BOSQUE DEL APACHE NATIONAL WILDLIFE REFUGE
San Antonio, New Mexico

Annual Narrative Report
Calendar Year 1982

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

Includes Esther and Frank Charlesworth Bosque NWR

2, 10, 5, 8, 6, 11, 9, 3, 7

PERSONNEL

1.	Ronald L. Perry	Project Leader	GS-12	PFT	Trans. 9/17/82
2.	Nita M. Fuller	Refuge Manager	GS-11	PFT	
3.	Gary P. Montoya	Assistant Refuge Manager	GS-9	PFT	
4.	Chris Olsen	Outdoor Recreation Planner	GS-9	PFT	Trans. 11/27/82
5.	Michael Hawkes	Complex Biologist	GS-9	PFT	
6.	Eufracio Lucero	Engineering Equip. Operator	WG-10	PFT	
7.	Frank Dunn	Maintenance Worker	WG-7	PFT	EOD 1/24/82
8.	Ernest Trujillo	Engineering Equip. Operator	WG-8	PFT	
9.	William Sipple	Automotive Mechanic	WG-10	PFT	
10.	Esther R. Myers	Refuge Clerk	GS-4	PFT	
11.	Anita Barnes	Office Assistant	GS-5	PFT	
12.	Leslie Talbott	Park Technician	GS-4	CS	Term. 3/6/82
13.	Bob Mumford	Park Technician	GS-4	CS	EOD 10/17/82
14.	Carolyn Boyd	Work Study Student		T	EOD 9/82
15.	Dave Bennett	Assistant Refuge Manager	GS-9	PFT (at CMR NWR)	Trans. 4/23/82

Review and Approvals

William H Hutchinson 4/29/83

Submitted by Date Regional Office Date

BOSQUE DEL APACHE NWR

Refuge

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A. HIGHLIGHTS

Plans for new office/visitor center finally approved in February (see Section I. 1).

Eufracio Lucero completed 40 years of government service on April 18 (Section E.1).

INDEED!

Re-evaluation of housing rates accomplished by Realty (RO) has created some animosity towards the present administration (Section K).

Work on the U. S. Bureau of Reclamation low flow channel has caused most of the sandhill cranes to roost in the river instead of ponds (Section F.2).

Tamsie Cooper, graduate student from the University of Arizona, presented her dissertation on public use at Bosque del Apache National Wildlife Refuge to refuge and regional office personnel (Section H.1).

Construction of new office building began on June 28 (Section I.1).

The visitor center portion of the new office/visitor center complex was approved in September, after a "show me" tour was given to Fred Mohrman, Senator Yates' aide (Section I.1).

The Latin American Refuge Management Seminar group toured the Bosque del Apache NWR on October 21 and 22 (Section J. 2).

National Geographic did some filming of the Bosque Snow Goose Hunt and Bosque Snow Goose Hunter Training Course for a television program on PBS (Section H. 1).

B. CLIMATIC CONDITIONS

Temperatures and amounts of precipitation were about normal this year. We did receive more snow on the refuge this year than in the past few years, although we don't have an accurate total of what we did receive at Bosque.

Table 1. 1982 Weather Summary

Months	Temperatures Extremes Max.	Temperatures Extremes Min.	Temperatures Average Max.	Temperatures Average Min.	Precipitation 1981	Precipitation 1982	Precipitation Avg.
January	68	8	58	25	0.00	0.22	0.30
February	77	14	64	27	0.13	0.83	0.27
March	80	16	71	35	0.43	0.25	0.30
April	88	32	78	43	0.01	0.00	0.34
May	90	32	85	46	0.55	0.40	0.32
June	101	45	94	52	0.00	0.68	0.66
July	100	51	95	62	0.77	0.31	1.36
August	95	54	91	63	1.51	2.74	1.60
September	100	43	87	54	3.13	1.47	1.23
October	92	23	77	37	1.61	0.00	0.83
November	75	20	61	30	0.54	0.00	0.17
December	84	8	54	23	0.00	0.39	0.36
			Total		8.68	7.29	7.74

D. PLANNING

1. Master Plan

The Bosque Master Plan was signed off by the Director in November after a two and a half year planning process. A tremendous amount of refuge staff time was taken up by the process, so it's hopeful that something of positive value will emerge. Hopefully most of the "bugs" will be worked out of the process, so that it won't take two years to Master Plan each refuge.

2. Management Plan

A review of the part of the Public Use Management Plan that was completed was done in May at the regional office. Our dismay was expressed in that the plan was not completed, because of additional money that was required would be taken out of station funds. Originally the plan was being financed by the regional office, but funds somehow were depleted which would require the refuge to pay for the completion of the plan. The refuge had not originally asked for the plan, so it was decided that the refuge could not economically afford to pay for the completion of the plan. Too many other projects had to be funded for completion at the refuge.

3. Public Participation

Nothing to report.

4. Compliance with Environmental Mandates

Nothing to report.

5. Research and Investigations

Bosque del Apache NR82 - "Snow Goose and Sandhill Cranes Effect on Alfalfa Fields"(22520-1-82

In October, twelve (4 meters^2) paired plots were set out in an alfalfa field heavily used by snow geese and sandhill cranes. One plot of each pair was fenced with chicken wire to prevent use by cranes and geese. one meter^2 was harvested from the center of each plot for wet weight and dry weight comparison. There was no sifnificant difference between pairs or between means.

Bosque del Apache NR82 - "Food Habits of Wintering Sandhill Cranes in the Middle Rio Grande Valley of New Mexico" (22520-2-82

Sanford D. Schemnitz, David L. Walker, Department of Fishery and Wildlife Sciences, New Mexico State University, Las Cruces, New Mexico.

Corn was the main food item in the diet of 97 sandhill cranes collected north of Socorro, New Mexico. Plant foods comprised 97.9 percent by volume of the foods eaten. Insects, primarily grasshoppers, were the main animal foods eaten, (2.1%). Alfalfa was found in 17.6 of the cranes collected in alfalfa fields. Corn kernels made up 89.9 percent of the total volume of food eaten while alfalfa leaves and stems totalled 3.0 percent. Crane damage may be serious in some newly planted alfalfa fields. Delayed plowing of corn stubble until after the spring migration of cranes in February is suggested to lessen crane damage in alfalfa fields.

Bosque del Apache NR82 - "Mule Deer Research" (22520-3-82

This project was conducted by the New Mexico Department of Game and Fish, and was divided into three segments.

Segment 1 - Numbers, productivity and age structure of mule deer populations were estimated at the Bosque del Apache study area. Population estimates are from data collected from helicopter and vehicle surveys. The refuge population estimates are 451.01$\pm$44.04 and 456.39$\pm$42.77 in March of 1980 and 1981; thus indicating a stable population size. Productivity rate is defined as the number of individuals in a given cohort per 100 individuals born in that cohort which survive to breeding age, e.g., their second January at about 18 months of age. Productivity rates versus mortality rates at Bosque del Apache indicate a stable or declining population. Sex structure in this unhunted deer population indicates that survival favors females. Indications are that this may be due to chance survival by sex of young fawns prior to six months of age. Attempts to determine coyote population trends and alternate prey species population trends proved to be futile.

