:	1987	1986	PERCENT CHANGE
Alamosa NWR	236	330	28% down
Monte Vista NWR	410	495	17% down
Combined	646	825	22% down
AVERAGE BIRDS/BAG:			
Alamosa NWR	2.69	2.25	16% up
Monte Vista NWR	2.09	2.58	19% down
Combined Average	2.39	2.41	01% down
TOTAL BIRDS HARVESTED:			
Alamosa NWR	635	745	15% down
Monte Vista NWR	857	1280	33% down
Combined	1492	2025	26% down

MID SEASON

TOTAL HUNTERS:	1987	1986	PERCENT CHANGE
Alamosa NWR	240	70	71% up
Monte Vista NWR	525	190	64% up
Combined	765	260	66% up
AVERAGE BIRDS/BAG:			
Alamosa NWR	1.31	0.95	27% up
Monte Vista NWR	0.90	2.13	58% down
Combined Average	1.11	1.54	28% down
TOTAL BIRDS HARVESTED:			
Alamosa NWR	314	67	79% up
Monte Vista NWR	470	405	14% up
Combined	784	472	40% up

LATE SEASON

TOTAL HUNTERS:	1987	1986	PERCENT CHANGE
Alamosa NWR	0	15	100% down
Monte Vista NWR	97	105	8% down
Combined	97	120	19% down
AVERAGE BIRDS/BAG:			
Alamosa NWR	0	1.06	100% down
Monte Vista NWR	0.45	1.30	65% down
Combined Average	0.45	1.26	64% down
TOTAL BIRDS HARVESTED:			
Alamosa NWR	0	16	100% down
Monte Vista NWR	97	136	29% down
Combined	97	152	36% down

9. Fishing

Nothing to report.

10. Trapping

Recreational trapping is not permitted on either refuge. For an explanation of our trapping permit system see Section G. 15, Animal Control.

11. Wildlife Observation

Although we have no accurate means of measuring numbers of visitors or hours spent observing wildlife, we believe these activities have increased along with the increase in interpretation and environmental education. Spring and fall provides an opportunity to observe thousands of sandhill cranes, and their adopted whooping crane cousins, along with large numbers of ducks and geese. Winter brings as many as 50 bald eagles to the two refuges and the San Luis Valley is well known for its raptor populations. American Avocets, Wilson's phalaropes, and black-necked stilts, along with their young, are a common sight along our auto tour route during the summer. Few visitors are willing to brave the onslaught of insects during summer so our foot trails receive little use during that time. Our best estimate is that approximately 6,000 visitors generate 12,000 activity hours of wildlife/wildland observation on the two refuge in 1987.

12. Other Wildlife Oriented Recreation

Approximately 500 activity hours of wildlife/wildlands photography were estimated during 1987 on the two refuges. Interest in photography on the two refuges peaks during spring and fall when sandhill and whooping cranes are using the refuge. Our winter population of bald eagles are also a popular subject. Wildlife photography is encouraged and no problems resulting from this recreational pursuit are anticipated.

13. Camping

Camping is not permitted on either refuge except in designated hunter parking areas during hunting seasons. These areas are used by hunters from outside the San Luis Valley, especially during the early waterfowl hunting season when the weather is usually cooperative. Essentially all camping is in conjunction with hunting activity. No problems associated with hunters camping in these areas were noticed during the year.

14. Picnicking

Nothing to report.

15. Off-Road Vehicling

Nothing to report.

16. Other Non-Wildlife Oriented Recreation

Nothing to report.

17. Law Enforcement

Six staff members held law enforcement credentials throughout most of 1987. Assistant Manager Salazar turned in her law enforcement credentials in conjunction with her resignation to be effective in early 1988. Manager Nail, Assistant Managers Brock, Merritt and Salazar, Maintenance Foreman Hudson and Equipment Operator McDermith all attended the 40 hour law enforcement refresher training held the week of March 9, in Denver.

Law enforcement efforts on both refuges are concentrated during the waterfowl hunting season. A law enforcement meeting was held at Alamosa NWR on September 29, to discuss enforcement, hunting regulations, and use of the new violation notice forms. The meeting was attended by all refuge officers and led by Special Agent John Griest. A firearms qualification shoot was held the same day. Refuge personnel wrote 11 citations during 1987. The following Table lists violations which resulted in a citation during the year.

