ALAMOSA
NATIONAL WILDLIFE REFUGE

Alamosa, Colorado

ANNUAL NARRATIVE REPORT

Calendar Year 1990

Department of the Interior
U.S. Fish and Wildlife Service
National Wildlife Refuge System

REVIEW AND APPROVALS

ALAMOSA NATIONAL WILDLIFE REFUGE

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Calendar Year 1990

Refuge Manager — Date 4/22/91

Associate Manager Review — Date 6/24/91

Regional Office Approval — Date 6/25/91

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 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.

The refuge is 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, abundant cropland, and artesian well flows, the San Luis Valley is an important waterbird 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 NWR averages about 90 days. July and August are usually the only frost-free months. The highest temperature so far recorded was 96 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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A. HIGHLIGHTS

-- Biological control of Canada thistle initiated. Section F.1.

-- Wildlife Extension Program started in the San Luis Valley. Section J.1.

-- Regional Office/Refuge Planning Group tried. Section D.6.

B. CLIMATIC CONDITIONS

The year of 1990 could best be described as a record breaker. January and February started out with temperatures ranging from the mid to high forties during the day and most nights still dipping below zero. Snow was finally received in the San Juan Mountains in January and both refuges ended the month with about one inch of snow on the ground. Only a small amount of snow fell during February and March.

Daytime temperatures were warmer in March and April. A record high of 72 degrees was equalled on April 14. The 30th of April brought a much needed 9 inches of snow and May 1st another 3 inches was recorded. May daytime highs exceeded the normals, but the nights were still cold with many lows at or below freezing.

June through December brought more record-breaking temperatures. In June, strong winds prevailed, several days which equalled or exceeded daytime highs and a record low of 2 degrees was recorded on the 2nd. The month of July was relatively moist following a dry June with 1.86 inches of precipitation received bringing the year-to-date total to 6.06 inches. July also broke a record low with 41 degrees on the 30th. Eight days in August either tied or broke record temperatures, and September did the same on 5 different days. August and September followed July's patterns for precipitation.

October tied only one record high and the first freeze of the year occurred on the 3rd which was the latest date since 1971. There were 26 days in October that were at or below freezing. November set a new record low on the 8th with -4 degrees and there were 29 days with lows at or below freezing. December started with seasonally high temperatures and had four record breaking lows. There were 16 days when temperatures never exceeded freezing and 11 nights were -13 or below. Christmas Eve recorded a low of -33 which was the coldest for the month.

November and December finished the year with several inches of snow. A total of 11.19 inches of precipitation was received for the year. This compares to a normal yearly precipitation of 6 to 7 inches. Snowpack in the San Juan Mountains looks good and the Sangre de Cristo Mountains also were snow covered by the end of the year.

TABLE 1
Temperature and Precipitation for 1990

MONTH	MAXIMUM TEMPERATURE (Fahrenheit)	MINIMUM TEMPERATURE (Fahrenheit)	PRECIPITATION	NORMAL PRECIPITATION	SNOWFALL
JANUARY	50	-25	.62	.27	13.0
FEBRUARY	59	-09	.20	.26	2.5
MARCH	66	04	.43	.36	3.4
APRIL	72	19	1.72	.50	9.2
MAY	78	22	.78	.70	4.8
JUNE	93	24	.45	.55	0.0
JULY	89	40	1.86	1.23	0.0
AUGUST	87	37	1.28	1.13	0.0
SEPTEMBER	87	33	1.48	.74	0.0
OCTOBER	76	15	.72	.68	0.2
NOVEMBER	59	-04	.90	.35	6.4
DECEMBER	52	-33	.75	.36	9.9
		TOTALS	11.19	7.13	49.4

C. LAND ACQUISITION

1. Fee Title

- Nothing to report.

2. Easements

Ten FMHA properties were inspected for possible conservation easements. Four of the properties were recommended for conservation easements. Two of these properties had conservation easements "recorded" this year.

The Deathrage easement was implemented to protect a beautiful wetland located within a waterway in the W1/2 of the NW1/4 of Section 28, T22S, R51W, Bent County, Colorado. The other easement was implemented to protect an eagle roost owned by Dan Cougar and located in the NW/1/4 of the NE 1/4 Section 17, T41N, R7E, Saguache County, Colorado.

3. Other

Alamosa NWR leases two tracts of land from the State of Colorado. The two tracts, designated Tract 2 and Tract 2a, comprise 611 acres. The proposal to work out some type of agreement with the State to enable these properties to officially become part of the refuge is still pending.

D. PLANNING

1. Master Plan

- Nothing to report.

2. Management Plan

The Annual Water Management Plan was completed. See Section F.2. for a water use summary.

3. Public Participation

- Nothing to report.

4. Compliance with Environmental and Cultural Resource Mandates

- Nothing to report.

5. Research and Investigations

Archuleta, A. - Contaminant issues on the Alamosa-Monte Vista National Wildlife Refuge and relationships to birds. M.S. Thesis, Colorado State Univ., Fort Collins. (Final report due 1991).

Grass Carp - Closed Basin Canal - In 1989 the Bureau of Reclamation proposed the use of grass carp to control aquatic weeds on an experimental basis in a section of the Closed Basin Channel from Baca Lane to the 6 mile South Road. Screens were placed in the channel to isolate this section and prevent the fish from escaping.

In July 1990, 370 triploid grass carp approximately 8 to 10 inches in length were released into the study section. Conclusions from the study are as follows:

1. *The triploid grass carp provided little control of the aquatic macrophytes in the study section of the Franklin Eddy Canal. However, the aquatic weed beds within the study section never became so severe that mechanical removal was needed to deliver water downstream as in previous years. Several speculations as to why the triploid grass carp did not control the aquatic macrophytes can be made, including: 1) the grass carp were stocked late in the season after the aquatic weed bed had already developed fully; 2) the stocking density of grass carp to aquatic weeds was too low to provide adequate control; 3) grass carp are not known to feed heavily upon filamentous algae, which was not only plentiful but covered most of the aquatic macrophytes; and 4) some of the grass carp could have escaped therefore the stocking density was lowered to a point where the remaining grass carp could not control the aquatic vegetation. Of these possibilities, the first one, late stocking is the most likely explanation for the poor aquatic weed control.*

2. *Recovery of the triploid grass carp was less than anticipated (36%), and an accountability of 42%. Shocking of the fish was less effective than was hoped for and it is believed that the grass carp became shock smart and learned to avoid the electrical field if they were not captured on the first pass. Also the triploid grass carp were brought to the surface less readily than common carp and because of this factor, it is believed that some of the grass carp were stunned within the electrical field but were unobserved, being in the deeper, more turbid water or hidden from view under the dense filamentous algal mats.*

3. *Most of the triploid grass carp appeared healthy upon recovery, although what seemed to be a high percentage (five percent), had malformed tails. The subsample of triploid grass carp which were weighed and measured had a mean length and weight of 321 mm and 412 gm respectively and a mean condition coefficient of 1.23. This condition evaluation compares well with the grass carp used in a study in Northern Colorado, in which their condition coefficient was figured to be between 1.1 and 1.3 during the three year study period. The mean head width of the triploid grass carp was 40 mm.*

4. *Water temperatures warm rapidly in spring and remain about 14 degrees Celsius for about four months providing a period from the middle of May to the middle of September in which the grass carp should be actively feeding. This temperature regime correlates well with the observed growing season for aquatic weeds in the Franklin Eddy Canal.*

5. *The vertical bar screens which keep the fish within the study area have been in place throughout the winter of 1990/1991. The heated ethylene glycol which is pumped through the hollow bars has provided an effective means of keeping ice from forming on the vertical bar screen and the vegetation trapped by these bars, even when air temperatures in the area reached -38 C during December of 1990.*

Diquat Herbicide Study - Closed Basin Channel

In 1989 the Bureau of Reclamation initiated a study on the "Safety and Efficacy of the Herbicide Diquat Used to Control Aquatic Weeds in the Franklin Eddy Canal" (FEC).

Since the canal runs through the refuge, we are very concerned with the wildlife/vegetation impacts of any kind of aquatic herbicide. Bureau of Reclamation's conclusions and recommendations are as follows:

No visible toxic effect due to herbicide treatment was observed in any of the wildlife in or around the area. Diquat appeared to decrease the aquatic weed biomass, both aquatic macrophytes and algae, within a few days after treatment. Low dissolved oxygen levels (< 2p/m) were observed 3 and 7 days after treatment. Diquat concentrations of greater than 0.5 p/m were observed in the aquatic plant residues in all treatment areas. The highest residues were found in the aquatic invertebrates, snails, and water boatmen, above 5 p/m and scuds above 3 p/m after a few days. These low dissolved oxygen levels and high

herbicide concentrations appeared to have little acute toxic affect upon the aquatic invertebrates, when comparison of the percent survival of the treated and control organisms was made. The slight decrease in survival of aquatic invertebrates in the treated areas can be attributed to the combination of low dissolved oxygen levels and high herbicide concentration. However, there were likely other factors involved in the decrease. It is likely that mechanical weed control methods would decrease the aquatic invertebrate population as much, if not more than, the decreases observed in this herbicide treatment. Handling of the containers which housed the invertebrates posed no turbidity problems during their removal, inspection, and return to the canal; and therefore, no herbicide deactivation because of turbidity was suspected.

It does not appear that chemical control of aquatic weeds using the herbicide, Diquat, would harm the environment any more than mechanical control methods do. Also, since diquat did provide some efficacy, a higher concentration of herbicide may provide better and quicker control, and this could be accomplished and still be applied in accordance with the herbicide label. Currently many, if not most, of the aquatic weed problems are caused by algae, and a herbicide program addressing this problem should be investigated more closely. A biological weed control program, which would be more compatible with the delicate environmental issues of concern in the FEC, should be considered.

The Bureau of Reclamation is presently using a sickle bar cutter to control aquatic weed growth in the Closed Basin Channel. Grass carp and herbicides are being considered for future control.

6/5/90 SSB

6. Other

In December, refuge and regional office personnel met to initiate a team planning process aimed at developing a document less than a master plan but more inclusive than a management plan. The overall process was left very undefined with a goal of seeing if a team effort could develop an acceptable directional document with a minimal amount of time and effort. If the goal is met, the technique may be expanded to other refuges. Adam Misztal, Regional Office Refuges and Wildlife, is facilitating the effort.

Considerable time was spent participating on a planning team headed by Colorado Division of Wildlife to develop a San Luis Valley Waterbird Plan. The plan addresses both the wildlife and water resources in the valley and should be finalized in 1991. Jim Olterman, Colorado Division of Wildlife Regional Biologist, is facilitating the effort.

A San Luis Valley Wetlands Group has been formed with the Bureau of Land Management, Fish and Wildlife Service, Soil Conservation Service, Colorado Division of Wildlife, Colorado Division of Water Resources and private citizens all as members. The group is attempting to coordinate wetland issues and efforts throughout the valley.

Refuge personnel participated in a Colorado Division of Wildlife area meeting regarding recommendations for the 1990 waterfowl hunting season. The meeting definitely helped create a better understanding between our two agencies particularly with regards to our wintering waterfowl dispersal effort.

A meeting was held with Art Hughlett, President of the National Wildlife Refuge Association, Melvin Nail and Pete Bryant (both previous refuge managers) to discuss water issues in the San Luis Valley.

The Bureau of Land Management is considering including the portion of the Rio Grande River running through the refuge as designation for Wild and Scenic. The refuge is opposed to the designation since it may severely restrict our water management. Bureau of Land Management has agreed to delay any action at the present time to enable more information to be gathered.