Segment 2 - The identification and evaluation of factors influencing mortality and survival of mule deer were studied by monitoring mule deer instrumented with radio telemetry. Radio neck transmitters were used to monitor status of instrumental study animals and to obtain positional data. Vaginal implant telemetry was used to monitor parturition and to assist in the location of newborn fawns.

One hundred thirty-three mule deer (22 adults and 111 newborn fawns) were radio collared on the Bosque del Apache study area and 9 of the pregnant does were implanted with vaginal telemetry during the project years of 1979-1981. Of the 22 adults, 36 percent have died, 5 percent have an unknown status, and 59 percent have survived. Of adult mortality, 50 percent have survived. Of adult mortality, 50 percent was due to predation and 50 percent to non-predation. The 9 vaginal telemetry-implanted does did not assist biologists in locating any fawns. One hundred eleven newborn fawns were captured and collared on Bosque del Apache. Of these 76% have died, 11 percent have an unknown status, and 13 percent have survived. Of fawn mortality, 50 percent was due to predation, 42 percent to non-predation, and 7 percent to unknown causes. Sixty-seven percent of the fawns were dead within the first 3 weeks of life. Positional data was collected from twenty-two individual mule deer.

Segment 3 - Mule deer were collected and sampled for blood cell values, blood chemistry, bacteriology and parasitology. Blood seras were collected to identify antibody levels for bluetongue (BT), epizootic hemorrhagic disease (EHD), and bovine viral diarrhea (BVD). Serum titers indicated high antibody levels for BT and EHD on the Bosque del Apache study area. Tissues from collected and necropsied deer were sampled for viral isolation. No viral agents were isolated from any of these collected deer or their fetuses. In conjunction with the collecting of deer for viral isolation, rumen ingesta samples were collected for crude protein analysis. Crude protein levels were different between seasons and years, thus indicating changes in habitat and food quality. Trace mineral content analysis was also done on blood samples and collected hair samples. Trace minerals varied between seasons and years; however, no minimum values are known for deer reproduction.

E. ADMINISTRATION

1. Personnel

Leslie "Dewey" Talbott was our seasonal park technician for the 1981/82 winter season. Dewey did an excellent job for us that winter. She was a hard worker and very congenial. We received some bad news after she left us and went to work at Glacier National Park. While on a hiking trip in Glacier NP, she and her friends were crossing a very turbulent creek, when she lost her footing and drowned. After having known her and working with her, this was quite a blow to all of us at Bosque.

Eufracio Lucero completed his 40th year of government service in April. He has worked at the Bosque since 1946, first as a maintenance worker, eventually graduating to a WG-10 dragline operator. He has done an excellent job in the past and is continuing to do so. It's amazing how someone can operate a piece of machinery as if it was part of him, but he does it.

Frank Dunn transferred to Bosque on January 24 from Inks Dam NFH. Frank's tranfer here will bring our maintenance personnel level back up to four, still two short of normal levels. Frank has been an excellent addition to our work force. He has some very good qualities that should be put to good use at Bosque.

Dave Bennett, assistant refuge manager at Charles M. Russell NWR, left the Bosque on April 23. Dave was a tremendous help this last winter, especially since Nita Fuller was still detailed to the regional office. He said he enjoyed working here very much, but was looking forward to going back to Montana.

Ron Perry, Project Leader, transferred to Bear River Migratory Bird Refuge in Utah on September 17. While Ron was at Bosque, he did an excellent job. Ron's primary concern was in trying to upgrade our water management system, which is virtually the basis of all management on the refuge. One of Ron's goals in the Service was to be able to go to Bear River Refuge to try and control the carp problem there. Good luck! Ron's first goal in the service was controlling carp!!

Ed

Ron and Ann Perry at his going-away party. 9/82 CMO

John Kiger, Refuge Manager at Sevilleta NWR, took an early retirement on September 17. A retirement and going away party was given to John and Ron for a job well done. John went to the southeast to help sell his father-in-law's farm, which required some "fixing up" before sale.

Bob Mumford came on board as our seasonal park technician in October. He assisted the ORP, until she left in November. After that time, he was in charge of accomplishing most of the ORP's duties, i.e., conducting tours, writing news releases, accomplishing tour loop duties, etc. Bob has had experience as a voulunteer at Arches National Park and has worked for various private businesses and oraganizations as a naturalist.

Chris Olsen, the Outdoor Recreation Planner, transferred to J. N. "Ding" Darling NWR in Florida on November 27. Chris did an outstanding job at Bosque. She was very devoted to her job and virtually upgraded the public use program from almost non-existence to a high, public demand.

Nita Fuller has been detailed to the regional office in November 1981. After serving approximately nine months in the RO, she was finally "pardoned" on August 27. Since Ron was transferring to Bear River Refuge, Nita had to come back to Bosque to assume the project leader position, until a new one could be hired. Nita was promoted to a temporary GS-12 until the new project leader comes on board.

Table 2. Refuge Staffing

	Permanent			
	Full-Time	Part-Time	Temporary	Total
FY82	11	0	3	14
FY81	9	5	1	15
FY80	9	3	3	15
FY79	10	3	1	14
FY78	11	1	2	14

2. Youth Programs

This year we were allotted two Youth Conservation Corps (YCC) enrollees. The enrollees were selected by a random drawing at the Employment Security Office in Socorro where all the applications were received. Out of approximately 15 applications, two boys were drawn for the positions. The two enrollees were doing real good, until two weeks before the program was to end, tren they started getting the "vacation fever". Some of the projects accomplished by the two enrollees were: 1) installing new signs on the tour loop; 2) painting the interior of Quarters #1; 3) trimming trees around the headquarters area; 4) picking up trash along the highway and tour loop; 5) general assistance to maintenance personnel; and 6) trapping gophers on the headquarters lawn.

3. Other Manpower Programs

The refuge farming encompasses approximately 1,300 acres of river bottomland. The farming is accomplished by four cooperative farmers that also have local farms. The farmers share of the farming is 2/3 of the crops and payment of electrical bill for each irrigation well that he uses. The farmer also supplies all of the farming machinery, labor, fertilizer, and seed to be planted. The farmer's share of the crop is planted in alfalfa, while the refuge's share is planted in a grain crop, which will be left standing for the wintering migratory birds. The grain crops planted consist of corn, milo (sorghum), barley, wheat, and rye grass.