TABLE OF CITATIONS

DATE	VIOLATION	OFFICER	DISPOSITION
4/11/87	Unlawful Trespass	Merritt	$100.00
7/16/87	Unlawful Trespass	Brock	$100.00
7/24/87	Unlawful Trespass	Brock	$100.00
10/3/87	Exceed Daily Bag Limit	Nail	$100.00
10/4/87	Exceed Daily Bag Limit	Nail	$100.00
10/10/87	Evidence of Spp./Sex	Salazar	$ 50.00
11/10/87	Hunting in Closed Area	Nail	$100.00
11/14/87	Goose Tag Violation	Nail	$ 50.00
11/28/87	Take During Closed Season	Brock	$100.00
11/29/87	Goose Tag Violation	Nail	~~Pending~~ $100.00
12/3/87	Take During Closed Season	Merritt	$ 50.00

18. Cooperating Associations

Nothing to report.

19. Concessions

Nothing to report.

I. EQUIPMENT AND FACILITIES

1. New Construction

ALAMOSA REFUGE

Nothing to report.

MONTE VISTA REFUGE

A new fuel pump island was constructed at the refuge shop area. This project included installing three underground fuel tanks, (1,000 gallon unleaded gasoline, 1,000 gallon diesel, and 500 gallon regular gasoline), and pouring a concrete pad to support the three pumps.

2. Rehabilitation

ALAMOSA REFUGE

Ten water control structures, pipes and water boxes were replaced throughout the refuge. The majority of these were replaced in the newly acquired Lillpop Tract (Tract 115).

Force account labor was used to clean .8 mile of the Andrews Lateral irrigation ditch and one mile of the Costilla Ditch.

The on going force account project of cleaning sediments from the Chicago Ditch continued throughout most of the year. This ARMMs funded project was initiated in 1985 and is being accomplished with a dragline borrowed from Fish Springs NWR. In 1987 about two miles of the Chicago Ditch, from the river to the refuge shop, and from the Mumm Lateral to headquarters had been cleaned and reshaped on both sides of the ditch. This project should provide both better water flows during irrigation and better protection from high flood waters which have in recent years dumped over the low ditch banks into the canal.

Grazing fee monies were used to reconstruct 3,461 feet of old boundary fence on the Lillpop Tract (115). The refuge supplied all materials and a contractor constructed the barbed wire fence for $1,007.00.

Grazing fees were also used to pay for removal of 2.25 miles of old interior fence and five old hay corrals in the Lillpop Tract (115). This was accomplished for $1,500.00 by a local contractor.

The old YACC shop building was reshingled at a cost of $1,425.00.

Quarters Maintenance and Operation monies ($2,132.00) were used on quarters number 143 to install a new wood stove, rock hearth and rock wall behind the stove.

The flood waters of early summer resulted in the east side of the spillway on the New Ditch diversion dam washing out. This was reconstructed by force account.

In anticipation of high water on the Rio Grande River 11 loads of concrete rip-rap were placed in the spillway of the Chicago Diversion Dam at a cost of $734.00.

About 30 old deteriorated goose nests were removed and replaced with newer fiberglass baskets.

MONTE VISTA REFUGE

Seven water control structures and pipes were replaced, repaired or reset in various ditches throughout the refuge. The large 4' x 4'x 8' water control box on the Sanderson Ditch in Unit 10 was replaced and a major washout repaired.

One-half mile of access road on the north end of Unit 1 was graveled.

The entrance road to the refuge shop area and shop yard were reshaped, covered with smaller potato rock and surfaced with chipped rock.

Ditch lateral number 5, lateral number 6 and the Olsen Lateral were all cleaned with backhoe to provide better water flow.

The power panel and underground powerline to well number 60 was damaged by lightening and required replacement.

Ten deteriorated goose nests were removed and replaced with new fiberglass baskets.

About 100 cubic yards of gravel was placed in Unit 16 around the headwalls of the new tubes to keep them from pushing up with ice heave.