E. ADMINISTRATION

1. Personnel

The following personnel actions took place for the complex:

1. Stephen S. Berlinger transferred from the Denver Regional Office to the complex as Refuge Manager in March.

2. Anne Morkill was hired as a Biological Technician in July.

3. Frank Dunn, Maintenance Foreman, transferred to Cibola NWR in August.

4. Lucien Martinez, Laborer, resigned in May.

5. David Lucero, Laborer, was hired in June.

6. Adolfo Amaya was promoted from Laborer to Tractor Operator WG-6.

7. Bill McDermith was promoted from a WG-8 to WG-10 Engineering Equipment Operator.

8. Gilbert Lucero, Lloyd McEwen, Raymond Bouma and Adolfo Amaya were converted from temporary intermittent to temporary full-time positions, thus restoring annual and sick leave.

9. Rich Schnaderbeck was given a Special Achievement Award for the excellent job he did in initiating a San Luis Valley Wildlife Extension Program.

10. Lloyd McEwen and Mack Rodgers were given monetary performance awards for Level IV Performance Appraisals. Both men's work was exceptional.

Staff Picture (left to right)

1.	Anne E. Morkill	Wildlife Biologist	GS-0485-5/1	PFT
2.	Steven P. Brock	S. Refuge Oper. Spec.	GS-0485-11/5	PFT
3.	Jackie G. Jones	Refuge Assistant	GS-0303-6/4	PFT
4.	Harvey M. Rodgers	Maintenance Worker	WG-4749-8/3	PFT
5.	Lloyd D. McEwen	Maint. Worker	WG-4749-8/1	03/19/90 - 12/31/90
6.	William O. McDermith	Engineering Equip. Oper.	WG-5916-10/3	PFT
7.	Thomas E. Wartman	Tractor Operator	WG-5705-6/5	PFT
8.	Stephen S. Berlinger	Refuge Manager	GS-0485-12/6	PFT
9.	Richard W. Schnaderbeck	Refuge Oper. Spec.	GS-0485-9/2	PFT
10.	Frankie G. Dunn	Maintenance Foreman	WS-4749-6/5	PFT

(not pictured - transferred 8/90)

(Temporary - Not Picture)

Gilbert E. Lucero	Tractor Operator	WG-5705-6/2	04/09/90 - 08/25/90
Lucien Martinez	Laborer	WG-3502-3/5	05/21/90 - 05/29/90
Adolfo Amaya	Tractor Operator	WG-5705-6/1	04/09/90 - 08/25/90
David R. Lucero, Jr	Laborer	WG-3502-2/1	06/11/90 - 10/20/90
Raymond O. Bouma	Laborer	WG-3502-2/1	04/23/90 - 09/22/90

2. Youth Programs

- Nothing to report.

3. Other Manpower Programs

- Nothing to report.

4. Volunteer Program

Three volunteers assisted in transporting sick or injured raptors to the Pueblo Raptor Rehabilitation Center.

Andrew Schroeder, Student Conservation Association volunteer from Virginia was primarily responsible for biological programs and did an excellent job.

Earl Markley has provided extremely valuable assistance in helping monitor the wintering waterfowl dispersal effort throughout the valley.

Herc Sanchez, working toward Eagle Scout stature, and a few of his fellow Boy Scouts transplanted grass and shrub vegetation to three recently constructed nesting islands.

Herc Sanchez and fellow Boy Scouts transplanted vegetation to newly constructed nesting islands
5/26/90 SSB

5. Funding

Fiscal Year 1990 Complex funding was:

1260 - Refuge O & M	
1261 - Base Operations	$338,000
1262 - Base Maintenance	$150,000
6860 - Expenses for Sales	$ 15,000
9120 - Fire Money	$ 6,000
1120 - Farm Bill/Wildlife Extension	$ 32,000
TOTAL	$511,000

Our imprest fund was increased to $7,000 to help facilitate prompt payment, i.e. non-penalized, of electric bills.

6. Safety

All employees (except Jackie) underwent hearing testing which was followed up with a four hour program by Mark Enill of Intermountain Speech and Hearing explaining test results and future precautions.

Frank Dunn lead a discussion on shop safety focusing on arc welding and acetylene torch use.

The following safety related films were shown:

1) Removing Underground Tanks
2) Safe Tractor Operation

Annual CPR refresher training was held at the Alamosa Office on February 28.

An expanded metal screen was attached on the roll bar of our JD 2440 tractor to prevent debris from striking the operator while rotary mowing.

The complex's last three-wheeler was dismantled with some parts being used to build a 3'x5' trailer to pull behind a four-wheeler.

New cooperative agreements were written with the Monte Vista and Alamosa Rural Fire Departments.

Anne Morkill attended an eight-hour Aircraft Safety training session in Denver.

The public water fountain in the Alamosa office was disconnected due to high arsenic levels in the water.

7. Technical Assistance

Refuge personnel assisted Colorado Division of Wildlife in conducting aerial production and wintering waterfowl counts.

Aerial photos of sandhill cranes taken by Doug Benning (MBMO) were dot-counted by Anne Morkill to help Doug arrive at population figures.

8. Other

Refuge personnel coordinated an effort with Arapaho and Browns Park NWR's and Colorado Division of Wildlife (CDOW) personnel in the northwest, southwest, and northeast regions to discuss law enforcement and other management issues. Scott Hoover, CDOW Northeast Area Wildlife Manager, has agreed to coordinate a similar effort in 1991.

Fish and Wildlife Enhancement personnel working on projects in the San Luis Valley met with refuge personnel to discuss various projects, management practices, and issues pertaining to the valley. Hopefully a more "Service" vs "Division" effort toward all of our work will result.

Getting our Wildlife Extension Program "off the ground" required considerable coordination. Several meetings with County Commissioners, Soil Conservation Service and Agricultural Stabilization and Conservation Service personnel, County Committees, Colorado Division of Wildlife, and the Division of Water Resources all lead to the ground breaking. See Section J.1. for details.

The Service and Bureau of Reclamation (BR) reached agreement on the site and design of BR's construction of an emergency spillway near the end of the Closed Basin Channel.

Berlinger presented a paper "Changes in Agricultural Practices on National Wildlife Refuges in the US Fish and Wildlife Service's Mountain-Prairie Region" at the 52nd Midwest Fish and Wildlife Conference in Minneapolis.

Valley Industries, a local business that employees only handicapped people, has been contracted to clean the Alamosa office once a month for $30 per month.

F. HABITAT MANAGEMENT

1. General

Wetland habitat management is dependent on intensive water management. A complex series of canals and dikes are used to distribute water throughout the refuge. Upland habitat management has used rest-rotation grazing, HRM planned grazing, and prescribed burning to maintain grassland and set meadow vegetation in health and vigorous stands. Noxious weed control has become less dependent on chemical control and relies more on alternative methods such as grazing, insects and mechanical control. One thousand stem-mining Canada thistle weevils were released throughout the refuge. County weed boards were offered to use the refuge as a collection site if the bugs are fruitful and multiply. Farming has also been used on this refuge to provide feed primarily for waterfowl and sandhill cranes.

2. Wetlands

The winter months of 1990 produced very little snowpack in the Rio Grande River watershed in the San Juan Mountains. It appeared that a severe drought would continue from 1989 into 1990 since by February 1, the moisture content of the snow in the San Juans was only 25 percent of the 25 year average. By March 1, this increased to 43 percent, and April 1 was 53 percent of normal. The last few days of April brought very heavy wet snows to the mountains and doubled the snow pack. This resulted in an increase of snow moisture content to 90 percent of normal.

At the Rio Grande Water User's Association annual meeting, it was decided to have ditch irrigation water turned on March 26. This was three weeks earlier than last year. The earlier date was approved based on the expected lower river flows. The Water User's felt that they could make the best use of available water as early as possible. This earlier date allowed the Alamosa NWR to run 312 acre feet of Chicago Ditch water in March which was not done in 1989. This early water along with 873 acre feet of Closed Basin Project water brought refuge wetlands to excellent condition by mid-April. At the request of the Division of Water Resources office due to heavy, wet, late April snowfall, the Chicago Ditch was shut off for about one week. This greatly facilitated Colorado's meeting compact obligations. All other river ditches were also shut off during this period.

Spring run off on the Rio Grande River did not result in any flooding of the Alamosa Refuge. This is the third consecutive year with no flooding. The peak river flows at the Alamosa gauging station occurred on May 10 with 1,250 cfs. This compares with 354 cfs in 1989, 176 cfs in 1988 and 5,130 cfs in 1987. Flows at the gauging station at Del Norte, on which canal allotments are based, peaked at 5,560 cfs on June 5. This compares to 3,540 cfs in 1989, 2,750 cfs in 1988, and 7.436 cfs in 1987. Elephant Butte Reservoir in New Mexico did not spill in 1990 and the Rio Grande River was run on a priority right basis.

River flows provided enough Chicago Ditch water to maintain good brood habitat through June and July. The Colorado Division of Wildlife provided 186 acre feet of water to the New Ditch from August 8-14 and another 148 acre feet between September 20-27. This water, along with Chicago Ditch water and 884 acre feet of Closed Basin Project water, delivered between September 17 and October 9 resulted in excellent fall migration and hunting conditions. Irrigation ditch water was shut off November 1.

The pump plant on the Closed Basin Project was utilized for the first time in 1990. This water provided 189 acre feet of water to start an experimental 30 acre moist soil unit adjacent to the pump station.

A 30 acre moist soil plant unit was developed next to the pumping station on the Closed Basin Channel
5/14/90 SSB

Water delivery for a 30 acre moist soil plant unit was easily provided by pumps and pumping costs paid for by the Bureau of Reclamation. As much as 19 CFS of water can be delivered at one time.

5/14/90 SSB

The Mumm Well was again allowed to run only from April 1 to July 31 and provided 1,379 acre feet of water during this period. This is the third year that flows were not permitted year around due to the District Water Court decision of 1987.

The Alamosa Refuge received a total of 15,611 acre feet of diverted river water, Closed Basin Project water, and artesian well flows in 1990. This is an increase of 1,030 acre feet of the 1989 amount of 14,581 acre feet. (See following tables)

TABLE 2
WATER DELIVERY RECORD 1967 - 1990 ALAMOSA NWR
(ACRE FEET)

YEAR	NEW DITCH	CHICAGO DITCH STEWART	MUMM	ANDREWS	SHEPARD DITCH	COSTILLA DITCH	SAN LUIS DITCH	MUMM WELL	CLOSED BASIN WATER DEL.	TOTAL
1967	4,632	1,996	468	284		1,638	30	1,577		10,625
1968	3,104	2,010	562	238		990	100	2,090		9,094
1969	2,538	1,714	875	152		1,070	170	2,286		8,805
1970	4,904	2,526	830	220	96	1,096	216	1,210		11,098
1971	3,628	2,488	1,144	410	54	418	20	2,130		10,292
1972	2,582	3,560	1,116	298	132	966	24	2,455		11,133
1973	1,816	2,388	2,290	966	126	774	318	2,640		11,317
1974	3,906	6,616	932	1,010	248	392	36	2,580		15,720
1975	492	4,421	864	151	116	1,049	190	2,175		9,458
1976	4,686	6,726	914	150	224	896	174	2,500		16,270
1977	2,664	3,020	100	104	40	192		2,072		8,822
1978	512	3,238	174	594	62	74	19	2,900		7,573
1979	3,514	5,612	1,116	376	120	1,032	253	2,100		14,123
1980	3,716	2,068	1,922	670	13	775	244	3,434		12,842
1981	1,504	7,800	248	812	16	353	54	3,395		14,182
1982	415	6,521	3,056	460	4	511	106	3,190		14,263
1983	3,027	4,316	566	328	12	1,559	186	3,242		13,236
1984	645	6,864	428	508	794	1,042	266	3,540		15,061
1985	4,206	4,189	806	978	150	1,125	185	3,550		15,189
1986	2,334	7,892	1,032	419	210	1,772	219	3,310	2,847	20,035
1987	4,582	4,724				1,654	2,240	2,065	5,320	20,585
1988	6,092	5,430	3,346	460	254	744	28	1,390	3,654	21,498
1989	238	7,180	2,380	832		420	194	1,389	1,948	14,581
1990	1,081	8,910	1,226	646	50	289	84	1,379	1,946	15,611

TABLE 3
ALAMOSA NATIONAL WILDLIFE REFUGE
WATER USAGE AND SOURCES 1990 (ACRE FEET)

MONTH	NEW DITCH	CHICAGO DITCH	COSTILLA DITCH	SHEPARD DITCH	SAN LUIS DITCH	MUMM WELL	CLOSED BASIN MUMM DITCH	DELIVERY CHICAGO DITCH	DELIVERY PUMP STATION	TOTAL
JAN										0
FEB										0
MAR		312						194	584	1,090
APR		1560				330	24	71	30	2,015
MAY	85	1286	139		22	12	354		44	1,942
JUN	146	1502	150	28	72	342			19	2,259
JUL		1504				353				1,857
AUG	*186	1602								1,788
SEP		1588				271	271	42		2,142
OCT	*148	1458				171	171	54		2,002
NOV	516									516
DEC										0
1990 TOTAL	1081	10,783	289	50	84	1,379	660	1,097	189	5,611
1989 TOTAL	238	10,392	420	0	194	1,389	656	1,292	0	14,581

*Includes Colorado Division of Wildlife water transferred to refuge
Aug. 8-14 163 AF
Sept. 20-27 148 AF

3. Forests

- Nothing to report.