4. Volunteers Programs

The volunteer progarm primarily consists of youth groups that utilize the refuge for camping and wildlife/wildlands observation. These groups are usually very receptive in giving assistance to the refuge. The groups usually consist of Boy Scouts, Girl Scouts, 4-H Clubs, and high school classes. This year we also had the Albuquerque Wildlife Federation and the Sandia Mountain Conservation Association do some work for one day. They helped post the new youth camp area with "No Hunting Zone" signs, stain the new redwood tour loop signs, transplant bulrush to a photoblind site, and cleaned up the tour loop. Some of the other projects accomplished by the Scouts, 4-H Clubs, and high school classes were: the cleaning of brush and trees from the north boundary fence, clean-up around headquarters area, pick-up of trash and litter along State Highway 1 and the tour loop, clearing of trails to new campsite areas, straightening and cleaning signs along the tour loop, and transplanting bushes around the north trail pond area.

Albuquerque Boy Scout Troop doing volunteer work on north boundary fence. 11/81 CMO

5. Funding

Bosque was slated for a 6% increase in its total budget over FY81, but instead received a 3% increase. This was due to some costs in the regional office that had to be paid for. So for another year, no major repairs on equipment could be sustained.

Table 3. Funding Subactivity

Fiscal Year	1210	1220	1230	1240	1400
1978	172,000	3,100	0	55,600	58,200
1979	187,000	3,100	400	55,600	56,200
1980	195,000	3,900	500	52,000	55,000
1981	202,000	5,000	0	52,000	55,000
1982	198,100	26,100	3,000	49,500	47,500

Overall our budget increased by approximately 3%, while the cost of inflation was more than that. Even though our visitation increased by approximately 3%, the 1240 funding decreased by approximately 5%. In order to adequately manage and accommodate the general public, additional personnel have to be hired during the winter months, which is our busy time of the year. However, without the money to hire these people, an additional load is put on the existing staff to try and accommodate the public, as well as accomplish their regular duties. The 1400 funding was also decreased by approximately 14%.

Approximately 86% of the station's budget ($279,946.00) was used for salaries for FY82. This left approximately $44,254 to maintain equipment and pay regular operations costs.

6. Safety

On February 6, 1982 the Bosque had a building burn down. The building was the YCC girls' dorm, which was constructed of plywood and 2"X4" lumber. The fire was attributed to an electrical short. The only electricity to the building was a line for some exit lights and an outside circuit for an outside trailer hook-up, that was mounted on the wall of the building. Estimated fire damage was $5,330 for the Service and $3,000 for the University of Idaho. The building was not occupied at the time, so no injuries were sustained.

How come? Part owners?

On May 10, 1982, Bosque sustained a heavy equipment accident without any serious injuries, luckily. Bill Sipple was driving the truck-mounted crane to a location to remove a beaver dam. As he was negotiating a curve to the right, the power steering system locked on him. He tried to stop as soon as he could, but the crane went down an embankment and

Trailer belonged to the Univ. of Idaho. It was completely destroyed.

Remains of YCC girls' dorm and heat damage to truck-mounted crane after the electrical short caused fire.
2/82 CMO

turned over on its top. Bill received minor injuries, but was more disappointed than anything elese because his perfect driving record had been blemished. After we took the power steering stablizer apart, we found a valve that was stuck closed. The crane is a 1950 model that will hopefully be replaced soon.

7. Technical Assistance

Nothing to report.

8. Other Items

Nothing to report.

Wreck of truck-mounted crane after steering cylinder check valve failed. After repairs to cylinder and body, the crane was put back in service. 5/82 CMO

F. HABITAT MANAGEMENT

1. General

Naturally occurring habitat conditions were near normal for 1982; however, artificially maintained habitat conditions were above normal in our farmlands and marshes.

2. Wetlands

Wetland management on Bosque consists of early spring drawdown in late February or early March allowing growth of moist soil vegetation throughout the summer. Mowing of any undesirable vegetation begins in late August and early September. The area is reflooded as the birds begin to show up in mid to late September.

During 1982 a portion of Unit 18A was kept flooded all summer with 4 to 6 inches of water from the sump pump that drains farm Unit 17A. This worked very well in attracting nesting white-faced ibis, black-necked stilts, and other marsh, water and shore birds. Unit 18B was also kept flooded all year to provide a nesting area for waterfowl.

Black-necked stilt, white-faced ibis, and snowy egret using flooded area in Unit 18A. This was the first time that this was left flooded during the summer.
4/82 CMO

The Bureau of Reclamation continued to divert water from the low flow channel into the old river channel just east of our marshes. This prevented us from completely drying up some areas in the marshes due to the extremely high water table. In August and September, it was not uncommon to be mowing in three or four inches of water or to get the dual-wheeled John Deere 4240 tractor stuck in three feet of gumbo marsh mud.

3. Forestlands

The dense stands of salt cedar located between the low flow channel and the refuge marshes were kept flooded all year by the Bureau of Reclamation.

4. Croplands

1982 was the second year in a row for good crop production on the refuge. The lower water tables resulting from last year's drain rehab and diversion projects appear to have been just what the doctor ordered for most of the refuge croplands.

The refuge's laser plane land leveling system was put to work this year with 183 acres of farmland leveled. We tried some different grades to see what works best with our farmers; some fields were leveled at dead level, some at a grade of 0.05 ft./100 ft., and some at a grade of 0.1 ft./100 ft. With our flood type irrigation, it appears as though 0.05 or 0.1 will work best.

Bureau of Reclamation using a "mudcat" to clean silt out of the low-flow channel that runs through the refuge. 8/81 GPM

Contractor for the Bureau of Reclamation putting rock along the sides of the newly dredged low-flow channel. 3/82 CMO

Soil sample results were received from the USDA soils lab in Las Cruces. We have some definite salt and alkalinity problems in several fields. Hopefully, by lowering the water table, we will be able to leach the salts out of some of the croplands.

5. Grasslands

Nothing to report.

6. Other Habitats

Nothing to report.

7. Grazing

Nothing to report.

8. Haying

Nothing to report.

9. Fire Management

There were two small wild fires along the railroad tracks this year. Both fires were caused by flares being thrown from passing trains. Both fires were contained at less than one acre.

Our annual extinguishing of railroad fire, caused by the brakeman trying to do a "controlled" burn for us with his fusee. 3/82 CMO

Controlled burning was carried out along the ditchbanks as usual and we were going to burn the dense stands of cattail in Units 25A and B, but with the above average high water table, we couldn't drain the units sufficiently.

Hard Hat & Nomex Clothing? He wasn't wearing them because he hadn't been to training

Frank Dunn, maintenanceman, doing a controlled burn on cattails around the display pond. 3/82 CMO

10. Pest Control

Most pest control done on the refuge relates to the farming program and is carried out by the cooperative farmers. The major weeds that require intensive control efforts are Johnson grass, kochia, and cocklebur. The herbicides used in control efforts are: 2, 4-D, eptam, atrazine, dowpon C, trifulurin, bladex, karmex, and roundup. The refuge farmers also use diazinon and malathion to control alfalfa weevils and aphids in their alfalfa fields. We don't use any insecticides on the refuge corn, milo or barley fields.