3. Major Maintenance

ALAMOSA REFUGE

The Chicago Ditch from the refuge shop to the Closed Basin conveyance channel (2 1/8 miles), was cleaned of silt at a cost of $4,980.00 using an excavator.

About 1.5 miles of hunter access road along the river between parking lots 3 and 4 was resurfaced with gravel at a cost of $4,980.00 for 830 cubic yards.

Flooding of the Rio Grande River resulted in about half of the Chicago Ditch diversion dam being washed out. When the river receded in late summer this was reconstructed by pushing up river sands with a caterpillar. This reconstruction cost $2,062.00.

The high river flows also caused some minor wash outs on the river road south of the conveyance channel. Several areas previously rip-rapped also required repairs. A total of 908 cubic yards of rock rip-rap, at a cost of $4,540.00, was used to repair these damages.

MONTE VISTA REFUGE

About 800 cubic yards of gravel were placed force account in Unit 19 on the dike running parallel to the highway. This was done to raise this dike to prevent water from running over the top.

The main dike in Unit 24, running parallel to the county line road, received 1,800 cubic of potato rock rip-rap to prevent wind erosion. This rip-rap was stock piled in 1986 at a cost of $4,950.00.

4. Equipment Utilization and Maintenance

A 1979 Little Giant, 3/4 yard bucket dragline was transferred to this refuge from the Bureau of Reclamation in Loveland, Colorado. The acquisition of this piece of equipment will assure that we will have the ability to maintain the many miles of ditches and dikes on both refuges. The dragline which had been borrowed from Fish Springs NWR can now be sent somewhere else as needed.

The refuge acquired a 1979 Little Giant, 3/4 yard bucket dragline from the Bureau of Reclamation. This piece of equipment appears to be in excellent condition.

6/87 M. Nail

4. Equipment Utilization and Maintenance

The International 986 farm tractor required a new PTO shaft, bearings and gears.

The injector pump on the Massey Ferguson 1135 farm tractor was rebuilt.

Two 4-wheel ATV vehicles were acquired to replace two older 3-wheel ATVs which have been deemed unsafe to operate. The new models are 1987 Yamaha YFM225T-R and cost $2,177.00 each.

A new 200 gallon slip-on fire pumper was purchased at a cost of $5,541.00 to replace an older 100 gallon pumper.

5. Communications System

Nothing to report.

6. Computer Systems

Mike Long, Electronic Data Coordinator from the Regional Office, conducted a computer workshop for the refuge staff the week of February 9 - 13. The workshop provided enough information so refuge personnel could go ahead and enter the computer age.

Assistant Manager Brock and Refuge Assistant Rennick attended a "Introduction to Computers" class at Adams State College, June 18-22.

This is the first year the new computer has been used as a word processor to complete the Annual Narrative report.

7. Energy Conservation

Nothing to report.

8. Other

Nothing to report.

J. OTHER ITEMS

1. Cooperative Programs

Engineering Equipment Operator McDermith spent two weeks, July 6-10 and August 24-28 at Leadville National Fish Hatchery operating the refuge D-7 caterpillar to assist in cleaning silt from hatchery ponds.

On September 21-22, Maintenance Foreman Hudson traveled to Pinyon Canyon near Trinidad, Colorado to train and certify Bruce Rosenlund, of the Fish and Wildlife Assistance Office, and his employees on the operation of a new tractor/backhoe they recently acquired.

On October 26 Engineering Equipment Operator McDermith certified Bill Swinehart in equipment operation at Leadville National Fish Hatchery.

2. Items of Interest

Nothing to report.

3. Credits

Refuge Assistant Georgena Rennick wrote Section B. and edited, typed, and assembled the entire report.

Refuge Manager Melvin Nail wrote the Introduction and Sections A., C., D., E., F. 11., J., and K.

Assistant Refuge Manager Steve Brock wrote Sections F. 4., F. 7., H. 8. and I.

Assistant Refuge Manager Edward Merritt wrote Sections F. 1.-3., F. 5.-6., F. 8.-10., F. 12.-13., G., and H.

K. FEEDBACK

Nothing to report.