4. Croplands

The farm fields located on the north-central edge of the refuge were reduced in size in 1990. Due to poor productivity of this land only 41 acres were planted to Triumph variety barley. The remaining 40 acres were seeded to native grassland mixture. No crop yield measurements were taken but this field generally yields about 30 bushels of barley per acre. Approximately 1,200 bushels of grain were produced in 1990.

This cropland remains important to refuge wildlife. Very little small grain is produced on private lands in this portion of Alamosa County. This field lies adjacent to the refuge entrance road and provides refuge visitors one of the best opportunities to view wildlife on the refuge. This field is commonly used by 2,000 ducks, 750 geese, 300 sandhill cranes, pheasants and 70 mule deer. In 1991, the extension program will aim at trying to get some food left on 44 quarters of land under center pivot irrigation lying southeast of the refuge.

5. Grasslands

- Nothing to report.

6. Other Habitats

- Nothing to report.

7. Grazing

The grazing program is used to maintain healthy, vigorous plant communities. Two grazing systems have been utilized. The traditional grazing program, involving one grazing unit this year, is a dormant season grazing which generally occurs in late fall through mid-winter. This grazing program required the permittee to graze through one of three separate grazing units on a three year cycle with a goal of removing as much vegetation and plant litter within the unit as possible. Any litter left following dormant season grazing is often prescribed burned. The dormant season grazing program has been generally successful in maintaining vigorous stands of vegetative cover; however, invasion by noxious weeds and especially giant whitetop is occurring, indicating an instability of plant communities. In an effort to control noxious weeds while at the same time increasing plant community health and diversity, a summer season HRM program was initiated in 1987 on Alamosa NWR and has since been expanded to two permittees in 1990.

The grazing fee charged was $7.10 per AUM resulting in $8.87 per month for cow/calf pairs, and $5.32 per month for yearlings. This was a $.60 per AUM increase over 1989 and is based on the 1989 fall beef prices. Grazing fees under the planned grazing were reduced by $1 per AUM to off-set additional time and effort spent to install and maintain electric fence and for repeated cattle movements.

Two grazing units on the Alamosa NWR comprising about two-thirds of the refuge are now being grazed under the HRM philosophy. The goal of this program is to provide high quality vegetative cover which will be attractive to wildlife and in particular nesting waterfowl while still tending towards overall plant diversity and stability. Following several seasons of this grazing management the vegetation looks healthier, with the once extensive heavy plant litter layer reduced to less than one inch. This has generally allowed the soil to warm earlier and has provided an earlier spring green-up by about two weeks.

The reduction of litter has resulted in the establishment of many more seedlings, both grass and forb. The general appearance of the entire area looks healthier than the non-grazed area.

Waterfowl nesting was monitored again this year. Nest success and densities were projected from 20 nests located during a late May nest dragging operation. A total of 433 acres were searched equally divided between grazed and ungrazed. Mayfield nest success averaged 19.8 percent in the Mestas grazing unit compared to 53.3 percent in the ungrazed area. Nest density was 2.7 nests per 100 acres in the grazed area and 6.5 nests per 100 acres in the ungrazed area. A complete discussion of this study can be found in Section G.3.

The grazing schemes were modified again this year in an effort to improve nesting cover and yet try to reach the goal of healthier vegetative stands. Every other paddock in the Mestas grazing cell was not grazed after July 15 and the herd was reduced from 1,200 yearlings to 600 yearlings after August 1. All cattle were removed August 15, which was two weeks earlier than the previous year. Two paddocks of the Lillpop grazing cell were totally rested with no grazing this year and one paddock was not grazed after July 15. These changes will provide more residual nesting cover for the 1991 nesting season.

The Bagwell-Sowards' grazing permit was issued for approximately 800 acres located west of the Closed Basin Channel. This unit was grazed in the traditional winter season, from October 31 through January 17, with 400 cows.

The refuge staff assisted with a one day Holistic Resource Management grazing course on May 9 sponsored by the Colorado State University Extension Service. This course was attended by about 25 local ranchers. An afternoon tour of the Lillpop and Mestas grazing units on Alamosa Refuge was included in the program.

TABLE 4
Alamosa NWR Grazing, 1990-1991

PERMITTEE	AUMS	ACRES	TIME PERIOD	FEE
Sowards	1,038	800	Oct. 31 - Jan. 17	$7,369.80
Lillpop	2,030	1,595	May 01 - Aug. 29	$11,324.50
Mestas	3,733	2,612	May 01 - Aug. 15	$13,895.84
TOTALS	6,801	5,007		$32,590.14

8. Haying

- Nothing to report.

9. Fire Management

- Nothing to report.

10. Pest Control

Herbicide use for controlling noxious weeds was further reduced in 1990. No herbicide was used in grasslands this year. The refuge has implemented a variety of management techniques to curtail the use of herbicides. These include grazing, mowing, and biological control. The most promising alternative appears to be a Holistic Resource Management grazing program aimed at improving plant community health and vigor. Refer to Section F.7 for a complete discussion of this grazing program.

Biological control of Canada Thistle was initiated this year with the introduction of 1,000 stem boring weevils (Ceutorhychus litura) which were released on May 14 on ten individual sites throughout the refuge. Monitoring for population establishment and expected control of thistle will be required in coming years.

Forty acres of barley was sprayed with 1.5 pints of 2,4-D amine per acre for broadleaf weed control.

The northwest corner of Alamosa Refuge lies within the Alamosa County mosquito control district. A permit was issued to the county for application of Bacillius thuringiensis to about 1,000 acres.

11. Water Rights

The most overwhelming water rights controversy in the San Luis Valley this year continues to be the American Water Development Incorporated (AWDI) application for 200,000 acre feet of underground water from below the Baca Ranch located about 25 miles north of the Alamosa Refuge. AWDI first filed an application for ground water rights in Alamosa District Court in 1986. On September 7, 1990 AWDI amended their application to reduce the initial amount of water removed to 60,000 acre feet of ground water under a phase one. Additional pumping would not be allowed without the court's determination that wells, streams, and the Closed Basin Project were adequately protected. This amendment also states that no water would be exported beyond Colorado borders and that 30,000 acre feet will remain in the San Luis Valley for agricultural purposes.

AWDI is a corporation of Canadian and other investors. Board members include former Environmental Protection Agency Director William Ruckelhaus and former Colorado Governor Richard Lamm as well as several former Denver Water Board members. Their basic premise is that there is enough ground water in the aquifers of the San Luis Valley to allow removal of an

initial 60,000 acre feet of water, 30,000 acre feet of which will be pumped to Colorado's front range communities at a market value believed to be about $5,000 per acre foot. If the court then determines that existing wells are safeguarded, then AWDI would increase removal to 200,000 acre feet of water annually.

The U.S. Department of Justice has filed as objector to this project and agencies including the Fish and Wildlife Service, Bureau of Land Management, Bureau of Reclamation and the National Park Service are all very concerned about the possible effects of AWDI's project. In early November the Department of Justice hired Hydrosphere Consulting to assist as an expert witness. On December 14, Refuge Manager Berlinger met with Department of Justice Attorney John Hill Jr. to prepare for court depositions in January. This court case is scheduled to begin in October of 1991.

A total of 1,948 acre feet of Closed Basin Project mitigation water was delivered this year. This was the full allotment of water scheduled for 1990.

The Colorado Division of Wildlife provided 186 acre feet of water to the New Ditch from August 8 - 14 and an additional 148 acre feet between September 20 - 27.

Refuge Managers Berlinger and Brock met with Division III Engineer of the Colorado Division of Water Resources, Steve Vandiver, to discuss a temporary substitute supply plan for the Mumm Well on the Alamosa Refuge. The refuge is requesting the right to run this large warm water artesian well at times which are not within our decreed period of April 1 - July 31. The refuge agreed to augment with other sources of water ten percent of any flows with exceed our decreed right. The final verbiage of this temporary substitute supply plan is still in the negotiation process as of the end of December. Final agreement will provide for much improved water management opportunities from this 5.3 cfs well.

12. Wilderness and Special Areas

- Nothing to report.

13. WPA Easement Monitoring

- Nothing to report.

G. WILDLIFE

1. Wildlife Diversity

Current refuge management programs created diverse habitats in various successional stages that were utilized by a variety of wildlife species. For example: moist soil management provided feeding areas for shorebirds as well as waterfowl; grazing provided open feeding areas for browsers, such as geese and cranes; dense nesting cover plots provided cover for pheasant and songbirds; and upland habitats benefited a variety of small mammals and birds.

2. Endangered and/or Threatened Species

Three federally endangered species used the Alamosa National Wildlife Refuge: bald eagle, peregrine falcon, and whooping crane. Greater sandhill cranes, a species of special concern, also used the refuge and are discussed in conjunction with whooping crane use.

Eagles - Bald eagle use occurred from mid-November through March. Two adult bald eagles were counted during the Mid-winter Bald Eagle Survey conducted January 12, 1990. Peak use occurred in early March when 50 eagles were observed feeding on winter-killed carp. Golden eagles were occasionally observed along Hansen's Bluff.

Peregrine Falcon - Two peregrine falcon sightings were recorded in April and June, respectively.

Whooping Crane - Researchers with the whooping crane cross-fostering experiment continued attempts to encourage pair bonds between whooping cranes by capturing females and placing them in males' territories at Grays Lake National Wildlife Refuge during the summer. While they have observed a number of associations between sexes and even parental behavior, no breeding has yet occurred.

Spring - The combination of sufficient food sources and mild winter weather in 1989-90 in New Mexico encouraged many cranes to remain on their winter grounds until early March. All 13 whooping cranes (9 males, 4 females) were accounted for in the San Luis Valley by March 12. One or more whooping cranes were present in the valley between February 22 and April 8.

Whooping crane and sandhill crane use of the Alamosa National Wildlife Refuge greatly adds to overall diversity. The first flock of migrant sandhill cranes was observed in the valley on February 8, while the majority arrived March 2-12. Approximately 500 sandhill cranes roosted on the Refuge during spring migration. One whooping crane was observed the past year, during spring migration.

Fall - Twelve whooping cranes were accounted for in the San Luis Valley by early November (a female captured on the nesting grounds was held at Grays Lake). The first whooping crane in the valley was observed on October 2, and the last confirmed observation of a whooping crane was on November 24. No whooping cranes were observed on the Alamosa Refuge during fall migration. Sandhill cranes roosting in the fall numbered as many as 1,000.