One incident occurred on April 17, 1982, when one of our farmers contracted to have diazinon aerially applied to his alfalfa. The day after spraying (12+ hours), 9 snow geese were killed when they fed in the alfalfa field. Cause of death was confirmed by the Madison Lab. We had two propane exploders placed in the field before the geese arrived, but to no avail.

11. Water Rights

The radial gate for the refuge's new point of diversion on the low flow channel is still not a reality. The Soil Conservation Service drafted the plans and the Bureau of Reclamation is supposed to build it, while we

furnish the funds for materials. Bureau of Reclamation has been short on funding this year so they put it off until next year . . . we'll see.

12. Wilderness and Special Areas

Dave Siegel, the Region II archeologist, came down and showed the refuge staff the locations of all thirteen of the refuge's archeological sites.

13. WPA Easement Monitoring

Nothing to report.

G. WILDLIFE

1. Wildlife Diversity

No new species were observed on the refuge this year. The 1982 Christmas Bird Count totaled 94 species, up 1 from last year.

2. Endangered and/or Threatened Species

Bosque began 1982 with a whooping crane flock numbering 13 individuals. There were 3 mortalities over the spring and summer; 75-1, the oldest remaining bird died when he flew into a barbwire fence, 77-17 was found dead and partially decomposed in a Wyoming farm field, and 1979 Patuxent #2 died of avian tuberculosis at Monte Vista NWR. Seven whooper chicks survived to migrate south in the fall, bringing the total population up to 17 birds. Two of this year's chicks are unmarked, making identification somewhat difficult. Two of the chicks that were located at Monte Vista NWR 82-8 and 82-15 were not seen after that, and may have gone down into Mexico as did 82-13.

The whoopers have still not paired up and attempted to mate.

The first whooper to arrive in the fall was 76-15, affectionately known as "IDA", who arrived on 10/11/82, which is right on the mean arrival date.

This year several of the whoopers were roosting on the river which complicated whooper management during the snow goose hunt. Whoopers flying from the river toward the hunt area have the sun behind them and are virtually impossible to distinguish from sandhills. On several occasions, whoopers were well into the hunt area before refuge personnel spotted them and alerted the hunters.

Bald eagle use peaked at 4, 2 adults and 2 juveniles. Usually we peak at 6 to 8 eagles. A possible cause for the decline is the increased use by the public of the 10 to 3 road. The preferred eagle roosting trees are close enough to the road so that any cars using the road will disturb any eagles in the area.

Pickin' up lead shot?? Steve L.

Whooping cranes and sandhill cranes in Unit 17A probing for chufa and corn. 1/82 GRZ

Someone with some initials on it say 3am Jim

3. Waterfowl

Duck use increased substantially over last year's low levels, with a peak of 14,900 compared to 5,700. The increase can probably be attributed to the extremely cold weather up north pushing more birds down, more production last summer, and drying up of the flooded salt cedar thickets on the south end of the refuge concentrating more birds onto the refuge marshes.

Canada goose use was up 40% over last year, also due to the extreme cold in Colorado and northern New Mexico pushing more birds down to the "Bosque Banana Belt".

Snow goose use totaled 2,654,000 use days, which exceeded our objective of 2,400,000 use days. The snow goose population had fewer juvenile birds this year due to poor production on the Arctic breeding grounds. Evidently we held more snows this year because of an abundant food supply which we were able to dole out during periods of cold, snowy weather.

The snow geese harvest was down considerably over the previous three years. Hunt data is presented in Tables 4 and 5. A lack of juvenile birds was the main cause for the poor hunt success; most of our adult birds have Phd's in surviving the refuge's goose hunt.

Table 4. Goose Harvest by Species

YEAR	CANADA GOOSE	WHITE FRONTED	ROSS' GOOSE	BLUE GOOSE	SNOW GOOSE	TOTAL KILL	% ROSS' GOOSE
1966	365	1	0	0	38	404	0
1967	354	0	8	0	63	425	1.9
1968	214	3	5	1	69	292	1.7
1969	1	0	3	4	73	81	3.7
1970	2	2	11	0	257	272	4.1
1971*	1	0	1	1	150	153	0.7
1972			3	0	47	50	6.0
1973			49	4	385	438	11.1
1974			23	2	303	328	7.0
1975			2	3	209	214	0.9
1976			18	5	691	714	2.5
1977			10	8	346	364	2.8
1978			14	2	424	440	3.2
1979			111	17	578	706	15.7
1980			208	7	587	804**	25.89
1981			130	9	820	959	13.6
1982/83	1***		41	10	411	462	8.9

*Last year that Canada geese and white-fronted geese were legal.

**Includes 2 white geese that were not identified as hunters checked out.

***Illegal, not included in total.

Table 5. 1982/83 Goose Hunt

Hunt	November	December	January	February	Total	
No. Hunters	224(26)	221(26)	221(26)	178(21)	848	
AD Snow	115(64)	99(60)	17(41)	48(65)	279(60)	411(89%)
JV Snow	38(21)	57(34)	17(41)	20(27)	132(29)	
AD Blue	1(0.6)	0	0	2(3)	3(.6)	
JV Blue	0	1(0.6)	2(5)	1(1)	4(.9)	10(2.1%)
UNK Blue	3(1.7)	0	0	0	3(.6)	
AD Ross'	1(0.6)	0	4(10)	3(4)	8(1.7)	
JV Ross'	3(1.7)	0	1(2)	0	4(.9)	41(8.9%)
UNK Ross'	20(11)	9(5.4)	0	0	29(6.3)	
Total Kill	181(39.2)	166(36)	41(9)	74(16)	462	
Shots	707	679	337	521	2244	
Shots/Hunter	3.16	3.07	1.50	2.93	2.65	
Birds/Hunter	0.81	0.75	0.18	0.42	0.54	
Crips/Hunter	0.06	0.1	0.04	0.09	0.07	
Crips/Shot	0.02	0.03	0.03	0.03	0.03	
Crips/Bird Shot	0.1	0.13	0.22	0.22	0.14	
Cripples	17	21	9	16	63	
Birds/Shot	0.26	0.24	0.12	0.14	0.21 = 5 shots/bird	

4. Marsh and Water Birds

Sandhill crane use was about normal, reaching a peak of 11,200 birds in late November, with approximately 70 to 80 percent of them roosting on sandbars in the river instead of their usual roosting areas in Units 18A, B, D, and 24B. Early in the fall cranes were spread throughout the valley feeding on private land and roosting on the river. As they depleted the food supply of waste corn in private landowners fields, they moved on down to the refuge where food was abundant all winter.

White pelicans were quite numerous in August and September reaching a peak of 168 birds. Evidently a good supply of edible size carp in the refuge's Unit 25A marsh was the major attractant.

White faced ibis were also up from previous levels.

GOOD!