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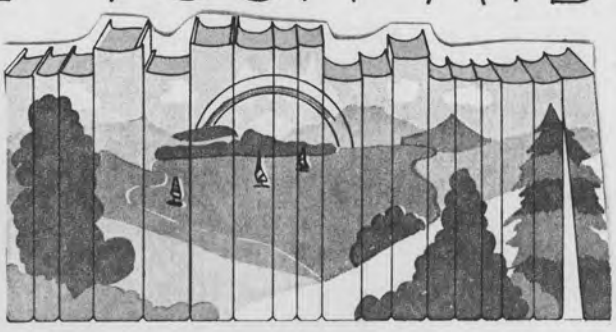
TEACHERS!

LET MOTHER NATURE BE YOUR AIDE



TEACHERS OF ALL SUBJECTS AND FROM ANY GRADE LEVEL, AND THOSE STUDYING TO BECOME EDUCATORS ARE INVITED TO PARTICIPATE IN AN A N N U A L F A L L O U T D O O R E D U C A T I O N W O R K S H O P .

THE REASON FOR THE WORKSHOP IS TO EXPOSE THE EDUCATOR TO THE ALAMOSA NATIONAL WILDLIFE REFUGE AS WELL AS THE GREAT SAND DUNES NATIONAL MONUMENT AS SITES FOR OUTDOOR CLASSROOM ACTIVITIES AND FAMILIARIZE EDUCATORS WITH RESOURCES AND MATERIALS THAT ARE AVAILABLE TO THEM.

AND...

TO INTRODUCE EDUCATORS TO PERSONS CURRENTLY INVOLVED IN OUTDOOR EDUCATION PROGRAMS IN OUR AREA AND TO SHARE SOME OF THE SKILLS AND MATERIALS THAT HAVE BEEN SUCCESSFUL WITH THEIR STUDENTS.

WHEN

THE ANNUAL FALL OUTDOOR EDUCATION WORKSHOP WILL BE ON SATURDAY AND SUNDAY, SEPTEMBER 26 AND 27, 1987.

THIS WORKSHOP OFFERS ONE UNDERGRADUATE OR GRADUATE CREDIT THROUGH ADAMS STATE COLLEGE.

PERSONS INTERESTED IN ATTENDING THE WORKSHOP SHOULD CONTACT GEORGENA RENNICK AT THE ALAMOSA NATIONAL WILDLIFE REFUGE. (303) 589-4021

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INT 423

OUTDOOR CLASSROOMS WORKSHOP

September 26 & 27, 1987

SCIENCE - 579

Outdoor Classrooms Workshop II

Teachers of all subjects and from any grade level, and those studying to become educators are invited to participate in an ANNUAL FALL OUTDOOR EDUCATION WORKSHOP at the Alamosa National Wildlife Refuge and the Great Sand Dunes National Monument on September 26 and 27, 1987. The purposes of the workshop are: (1) to introduce educators to ideas for using the outdoors as a classroom in their teaching program; (2) to introduce educators to persons currently involved in outdoor education programs in our area and to share some of the skills and materials that have been successful with their students; (3) to expose educators to the ALAMOSA NATIONAL WILDLIFE REFUGE as well as the GREAT SAND DUNES NATIONAL MONUMENT as sites for outdoor classroom activities; and (4) to familiarize educators with resources and material that are available to them.

The workshop will begin at Polston Elementary School -- 6935 Hwy. 17, Alamosa, Colorado (a map will be sent with acknowledgement of registration). It will promptly begin at 8:00 a.m. on Saturday, September 26th, and will conclude at approximately 3:30 p.m. on Sunday, September 27th. Plan to have a sack lunch for both days. Outdoor clothing suitable for changing weather, including a rain coat, and shoes adequate for rough terrain and cactus (hiking boots), a notebook for your journal, binoculars, camera, etc. A hand lens will be beneficial but not required. Activities will be primarily outdoors, come prepared.

This course offers one undergraduate or graduate credit (Science-579) at a cost of $40.00 through Adams State College. A journal of workshop activities, an evaluation of the workshop, attendance of all sessions, and a lesson plan, field tested with your students will be the requirements to receive credit. The lesson plan will be due December 1, 1987.