3. Waterfowl

Population Surveys - The year began with few waterfowl present, with only 250 Canada geese and 50 mallards, concentrated on a small open water area at the Mumm well. The remainder of refuge wetlands and the Rio Grande River were frozen. Early migrant flocks of pintail and green-wing teal arrived in mid-February, and waterfowl numbers increased to an estimated 1,000 geese and 2,000 ducks. Waterfowl populations peaked in late March with an estimated 11,000 ducks. By May, most migrants had moved north and approximately 7,500 ducks and 500 geese remained for the nesting season.

Fifty-eight out of 72 elevated goose nesting structures were used in 1990. Of those 58 nests, 47 hatched for a success rate of 81%. Given an average brood size of 4.2, an estimated 197 goslings were produced to flight stage from geese nesting in elevated structures. Duck nesting and production will be detailed in the next sub-section.

By late summer, many waterfowl moved off the refuge to molt elsewhere in the valley, and the refuge population dropped to 6,000 ducks and 400 geese. While many wetlands had dried through the summer, we refilled many wetlands for migrant use. Fall waterfowl populations peaked in October at 10,000 ducks and 500 geese. Few waterfowl remained by mid-November as wetlands began to freeze for the winter. An estimated 450 geese roosted along open portions of the Rio Grande River, and as many as 350 ducks concentrated on a small open water area at the Mumm well by the end of the year.

Nesting Studies - We continued our efforts to study waterfowl nesting to estimate waterfowl production and compare nesting parameters in grazed and ungrazed areas. A total of 432 acres (215 ac ungrazed, 217 ac grazed) was searched for nests during May 21-31 by flushing hens off nests with a 110-foot cable pulled between two ATVs. Nest fate was checked by early July. Nest parameters studied were waterfowl species, egg incubation, distance to standing water, nest vegetation, aerial cover, and nest fate.

During searches in May, 20 waterfowl nests were located on 432 acres of nesting habitat. We did not conduct additional searches in June due to limited manpower; consequently, we adjusted 1990's figures according to the proportion of nests found in May (48%) and June (52%) of 1989. Therefore, given a potential of 22 additional nests, we projected a total of 42 nests and a density of 9.7 nests/100 ac on 432 ac of nesting habitat.

Since the searched area closely resembled grazed and ungrazed proportions (50:50) of the entire refuge, density and nest success figures are projected for the total area of available nesting habitat, estimated at 9018 ac. Also note that both Mayfield and apparent nest success are reported here, which allows for comparison to previous years' waterfowl production estimates based solely on apparent nest success. In recent years, researchers have found that the apparent estimator of nest success may be severely biased, because unsuccessful nests are less likely to be found than are successful nests. Therefore, we have adopted the Mayfield estimator which accounts for both successful and unsuccessful nests.

Overall Mayfield nest success was 45% (apparent 58%) and density of successful nests averaged 4.4/100 ac (apparent 5.6/100 ac). The average brood size of observed Class IIc and III ducklings was 5.81. Total production in 1990 was estimated at 2,289 ducks (apparent 2,951 ducks) produced to flight stage.

A comparison of grazed and ungrazed areas indicated that waterfowl production was significantly reduced in the Mestas grazing unit, as in previous years. Mayfield nest success averaged only 19.8% (apparent 33%) in the grazed area, compared to 53.3% (apparent 64%) in the ungrazed area. Nest density averaged 2.7 nests/100 ac in the grazed area, compared to 6.5 nests/100 ac in the ungrazed area. Number of successful nests based on Mayfield was 0.5 nests/100 ac (apparent 1/100 ac) in the grazed area, compared to 3.5 nests/100 ac (apparent 4/100 ac) in the ungrazed area. The current grazing system in the Mestas unit is designed to control giant whitetop and has resulted in limited residual cover available for nesting habitat. Mature whitetop is an extremely aggressive, noxious weed that out competes more desirable vegetation types that are preferred by nesting waterfowl, such as baltic rush. Intensive grazing is currently the best long-term, non-herbicidal means of whitetop control and we hope to further modify the Mestas grazing system to improve vegetative condition and increase waterfowl production.

We detected a difference in the composition of species nesting in the grazed and ungrazed areas. Mallards comprised only 17% of species nesting in the grazed area, while they comprised 50% of species in the ungrazed area. In contrast, blue-wing/cinnamon teal comprised 83% of species nesting in the grazed area, yet comprised only 36% of species in the ungrazed area. Gadwall and shoveler nests equally comprised the remaining 14% of species nesting in the ungrazed area.

We had insufficient data to detect differences in vegetative cover or predators of nests in grazed vs. ungrazed areas; however, no differences were found in 1989. Vegetation selected by waterfowl for nesting cover for both areas combined was 60% baltic rush, 20% grass species, and 20% other. Of 8 nests predated, half were attributable to ravens/magpies, and the remainder were undetermined. Note that, while one should be cautious interpreting such results based on a small sample of 20 nests, these results are very similar to 1989 results (based on 165 nests). A more extensive effort will be undertaken in 1991 to search a larger proportion of the refuge and obtain accurate production figures.

4. Marsh and Waterbirds

A colonial waterbird nesting survey was conducted in July at a large colony located along Larson Dike. By the time of the survey, the colony had been abandoned and many dead young were found. Predation was evident, but whether or not predation caused or followed abandonment was unknown. This colony was first documented in 1989, consisting of 725 nests of white-faced ibis, snowy egret, black-crowned night-heron, and cattle egret.

5. Shorebirds, Gulls, Terns, and Allied Species

Use of the Alamosa National Wildlife Refuge by these species appeared similar to past years. Scheduled drawdowns of wetlands provided mud flats and shallow water feeding areas for shorebirds.

6. Raptors

Raptor use appeared similar to past years. Commonly-observed species included Northern harrier, Great Horned owl, Swainson's hawk, American kestrel, and Red-tailed hawk. Bald eagle, golden eagle, and peregrine falcon information may be found in the Endangered Species section of this report.

We often find or receive injured raptors from throughout the San Luis Valley, which are subsequently transported to the Raptor Center of Pueblo for rehabilitation. The following is a list of raptors transported to the center in 1990 and their current status:

TABLE 5

No. Birds	Species	Status
4	Golden eagle	1 captive, 3 died
1	Great Horned owl	released
4	Swainson's hawk	3 released, 1 died
4	Red-tailed hawk	3 released, 1 captive
1	Northern harrier	released

7. Other Migratory Birds

Two Breeding Bird Surveys (BBS) were conducted in an effort to survey non-waterfowl bird species on or near the refuge. SCA Volunteer Andrew Schroeder recorded a total of 27 species on the Moffat BBS route on July 21, and 23 species on the Alamosa BBS route on July 22. Survey results were similar to previous years. More complete information on BBS results can be found in Refuge files.

Details on Greater sandhill crane use can be found under the Endangered Species section in conjunction with whooping crane use.

8. Game Mammals

The mule deer population increased slightly during the past year. Approximately 90 mule deer spent most of the winter months around barley fields and open meadows on the north end of the refuge. In June, three white-tailed deer were observed along the Rio Grande River, which is the first recorded observation of this species on or near the Refuge.

Elk use is rare; however, three elk were observed at various times on the Refuge throughout the summer.

9. Marine Mammals

- Nothing to report.

10. Other Resident Wildlife

Pheasant numbers remained low despite what appears to be adequate food and cover available on the Refuge. Coyote and rabbit numbers appeared high, perhaps indicating an upward swing in their population cycles. There were few muskrat this year, and we suspect that three consecutive winters with little water resulted in high winter mortality. Beaver numbers were down significantly along the Rio Grande River and other rivers in the valley.

11. Fisheries Resources

No actions were taken in 1990 to control populations of carp.

12. Wildlife Propagation and Stocking

- Nothing to report.

13. Surplus Animal Disposal

- Nothing to report.

14. Scientific Collection

Colorado State University graduate student Andrew Archuleta collected water and duck samples for his study of contaminants on the Alamosa-Monte Vista NWR complex and relationships to birds. This year, he collected 20 adult mallards, 1 American coot, and 1 Canada goose showing physical signs of avian cholera, and 28 mallard eggs (5 from Alamosa).

15. Animal Control

Predator management was conducted to reduce predation on waterfowl nests, thereby increasing waterfowl production. Many other nesting species also benefited from predator management, including pheasant, snipe, avocets, and colonial waterbirds. The predator management program consisted of trapping and shooting of predator species by refuge staff and commerical furbearer trapping. Predator species included raven, magpie, racoon, skunk, feral cat, weasel, and coyote. Beaver were also controlled because they were considered a nuisance species which destroy the few remaining raptor roost trees and create problems with water delivery systems.

Following is a list of animals controlled on the Refuge from October 1989 through March 1990.

TABLE 6

Species	Commercial Fur Trapping	Refuge Staff Shot	Refuge Staff Trapped	Total
Magpie		11	12	23
Raccoon	20	5	10	35
Coyote	1	10	1	12
Skunk	37	8	15	50
Cat		1		1
Beaver	27	7		34
Weasel	1			1
				155

16. Marking and Banding

- Nothing to report.

17. Disease Prevention and Control

Despite the avian cholera epizootic on Monte Vista National Wildlife Refuge during the winter of 1989-90, no dead or sick birds were found on Alamosa National Wildlife Refuge during the same period.

H. PUBLIC USE

1. General

Public visitation keeps increasing on Alamosa National Wildlife Refuge. The office/visitor contact station was rearranged and some doors removed to create a more open area. Public use of Alamosa NWR has increased almost two-fold since the River Road has been open to more activities.

Maurice Wright and Sheri Fetherman visited the refuge and provided some good ideas.

A sign designating Alamosa as "Open During Daylight Hours Only" was erected and the the word "Refuge" was added to Bluff Overlook directional signs along with the mileage to the overlook.

A new complex leaflet was sent to the Regional Office for printing.

2. Outdoor Classrooms - Students

The demand for guided school tours and other environmental education activities increased from 1989. During the spring of the year when whooping and sandhill cranes are present, the demand for tours exceeded what we could accommodate so some school groups were encouraged to take their own tours utilizing the auto tour route on Monte Vista NWR and the hiking trail on Alamosa NWR.

3. Outdoor Classrooms - Teachers

- Nothing to report.

4. Interpretive Foot Trails

Use of the interpretive trails on Alamosa NWR has increased by over 50%. Approximately 750 visitors used the trail in 1990 resulting in approximately 938 activity hours. Most of the aforementioned visitors are from the local commuting area.

The Rio Grande Birding Trail, running west from the refuge headquarters, was abandoned this spring and allowed to grow back to natural vegetation. The trail traversed the Chicago ditch bank and offered a far-from-scenic view of the refuge residence, shop and bone yard.

The River Road Walk which utilizes an existing refuge service road was expanded to allow travel for 3 miles along the Rio Grande River. New activities were permitted and visitors may now hike, bicycle, horseback ride and cross-country ski on the trail. This has received quite a positive response from the public.

5. Interpretive Tour Routes

- Nothing to report.

6. Interpretive Exhibits/Demonstrations

The interpretive exhibits at Alamosa NWR were originally on display at Bear River MBR, and consist of wall panels which interpret bird behavior, flight, and adaptation for living with water. The exhibits feature a bird sound booth and several wood carvings. The two exhibits targeted for the young visitor, Kids Corner exhibit and the touch table, remain the most popular among everyone, young and old alike.

A new interpretive panel was erected at the Bluff Overlook this spring. The exhibit gives a brief explanation of what visitors are seeing from the bluff.

A fiberglass interpretive panel was erected
at the Bluff Overlook
7/6/90 SSB

7. Other Interpretive Programs

Refuge staff participated in the 7th annual Crane Festival sponsored by the Monte Vista Chamber of Commerce. Refuge Manager Berlinger, Assistant Managers Brock and Schnaderbeck, Colorado Division of Wildlife and Soil Conservation Service employees conducted nine bus tours during the festival. These tours gave participants a chance to observe whooping cranes, sandhill cranes, bald eagles and waterbird species on Monte Vista Refuge and private lands. Refuge Assistant Jones and Assistant Manager Schnaderbeck planned and set up the information booth at the festival. The portable exhibit "National Wildlife Refuge System" was used as a backdrop and a borrowed copy of "Flight of the Whooping Crane" was set up on continuous play for viewing by crane festival participants.