Black-necked stilts. 4/82 CMO

5. Shorebirds, Gulls, Terns and Allied Species

Black-necked stilts and American avocets were quite numerous all summer. We kept portions of Unit 18A wet all summer by diverting the outflow from the Unit 17A sump pump into 18A. Several broods were produced by both species this year. Usually only the American avocet nests here in any appreciable numbers.

6. Raptors

Raptor use was up over last year with a large number of red-tailed and Swainson's hawks arriving during the extremely cold periods up north.

We picked up 2 redtails that had secondary lead poisoning. One died and was necropsied by Dr. Bob Lange from the Madison Lab, and he confirmed the cause of death as secondary lead poisoning.

7. Other Migratory Birds

Crows were quite numerous in the fall; the individual running the hunting club on our north boundary got a permit from Law Enforcement to shoot crows that were "disturbing" their hunts.

8. Game Mammals

The 1982 mule deer census was conducted from 11-2-82 to 12-2-82 by Refuge Biologist, Mike Hawkes. Survey results and population estimates are compared in the table below.

Table 6. Mule Deer Survey: Mean Values & Reliability at 95% C.L.

Year	Bucks	Does	Fawns	Total	Fawns/100 does/Bucks
1980	68±9.3	118±24.3	38±2.6	222±31.6	31/100/63
1981	50±13.4	102±16	35±6.4	187±28.5	35/100/49
1982	64±10.22	147±12.7	47±3.5	258±21.3	32/100/44

Table 7. Total Population Estimates at 95% C.L.

	Bucks	Does	Fawns	TOTAL
1980	176-232	281-427	106-122	568-758
1981	110-190	258-354	86-124	475-647
1982	161-223	403-479	130-152	710-838

The refuge deer herd appears to still be increasing even though last year we thought it was decreasing. We located 16 dead deer throughout the year, one road kill and the rest (10 males, 6 females) apparently died of disease. The refuge biologist took two bucks to the Veterinary Diagnostic Lab in Albuquerque for analysis. The first, a sick, yearling, male that was collected had pinkeye, contagious ecthema, enteritis and appeared to have been predisposed by a viral infection, probably blue tongue or EHD. The second, an adult male found dead, had tuberculine pneumonia and enteritis, and was probably predisposed by the same virus as the first.

It appears the male segment of the population is weakened enough by rutting activities that the virus, which appears to be endemic in the herd, becomes severe enough to cause the animals'deaths.

Attempts to positively identify the virus, by the NM Game and Fish Department and the Madison Lab, have been futile.

The refuge's proposed deer hunt, scheduled to begin in 1983, was delayed for at least another year, while the problem gets worse.

Bosque buck in Unit 6. 12/82 GPM

9. Marine Mammals

Nothing to report.

10. Other Resident Wildlife

Long-tailed weasels were quite numerous during the summer months with several sightings throughout the refuge bottomlands.

11. Fishery Resources

Nothing to report.

12. Wildlife Propagation and Stocking

d. They have a French accent? KB
only a taste for Molson beer

Twelve more female Canadian geese were sent to Alberta as part of our Canada goose re-establishment program. These geese are placed with "super broods" of goslings in hopes they will lead their adopted families back to Bosque next winter. This is the second year for the project and we spotted only 1 collared Canada goose last year and 2 this winter. New Mexico Game and Fish Department, sponsors of the project, through federal aid, decided to drop it for next year.

13. Surplus Animal Disposal

Nothing to report.

14. Scientific Collections

Dave Walker from NMSU continued his crane collecting activities from an area north of the refuge. At final count in March he had collected 97 cranes, 75 in 1981 and 21 in 1982. Dave began collecting again in the fall of 1982.

15. Animal Control

Depredation complaints were greatly reduced from last year. The extended snow goose hunt was quite effective in keeping the geese on the refuge.

Seven troublesome beavers were trapped with Conibear instant kill type traps and removed from the refuge. The only trapping done on the refuge at this time is beaver trapping by refuge personnel. Beavers are being controlled because of the damage done by their dams in our drainage ditches. Our water table is approximately 3-4 feet on most of our farmland, so it is essential to keep our drainage ditches clear. Otherwise our crop production would decrease and we would not be able to maintain an adequate food source for the wintering waterfowl and cranes.

Let's face it, a dead beaver is a dead beaver. They die, Let's not be defensive. Before were forced to say "trapped" let's all say "killed"

16. Marking and Banding

The 1982 banding quota was 400 mallards of each set, post season group II. We only banded 241 females and 299 males for a total of 540. The major cause for not reaching the quota was a lack of mallards (2,500 peak) to draw from. Also, once the deer discovered the corn on the banding site, it was impossible to keep them off the area.

17. Disease Prevention and Control

A major (for Bosque) disease outbreak occurred during January when 130 snow geese and 70 Ross' geese died of fowl cholera. The outbreak was not isolated on any one area of the refuge, but seemed to affect geese in the marshes and the farm fields. The geese would fly into a farm field at 7:30 a.m. and when they flew back to the marsh at 10:30 a.m. there would be 5 or 6 dead geese left behind. To help alleviate the problem, all dead geese were picked up and incinerated; the 10 a.m. to 3 p.m. tour road through the marsh was closed to reduce disturbance and stress. A large volume of corn was mown to further reduce stress, and the marshes were flushed out with fresh water to dilute the bacterial concentration. No ducks or cranes were observed to be affected by the disease.

Dead Ross' geese in alfalfa field. Death caused by avian cholera. 2/82 DT

H. PUBLIC USE

1. General

Bosque, as in the past, had a very busy interpretive and recreational program this year. The refuge accommodated 71,280 visitors this year, which is an increase of about 5% over last year. Our major increases, as far as visitors per month, occurred in April (42% increase), September (24% increase), and October (26% increase). The increase in coverage by the television and newspaper medias have steadily increased the number of visitors during the winter months. The large increase was primarily due to the late coverage of the Bosque by the CBS and ABC television networks and the Albuquerque Journal. The coverage was done in February and March, which prompted many people to journey to the Bosque looking for cranes and snow geese in April. Most, if not all, the cranes and snow geese have migrated north by mid-March, which was not brought out in the news coverage.

Jeff Foote and a sound man shot some film at the Bosque for National Geographic. They primarily worked on getting footage of the whooping cranes and the snow goose hunt on the refuge. The intent of the program, to be aired sometime in 1984 or 1985, is to show how the presence of an endangered species will not necessarily disrupt other wildlife management programs.