The $40.00 fee is payable upon registration. Registration by September 14, 1987 is encouraged as space is limited. In the case of cancellation $5.00 of the registration fee will be non-refundable.

Each participant will receive a "Project Learning Tree Activity Guide" , "Project Wild Activity Guide", "Classroom Without Walls Guide", numerous free teaching aids, and will have the opportunity to take part in hands-on learning activites in small group seminars.

The Great Sand Dunes National Monument will be providing camp spaces free of charge. A barbecue at not extra cost for enrollees ($5.00 for additional people) is planned at Polston Elementrary following Saturday's seminars.

You will receive confirmation of your registration, additional instructions, and additional information shortly after you register.

SCHEDULE FOR WORKSHOP

SATURDAY, September 26, 1987 - LOCATION POLSTON ELEMENTARY SCHOOL AND ALAMOSA NWR

8:00 - 8:30 REGISTRATION

8:30 - 9:30 ORIENTATION
- Micro Computers in Environmental Education
- Bird Identification Exercise

10:00 - NOON WETLANDS AND WILDLIFE SEMINAR
- Bird Watching
- Aquatic Plants/Animals
- Environmental Parameters
- Wetland Ecology
- Waterfowl Management
- Wetland Values
- Endangered Species
- The National Wildlife Refuge System

12:00 - 1:00 L U N C H

1:00 - 5:00 PROJECT WILD SEMINAR (AQUATIC)
- Awareness and Appreciation
- Diversity of Wildlife Values
- Ecological Principles
- Management and Conservation
- People, Cultures, and Wildlife
- Trends, Issues and Consequences
- Responsible Human Actions

THE GREAT SAND DUNES NATIONAL MONUMENT WILL BE PROVIDING CAMPING SPACES FREE OF CHARGE FOR WORKSHOP PARTICIPANTS AND THEIR FAMILIES. A COOKOUT WILL BE HELD FOLLOWING THE SATURDAY SEMINARS AT 6:00 PM. THERE WILL BE NO EXTRA CHARGE FOR ENROLLEES, AND $5.00 CHARGE FOR ANY ADDITIONAL PEOPLE, FAMILY MEMBER, ETC. THE COOK OUT IS BARBECUE BEEF WITH ALL THE FIXIN'.

PLEASE NOTE THE SUNDAY SEMINARS WILL BE AT THE SAND DUNES NATIONAL MONUMENT. ALL PARTICIPANTS NOT PLANNING ON CAMPING SHOULD BE AWARE OF THE 45 MINUTE DRIVE FROM ALAMOSA TO THE DUNES.

SUNDAY, September 27, 1987 - LOCATION GREAT SAND DUNES NATIONAL MONUMENT

9:00 -12:00 PROJECT LEARNING TREE SEMINAR
- Awareness and Appreciation
- Information Acquisition
- Analysis
- Evaluation
- Inventiveness

12:00 -12:30 L U N C H

12:30 - 3:30 ENTERING THE HOUSE OF NATURE/ECOLOGY OF UPLANDS SEMINARS
- Sensory Awareness Techniques
- Group Communication Skills
- Building Self Confidence in Students
- Forest and Range Ecology
- Big Game Management
- Upland Plant and Animal Communities

IF YOU ARE INTERESTED IN ATTENDING THE WORKSHOP, PLEASE PRE-REGISTER BY FILLING OUT THE COUPON ON THE BOTTOM OF THIS BROCHURE. RETURN YOUR COUPON ALONG WITH YOUR REGISTRATION FEE, AND PAYMENT FOR ANY ADDITIONAL MEALS, TO THE SAN LUIS VALLEY OUTDOOR EDUCATION ASSOCIATION, C/O ALAMOSA-MONTE VISTA NATIONAL WILDLIFE REFUGE, P.O. BOX 1148, ALAMOSA, COLORADO 81101. ENROLLMENT IS LIMITED TO 30, THEREFORE EARLY REGISTRATION IS ADVISED. FOR FURTHER INFORMATION CONTACT GEORGENA RENNICK AT THE ALAMOSA-MONTE VISTA NWR (303) 589-4021.