Alamosa Refuge still does not have the demand for guided tours that Monte Vista does; however, more and more groups including area schools, colleges, and private organizations are utilizing the visitor center exhibits, films and videos and are conducting their own self-guided tour down the River Road Walk.

8. Hunting

A portion of Alamosa Refuge is open to hunting. Approximately 80 percent of hunter use is waterfowl oriented while pheasant and rabbit hunting comprise the remaining 20 percent. Six parking lot areas are available to hunters on this each refuge. The majority of all hunters travel a distance of 30 miles or more to hunt on the refuge complex.

Goose hunting in the San Luis Valley was previously by permit only. This year the permit system was eliminated, and a bag limit of 2 geese was put in effect for the 1990 goose season. Of the 49 hunters checked on both refuges during goose season, about 20 geese were taken. The largest contributing factor to poor hunting success for geese was freezing conditions on both refuges and the only open water was around artesian wells, most of which are in areas closed to hunting.

Pheasant hunting activity has dropped significantly the past few years due to low pheasant numbers through the valley. Hunter visits to the refuge complex have declined from 300 visits in 1987, to less than 50 visits in 1990. Estimated number of birds taken have dropped from 240 birds in 1987 to about 20 birds 1989, and about the same in 1990. The average birds per hunter trip afield in 1990 was only 0.4 birds.

Hunting for snipe, mourning dove, cottontail and jackrabbits is permitted 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.

Alamosa Refuge received good water in 1990 and hunter use was up from previous years despite the additional $5 State waterfowl stamp required this year. With the new State stamp, this brought the costs of waterfowl stamps alone to $17. On opening weekend of the first duck season split, 61 hunters were checked and harvest averaged 1.5 birds. On the first day of the season, mallards and teal each totalled 36% of the birds taken. On the second day, teal out numbered mallards 54% to 24%.

By the beginning of the second split of duck season, cold weather had set in and freezing conditions which kept a lot of hunters away and the birds began to use the open water on the areas closed to hunting. There were only 11 hunters checked on opening weekend. and .68 ducks per hunter harvested, 67% were teal.

During the third split (December 15 - January 2, 1991) Alamosa Refuge, except for the river, was froze over.

9. Fishing

- Nothing to report.

10. Trapping

Recreational trapping is not permitted. For an explanation of our trapping permit system, see Section G-15.

11. Wildlife Observation

Wildlife observation activities is increasing on the refuge. More and more people are taking the time to stop at Alamosa National Wildlife Refuge and use the Bluff Overlook and River Road Walk to observe the variety of wildlife present during different times of the year.

Spring and fall bring in a large migration of ducks, geese, sandhill cranes and the remaining few cross-foster whooping cranes into the San Luis Valley. Summertime offers visitors the chance to see a wide variety of waterbirds along with the summer resident ducks and geese.

In the winter, the San Luis Valley is known for its raptor populations, especially eagles. In past years, as many as 80 bald eagles have been counted on the refuge complex; however, this year due to our dispersal of wintering waterfowl, raptor populations also dispersed throughout the valley. Deer are abundant on Alamosa NWR around the headquarters and refuge farm field and can be seen feeding in the early morning and late evening hours.

12. Other Wildlife Oriented Recreation

Wildlife/Wildland photography is very popular. Peak use on the refuge occurs during spring and fall when sandhill and whooping cranes are migrating through the San Luis Valley. With large numbers of bald and golden eagles using the valley, more and more inquiries for winter photography are being received.

13. Camping

Camping is not permitted on the refuge except in designated hunter parking areas during the waterfowl seasons. These areas are used mainly by hunters from outside the San Luis Valley during the early waterfowl hunting season when weather is conducive to camping. No problems associated with hunters camping in these areas occurred during the year.

14. Picnicking

- Nothing to report.

15. Off-Road Vehicling

No off-road travel of vehicles is allowed. "Vehicle Prohibited" signs are posted where a potential problem exists and seem to help deter traffic from these areas.

16. Other Non-Wildlife Oriented Recreation

- Nothing to report.

17. Law Enforcement

Most law enforcement activity occurs during the waterfowl seasons. At least two refuge officers worked every weekend during the first and second splits of the waterfowl season. Hunting pressure was almost non-existent during the third split of waterfowl season because of freezing conditions on both refuges and only occasional checks were performed during this time.

Three staff members hold law enforcement authority on the complex. These officers attended a 40 hour law enforcement refresher at Marana, Arizona in January and February. A requalification was held for refuge law enforcement officers from Colorado during an interagency meeting with Colorado Division of Wildlife in Glenwood Springs in August.

Refuge officers received State Law Enforcement credentials from Colorado Division of Wildlife in November. Refuge officers assisted Colorado Division of Wildlife in working one of their deer decoy stakeouts during the fall where seven citations were written amounting to over $2500 in fines. One deer decoy stakeout was performed on Alamosa Refuge by Refuge officers assisted by Larry Krisl (GMA) after spotlighting activity was reported; however, no violations occurred.

Refuge officers also participated in night qualification with valley Colorado Division of Wildlife officers. Qualifying by camp fire light only was interesting but prior to dark we all shot a "dueling tree" competition. Needless to say, officers shooting semiauto's easily won the competition.

Three violations were written during the 1990 waterfowl hunting seasons. Two for excess daily bag limits, and one for taking geese without a state waterfowl stamp. Each violations carries a $100 fine.

The U.S. Magistrate position in Monte Vista was eliminated and the Magistrate from Durango will now be handling our area. The new Magistrate, David West, met with Refuge and U.S. Forest Service officers to layout the courts philosophy. The meeting was an excellent exchange of information we were very impressed with Mr. West.

Three violations were written during the 1990 waterfowl hunting seasons. Two for excess daily bag limits, and one for taking geese without a state waterfowl stamp. Each violations carries a $100 fine.

18. Cooperating Associations

- Nothing to report.

19. Concessions

- Nothing to report.

I. EQUIPMENT AND FACILITIES

1. New Construction

A. Pipe gates were installed across the River Road and Mumm Well access roads.

B. The Bluff Overlook display was erected.

C. Structure (missile tube) allowing Chicago Ditch water to flow into New Ditch east of Closed Basin Channel installed.

A water control structure was installed between the Chicago and New Ditch ditches to facilitate water management

5/10/90 SSB

D. Aerial photo displays erected at office.

E. Two and one-half miles of high tensile steel electric fence erected.

F. Thirty acre moist soil plant unit constructed near Closed Basin Pump Station.

G. New Hunter Parking Area #1 constructed.

New Hunter Parking Area #1, complete with trees and a 2" artesian well.
2/21/91 SSB

2. Rehabilitation

A. River Road was shaped and bladed.

B. Lowery dike road was shaped and bladed. Bids let for 5,000 cubic yards of gravel from Monte Vista pit.

C. 1-1/4" stem/bearing installed on Chicago Ditch headgate.

D. Office visitor area opened up and conference room established.

E. Andrews lift pump to crop fields rebuilt.

3. Major Maintenance

A. Taylor building dismantled

B. Bluff Overlook hunter parking area eliminated.

C. Office solar heating system repaired.

D. Five rigid metal gates installed in Mestas grazing unit.

E. Office roof repaired.

F. Lowery Dike crossing washout repaired.

G. New Ditch dam washout repaired.

The New Ditch Dam, located on the Rio Grande River experienced a 20 foot washout. The dam is unsafe, hazardous, and a general disaster. Replacement costs are estimated at $350,000... so we'll just keep patching this thing together.
7/24/90 SSB

4. Equipment Utilization and Replacement

A. Purchased new 4-wheeler.

B. Purchased grass seeder for 4-wheeler.

C. Purchased self-leveling level, rod, and tripod.

D. Received via transfer from Bosque del Apache NWR a David Brown farm tractor.

E. Received via transfer from Flint Hills NWR a Case Farm Tractor.

F. Received 1970 Allis-Chalmers grader from surplus - Flint Hills NWR arrangement.

G. Received via transfer from Bureau of Reclamation about 15,000 feet of aluminum pipe with fittings and sprinkler heads.

H. Disposed of Little Giant dragline.

I. Disposed of MF-165 tractor and loader.

J. Disposed of 1977 Chevy pickup.

5. Communications

We purchased three portable radios with fire dollars.

6. Computer Systems

We purchased a new Dell 386 computer and monitor, and a new Zenith Supersport 286 laptop computer. Our existing computer was put at the Monte Vista visitor contact station.

7. Energy Conservation

Irvin Oil, Canon city, Colorado is picking up our used oil for recycling.

Paper, cans, and glass are put in recycling bins located at the Loaf-N-Jug in Alamosa.

8. Other

The State Highway Department relocated their sign on Highway 160 to the Alamosa office.

Bill McDermith and Steve Brock attended a water control structure workshop in Las Vegas, New Mexico.

Ernie Husmann, Regional Office Engineering, inspected both the Chicago and New Ditch Dams and estimated replacement cost at $350,000 each. Both structures are unsafe and a hazard to employees and the general public.

J. OTHER ITEMS

1. Cooperative Programs (Wildlife Extension Program)

INTRODUCTION

Implementation of the Wildlife Extension Program in the San Luis Valley (SLV) began April 1,1990. Despite a late start relative to other states in the Region the Wildlife Extension Program in the SLV "hit the ground running" and quickly made up for lost time. By the end of the fiscal year, a total of 30 Wildlife Management Agreements were developed with private landowners

ORGANIZATION AND STAFFING

The Wildlife Extension Program is administered out of the Alamosa National Wildlife Refuge(NWR) office, located 3 miles south and east of Alamosa, Colorado. To date, the Extension Program has been confined to the 5 counties comprising the SLV. Other Farmbill activities such as inspections of possible FMHA conservation easements and Minimal Effect Determinations for SCS have occurred throughout all of southern Colorado.

Refuge Operations Specialist Schnaderbeck, headed up the Extension effort. Project Leader Berlinger, former Farmbill Coordinator for the Region, also played a key role in the development of the program. Schnaderbeck worked on both his normal refuge responsibilities and the Extension Program through most of the year. The addition of Refuge Biologist Morkill to the staff in late July allowed Schnaderbeck to devote most of of his time to the Extension Program.

OBJECTIVES

During the first year of operation in the SLV, the Extension Program focused on exploring what could be done, with whom, and how best to do it. Specific objectives of the Extension program during 1990 were:

1. Introduce the program to local ASCS, and SCS staff in each of the five counties comprising the SLV and establish working relationships with each of those agencies.
2. Reduce the severity of avian cholera epizootics on Monte Vista NWR by providing additional wintering habitat on private lands.
3. Formulate methods to increase waterfowl production on private lands and begin implementing those methods.

We believe the specific objectives listed above were accomplished this past year. We are especially excited with the preliminary results of our attempt to reduce avian cholera losses on Monte Vista NWR. It appears that our efforts to provide additional habitat on private lands have significantly reduced the number of waterfowl lost to avian cholera on

Monte Vista NWR. Obviously, we will have to analyze the program for a few years before we can verify that the program has successfully reduced cholera losses. Getting the birds through this relatively severe winter without any significant cholera losses has certainly been a step in the right direction.

FUNDING

Funding of the Extension Program (1120-6B) for FY 90 was a mere $32,000. We had no problem finding good projects to spend the $32K on and unfortunately had to turn down or postpone many excellent projects. We are hoping for a substantial increase in our FY 91 Extension budget.