Tamsie Cooper, a graduate student from the University of Arizona, presented her dissertation about her study on public use on the Bosque del Apache National Wildlife Refuge to refuge and regional office personnel in June. Due to the favorable reaction she got, she was proposing to do a refuge guidebook through the coop association to be sold at the refuge. Her study brought to light many interesting facts about our public use such as: 1) Most people's most memorable experience was being able to go on a scenic drive more than viewing sandhill cranes, snow geese, deer, or whooping cranes (40%). Only 10% thought that the whooping crane was their most memorable experience. Thirty percent thought that seeing sandhill cranes was their most memorable experience. Surprisingly 72% were against paving the tour loop road and 88% disapproved of campground facilities. Another surprise was that 48% of the people interviewed felt that visitor activities had no effect at all on wildlife. The purpose of her study as to examine the visitor perceptions of wildlife on the refuge and to examine the nature of human/wildlife interactions on the refuge. With this information, we will be able to cope better with our increasing public pressure. In the last ten years our annual visitation has increased by 64% from 25,580 to 71,280 visitors.

2. Outdoor Classrooms - Students

Nothing to report.

3. Otdoor Classrooms - Teachers

Nothing to report.

4. Interpretive Foot Trails

Nothing to report.

5. Interpretive Tour Routes

The new directional redwood signs were erected on the tour loop this year by the YCC. These signs were acquired because of the reduction in maintenance necessary for upkeep of them. Our next project will be to get new interpretive signs for the tour loop.

We are also still working on how to eliminate the dust problem on the refuge tour loop, without using asphalt. One suggestion was to mix the gravel on the tour loop with a mixture that would harden into a solid layer. money

chemical, I believe. Requires moisture from the atmosphere to keep it cohesive, so Bosque + Bitter Lake may not be suitable — but it should be tested. fm

6. Interpretive Exhibits/Demonstrations

Nothing to report.

7. Other Interpetive Programs

Nothing to report.

8. Hunting

The snow goose hunt for 1982 had the lowest take (462 geese) since 1978 when only 440 geese were taken. This was primarily due to the decrease in numbers of young that migrated. Last year's take of geese on the Bosque was 959 compared to this year's take of 462, a 52% decrease. A couple of significant changes in the hunt this year were: 1) instead of the three hunt periods in the past (two five-day hunts and one six-day hunt), we went to four 4-day hunt periods. 2) On the last two days of each hunt, the hunting hours were extended from 10:00 a.m. to 11:00 a.m. This year's hunt periods were as follows: November 20-24, December 3-6, January 6-9, and February 4-7. Most of the geese taken occurred in the November hunt (181 geese), while the least number taken occurred in the January hunt (41 geese). The cost of the snow goose hunt this year amounted to approximately $8,828.

Quail, dove, rabbit, and deer (rifle and archery) are still allowed in designated areas, which are primarily comprised of the desert upland areas. Hunting for these speices was considered to be fair to good, but since we don't have a check-in/out procedure, these assumptions are based on contacts made while on patrol.

Table 8. Hunting Visits

Species	Visits				Take				Avg. Take/Hunter			
	82	81	80	79	82	81	80	79	82	81	80	79
Deer (bow)	5	7	*	*	0	0	*	*	0	0	*	*
Deer (rifle)	80	65	*	*	5	3	*	*	.06	.46	*	*
Deer(rifle & bow)	85	72	82	10	5	3	*	*	.06	.46	*	*
Dove	56	49	76	85	125	97	62	263	2.2	1.98	.82	3.1
Rabbit	15	9	15	8	15	4	5	27	1.0	.40	.30	3.4
Quail	90	43	139	18	105	31	96	40	1.2	.72	.69	2.2
Snow Geese	848	854	831	843	462	959	804	706	.55	1.12	.97	.83

*No data available

9. Fishing

Fishing was very poor on the refuge again due to the diversion of the low flow channel. This diversion did not allow the fish to come up through the refuge from Elephant Butte Lake as in past years. In October the diversion dam was removed from the channel and all the water was put back into the low flow channel. This was too late for this year's fishing season, but will hopefully improve next year's season.