- -

REGISTRATION FORM

OUTDOOR CLASSROOMS WORKSHOP II - SCIENCE 579 - INSTRUCTOR OF RECORD HOBERT DIXON

Please Print Full Legal Name (no nicknames etc.)________________________

Birth Date:__________ Social Security Number:__________ Phone Number:__________

Current Mailing Address:____________________

____

____

I am taking this course for _____UNDERGRADUATE _______GRADUATE credit.

Please check your classification: FRESHMAN__ SOPHOMORE__ JUNIOR__ SENIOR__ GRADUATE__

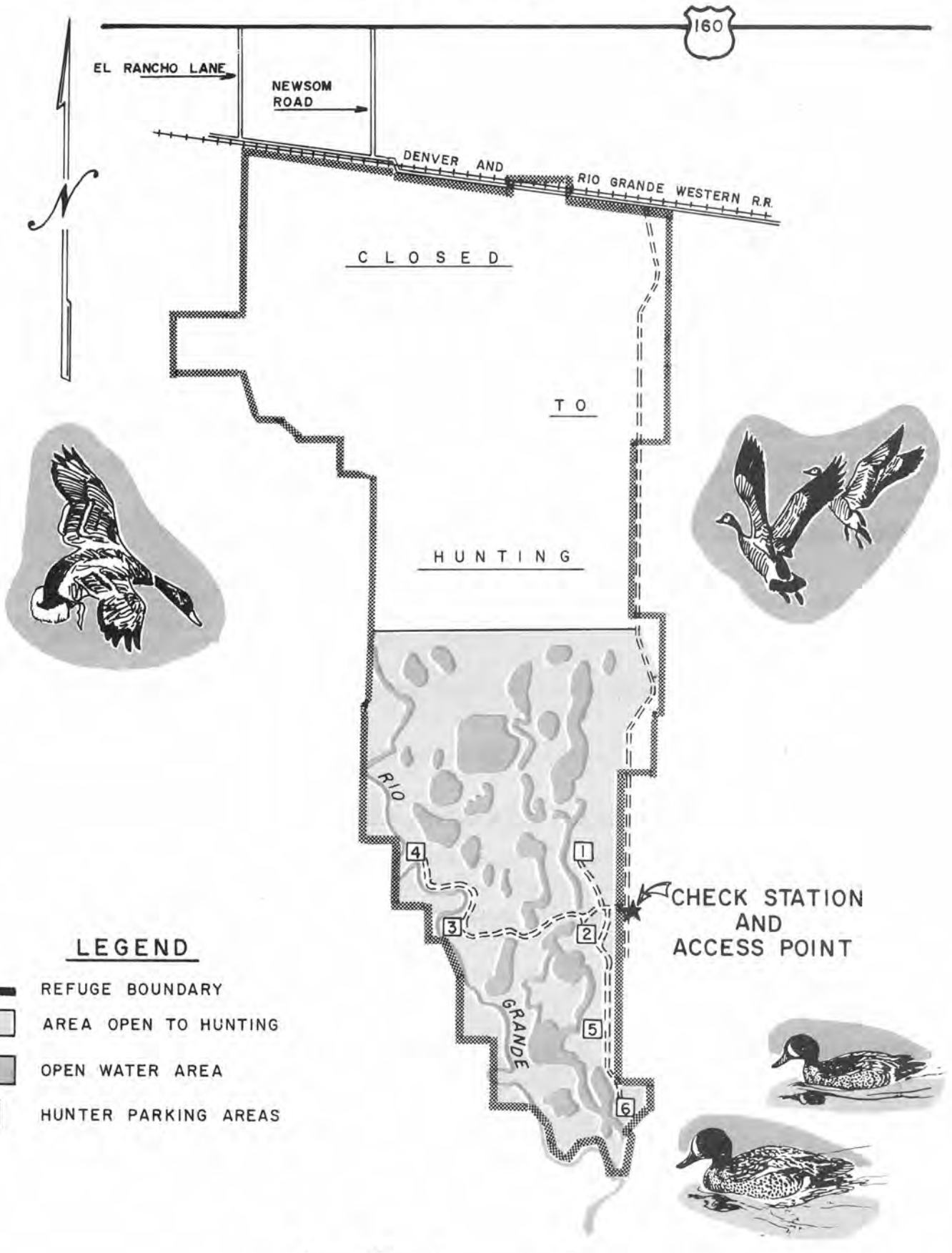
Have you had any PROJECT WILD SEMINARS? __YES __NO