After two prospects for $20K of end of the fiscal year Extension funds failed to materialize in mid September, $14,451 of station funds were used to obtain critical habitat for wintering waterfowl. Station funds were used in this unique situation because we felt the few wintering areas secured with Extension funds were simply not enough to adequately test the feasibility of dispersing wintering waterfowl from Monte Vista NWR to wintering habitat on private lands. We considered this winter's dispersal program to be a one-time experiment and felt it was in the best interest of the birds and the refuge to give it our best shot by securing an adequate number of roost and feed areas on private lands. Many of the wintering sites secured at the end of the fiscal year with station funds proved to be some of our best wintering areas. We have no plans of using station funds to supplement the Extension Program in the future.

TECHNICAL ASSISTANCE

Most of the technical assistance provided by refuge staff involved introducing the Extension Program through various presentations to a wide variety of agencies and groups. A listing of presentations follows.

Presentations introducing the Extension Program and emphasizing the importance of wetlands and wetland management on private lands included:

Saguache County ASCS and SCS staff, Project Leader and Private Lands Coordinator, April.

Saguache County Commissioner Meeting, Project Leader, April.

Saguache County ASCS Board of Directors, Private Lands Coordinator, May.

Rio Grande County ASCS and SCS staff, Project Leader and Private Lands Coordinator, April.

Rio Grande County ASCS Board of Directors, Private Lands Coordinator, June.

Rio Grande County Commissioner Meeting, Project Leader, May.

Conejos County ASCS and SCS staff, Project Leader and Private Lands Coordinator, May.

Alamosa County ASCS and SCS staff, Project Leader and Private Lands Coordinator, May.

Alamosa County Commissioner Meeting, Project Leader, May.

Costilla County ASCS and SCS staff, Project Leader and Private Lands Coordinator, June.

Costilla County Commissioner Meeting, Project Leader, May.

Colorado Division of Water Resources, Project Leader and Private Lands Coordinator, April.

Colorado Division of Wildlife Staff, Project Leader and Private Lands Coordinator, June.

The Extension Program received good coverage by local newspapers and radio stations. These media and crop insurance agents proved to be especially helpful in getting the word out about our hail damage program. Colorado Rancher and Farmer Magazine also published an article which generated a lot of interest.

Refuge staff also advised SCS on one Minimal Effect Determination involving the placement of fill in a seasonal wetland. A total of 10 FMHA properties were evaluated for possible conservation easements. An additional 4 contaminant surveys were also completed for FMHA conservation easements.

WETLANDS

High priority was given to wetland projects this year. Wetland projects accounted for 46% of the Extension budget and it appears wetland projects will comprise an even greater proportion of the budget in the coming years.

We expect excellent production from our wetland projects since all of our projects involve a dependable, annual source of water. This guaranteed water ensures that our projects will not be devastated by cycles of drought and consequently be productive for each year of the agreement. When the permanent nature of our wetlands is combined with expected apparent nest success of 30-50%, one can appreciate the production potential of SLV Extension projects.

We also used the Extension Program to create more wintering wetland habitat on private lands. Formerly 95% of the mallards wintering int the SLV have crowded onto the Monte Vista NWR where annual epizootics of avian cholera have killed between 1,500 to 15,000 mallards in recent years. Refuge staff believe that cholera epizootics on Monte Vista NWR are related to overcrowding.

Many of the wintering wetlands created by the Extension Program received considerable use by wintering waterfowl. Consequently, the number of waterfowl wintering on the Monte Vista NWR was reduced dramatically. It

appears that cholera losses on both private and refuge lands will be less than 250 this winter. This is an obvious and significant reduction compared to epizootics of previous years and we are optimistic that we can achieve similar results in future years.

TABLE 7
SUMMARY OF FY 90 WETLAND PROJECTS

Project Type	Basins	Wetland Acres	Cost	Cost/Acre
Wetland Restoration	11	24.1	$1446	$60.12
Wetland Creation	12	135.0	$9093	$67.35
Wetland Management	51	148.0	$4074	$3.55
Wintering Wetland	23	33.5	$4500	$134.33
Nesting Structures	*16	-	$720	-
TOTAL	97	1340.6	$19833	$14.26

*Not included in the total

Wetland Restoration

A typical SLV wetland before the dike is repaired and cattle fenced out with Extension Funds
12/90 RWS

Due to the topography and local farming practices of the SLV, few wetlands have been drained relative to other parts of the nation. Since the SLV receives only 6-8 inches of precipitation per year, wetlands are highly valued sources of hay and pasture land that support the SLV's large livestock industry. Many of our wetland restorations involve plugging holes in existing dikes or replacing dilapidated water control structures. Farmers and ranchers are usually eager to restore drained wetlands but hesitant to restrict haying and grazing. All agreements involving wetland restoration specify that at least one half of the restored wetland/wet meadow be managed as nesting cover and not be grazed, hayed or manipulated in any form. All of the agreements involving restored wetlands protected habitat for 6 or more years.

Wetland Creation

During the short first year of the program we were overwhelmed by landowners requesting assistance to create shallow wetlands. Unfortunately, lack of funding forced us to put many of these wetland creation projects on hold.

Landowners constructing dike impounding a
30 acre shallow water wetland
10/90 RWS

Typically, wetlands are created by constructing dikes across drainages or around artesian wells. Since the topography of the SLV is relatively flat, wetland construction usually involves dikes less than 2.5 feet high. All wetland creation projects run for at least 10 years and usually specify that wetlands be held at a consistent water level throughout the nesting season.

Wetland Management

Waterfowl prefer to nest in wet meadow vegetation in the SLV. Most privately owned wetlands in the SLV are hayed during the nesting season and then heavily grazed during the fall and winter seasons. Typical agreements usually involve dividing a wet meadow into two pastures. One pasture is managed for nesting waterfowl by "idling" it for one year while the landowner is allowed to use the other pasture as he sees fit. Use of the pastures is then alternated for the duration of the 10 years covered by the agreement. Ideally we would like to idle nesting cover for three years before allowing one year of haying/grazing but unfortunately our payments are well below the cash rent value of the land and few landowners can afford such an economic loss.

Wintering Wetland

Avian cholera has become a serious threat to mallards wintering on the Monte Vista NWR. During the past 4 years, an average of 6,500 mallards have been lost annually. We used the Extension Program to provide additional wintering wetlands on private land in hopes of reducing overcrowding and cholera losses on Monte Vista NWR. Wintering wetland habitat secured with the program included both drain ditches and wetlands which were kept ice-free by the flow from warm water artesian wells. In addition to maintaining an open water area for roosting waterfowl, landowners were also required to close the area to trespass. This action was taken to prevent hunters from hazing birds off of wintering wetlands. The Service provided the landowners signs closing the area to trespass.

Some of the 5,000 mallards which utilized this wintering wetland created through the Extension Program
12/90 RWS

News releases explaining our efforts to increase wintering habitat on private lands and our reasons for closing the areas to trespass resulted in general public support of the program. Since our payments were well below average, we feel the majority of landowners participating in the wintering program did so because they wanted to "help the birds out". A few complaints were received from hunters who wished to hunt the wintering areas but the vast majority of hunters supported the program. Only 3 of the 400+ "Closed to Trespass" signs erected on private land were destroyed by vandals.

NESTING STRUCTURES

Sixteen fiberglass nesting tubs for Canada geese were erected on private lands. Since cost of nesting tubs averaged $45/structure, we used them mainly to develop a working relationship with a landowner.

UPLAND PROJECTS

Upland projects comprised 54% of the FY 90 Extension budget. All upland projects were directly associated with wetland projects. Most of the upland projects focused on securing some form of feed in close proximity to our wintering wetlands. In most cases, landowners were paid not to plow under barley stubble which contained large amounts of waste grain. This proved very economical since many of the projects involved fields which were damaged by hail and contained 30-50 bushels/acre of unharvested barley which we obtained for an average price of only $0.28/bushel.

Little emphasis was placed on creating/enhancing upland nesting cover since most waterfowl prefer to nest in wet meadow vegetation in the SLV. Basically, we used upland nesting cover projects to establish a working relationship with landowners who owned wetland habitat we were interested in.

TABLE 8
SUMMARY OF FY 90 UPLAND PROJECTS

Project Type	# of Projects	Acres	Cost	Cost/Acre
Prevent Plowing of Hail Damaged Crops	9	1011	$11482	$11.36
Prevent Plowing of Barley Stubble	4	375	$1190	$3.17
Purchase Standing Grain	5	55	$9178	$166.87
Establish Nesting Cover	2	20	$217	$10.83
Delayed Haying of Alfalfa	1	80	$480	$6.00
Total	21	1541	$22547	$14.63

Prevent Plowing of Hail Damaged Crops

Wintering waterfowl utilizing a hail damaged barley field obtained through the Extension Program
12/90 RWS

Hail frequently damages small grain crops in the SLV. Insurance agents in the SLV estimate that approximately 20% of their clients experience hail damage to their crops annually. Normally farmers plow under hail damaged crops which unfortunately eliminates waterfowl use of this valuable and extensive food source. We paid farmers to postpone plowing of these fields so that waterfowl could utilize the waste grain throughout the winter. The amount of feed knocked to the ground by hail and available to feeding waterfowl in these field was considerable. Waste grain present on our projects averaged between 30-50 bushels/acre. A few of our projects which experienced 100% hail damage, actually had 110 bushels of waste grain/acre available to feeding waterfowl. Eight of the 9 hail damage projects experienced heavy use by ducks, geese, and cranes. Whooping cranes were observed feeding on 4 of the 9 hail damage projects. To insure use by wintering waterfowl all projects were closed to trespass with signs provided by the Extension program.

Prevent Plowing of Barley Stubble

We used this project in areas where we had secured wintering wetland habitat but could not secure feed with the hail damage projects. Landowners were paid to postpone the plowing under of small grain stubble until spring. These areas were also closed to trespass to insure use by wintering waterfowl. These projects were usually combined with the standing grain projects listed below.

Some of the 40 bushels/acre of barley the Extension Program saved from the plow for wintering waterfowl
10/90 RWS

Purchase Standing Grain

Small acreage of standing grain were purchased in areas where feed could not be secured with hail damage projects. Typical agreements consisted of 3 to 6 acres of standing grain located within 80+ acres of stubble. The grain was left standing to provide feed in the event that heavy snows temporally prevented birds from feeding in stubble. Since standing grain purchases proved to be expensive; they were only used when we felt it was absolutely necessary. Hopefully the purchase of standing grain will not have to play a major role our future efforts to provide additional wintering habitat.

Establish Nesting Cover

Since waterfowl prefer to nest in wet meadow vegetation in the SLV, very little effort was placed on upland nesting cover. Only two agreements involved establishing upland nesting cover and both of these were used to help open the door to agreements involving wetland habitat.

Delayed Haying of Alfalfa

Low priority was given to the delayed haying project. Although some waterfowl nests have been documented in stands of alfalfa in the SLV, we feel nest densities are just too low to justify a $6.00/acre investment. Like the nesting cover project we used delayed haying agreements to get our foot in the door.

2. Other Economic Uses

- Nothing to report.

3. Items of Interest

- Nothing to report.

4. Credits

-- Refuge Assistant Jones wrote sections B and H, and also typed and assembled the entire report.

-- Refuge Manager Berlinger wrote Sections A, D, E, and I.

-- Supervisory Refuge Operation Specialist Brock wrote Section F.

-- Refuge Operations Specialist Schnaderbeck wrote Sections C and J.

-- Wildlife Biologist Morkill wrote Section G.

K. FEEDBACK

We were required this year to write separate Narrative Reports for the Complex. While the redundancy that has to appear in each i.e. funding, personnel, etc. is of some concern, my major concern is that a very fragmented picture of what we are doing will be portrayed. Readers of either narrative can only be left with a piece-meal view of our operation.

Our total emphasis has been on looking at how all of our programs can complement San Luis Valley resources as viewed from a "whole". Maybe one report written in the context of "San Luis Valley Resources as Complemented by Refuges and Wildlife Programs" would be more representative, understandable, meaningful (and holistic) of our efforts?