Table 9. ANNUAL VISITATION

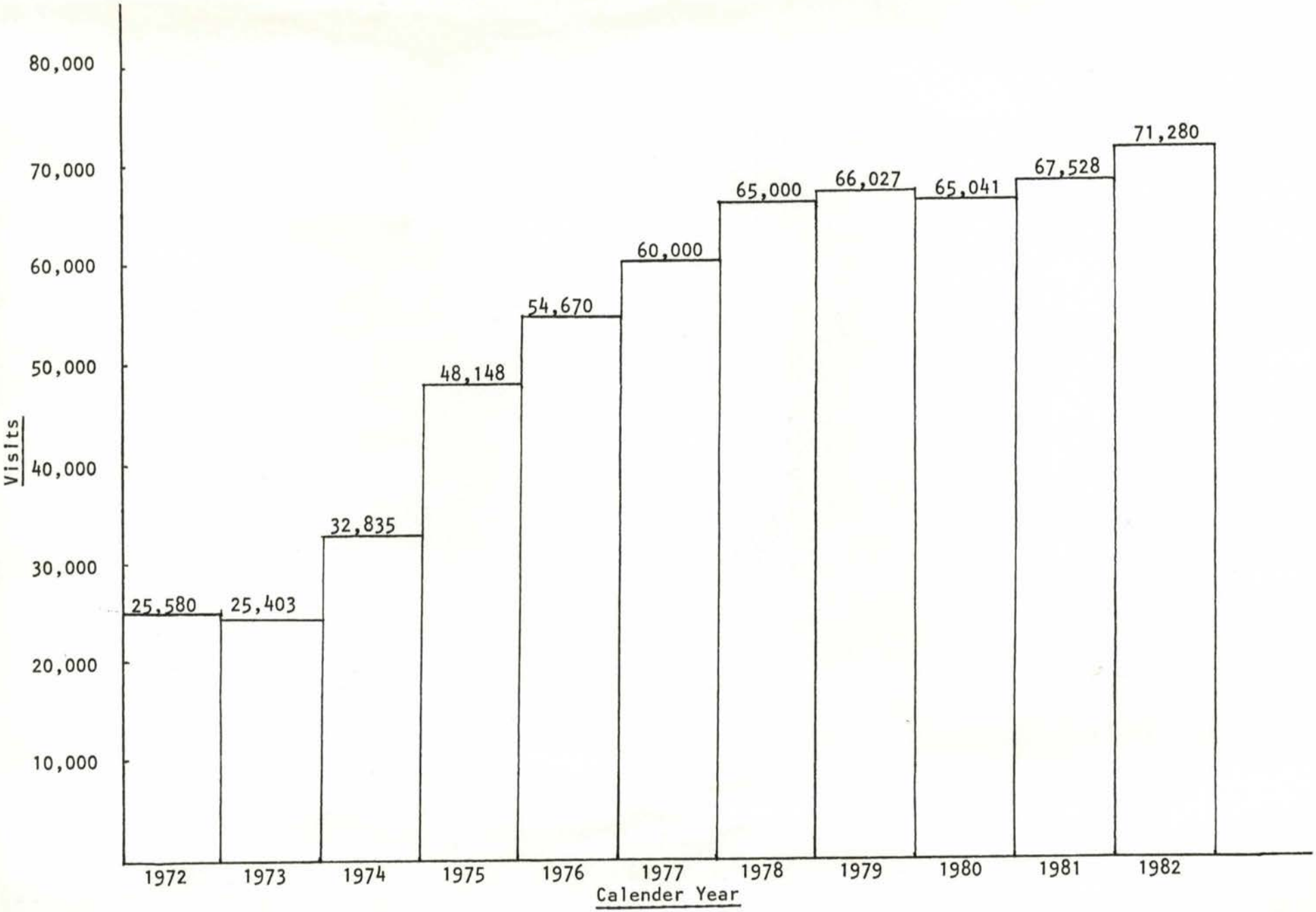
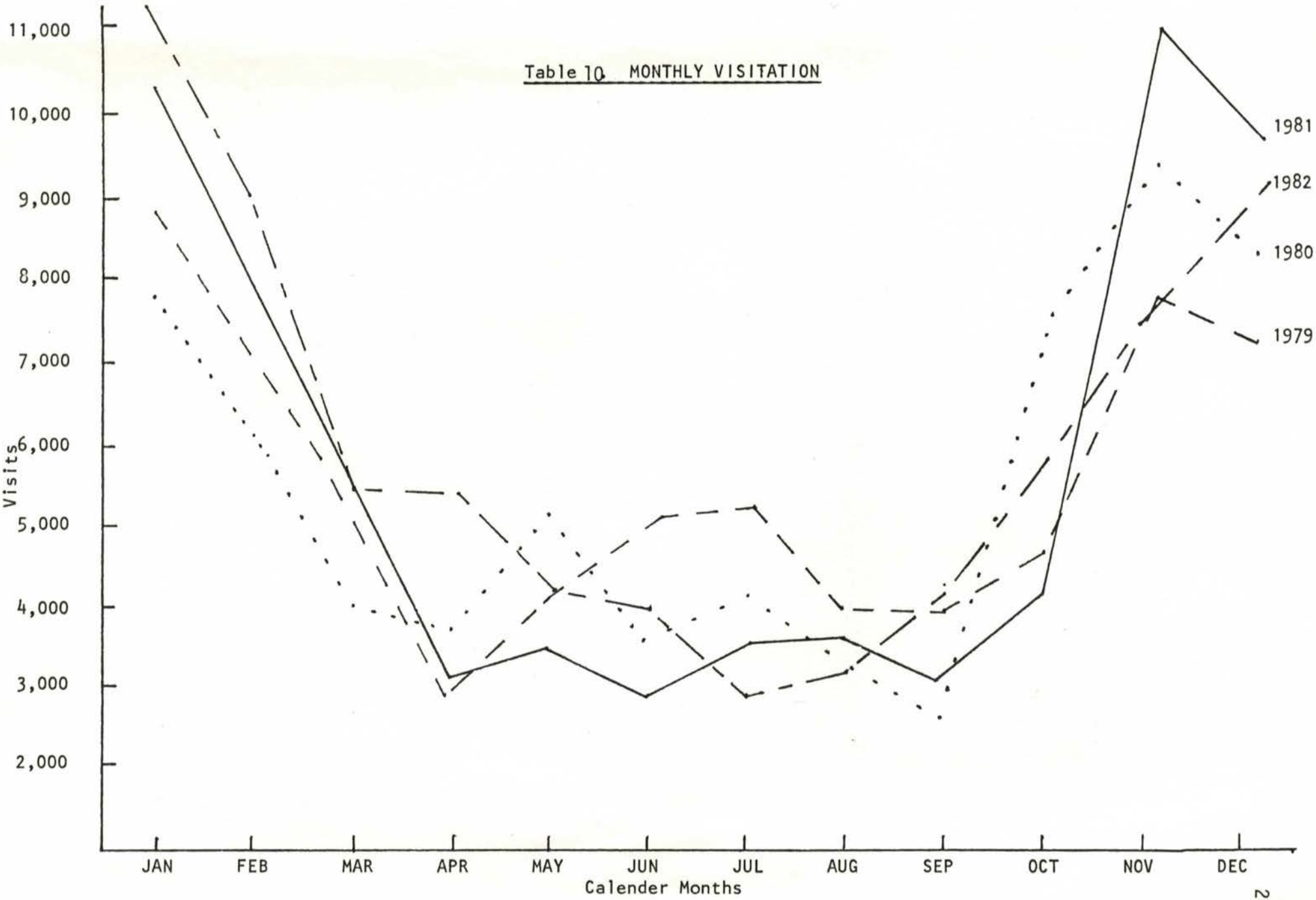


Table 10 MONTHLY VISITATION



We are also trying to dry up our permanent marsh area, so that we can make some improvements, i.e. nesting islands, drainage channel, etc. This has also decreased our fishing pressure for the present, but when explained to the fishermen that our goal is to improve wildlife habitat and our fisheries, then they don't mind. As the water evaporates, the fish are concentrating more in the deeper holes. This has allowed some fishermen to catch some very nice fish, especially large-mouth bass. One family caught about 20 of these bass, each bass averaging about 1½-2 pounds.

10. Trapping

Nothing to report.

11. Wildlife Observation

Most of the wildlife observation done on the refuge is by motorized vehicles. Approximately 19,925 cars drove the tour loop, if not completely, at least in part. This is an average of 55 cars per day, seven days a week. Actually this is not the case. The fact of the matter is that the majority of these vehicles are used on the refuge during the months of October through February approximately 151 days. During those months, there were 13,217 vehicles on the tour loop. This is an average of approximately 87 vehicles per day.

12. Other Wildlife Oriented Recreation

The Albuquerque Retriever Club held their annual Field Trails during the first weekend of April. The field trials were very orderly, with very minor inconveniences occurring for the general public. There was a confrontation between a couple that bird on the refuge on a regular basis and some field trial people. The couple thought that the field trialers were shooting wild ducks. When the fact was explained to them, that pen-raised ducks were being used and some facts about field trial trained dogs being used to fetch downed game birds and waterfowl while hunting, everything smoothed out. Approximately 92 dogs competed in the trials.

Educational youth camping is the only type of camping allowed on the refuge, i.e. Boy Scouts, Girl Scouts, high schools, and universities. This year we had approximately 566 Boy and Girl Scouts from 29 troops, primarily from the Albuquerque area. We had Albuquerque Academy High School come down and do some projects for us (refer to Section E. 4). We also had the Science Club from Silver City High School come to the Bosque and discuss ecological aspects of nature. This year we changed the location of the campsites. This was done because of problems with scout troops going on the tour loop prior to our opening of the tour loop. The old campsites were located inside of our access gate for the tour loop. The new campsites are now located west of the New Mexico State Highway 1 and more specific, west of where the railroad crosses NM1 and north of the headquarters area. There were not as many trees in this area as the old campside area, which was located along the Rio Grande River, but we are hoping to encourage the scouts to do some transplanting of trees to the new campsite area.

13. Camping

Nothing to report.

14. Picnicking

Nothing to report.