If the Outdoor Classrooms Workshop is filled at the time we receive your application, would you want to participate in one of our future workshops? __YES __NO

Will you be camping at the Great Sand Dunes National Monument? __YES __NO

Camping in: TENT __TRAILER __OTHER NUMBER IN YOUR PARTY________

ALAMOSA NATIONAL WILDLIFE REFUGE
HUNTING MAP



REGULATIONS COVERING THE HUNTING OF DUCK, GOOSE, COOT, MERGANSER, DOVE, SNIPE, RABBIT, and PHEASANT at the ALAMOSA NATIONAL WILDLIFE REFUGE ALAMOSA, COLORADO

Hunting on the refuge will be permitted only during the waterfowl season as set by State and Federal regulations. During this period the following birds and animals may be hunted on the refuge if the State season for a given bird or animal is open: Duck, goose, coot, merganser, dove, snipe, rabbit and pheasant.

HUNTING AREA: As posted and shown on map on reverse side.

ADMITTANCE: Entrance to the open area and parking of vehicles is restricted to the six designated parking areas as posted and shown on the yellow portion of the map. Do NOT enter at any other point.

WEAPONS: Only legal shotguns and hand held bows meeting state regulations with flu-flu arrows will be permitted ***(Rifles and hand guns are strictly prohibited.)***

SHOOTING HOURS: Shall coincide with the hours set by State proclamation for the hunting of migratory waterfowl.

HUNTING DOGS: Hunting dogs, not to exceed two per hunter, may be used for purposes of hunting or retrieving.

CLOSED AREA: Do not enter the closed area of the refuge for any purpose, including the retrieving of wounded waterfowl. Open and closed areas are fully posted. Signs are for your information and guidance. **PLEASE OBSERVE THEM.**

FIRES: No fires of any type, except those in self-contained stoves in campers, trailers, or tents will be permitted within the refuge.

SAFETY WARNING: Hunters are warned to be on the alert for "boggy" areas and deep abrupt channels. Please be **very** careful.

WHEN IN DOUBT AS TO ANY REGULATION, CONTACT A REFUGE OFFICER

It is our desire to prevent violations rather than to prosecute violators. Please respect the privileges of other hunters who may be hunting in close proximity to you. Please handle firearms carefully, for your own protection as well as your fellow hunters. The cooperation of all sportsmen is respectfully requested.

U.S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

RF6-65510-6

GPO 854-738

Reprinted 1980

MONTE VISTA NATIONAL WILDLIFE REFUGE
HUNTING MAP

TO MONTE VISTA

STATE HIGHWAY 15

TO MONTE VISTA 5 MILES

Vista Canal

Creek

Empire Canal

COUNTY LINE ROAD

CLOSED AREA

REFUGE FIELD HEADQUARTERS

PUBLIC HUNTING AREA

SWITCH ROAD

CLOSED AREA

CLOSED AREA

Spring

Trout

CLOSED AREA

1 2 3 4 5 6

8 MILE ROAD SOUTH

TO ALAMOSA 10 MILES

N

0 1/2 1 2

SCALE IN MILES

LEGEND

- 4 — HUNTER PARKING AREAS
- PUBLIC HUNTING AREA
- REFUGE LANDS CLOSED TO ALL HUNTING
- REFUGE BOUNDARY
- ROADS (PAVED)
- ROADS (UNPAVED)

REGULATIONS COVERING THE HUNTING OF DUCK, GOOSE, COOT, MERGANSER, DOVE, SNIPE, RABBIT, and PHEASANT at the MONTE VISTA NATIONAL WILDLIFE REFUGE MONTE VISTA, COLORADO

Hunting on the refuge will be permitted only during the waterfowl season as set by State and Federal regulations. During this period the following birds and animals may be hunted on the refuge if the State season for a given bird or animal is open: Duck, goose, coot, merganser, dove, snipe, rabbit and pheasant.

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U.S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

RF6-65560-6

GPO 856-039

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