Mountains, marshes, and deserts
- A San Luis Valley Perspective
4/1/90 SSB

ALAMOSA-
MONTE VISTA
NATIONAL WILDLIFE REFUGE
COMPLEX

VALLEY SANCTUARIES

The San Luis Valley originally was Ute Territory, intermittently raided by Comanches. Called the "Blue Sky People" by other Indians, the Utes found an abundance of elk, deer, antelope, small game, and waterfowl in the Valley. Earliest written evidence of white men in the San Luis Valley is from the records of Diego de Vargas written in 1694. The most prominent explorer in the Valley was Lt. Zebulon Pike. His winter trip through the Valley probably passed through the present refuge, at that time, Spanish territory. At the conclusion of the Mexican War in 1848, the Valley changed ownership and became American territory. Soon mines, ranches, farms, railroads, and towns spotted the Valley and surrounding mountains.

As large numbers of people eased into the Valley, wildlife began to decrease. The Migratory Bird Conservation Commission realized the urgent need for a place for wildlife and particularly waterfowl in the Valley. Monte Vista National Wildlife Refuge was created in 1953 and Alamosa National Wildlife Refuge was established in 1962. In 1979 these two were combined administratively into the Alamosa-Monte Vista National Wildlife Refuge Complex, which is administered as part of the National Wildlife Refuge System by the U.S. Fish and Wildlife Service. The major program of the complex is marsh and water management to provide nesting, feeding, and resting areas for migratory birds. Other programs such as farming and grazing are used to provide food, cover, and production habitat for a variety of wildlife.

Canada Geese over Alamosa Refuge. Photo by K. Olson, USFWS.

A VITAL ELEMENT

The life blood of the Valley, and more specifically of the refuge complex, is water. When it is in short supply, as in a drought year, migrating birds may pass by in search of wetter areas. Local nesting birds may fail to nest. Rainfall averages only 8 inches annually. But snowpack in the Sangre de Cristo Range to the east and the San Juan Mountains to the west rescues the Valley by feeding the Rio Grande and other streams, and by replenishing the underground water table that is tapped through artesian and pumped wells. In the 1880's there was a "ditch boom" in the Valley. Irrigation canals fanned out from the Rio Grande rendering the valley agriculturally productive. Many of these canals still support the area and the refuge. A unique phenomenon—desert and marshland—coexisted side by side, each with its indigenous ecosystem of plants, insects, and animal life. Alamosa-Monte Vista conserves and builds upon this environment, expanding nesting habitat and providing food and shelter for thousands of migrating and wintering waterfowl.

Sandhills engage in ritual dancing prior to breeding.

Mallard brood. Photo by H. Stuart, USFWS.

LIFE SUPPORTING VEGETATION

These man-created pockets of wetlands with a complex mixture of sedges and rushes provide nesting habitat for pintails, cinnamon teal, mallards, avocets, and other marsh and waterbirds. In the arid uplands of the refuge, greasewood predominates. Its low branches protect rabbits and other small animals. Barley is grown on the refuge supplementing the sometime drought-limited natural food supplies for wildlife. Approximately 1,000 acres out of the 24,587 total acres of the refuge are farmed to provide food for migrating and wintering waterfowl. The ponds also produce several species of pond weeds which ducks favor.

LIVING SIDE BY SIDE

The quiet spring and summer visitor may see the bright snowy egret with his tufted crown and his scrappy, jumping, display antics. Egrets share the marshes with black crowned night herons, avocets, terns, and gulls. Avid waterfowl viewers can see pintails, blue-winged and cinnamon teal, mallards, and other species both during the nesting and migrating seasons. Avocets, common snipe, American bitterns and other shorebirds nest on the refuge and feed on aquatic insects, grasshoppers, and other inhabitants of the transition zone between land and water. Early October brings thousands of sandhill cranes to the refuge and, in their foster care, a few rare whooping cranes making a gallant fight for survival.

As an experiment to help save the vanishing whooping cranes, the U.S. Fish and Wildlife Service

takes whooping crane eggs from nests at their summer home in Wood Buffalo National Park in Canada. Biologists place the eggs in the nests of sandhill cranes at Grays Lake National Wildlife Refuge in Idaho. The sandhill cranes become foster parents for the newly hatched whoopers. The young whoopers follow their sandhill guardians on their migratory journey through the San Luis Valley and on to New Mexico where they winter. Listen for their cries overhead as flocks circle before landing in the fields to feed. Among them you may see some young whoopers who will be partly white-colored in fall and almost pure white in spring. The foster parent program has been in existence since 1975.

In winter, hawks and bald and golden eagles are present. During February and March large concentrations of bald eagles can be observed from the bluffs on the east side of the Alamosa unit. There are mule deer and beaver along the river and pheasant in the brush.

VISITOR OPPORTUNITIES

Monte Vista unit is easily accessible on all weather roads the year round. Once on the refuge, take Avocet Trail, a self-guiding loop drive open from sunrise to sunset during winter, spring, and summer. This pocket of wetlands in a dry desert offers fascinating encounters to the interested visitor. Wildlife enthusiasts, bird watchers, and photographers will find Monte Vista abundant with vitality.

On the Alamosa unit, refuge lands straddle the Rio Grande which flows along the western boundary of the refuge. Old river channels make up several large ponds against the nearby bluffs to the east. There is limited public access to the refuge. Roads are primitive. However, the Bluff Overlook Road is open to the public and offers excellent wildlife viewing from the Bluff Overlook. Motel and restaurant accommodations are found in Alamosa, and commercial campgrounds are located in the vicinity of the towns of Monte Vista and Alamosa. There is no camping permitted on the refuge complex.

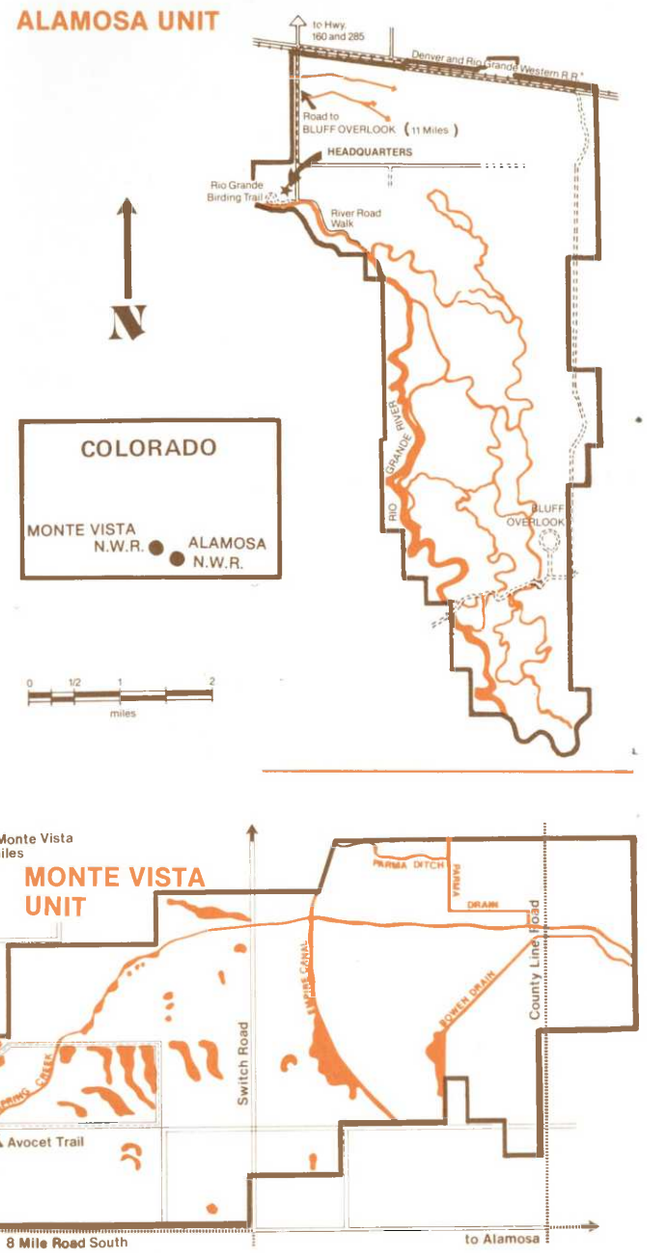
Hunting for waterfowl and upland game is permitted on a portion of the refuge complex only during the waterfowl season and conforms with State and Federal regulations. Hunting information is available from refuge headquarters and in the hunting area.

Headquarters is located on the Alamosa unit 6 miles from the center of Alamosa, 4 miles east on Highway 160 and 2 miles south on El Rancho Lane.

For further information, address the Refuge Manager, Alamosa-Monte Vista National Wildlife Refuge, P.O. Box 1148, Alamosa, CO 81101, (719/589-4021).

Young whooping crane among greater sandhill cranes. Photo by Dr. Rod Drewien.

Children being shown a mallard nest by refuge employee. USFWS photo.



U.S. FISH AND WILDLIFE SERVICE
Department of the Interior

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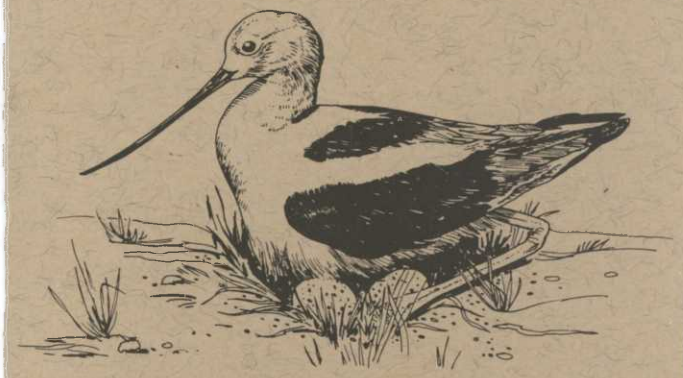
Birds of the Alamosa-Monte Vista

NATIONAL
WILDLIFE
REFUGE
COMPLEX



Alamosa and Monte Vista National Wildlife Refuges are located in the San Luis Valley of south-central Colorado. The San Luis Valley is 50 miles wide and 100 miles long and varies in elevation from 7,500' to 7,800'. The high mountian valley is bordered on the west by the San Juan Mountains and on the east by the Sangre de Cristo Mountains, which have several peaks exceeding 14,000 feet. The high elevation and the fact that the valley is in the rain shadow of the San Juan Mountains produces a climate that is dry and cold. Annual precipitation on the valley floor averages 7 inches per year and temperatures range from −50°F in winter to 90°F in summer. Despite the arid climate, the valley receives abundant streamflow from surrounding mountains and has ample groundwater. Water from these sources is used to grow vast acreages of barley, wheat, potatoes, alfalfa, and to irrigate natural meadows for hay and pasture for large numbers of cattle, horses, and sheep. The refuges use this same water to provide excellent wetland habitat for waterfowl, shorebirds, cranes, and numerous other species. The combination of wetland habitat and grain availability make the San Luis Valley Colorado's best waterfowl producing area and the traditional stopover for the Rocky Mountian greater sandhill crane flock. Since 1975 the endangered whooping cranes have accompanied this flock.

The Alamosa National Wildlife Refuge is located 3 miles southeast of Alamosa, Colorado. The 11,168 acre refuge is composed of natural riverbottom wetland and is bordered on the west by the Rio Grande River. The refuge is dissected by numerous sloughs and oxbows of the river. The refuge provides habitat for numerous waterfowl species, primarily mallards, blue-winged and cinnamon teal and for other dabbling ducks as well as Canada geese. Numerous shore bird and wading bird species breed here such as American avocets, killdeer, common snipe, phalaropes, black-crowned night herons and snowy egrets. Raptors such as marsh hawk and Swainson's hawk breed here; and rough-legged hawks, golden and bald eagles winter here. Cottonwood and willow riparian habitat along the river provide one of the best songbird habitats in the valley.