15. Off-Road Vehicling

Nothing to report.

16. Other Non-Wildlife Oriented Recreation

Nothing to report.

17. Law Enforcement

Bosque does not have a big, law enforcement problem. Most violations are minor in nature and usually a warning is all that is required.

The worst violation of the refuge this year was when four men were caught bow-hunting on the north end of the refuge tour loop. They had already taken one buck, which was found field dressed and hanging in a tree. The men were cited by the state game and fish warden for illegal hunting of deer on a national wildlife refuge, illegal possession of a deer, and one of them was also cited for hunting without a hunting license. Each man was charged $200/violation and sentenced to 10 days in jail. The judge then reduced the penalties to $100/man and suspended the jail sentence.

Other violations included the illegal taking of a Canada goose, illegal taking of a snowy egret (migratory bird), and illegal trespass on the refuge.

18. Cooperating Associations

Nothing to report.

19. Concessions

Nothing to report.

I. EQUIPMENT AND FACILITIES

1. New Construction

The new office/visitor center building construction got underway on June 28. The contractor was SeeGee Engineering Company, Inc. of Albuquerque, New Mexico. Originally the construction began only on the office part of the

uilding because Congress would not approve funds for the visitor center part of the building. After many talks with New Mexico Congressmen and their staffs, enough concern was generated that provoked Senator Yates aide, Fred Mohrman, to fly out here and inspect the refuge. After a tour of the refuge with Project Leader, Ron Perry, and Primary Assistant, Nita M. Fuller, he appeared very impressed. In fact, he must have been because the funds were then approved for the complete building. In September, construction began on the visitor center part of the building and the auditorium. The building will have approximately 6,800 square feet of usable space, which is quite a bit compared to the 2,250 square feet in the old office. Completion date is slated for the end of January.

2. Rehabilitation

Nothing to report.

3. Major Maintenance

Some major maintenance projects included: 1) installing a sump on the interior drain to include two lo-lift pumps to fill the temporary marsh units; 2) constructing islands in Unit 24B so that it can be used as a brood pond; 3) mowing along drain ditches and roadways; 4) mowing temporary marsh units; 5) land levelling of approximately 200 acres of farmland; 6) up-keep of the tour loop that includes grading, gravelling, etc.; 7) dredging and continual cleaning of beaver dams and weed jams out of the drain ditches and 8) installing drain pipes for marsh units.

Another project which kept a couple of the maintenance men busy was the Bosque snow goose hunt. In order to keep track of the whooping cranes adequately we usually have to use five people. This means we usually have to use at least one maintenance man and sometimes two. Therefore we "lose" approximately 16-32 days of maintenance time on a non-maintenance job.

4. Equipment Utilization and Replacement

Our truck-mounted crane requires some major maintenance that we had contracted out to Rust Tractor, Inc. The maintenance included having a rebuilt engine installed in the crane and new brake bands, clutches, etc. installed. The mechanic at the refuge also installed a new clutch plate, clutch, and throw-out bearing in the truck part of the crane.

Even though we only had to do some major work on one vehicle this year, our vehicles are beginning to show their wear and tear. If we don't start replacing our vehicles now at a rate of one or two a year, we may have to replace three or four at one time, which can get very expensive. Otherwise major rehabilitation expenses may have to be incurred, which may be more expensive in the long run. This year we had to replace a transmission in one of the Datsun trucks. This was at a cost of about $600.

5. Communications System

Nothing to report.

Construction of new office (in background) and visitor center (foreground). 10/82 CMO

East end of new building. 12/82 GPM

Fort (Bosque del) Apache

Installation of new culvert from Unit 18D to the interior drain. 10/82 CMO

6. Energy Conservation

In an effort to improve the energy efficiency in our residences, fireplace inserts were installed and the roofs were sprayed with a foam insulation layer. The office building, carpenter shop, and mechanic's service shop were also sprayed with the foam insulation to conserve energy and help seal out the bats from the carpenter shop.

The fireplace inserts were recommended by a local salesman and former friend. He had expressed how the heat from the inserts would run us out of the house. After experiencing that they didn't run us out of house, we had a dealer from Albuquerque come down to try and figure out the problem. He said that he doesn't even recommend to people to buy the type of inserts we bought because they only increased the efficiency by about 5%. Therefore, we are having to start all over again.

7. Other

Nothing to report.

1. Cooperative Programs

Two special use permits were again issued to Mrs. Lillian Hammack and Berna Johnston for a total of 900 beehives at 30¢/hive.

Refuge personnel were again involved in ground couts of waterfowl and cranes on Bosque in coordination with the New Mexico Department of Game and Fish aerial counts.

In cooperation with the New Mexico Mining and Technology Institute, a work study student was hired to work on weekends to assist the ORP in public use management and to allow the student to earn money so as to continue her education. The student hired this year was Carolyn Boyd, who is studying petroleum engineering.

2. Items of Interest

The Latin American Refuge Management Seminar group toured the Bosque on October 21 and 22. The group consisted of wildlife management people from Spain, Paraguay, Colombia, Honduras, Chile, Brazil, Guatemala, and Peru. There were given a tour of the refuge, involved in a discussion of master planning and introduced to our public use program. They were very interested in wildlife management techniques, but were especially interested in how we manage our public use and our environmental education program. After all the work, they were then treated to a Bosque bar-b-que with Master Chef, Ernie Trujillo, at the helm. Curt Freese was the coordinator and interpreter for the group and did an outstanding job.

3. Credits

The following people should be commended and given a raise for their hard work and diligence in wiring this narrative. Sections A, B, C, D. 1, D. 2, D. 3, D. 4, E, H, I, J, and K were laboriously accomplished by Gary Montoya. Sections D. 5, F and G were easily accomplished by Mike Hawkes.

K. FEEDBACK

The present administration evidently felt that government employees living in government quarters were getting something for nothing. Sometimes you wonder how the people in Washington, D.C. know what's going on out in the field. One thing they evidently didn't realize was the bargain they were getting from some of the people living in government quarters. It's not realized by a lot of people the number of after duty hours that are put in by employees living on-station. Now because of the rental rate increase, these people are going to start putting in for overtime for every little job they do. And you can't blame them, especially since it doesn't seem like anymore money is coming back to the stations so that the quarters can be

maintained or upgraded as necessary. Our houses at Bosque are over 40 years old and are still in good shape. But there is a considerable amount of work to be done on them to make them more energy efficient, as well as ensure that structural problems do not begin to plague us. If we could be appropriated a fair share of funds to work on these houses now, these houses could easily last another 40 years. It has also been suggested that we do away with residences and hire a guard to watch over the headquarters. My suggestion would be to hire a maintenanceman and keep the housing on station. Sure he would have to spend some time working on the houses, but he could also be helping do work in the field. Housing at Bosque allows for better security of the refuge, not to mention "after hours" service to the public and provides a chance for lower grade employees to find housing in an area where it is difficult to find rental housing.