Monte Vista National Wildlife Refuge is located 6 miles south of Monte Vista, Colorado. The 14,189 acre refuge consists of numerous dikes and ponds which provide excellent waterfowl habitat. The refuge provides the valley's best waterfowl habitat and winters 20,000 ducks. Populations peak during September and October when more than 35,000 ducks are present. The refuge is also a major crane resting and feeding area during fall and spring migrations. Bald and golden eagles are common during winter months and are usually found near concentrations of waterfowl which they feed on.

Both refuges provide numerous opportunities for viewing birdlife. The Monte Vista Refuge offers a 6-mile auto tour route, and several county roads cross through the refuge. The Alamosa Refuge provides two trails along the river for birders interested in walking and a bluff overlook which provides a spectacular view of the refuge. Bird watching is permitted on a walk-in basis from the bluff overlook.

During summer months a light jacket is often necessary during mornings and evenings. Mosquito repellant is useful. Best birding opportunities are during March-May in spring and during September-November in the fall. Numerous opportunities exist for the patient photographer and a telephoto lens is recommended.

EXPLANATION OF SYMBOLS:

Seasons:

S —March-May
S —June-August
F —September-November
W—December-February

Birds nesting on the refuge are preceded by a •.

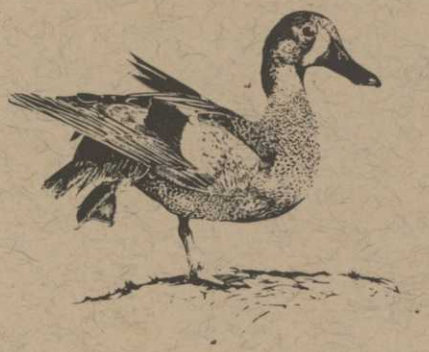
Symbols indicating seasonal abundance of each species are as follows:

a—abundant	certain to be seen, very numerous
c—common	should see in suitable habitat
u—uncommon	might see in suitable habitat
o—occasional	seen only a few times during a season
r —rare	seen at intervals of 2 to 5 years

	S	S	F	W
LOONS				
— Common Loon	o		o	
— Arctic Loon	accidental			
GREBES				
—• Eared Grebe	o	o	o	
—• Western Grebe	o	o		
—• Pied-billed Grebe	c	c	c	
PELICANS				
— American White Pelican	r			
CORMORANTS				
— Double-crested Cormorant	r			
HERONS				
— Great Blue Heron	c	c	c	u
— Little Blue Heron		o		
— Green Heron	o		o	
—• Cattle Egret	o	o	o	
— Common Egret		r		
—• Snowy Egret	c	a	a	
—• Black-crowned Night Heron	c	a	c	r
—• American Bittern	u	u	u	o
— Least Bittern	o	o		
IBISES				
—• White-faced Ibis	c	c	c	
SWANS, GEESE, DUCKS				
— Tundra Swan	r		r	
—• Canada Goose	a	a	a	a
— White-fronted Goose	r		r	r
— Snow/Blue Goose	o		o	o
— Ross' Goose	r		r	r
—• Mallard	a	a	a	a
—• Gadwall	a	a	a	
—• Pintail	a	c	c	c
—• Green-winged Teal	a	a	c	u
—• Blue-winged Teal	c	c	c	
—• Cinnamon Teal	a	a	a	
—• American Wigeon	c	u	u	
—• Northern Shoveler	c	c	u	o
— Wood Duck	r	r	r	r
—• Redhead	c	c	c	
— Ring-necked Duck	u	r	r	
— Canvasback	u	r	r	
— Greater Scaup	r		r	
— Lesser Scaup	c	r	r	
— Common Goldeneye	o		o	r
— Bufflehead	u		o	r
—• Ruddy Duck	c	c	c	r
— Hooded Merganser		r		
— Common Merganser	c		c	
— Red-breasted Merganser	r			
VULTURES				
— Turkey Vulture	u	c	u	
HAWKS, EAGLES				
— Goshawk		r		
— Sharp-shinned Hawk	o		o	
— Cooper's Hawk	o		o	
—• Red-tailed Hawk	o	c	c	u
—• Swainson's Hawk	o	c	c	
— Rough-legged Hawk	o		c	c
— Ferruginous Hawk	r	r	r	r
— Golden Eagle	u	u	u	u
— Bald Eagle	u		c	c
—• Northern Harrier	c	c	c	a
OSPREY				
— Osprey	o	r	r	
FALCONS				
— Prairie Falcon	u	u	u	u
— Peregrine Falcon	r	r	r	r
— Merlin	r	r	r	r
—• American Kestrel	c	c	c	r
PHEASANTS				
—• Ring-necked	a	a	a	a
CRANES				
— Whooping Crane	u		u	
— Sandhill Crane	a	u	a	r
RAILS				
—• Virginia Rail	c	c	o	r
—• Sora	u	c	c	r
— Purple Gallinule	accidental			
— Common Gallinule	accidental			
—• American Coot	a	a	a	
PLOVERS				
—• Killdeer	a	a	u	o
— Black-bellied Plover	r	u	r	
— Semi-palmated Plover		r		
SANDPIPERS				
—• Common Snipe	c	c	c	c
— Long-billed Curlew	o	o	o	
— Whimbrel	accidental			
—• Spotted Sandpiper	c	c	u	
— Solitary Sandpiper	o	o	o	
— Willet	o		o	
— Greater Yellowlegs	u	u	u	
— Lesser Yellowlegs	u	u	u	
— Pectoral Sandpiper	o	o	o	
— Baird's Sandpiper	o	o	o	
— Least Sandpiper	o	o	o	
— Western Sandpiper	u	u	u	
— Sanderling	o	o	o	
— Long-billed Dowitcher	o	u	c	
— Marbled Godwit	o	o	o	
AVOCETS, STILTS				
—• American Avocet	a	a	u	
—• Black-necked Stilt	u	u	o	
PHALAROPES				
—• Wilson's Phalarope	a	c	u	
— Northern Phalarope	accidental			
GULLS, TERNS				
— Ring-billed Gull	u			
— Franklin's Gull	u	u		
— Bonaparte's Gull	accidental			
— Forster's Tern	r			
— Common Tern	r			
— Least Tern	r			
— Caspian Tern	r			
—• Black Tern	u	u	u	
DOVES				
— Band-tailed Pigeon	u	u	u	
— Rock Dove	o	o	o	o
—• Mourning Dove	c	c	a	r
OWLS				
— Barn Owl		r		
—• Great Horned Owl	c	c	c	c
—• Burrowing Owl	r	o	o	
— Long-eared Owl			r	r
—• Short-eared Owl	c	c	c	c

	S	S	F	W
NIGHTJARS				
___ Poor-will			r	
___• Common Nighthawk	u	c	c	
SWIFTS				
___ White-throated Swift	r			
HUMMINGBIRDS				
___ Black-chinned Hummingbird	u	u	u	
___ Broad-tailed Hummingbird		o	r	
___ Rufous Hummingbird		u	u	
KINGFISHERS				
___• Belted Kingfisher	u	u	u	
WOODPECKERS				
___ Red-shafted Flicker	c	c	c	
___ Red-headed Woodpecker		o	r	
___ Lewis' Woodpecker	r			
___ Hairy Woodpecker	u		u	
___ Downy Woodpecker	u	u	u	
FLYCATCHERS				
___ Eastern Kingbird		o	r	
___ Western Kingbird	o	o	o	
___ Cassin's Kingbird	o	o		
___• Say's Phoebe	u	u		
___ Willow Flycatcher	o	o	r	
___• Western Wood Pewee	u	c		
___ Olive-sided Flycatcher			r	
___ Vermillion Flycatcher	accidental			
___ Gray Flycatcher		r		
LARKS				
___• Horned Lark	c	c	c	c
SWALLOWS				
___ Violet-green Swallow	o	c	u	
___• Tree Swallow	c	c	u	
___ Bank Swallow	o	u	u	
___ Rough-winged Swallow	o	o	o	
___• Barn Swallow	c	a	o	
___• Cliff Swallow	c	c	o	
___ Purple Martin	accidental			
MAGPIES, CROWS				
___• Black-billed Magpie	c	a	a	c
___ Common Raven	c	o	o	o
___ Common Crow	c	o	c	u
CHICKADEES				
___ Black-capped Chickadee		u	u	u
___ Mountain Chickadee	o	r	o	o
NUTHATCHES				
___ White-breasted Nuthatch	o	r	o	
WRENS				
___• House Wren	u	u	u	
___• Long-billed Marsh Wren	c	c	o	r
___ Short-billed Marsh Wren	accidental			
___ Rock Wren	r			
THRASHERS				
___ Mockingbird	o	o		
___• Sage Thrasher	c	c	u	
THRUSHES				
___• American Robin	o	c	r	
___ Swainson's Thrush	r			
___ Mountain Bluebird	c	r	o	
___ Western Bluebird	r			

	S	S	F	W
KINGLETS				
___ Ruby-crowned Kinglet	r	r	r	
___ Golden-crowned Kinglet	r	r	r	
PIPITS				
___ Water Pipit	r			
SHRIKES				
___• Loggerhead Shrike	o	o	o	r
STARLINGS				
___• Starling	c	u	o	c
VIREOS				
___ Warbling Vireo	r			
WARBLERS				
___ Yellow Warbler	u	u	o	
___• Yellow-rumped Warbler	c	c	o	
___ Townsend's Warbler			r	
___ Northern Waterthrush	o			
___ MacGillivray's Warbler	accidental			
___• Common Yellowthroat	c	c	u	
___ Wilson's Warbler	u		u	
WEAVER FINCHES				
___• House Sparrow	c	c	c	c
BLACKBIRDS, ORIOLES				
___ Bobolink	o		r	
___• Western Meadowlark	c	c	c	r
___• Yellow-headed Blackbird	c	a	c	r
___• Red-winged Blackbird	c	a	c	r
___• Bullock's Oriole	o	o	o	
___• Brewer's Blackbird	c	c	c	
___ Great-tailed Grackle	o	o		
___• Brown-headed Cowbird	c	c	c	
TANAGERS				
___ Western Tanager		o	o	
FINCHES				
___ Black-headed Grosbeak	o	o		
___ Blue Grosbeak	o	o		
___ Pine Sisken	o	c	c	
___ Cassin's Finch	u	u	u	u
___• House Finch	c	c	c	o
___• American Goldfinch	a	a	c	
___ Lesser Goldfinch	u	u		
___ Green-tailed Towhee	o		o	
___ Rufous-sided Towhee		r		
___ Lark Bunting		o		
___• Savannah Sparrow	c	c	c	
___• Vesper Sparrow	c	c	u	r
___ Chipping Sparrow	u	u		
___ Sage Sparrow	r	r		
___ Lark Sparrow	o	o	o	
___ Cassin's Sparrow		r		
___• Tree Sparrow	r		c	c
___• Brewer's Sparrow	o	u	o	
___• White-crowned Sparrow	c	u	c	o
___ Swamp Sparrow	accidental			
___• Song Sparrow	c	c	c	c
___ Lapland Longspur	r			
___ Dark-eyed Junco	o		c	c
___ Black-throated Sparrow		o		
___ Grasshopper Sparrow		r		
___ Gray-crowned rosy finch				r



As the Nation's principal conservation agency, the Department of the Interior has basic responsibilities for water, fish, wildlife, mineral, land, park, and recreational resources. Indian and Territorial affairs are other major concerns of America's "Department of Natural Resources."

The Department works to assure the wisest choice in managing all our resources so each will make its full contribution to a better United States—now and in the future.

☐ When in doubt as to any refuge regulation, contact a refuge officer.

☐ Where to write for current regulations and information:

Refuge Manager
Alamosa-Monte Vista National
Wildlife Refuge
P.O. Box 1148
Alamosa, Colorado 81101
or call (719) 589-4021

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

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